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**RICE LAKE**<sup>®</sup>  
WEIGHING SYSTEMS

# Precision

solutions

800-472-6703

[www.ricelake.com](http://www.ricelake.com)

**2016**

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# Shipping Information

FREIGHT SERVICES OFFERED	"SMALL PACK"	LTL	TRUCK LOAD
Nationwide Same Day Service	Y* ***	Y*	N
Same Day, Counter to Counter***	Y	N	N
Next Day (AM)	Y**	Y**	Y**
Next Day (END OF DAY)	Y	Y**	Y**
2 Day	Y	Y	Y
3 Day	Y	Y	Y
Ground	Y	Y	Y
Canada	Y	Y	Y
Mexico	Y	Y	Y
Express Freight (Air-over 150 lb)***	Y	Y	N
International (Sea)	Y	Y	Y
International (Air)	Y	Y	N

\* Subject to cost/distance

\*\* Subject to distance

\*\*\* Subject to flight availability and proximity of nearest airport

## Same Day Services

These services do not carry the same service guarantees that standard delivery schedules do and are subject to availability

## Small Parcel Services

We ship with internationally recognized parcel carriers based on delivery time and services offered.

## Determining Dimensional Weight for Small Parcel Shipments for Air & Ground

When shipping via air services, couriers require that the shipping weight be determined by the greater of the actual weight of the boxed product or its dimensional shipping weight. The formula for calculating dimensional shipping weight is as follows:

L x W x H/166 for domestic air shipments and L x W x H/139 for international air shipments. Rice Lake Weighing Systems takes the added precaution of double boxing some of our electronic products and balances. This may result in dimensional weight charges by the carrier when shipping by air. Even with this added precaution, we suggest that you always ship high precision and fragile products via air service.

## Less Than Truck Load (LTL)

Full service LTL coverage for the continental United States, Puerto Rico, Canada and Mexico.

Note: A standard LTL delivery is considered to be one that ships from either a company or partner dock to arrival at a standard commercial address with disposition of the goods at the rear of the truck to enable off loading by material handling equipment provided by the consignee at either ground level or via loading dock. Allied to this, the freight in question should be palletized and secured in a way to facilitate the safe handling of the freight with no one dimension over seven feet, six inches.

Any LTL delivery falling outside of this criteria may well accrue accessorial charges levied by the carrier in line with their tariff rules. It is recommended that any potential accessorial cost are discussed at the time of order placement so that these costs can be billed appropriately at the time of shipment. If this is not the case, RLWS reserves the right to charge the customer retrospectively for any accessorial costs incurred during the delivery process.

### Accessorial charges include, but are not limited to the following:

- Lift gate: \$100.00
- Call for appointment: \$40.00
- Guaranteed delivery: Day \$45.00, 10:30 a.m. (where available) \$100.00
- Inside delivery: \$100.00 **NOTE: To inside of first threshold crossed only**
- High cost delivery areas: Excessive length, government sites and mines, re-delivery, re-consignment, residential and restricted access shipments

## Full Truckload

Various truckload providers give us the ability to ship to the contiguous United States, Alaska, Canada and Mexico

## Forwarders (International Freight)

We can provide service through a forwarder of our choice, or select one of your preferred forwarders.

**Air freight:** All of our forwarders are internationally recognized brands

**Ocean freight:** All of our forwarders are internationally recognized brands





# Signed Sealed Delivered... It's yours!

**On average, regardless of carrier, 2% of all freight is damaged in transit. Don't let the delivery person slip away. And don't get left holding the bag.**

Rice Lake merchandise is packaged carefully to arrive at your location on time, intact and in perfect working order. We don't ship damaged goods, and we work with many of the most reputable national carriers. But know this—anytime a package is sent, as many as 2 out of 100 will be mishandled. To be sure your business doesn't take the hit for someone else's mistake—INSPECT before you sign.

Whether or not the product itself has been damaged, remember—your signature accepts the delivery as is, releasing the carrier and supplier of all liability, unless you take action:

- Make note of any damage to the packaging, no matter how slight, including re-packaging, water damage, scratches to paint, etc. Take photos if possible to back up any necessary claims.
- Do not accept or sign for as “unchecked” —this is not an acceptable disclaimer.
- Where damage to contents is obvious, take photos and refuse the shipment.

Notify your supplier immediately with the claim number provided by the driver. Noting the condition of your delivery upon receipt is the only recourse when making a damage claim. Follow these steps and you'll get replacement merchandise faster, keep costs down and ensure the carrier is held responsible for their mistakes; not you, and not your supplier.

**RICE LAKE**<sup>®</sup>  
WEIGHING SYSTEMS

To be the best by every measure<sup>®</sup>

800-472-6703  
[www.ricelake.com](http://www.ricelake.com)

# Trademarks

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Allen-Bradley®	Interchange®	Pioneer™	TekLynx®
Amphenol®	Intercomp CS™	PowerCell®	Toledo®
AstraLabel™	Intercomp PT300DW™	Powerware®	Torque™
AstraLink™	Intercomp PT300™	PreVent™	TRANSCORE®
AutoCal™	IONMASTER™	Prodigy Max™	Trooper®
Beldfoil®	iPAQ™	Prodigy™	Turck®
Bitstream®	ISOBAR®	Profibus®	Valor®
Bluetooth®	ISOBLOK®	ProPrinter®	Voyager®
Cardinal®	JavaPOS™	Quencharc®	Vulcan®
Cent-O-Gram®	LabelView™	Quickbooks®	WinCT®
Centronics®	LifeGuard™	QuickScan®	Windows®
Citizen®	Linux®	QuikSharp™	WinWedge®
ConnexLink™	LoopTracker™	R Stahl®	Xscale®
ControlNet®	Lotus™	Ranger™	XTend-PKG™
Conxall®	Maxi-Scoop™	Rapid Exchange®	Zebra®
CRS™	MaxWax™	Rockwell Automation®	ZigBee™
Cubis®	Microline®	Roman and Swiss™	ZPL®
Datalogic QuickScan®	Microsoft®	S4M™	
Datamax-O'Neil®	Midrics®	Sartorius®	
DeviceNet™	MIFARE®	Satorious®	
Dial-O-Gram®	Mobile 5.0™	Scout Pro®	
DIGI®	Motiontrap™	SI®	
Discovery™	Motorola ColdFire®	STAR®	
Dymo®	MS-DOS™	The Crosby Group LLC	
EPL®	NatraSorb®		
EPL2®	Novell®		
EPSON®	OHAUS®		
ESC/POS®	OKI®		
Excel™	Pax®		
Explorer®			
Fairbanks™			
Flintec™			
Genius®			
Hewlett-Packard™			
Howe™			
IBM®			

# Customer Service Contacts

At Rice Lake Weighing Systems we strive to give you the best customer service in the industry. You can depend on our knowledgeable staff to deliver decisive, courteous assistance when you need it most.

Customer Service Representative Hours (CST): Monday through Friday 6:30AM to 6:30 PM; Saturday 8:00AM to Noon

## United States and Canada Field Sales



**Michael Bordino**  
Southeast Region  
715-434-5079

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715-736-6457

**Tim Campbell**  
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715-434-5067

**Jeff Canfield**  
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**Brad Harder**  
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**Roger Kimber**  
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**Jim Lynch**  
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Rice Lake de Mexico  
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715-434-5822

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715-434-5041

## Customer Relations



**Mark O. Johnson**  
Chief Executive Officer

**Mark Johnson, Jr.**  
President

**Steve Parkman**  
Chief Operating Officer

**John Hughes**  
Vice President of Business Development

**Tom Kowalski**  
Vice President of Technology

**Todd Backer**  
Vice President of Engineering/Innovation

**Guru Ganesh**  
Director, India Operations



**Joe Grell**  
Vice President Heavy Capacity

**Walter Hendriks**  
Managing Director, Europe

**Dominic Hodkiewicz**  
Director of Manufacturing

**Bruce Johnson**  
Customer Service Manager

**Kevin Marshall**  
Logistics Manager

**Patrick Ranfranz**  
Director of Marketing

**Dick Shipman**  
Quality Manager

# Customer Service Contacts Continued

## Inside Sales



**Deanna Stanley**  
Inside Sales Supervisor



**Terica Schamberger**  
Sales Referral  
Coordinator



**Janelle Alton**



**Andrew Burish**



**Becky Clausen**



**Dave Jalowitz**



**Karja Keller**



**Tricia Larson**



**Gene Marquardt**



**Gail Mussehl**



**Len Nicpon**



**Tom Peterson**



**Ali Richter**



**Alex Schlichting**



**Russ Schnacky**



**John Tennant**



**Lynnette  
Thompson**



**Kally Wagner**

## International Region



**Peter Allen**  
Export Customer  
Service Supervisor



**Jennifer  
Krahenbuhl**



**Gloria Miranda**  
Habla Español



**Bobbie Stiver**  
Habla Español  
Parle Français

## MSI



**Tim Carroll**  
National Sales  
Manager



**Phil Gray**  
Director of Operations



**Jim Norvid**  
Mechanical  
Engineering Manager



**Dave Taylor**  
Director of Engineering



**Ron Wenzel**  
Vice President  
International Sales  
and Aviation Products

## Sales Engineers



**Ben Fauske**  
Technical Support  
Manager



**John Eisele**



**Doug Hagie**



**Darin Ides**



**Sharon Miller**



**Efrain Molinari**  
Habla Español



**Mike Schilling**



**Rob Shofner**



**Marvin Stodola**

## Heavy Capacity Sales



**Matt Davis**



**Karen Hansen**



**Tony Zillmer**

## Directors of Strategic Accounts



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715-434-5293



**Joe Giglio**  
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715-434-5068



**Thomas Kendall**  
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715-434-5177

# Customer Service Contacts Continued

## Technical Support



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Alan Dobrowolski



Joe Heinicke



Patrick Hillman



Mark Hopland



Chris Lancaster



Kyle Messerly



Preston Reed



Brady Reetz



Scott Ross



Greg Stager



Layne Siverling



Mark Ware



Savannah Emerson  
Retail



Don O'Connell  
Retail

## Repair Department



Phil Stoeberl  
Electronic Assembly  
Repair Manager



Diane Gagner  
Warranty>Returns



Lisa Maciosek  
Warranty>Returns



Randee Bauch



Art Folstad



Les Karpel



Dale Koehler



Tracy Lavalieri



Landon Nielson

## Receptionists



Tammy Kline



Michelle  
Niederhauser



Cindy Aherns

## Mobile Marketing Unit



Jeff Malinowski



Jeff White

## Financial Services



Lynette Marshall  
Financial Services  
Supervisor



Wendy Boese



Nicole Dostal



Marcia  
Fankhauser



Vivian Kroon  
Europe



Kathleen Miller



Shannon Ullom

# Terms and Conditions

The terms “buyer,” “authorized reseller,” and “customer” as used herein, shall mean the party placing the purchase order with Rice Lake Weighing Systems. No contractual relationship between Rice Lake Weighing Systems and said party shall arise until such time as a purchase order has been accepted by Rice Lake Weighing Systems and such acceptance has been indicated on a written acknowledgment. Tenders which do not stipulate an acceptance period shall not be binding. Orders shall be subject to Rice Lake Weighing Systems’ standard terms and conditions as printed below, subject to correction for clerical errors.

These sales terms and conditions shall be binding if declared applicable in the tender or in the order acknowledgement. Any conditions stipulated by the buyer which are in contradiction to these sales terms and conditions shall only be valid if expressly acknowledged by Rice Lake Weighing Systems in writing.

## 1. Prices

(a) Rice Lake Weighing Systems (Rice Lake) prices are net 30 days Ex Works Rice Lake plant. Orders are subject to approval of our credit department with rights reserved to change or withdraw credit terms without notice and to terminate any orders when invoices for work done thereon have gone unpaid for 60 days.

(b) Prices do not include taxes of any kind by federal, state, municipality or other governmental authority, which Rice Lake may be required to collect or pay with respect to the sale or shipment of goods sold hereunder. Regardless of when any such taxes are determined or become payable, all taxes would be the responsibility of the customer and would be in addition to the prices quoted hereon.

(c) This quotation is made upon the basis of the cost of materials and labor as of the date of this quotation. A change in such costs shall give Rice Lake the right to alter prices to reflect such changes in cost.

## 2. Shipment, Title, Risk of Loss

(a) All shipments are Ex Works point of shipment. Title and risk of loss or damage passes to the customer upon presentation of the goods to the customer’s carrier at Rice Lake’s facility, except that title and risk of loss or damage as to customer’s partially manufactured parts and raw materials delivered to Rice Lake, and as to jigs, fixtures and tools specially ordered for the customer shall at all times remain with the customer.

(b) Rice Lake does not carry fire insurance upon jigs, fixtures and tooling built by Rice Lake for customers or supplied to Rice Lake by customers, nor does Rice Lake carry insurance upon raw materials supplied to Rice Lake by customers. Customers assume all risk of loss, damage or destruction of jigs, fixtures, tooling or raw materials belonging to the customer in Rice Lake custody caused by fire, water, gas, natural disasters, strikes, insurrection, riots or by acts of the civil or military authorities and whether or not such loss, damage or destruction was the result of our negligence or misconduct or that of our agents or employees. The customer agrees to indemnify and hold Rice Lake harmless from all direct and consequential costs and damages resulting from such loss.

(c) Except as hereinabove stated, we agree to maintain all jigs, fixtures and tooling built by Rice Lake in working condition for their normal life only, except that our liability in this respect shall not extend more than one year after the completion of the most recent production order.

## 3. Quantity, Materials and Tolerances

(a) Unless dimensions are limited by a specific tolerance, it is understood that the production variations as published by Rice Lake will be acceptable.

(b) Rice Lake will not be responsible for color, thickness variations, or flaws in sheets or parts from which fabrications are made, nor for other material variations beyond our control.

(c) Rice Lake assumes no responsibility for loss or damage occurring by reason of delay or inability to deliver caused by fires, strikes, accidents, embargoes, car shortages, delays of carriers, insurrection, riots, acts of the civil or military authorities, nor will we assume responsibility for any reason whatever for damages of any kind on account of failure to deliver at the time specified. The customer shall indemnify and hold Rice Lake harmless from all direct and consequential costs and damages resulting from such loss or delay.

(d) Unless otherwise specified, delivery of 10 percent more or less of completed parts than the quantity specified shall constitute fulfillment of this order and any excess not exceeding 10 percent shall be accepted and paid for by the customer.

(e) In the event any raw material specified for incorporation into the product covered by this proposal shall become unavailable, Rice Lake shall notify the customer and the customer may direct Rice Lake to substitute available material for that originally specified; it being understood and agreed that the customer shall assume any and all consequences resulting from such substitution.

## 4. Patents

If this quotation covers parts made specifically for the customer, the customer agrees to indemnify and hold Rice Lake harmless against any loss resulting from infringement of patents or trademarks, or from claims of such infringements and shall pay all legal and defense costs incurred by Rice Lake in the defense of such actions.

## 5. Software

Unless specifically otherwise stated, any and all software associated or part of any product sold, loaned on trial or demonstration to the customer is to be considered proprietary to Rice Lake. The customer agrees not to duplicate for distribution or to sell or distribute in any way without the prior written consent of Rice Lake.

## 6. Changes And Cancellation: Rejection, Claims

(a) Orders placed with Rice Lake are not subject to cancellation, change or reduction in amount or suspension of deliveries except with Rice Lake’s consent and upon terms that indemnify Rice Lake against loss. Unless confirmed in writing, all verbal agreements are void.

(b) Rice Lake will not be responsible for changes in design, deliveries or other instructions, unless they are furnished in writing. The customer agrees to pay for all tooling charges caused by changes in design or specifications.

## Terms and Conditions

(c) Samples submitted shall be deemed approved unless written rejection is received within two weeks of submission.

(d) Manufactured parts will be shipped and billed as they are produced.

(e) Claims for shortage or rejections for defects must be made within 10 days of receipt of goods. Credit will be rendered on such defective parts after we have had an opportunity to inspect them, provided they are returned to our factory, transportation charges prepaid, within 30 days, and provided they have not been altered or defaced in any way.

### 7. Tooling and Designing

(a) In consideration of the engineering service necessary in the designing of jigs, fixtures and tooling not being charged for, but being quoted on the basis of labor and material only, and not at their fair market value, such jigs, fixtures and tooling shall remain in our possession for at least one year. Thereafter, the customer desiring delivery of such jigs, fixtures and tooling shall pay an engineering charge of 50 percent of the original price of said jigs, fixtures and tooling and accept same as-is.

(b) When requested, we will submit suggestions concerning design and construction of parts, but we will not accept responsibility of liability for the practicability of these suggestions if adopted by the customer.

### 8. Delivery and Adjustment to Price

(a) If the customer requests that the goods be manufactured and shipped on a date (or dates) earlier than originally agreed to by Rice Lake and the customer, and Rice Lake agrees to the earlier date (or dates), any increase in the cost of performance incurred by Rice Lake resulting from earlier manufacture and shipment will be included in an adjustment of the purchase price to be made by Rice Lake and will be paid by the customer.

(b) Should shipments be held beyond scheduled date for convenience of the customer, goods will be billed and charges will be made for warehousing, trucking and other expenses incident to such delay. Reasonable and sufficient care is taken by Rice Lake in crating its goods. Rice Lake cannot be held responsible for breakage after having received "in-good-order" receipts from the transportation carrier. All claim for loss and damage must be made by the customer to the carrier, but we will assist insofar as practical in securing satisfactory adjustment of such claims.

### 9. Payment and Liens

(a) All invoices shall be due and payable when submitted for payment in accordance with the revisions of Rice Lake terms. No withholding of funds, back charges or credits against amounts otherwise due to Rice Lake will be permitted unless specifically agreed to in writing by Rice Lake. Settlement of any amounts due to the customer will be negotiated as separate items and not as offsets against amounts otherwise due to Rice Lake from the customer for products sold hereunder.

(b) Any unpaid account for work done shall constitute a lien on any jigs, fixtures, manufactured parts and raw materials in Rice Lake possession. In the event any account remains open and unpaid for 90 days, Rice Lake reserves the right to use the customer's jigs and fixtures to make parts therefrom, and to sell or dispose of manufactured parts and raw materials.

(c) The customer shall not assign or transfer any rights or obligations arising from this proposal, or monies payable thereunder, without the prior written consent of Rice Lake, and any such assignment or transfer made without such written consent shall be deemed null and void.

### 10. Additional Provisions

(a) Errors—stenographic and clerical errors are subject to correction.

(b) These terms and conditions constitute the entire contract between the customer and Rice Lake, transcending any oral arrangements or representations which may be inconsistent therewith.

(c) This quotation is made under and shall be governed by the laws of the state of Wisconsin.

### 11. Resale of Rice Lake Weighing Systems Products

In order to ensure compliance with the U.S. Export Administration Regulations we ask you to comply with the following:

(a) The customer shall not export or re-export Rice Lake Weighing Systems products, either directly or indirectly, in contravention of any applicable law, statute or regulation and will first obtain any required licenses or authorizations from the relevant government authority when necessary as prescribed by law.

(b) The customer confirms that it is familiar with and complies with the relevant national and international export control regulations and embargo regulations. The customer furthermore confirms that it is in particular familiar with and complies with the U.S. Department of Commerce, Export Administration Regulations; U.S. Department of Treasury, OFAC Sanctions; the U.S. Department of Defense, ITAR requirements and the U.S. Department of State regulations.

(c) If deemed necessary, Rice Lake Weighing Systems, in individual cases may make further requests from the customer for information required for export compliance.

(d) Should it be necessary for the customer to obtain an export license from the appropriate authorities pursuant to the aforementioned regulations, the customer shall apply for such a license autonomously and at their own expense.

**The foregoing warranties are exclusive and in lieu of all other express and implied warranties whatsoever, including but not limited to implied warranties of merchantability and fitness for a particular purpose. Rice Lake shall not be subject to any other obligations or liabilities whatsoever with respect to parts manufactured or supplied by Rice Lake or services rendered by it.**

**Anything herein to the contrary notwithstanding, Rice Lake shall not be liable for incidental and consequential damages, and in substitution for all remedies which the customer may have under any applicable law. The customer's sole and exclusive remedy against Rice Lake for any breach of warranty or any other breach relating to goods delivered pursuant hereto shall be for repair or replacement (at Rice Lake's option) of the goods or parts effected by such breach.**

# Warranty and Limitation of Liability

## Warranties

### Standard Product Limited Warranty

Rice Lake Weighing Systems (Rice Lake) warrants that all Rice Lake brand equipment and systems properly installed by an authorized reseller or original equipment manufacturer (OEM) will operate per written specifications as confirmed by the authorized reseller/OEM and accepted by Rice Lake. All systems and components are warranted against defects in materials and workmanship for one (1) year from the date of shipment from Rice Lake, unless otherwise stated in the product catalog or manual.

Rice Lake warrants that the equipment sold hereunder will conform to the current written specifications authorized by Rice Lake. Rice Lake warrants the equipment against faulty workmanship and defective materials. If any equipment fails to conform to these warranties, **Rice Lake will, at its option, repair or replace such goods returned within the warranty period subject to the following conditions:**

- Upon discovery by the customer of such nonconformity, Rice Lake will be given prompt written notice with a detailed explanation of the alleged deficiencies.
- Individual electronic components returned to Rice Lake for warranty purposes must be packaged to prevent electrostatic discharge (ESD) damage in shipment. Packaging requirements are listed in the publication, "Protecting Your Components from Static Damage in Shipment," available from the Rice Lake equipment return department.
- Examination of such equipment by Rice Lake confirms that the non-conformity actually exists, and was not caused by accident, misuse, neglect, alteration, improper installation, improper repair or improper testing. Rice Lake shall be the sole judge of all alleged nonconformities.
- Such equipment has not been modified, altered or changed by any person other than Rice Lake or its duly authorized repair agents.
- Rice Lake will have a reasonable time to repair or replace the defective equipment. The customer is responsible for shipping the product to Rice Lake. Rice Lake is responsible for shipping the product back to the customer.
- In no event will Rice Lake be responsible for travel time or on-location repairs, including assembly or disassembly of equipment. Nor will Rice Lake be liable for the cost of any repairs made by others.
- On all intrinsically safe equipment, any field repair or modifications voids any and all warranties expressed or implied and void F.M. approval.
- Any loose hardware, screws, washers or non-ESD bags of hardware stored inside indicator will void warranty. This could cause harm to repair technician or damage the CPU board.
- If just the board is sent in for repair, the serial number of the product the board is from should accompany the board.

**These warranties exclude all other warranties, expressed or implied, including without limitation warranties of merchantability or fitness for a particular purpose. Neither Rice Lake nor the authorized reseller will, in any event, be liable for incidental or consequential damages at the point of use.**

**Rice Lake and the customer agree that Rice Lake's sole and**

**exclusive liability hereunder is limited to repair or replacement of such goods. In accepting this warranty, the customer waives any and all other claims to warranty.**

**Should the seller be other than Rice Lake, the customer agrees to look only to the seller for warranty claims.**

No terms, conditions, understanding or agreements purporting to modify the terms of this warranty shall have any legal effect unless made in writing and signed by a corporate officer of Rice Lake and the customer.

### Custom Software Limited Warranty

Rice Lake Weighing Systems (Rice Lake) warrants that (a) the software will perform in accordance with the specification and accompanying written endorsement by the customer for a period of 90 days from the date of receipt; (b) any hardware accompanying the software will be free from defects in materials and workmanship under normal use and service for a period of one (1) year from the date of shipment from Rice Lake; and (c) the customer should perform inspection and testing of software products prior to installation.

This limited warranty is void if failure of the software or hardware has resulted from accident, abuse, misapplication or incorrect customer specification. Any replacement software will be warranted for the remainder of the original warranty period or 30 days, whichever is longer.

If the software fails to conform to these warranties, Rice Lake will, at its option, repair or replace such goods returned within the warranty period subject to the following conditions:

- Upon discovery by the customer of such nonconformity, Rice Lake will be given prompt written notice with a detailed explanation of the alleged deficiencies.
- Examination of software by Rice Lake confirms that the nonconformity exists, and was not caused by accident, misuse, neglect, alteration, improper installation, improper repair, improper testing or incorrect customer specification. Rice Lake shall be the sole judge of all alleged nonconformities.
- Rice Lake will have a reasonable time to repair or replace the software. The customer is responsible for shipping charges both ways.
- In no event will Rice Lake be responsible for travel time or on-location repairs, including assembly or disassembly of equipment. Nor will Rice Lake be liable for the cost of any repairs made by others.

**These warranties exclude all other warranties, expressed or implied, including without limitation warranties of merchantability or fitness for a particular purpose. Neither Rice Lake nor the authorized reseller will, in any event, be liable for incidental or consequential damages at the point of use.**

**Rice Lake and customer agree that Rice Lake's sole and exclusive liability hereunder is limited to repair or replacement of such goods. In accepting this warranty, the customer waives any and all other claims to warranty.**

**Should the seller be other than Rice Lake, the customer agrees to look only to the seller for warranty claims.**

No terms, conditions, understanding or agreements purporting to modify the terms of this warranty shall have any legal effect unless made in writing and signed by a corporate officer of Rice Lake and the customer.

# Warranty and Limitation of Liability

## Return Policies

Our commitment to our Customers states that if any standard product purchased from Rice Lake does not work, or if the incorrect product is shipped, **return it in its original shipping carton with all accessories in “like new” condition** for full credit or replacement within 30 days of purchase. **Electronic components returned to Rice Lake must be properly packaged to prevent electrostatic discharge (ESD) damage in shipment.** Packaging requirements are listed in the publication, “Protecting Your Components from Static Damage in Shipment,” available online or from our returns department. This policy and the 30-day limit also apply to any products drop-shipped directly from the manufacturer.

Please note that if an incorrect quantity of product was shipped, Rice Lake must be contacted within 10 days of the purchase. Upon notification, we will immediately correct the situation.

**A restocking charge will apply if equipment is not in like-new condition.** The restocking charge is directly proportional to the amount of time and material required to return the item to resalable condition—we will make every effort to do this quickly and economically. Equipment that has been abused and/or shows signs of excessive wear and cannot be reconditioned and resold will not be accepted for return or credit after excessive wear or modification.

### As Applied to Drop Shipments

All Rice Lake return guidelines apply to products drop-shipped directly from the manufacturer. If a perceived error occurs, Rice Lake will investigate to the best of our ability to determine if the error occurred prior to shipping, during shipping, or at the end user site. If our records and subsequent investigation indicate that the shipment was correct when it left our factory, our responsibility extends only to the authorized reseller, not their end user. Our standard product warranty notes that our coverage extends only to equipment and systems **properly installed by an authorized reseller.**

### Obtaining an RMA

A return authorization number (RMA) is required for all materials being returned to Rice Lake for credit. Flat rate repairs require purchase orders at time of RMA issuance.

When returning equipment for repair or warranty reimbursement consideration, these simple steps will help to expedite your request:

1. Call our returns department.
2. Please have your customer number and both the item description and problem for a repair.
3. Please have the original sales order or invoice number for items to be returned for credit or warranty. NOTE: See return policy
4. An RMA number will be given for eligible returns. This RMA number may also be faxed or emailed per your request.

## Return Shipments Outside the United States for Repair, Warranty, Calibration or Other Services and Re-export.

### For shipment to the U.S.:

1. The commercial invoice must include the following statement:
  - a. “These goods are being returned for maintenance under”
    - i. Goods Made in the USA -- “HTS 9801.00.1012”
    - ii. Goods NOT made in the USA -- “HTS 9801.00.2500”
2. The commercial invoice must list items individually and include the fair market value of the item based on its present condition for customs purposes only.
3. Please reference original Rice Lake commercial invoice number and date item was purchased if applicable.
4. Please note that failure to follow these procedures may cause delay and will certainly incur extra charges that will NOT be absorbed by Rice Lake.

## Return Shipments Outside the United States Other Than for Repair, or Service Work Not Being Returned.

### For shipment to the U.S.:

1. The commercial invoice must include the following statement:
  - i. Goods Made in the USA -- “HTS 9801.00.1045”
  - ii. Goods NOT made in the USA -- “HTS 9801.00.2500”
2. The commercial invoice must list items individually and include the fair market value of the item based on its present condition for customs purposes only.
3. Please reference original RLWS commercial invoice number and date item was purchased if applicable.
4. Please note that failure to follow these procedures may cause delay and possible reduction in your refund.
5. Please be advised that you may qualify for a refund of your duties and should contact your local customs authority for instructions and forms.

## Special Order, Modified, Non-Catalog, or Non-Stock Items

Due to the added resources and difficulty in reselling special or non-standard products, returns or credit are not allowed for special order equipment, special software programs, equipment physically modified or altered in the field, discrete electronic components, relays, manuals or opened software packages.

## Test Weights

All weights returned for credit will be assessed a restocking charge because of the required inspection and verification. Credit is not allowed for serialized weights, calibration or traceable services performed on weights.

## Balances

Balances returned for credit within 30 days of purchase may be subject to a restocking fee if assessed by balance manufacturer.

# Warranty and Limitation of Liability

## Carrier Product Damage

As part of our commitment to customer satisfaction and in accordance with ISO 9001 standards, we make every attempt to pack our products so they will arrive in new condition. Occasionally due to rough handling or carelessness, product may arrive in a damaged condition. When this happens, don't assume that the shipment left Rice Lake in that condition or that the original packing was not sufficient.

The receiver, whether it is the authorized reseller or their customer, is responsible for making a notation of damaged or missing items when signing the carrier's delivery receipt. If you or your customer are not sure whether there is damage, we suggest adding a statement "CONDITION UNKNOWN" to the delivery receipt. In the event that damage or missing items are not properly documented at time of receipt, the carrier is relieved of responsibility and the receiver is then responsible for the cost to get the product back to new condition.

After the damage or shortage has been properly noted with the carrier, contact Rice Lake immediately and keep all the original packaging material for inspection by the carrier's representative. It is also helpful in the claim process to take pictures of the condition of the packaging and damage.

When drop-shipping items to your customers, it is imperative that you advise them of their responsibility in accepting shipments from common carriers. Even if the equipment is not expected to be installed or used for a period of time, the shipment must be inspected at time of receipt in order to preserve their rights for making a claim.

## How to Prepare a Balance for Shipment

The best and most effective method for shipping a balance at any time and for any reason is to use the original manufacturer's packaging materials and subsequently double box it as described below. Teach your Customers to retain the packing set. Please remember that due to the nature of the equipment, new packaging materials can be very expensive.

In the event that the original manufacturer's packaging materials are not available, follow these instructions for top loading balances.

1. Remove the weighing platform cover, support buttons, weighing platform, floor plate and other devices installed in the weighing chamber. Pack these pieces individually in bubble wrap and tape the wrapping closed. Follow this same procedure for AC adapters and power cords. Please note that AC adapters and power cords are necessary to adequately evaluate the problem.
2. Examine the device (refer to the operating instructions) and if necessary, re-install or tighten any shipping screws/retaining devices to prevent damage to the weighing mechanism during shipment.
3. If the floor plate is not removable, ensure it is securely in place and cannot come loose during shipment, even if the balance is inverted. Do NOT invert the balance to test the security of the floor plate.
4. Clean the device of any loose debris or potential contaminants to our testing facility.

5. Prepare and sign a Statement of Decontamination (form #0679). This form MUST be included in a separate packing list envelope on the outside of the box with the "Statement of Decontamination" statement clearly visible.
6. Using Scotch tape or "speed" tape, tape all the glass doors on the device CLOSED. Be sure the tape is securely affixed and will not come off during shipment. Please note that on some devices, the glass breeze break around the weighing chamber can actually be disassembled and packed separate prior to shipment. Refer to the manufacturer's operating instructions. If this is a feature of the device being return, disassemble the breeze break and pack it in its own packing material and box.
7. Use a large box that will provide a minimum of three inches of space around the device for loose-fill packing material.
8. Place a padding of foam or Styrofoam™ (at least one-inch thick) at the bottom of the box.
9. Place the balance in a large plastic bag and seal the bag closed.
10. Please put the device on top of the foam padding or Styrofoam from step 8 above.
11. Ensure that there is at least three inches of clearance between the top of the balance and the top of the box.
12. Using generous amounts of anti-static, loose-fill packing material, fill all the spaces around the balance. Shake the box to cause the material to settle and add additional loose fill as necessary.
13. Place the small box containing all the items from step 1 above on top of the loose fill covering the balance. Add additional loose fill to completely cover all items within the box.
14. Double pack this box in another box that will again provide an additional two inches of space around the inner box. Fill all existing space between the inner and outer box with copious amounts of anti-static loose fill packing material.
15. Seal the box and include all the necessary documentation on the outside of the box. Don't forget the decontamination form (form #0679) from step 5 above.

## Repair Service Policies

Our service department is staffed Monday through Friday from 6:30 a.m. to 6:30 p.m., and Saturday from 8:00 a.m. to noon, Central time. For those utilizing the conveniences of the Internet, we have an e-mail address dedicated to technical support. Please contact Rice Lake at [service@ricelake.com](mailto:service@ricelake.com) for answers to your technical questions and the status of repair products during normal business hours.

### Standard Repair Service Policy and Rates

We provide quality and timely repairs for the products we sell. Flat rate repair is offered for selected models of indicators, printers and remote displays. Prior to returning a product for repair, our returns department will work with you to determine some key factors that will help Rice Lake better serve you. Please provide the following via phone to extensions 5348 or an RMA form.

# Warranty and Limitation of Liability

- Customer Number: Without a customer number we cannot issue an RMA number.
- Ship-to Address: Your customer number will bring up the bill-to address. You must inform Rice Lake of the ship-to address if it's different than the bill-to address.
- **Original sales and invoice orders: Required on warranty claims.**
- Freight Type: Unless stated otherwise, we ship the device back to you utilizing the same freight type in which we received it. If Rice Lake is responsible for freight charges, the carrier will be selected at the sole discretion of Rice Lake.
- **Definition of Product and Problem: Please provide as much detail as possible regarding the type of product, application and problem.**
- Purchase Order Number for Flat Rate Repair: Once we receive the equipment and the RMA, equipment for flat rate repair will be processed immediately. Other equipment will be evaluated and a minimum \$45.00 evaluation charge will apply.

You may be asked about the possibility of a new replacement product. It may be in your customer's best interest to explore the option of purchasing a new product if the repair will exceed 50 percent of authorized reseller net price, since new products carry full-warranty benefits.

Please note that our hourly service rate on all current Rice Lake products is \$125.00/hour. There is a 120-day limited warranty on parts and workmanship performed and noted under the scope of the specific repair.

## Balance Repair Policy and Rates

We offer repair support on the following balance models:

- All Rice Lake brand models

Once we receive the equipment and the RMA form, an estimate will be prepared.

A minimum charge of one hour will apply.

Please note that the hourly service rate on all balances is \$125.00/hour. All balance repairs are covered by a 90-day limited warranty on parts and workmanship performed and noted under the scope of the specific repair. Balances must be packaged to adequately protect them from damage in transit. Please refer to "How to Prepare a Balance for Shipment" available on our website and from our returns department.

## Test Weights

No returns will be accepted for items that are specifically modified for the customer's requirements. Examples of such modifications may include, but not necessarily limited to:

1. Weights that have been specifically built to the customer's specifications.
2. Standard product specifically modified to the customer's specifications.
3. Standard product engraved with serial numbers at the customer's request.
4. Laboratory procedure charges.
5. Laboratory documentation fees.

## Load Cell Evaluation Policy, Repairs and Rates

We support, service, repair and perform warranty evaluations on all Rice Lake brand load cells. We also provide repair evaluation for other manufacturers' load cells through each manufacturer's established service policies.

## Power Conditioning Policy

Rice Lake Weighing Systems recommends the installation of AC and/or DC transient protection which has proven to be effective in significantly reducing both the frequency and degree of damage caused by AC and/or DC transient voltage occurrences. Rice Lake Weighing Systems does not warrant or guarantee any transient protection device against damage or repair sold by it or any of its representatives or authorized resellers. Rice Lake Weighing Systems does not warrant or guarantee any scale-related or other electrical/electronic device against damage or repair which is intended to be protected by any transient protection device sold by it or any of its representatives or authorized resellers. Any damage or repair expense resulting from a transient strike or occurrence including the transient device itself, as well as the components intended to be protected, will not be at the expense of Rice Lake Weighing Systems. No other warranty or guarantees—express or implied—contrary to this written policy are supported or acknowledged by Rice Lake Weighing Systems.

## Field Service Rate Policy

For field service, we provide the services of highly-trained professionals for the following rate: \$1,080.00 list per work day (not to exceed eight work hours). Additional daily hours are prorated at \$200.00/hour.

An additional 50 percent charge is added for services performed on Saturday and Sunday. The authorized reseller is responsible for travel expenses between Rice Lake, Wis. and the job location, regardless of the mode of transportation. Meals, lodging and shipment of special equipment to and from the on-site location are billed to you at cost.

# Warranty and Limitation of Liability

## Exchange Board Policy

### Exchange Procedures

Simply call Rice Lake Weighing Systems' service department and specify the exchange circuit board you require. If an exchange board is available, we issue a return authorization number for your return and immediately ship you a reconditioned circuit board.

Upon receipt of your returned product, an inspection is made to ensure that it can be rebuilt or repaired. If it meets the inspection/analysis criteria for our exchange program, a credit is immediately applied to your account. Credit is not issued on any returned product that, upon inspection and analysis by our service department, is determined to be unrepairable or obsolete. Circuit boards that have been physically altered or modified are not eligible for exchange. If your return does not qualify under these guidelines, you are contacted and disposition of your return is mutually agreed upon.

Discontinued products' exchange boards may have limited availability.

### Warranty

We offer a 120-day limited warranty on exchange circuit boards. The replacement board exchange list price is 80% of the new board list price. All level 1, 2, 3 and 4 authorized resellers receive a 25% discount off of the board exchange list price.

**Note: An \$85.00 exchange board credit is given when a usable board is returned.**

### Circuit Board Inspection/Analysis

All incoming boards are subject to an inspection to determine if they are eligible for our exchange program. A returned board is considered eligible for the exchange board program provided it:

- has all its traces intact.
- does not contain corrosion, burn marks or lightning damage.
- has not been field-repaired using incorrect soldering or service techniques.
- has not been painted or coated with a foreign substance.
- Sense traces are cut. If so, no core credit.

Upon passing inspection, a credit for your returned board is immediately applied to your account.

### REPAIR BOARD EXCHANGE EXAMPLE:

<b>IQ plus® 355</b>	
Exchange Board List .....	\$360.00
LESS 25% Authorized Reseller Discount .....	\$270.00
Exchange Board Credit.....	\$85.00
Final Net Price .....	\$185.00

### COMPARE AND SAVE:

<b>IQ plus® 355</b>	
New Board List .....	\$445.00
LESS Max Discount.....	\$289.25
You Save .....	\$107.25

### EXCHANGE CIRCUIT BOARDS

Part #	Model	Board Type	Exchange List Price	Authorized Reseller Net	FINAL NET Price*
<b>Indicators*</b>					
99346	120 reconditioned, internal connector .....	CPU .....	200.00.....	150.00.....	\$110.00**
68442	IQ plus® 355 reconditioned .....	DISP/CPU .....	360.00.....	270.00.....	185.00
68439	IQ plus® 390 reconditioned .....	DISP/CPU .....	400.00.....	300.00.....	215.00
85930	420 reconditioned .....	CPU .....	400.00.....	300.00.....	225.00
94559	420 HE reconditioned .....	CPU .....	420.00.....	315.00.....	230.00
83132	520 reconditioned .....	CPU .....	480.00.....	357.00.....	272.00
88810	IQ plus® 590 reconditioned .....	CPU .....	400.00.....	300.00.....	215.00
19278	UMC 600/IQ 700 reconditioned, RFI.....	CPU .....	610.00.....	458.00.....	372.00
68440	IQ plus® 710 reconditioned, ver. 2.0.....	DISP/CPU .....	560.00.....	420.00.....	335.00
105923	720i™ reconditioned .....	CPU .....	630.00.....	473.00.....	388.00
101399	820i dual chn. reconditioned.....	CPU .....	800.00.....	600.00.....	515.00
97267	820i® signal chn. reconditioned.....	CPU .....	720.00.....	540.00.....	455.00
83133	920i® reconditioned (Rev L and above) .....	CPU .....	700.00.....	525.00.....	440.00
100345	320IS CPU board reconditioned .....	CPU .....	400.00.....	300.00.....	215.00
<b>Remote Displays*</b>					
85932	LaserLight® reconditioned .....	CPU .....	315.00.....	237.00.....	152.00
<b>Bench Scales*</b>					
71628	IQ plus® 2100 reconditioned .....	CPU .....	284.00.....	213.00.....	128.00

\* After the \$85.00 exchange board credit has been issued to your account. Board exchange list prices are subject to change without notice based on 80% ratio to new board pricing.

\*\*The 80% exchange list price or the \$85.00 exchange credit may not apply to these boards

# Balances

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# Balances

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**Standard Features**

- Capacities between 300 g and 6,000 g
- Internal resolution: 1/600,000
- LCD display
- Quick response
- Accumulation, counting and percentage modes
- 13 different units of measure
- Detachable enclosed weighing chamber (in capacities ≤1 kg)
- Battery operation for up to 40 hours of continuous use (without backlight)
- Standard RS-232 interface for connecting to printer or PC
- Plastic enclosure
- AC adapter

**Approvals****Specifications**

	EQ-300 <sup>^</sup>	EQ-600 <sup>^</sup>	EQ-1500	EQ-3000	EQ-6000
<b>Part#</b>	<b>129410</b>	<b>129411</b>	<b>165340</b>	<b>165341</b>	<b>132435</b>
<b>List Price</b>	<b>\$285.00</b>	<b>\$285.00</b>	<b>\$285.00</b>	<b>\$285.00</b>	<b>\$295.00</b>
Capacity	300 g	600 g	1500 g	3000 g	6000 g
<b>Resolution</b>	<b>0.01 g</b>	<b>0.02 g</b>	<b>0.05 g</b>	<b>0.1 g</b>	<b>0.2 g</b>
Weighing Units	Gram, Carat, Ounce, Ounce Troy, Pound, Pennyweight, Grain, Momme, Hong Kong Tael, Singapore Tael, Taiwan, Tael, tola				
Operating Modes	Weighing, Percent Weighing, Parts Counting, Accumulation				
Repeatability (+/-)	0.01 g	0.02 g	0.05 g	0.1 g	0.2 g
Linearity (+/-)	0.02 g	0.04 g	0.1 g	0.2 g	0.4 g
Stabilization Time	2 seconds				
Operating Temperature	32° F to 104° F (0° C to 40° C)				
Weighing Chamber	6.7 x 5.7 x 3.1 in (170 x 145 x 80 mm)		N/A	N/A	N/A
<b>Pan Size</b>	<b>Ø 4.7 in (Ø 120 mm)</b>		<b>4.8 in x 5.6 in (122 mm x 142 mm)</b>		
Dimensions	7.1 x 8.7 x 3.3 in (180 x 220 x 85 mm)				
Est. Ship Weight	6.6 lb (3 kg)				
Calibration Weight	300 g	600 g	1,500 g	3,000 g	6,000 g
Power	AC adapter (12V/500 mA); internal rechargeable battery (6V/1.2Ah)				
Warranty	One-year limited warranty				
Return Policy	Rice Lake Standard Policy				

<sup>^</sup>Weighing Chamber

Rice Lake

## Equipoise Series

Compact Balance

### Part Number/Price

PART #	MODEL #	CAPACITY	EST SHIP WEIGHT	PRICE
129410	EQ-300	300 g x 0.01 g	6 lb	\$285.00
129411	EQ-600	600 g x 0.02 g	6 lb	285.00
165340	EQ-1500	1,500 g x 0.05 g	6 lb	285.00
165341	EQ-3000	3,000 g x 0.1 g	6 lb	285.00
132435	EQ-6000	6,000 g x 0.2 g	6 lb	295.00

### Options/Accessories

PART #	DESCRIPTION	PRICE
41279	Printer cable, DB9M to 25-Pin M	\$65.00
103141	SP712 dot matrix printer, tear bar	350.00
158056	Prove statistical printer	715.00
119919	AbleCable RS-232/USB cable (requires 130789)	185.00
130789	Slim line null modem adapter	12.00
131135	Aluminum case	100.00
165183	AC adapter, 110-240VAC, interchangeable plugs	45.00



Multi-range AC adapter and multi-plug

## Tuning Fork Compact Balance

**Standard Features**

- Large, 16.5 mm-high, backlit liquid crystal display (LCD)
- Selectable modes: weight, unit count and percentage
- 12 units of measurement
- Mono-Metal Tuning Fork Sensor (MMTF) provides quick response and stability
- 20-step bar graph display
- 115VAC adapter included (230VAC optional)
- Semi-automatic calibration, external weight
- Plastic housing on models < 1000g, plastic top and die cast bottom on models > 1000g

**Optional Features**

- RS-232
- Rechargeable battery

**Specifications**

	TC-620	TC-1200	TC-4200	TC-6200
<b>Part#</b>	<b>107232</b>	<b>107233</b>	<b>107234</b>	<b>107235</b>
<b>List Price</b>	<b>\$700.00</b>	<b>\$640.00</b>	<b>\$700.00</b>	<b>\$755.00</b>
Capacity	620 g	1,200 g	4,200 g	6,200 g
<b>Resolution</b>	<b>0.01 g</b>	<b>0.1 g</b>	<b>0.1 g</b>	<b>0.1 g</b>
Operating Modes	Count, Percentage, Limit Function (Checkweighing)			
Repeatability	1 division			
Linearity	1 division			
Operating Temperature	41° F to 95° F (5° C to 35° C)			
<b>Pan Size</b>	<b>Ø 5.5 in (139.7 mm)</b>	<b>6.7 in x 5.6 in (170.2 x 142.2 mm)</b>	<b>7 in x 6.2 in (177.8 x 157.5 mm)</b>	
Dimensions	9.2 x 7.1 x 2.9 in (234 x 180 x 74 mm)	10.4 x 7.5 x 3.4 in (264 x 191 x 86 mm)		
Weight (Approx.)	2.9 lb (1.3 kg)		5.9 lb (2.7 kg)	
Calibration Weight	600 g	1,200 g	4,000 g	6,200 g
Power	120 VAC adapter			
Warranty	Five-year limited warranty			
Return Policy	Rice Lake Standard Policy			
Decimal Ounce	21 x 0.0005 oz	42 x 0.005 oz	140 x 0.005 oz	210 x 0.005 oz
Decimal Pound	1.3 x 0.00005 lb	2.6 x 0.0005 lb	9.2 x 0.0005 lb	13 x 0.0005 lb
Troy Ounce	19 x 0.0005 ozt	38 x 0.005 ozt	130 x 0.005 ozt	190 x 0.005 ozt
Pennyweight	390 x 0.01 dwt	770 x 0.1 dwt	2,700 x 0.1 dwt	3,900 x 0.1 dwt
Carat	3,100 x 0.05 ct	6,000 x 0.5 ct	21,000 x 0.5 ct	31,000 x 0.5 ct
Momme	160 x 0.005 mom	320 x 0.05 mom	1,100 x 0.05 mom	1,600 x 0.05 mom
Grain Unit	9,500 x 0.2 GN	18,000 x 2 GN	64,000 x 2 GN	95,000 x 2 GN
Tael (Hong Kong)	16 x 0.0005	32 x 0.005	110 x 0.005	160 x 0.005
Tael (Singapore, Malaysia, Taiwan)	16 x 0.0005	31 x 0.005	110 x 0.005	160 x 0.005
Tola	53 x 0.001	100 x 0.01	360 x 0.01	530 x 0.01

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## TC Series

Tuning Fork Compact Balance

### Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
107232	TC-620	620 g x 0.01 g	\$700.00
107233	TC-1200	1,200 g x 0.1 g	640.00
107234	TC-4200	4,200 g x 0.1 g	700.00
107235	TC-6200	6,200 g x 0.1 g	755.00

### Options/Accessories

PART #	DESCRIPTION	PRICE
107236	Rechargeable battery-TC-620, TC-1200, 32 hr	\$100.00
107237	Rechargeable battery-TC-4200, TC-6200, 32hr	100.00
107238	RS-232 option with DIN-5-Pin connector (not compatible with battery option) (TC-620, TC-1200)	125.00
107239	RS-232 option with DIN-5-Pin connection (not compatible with battery option, (TC-4200,TC-6200)	125.00
107240	In-use dust cover, 220 g to 1200 g	25.00
107250	In-use dust cover, 2,200 g to 12 kg	25.00
109236	Underweigh hook TC-620, TC-1200	25.00
109292	Underweigh hook TC-4200, TC-6200	25.00
42566	120VAC adapter	50.00
42168	230VAC adapter	70.00
107243	Additional operating manual	15.00
75351	WinWedge software	325.00
115303	5-Pin to 9-Pin RS-232 cable	95.00
115148	RS-232 manual	5.00

BALANCES

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RICE LAKE

**Standard Features**

- External weight calibration
- Large, 16.5mm-high backlit liquid crystal display (LCD)
- Selectable modes: weight, unit, count and percentage
- 12 units of measurement
- Mono-Metal Tuning Fork Sensor (MMTF) provides quick response and stability
- 20-step bar graph display
- 115VAC adapter included (230VAC optional)
- One part in 620,000 resolution
- RS-232 bidirectional
- Plastic housing on models < 1,000g, plastic top and die cast bottom on models > 1,000g



**Optional Features**

- Rechargeable battery
- NTEP Certified models

**Approvals**



**Specifications**

	TP-220^	TP-420NT^	TP-820	TP-1200NT	TP-3200	TP-4200NT	TP-6200NT	TP-8200	TP-12K
<b>Part#</b>	107244	-	107245		107246	-		107247	107248
<b>List Price</b>	\$1,000.00	-	\$1,000.00		\$1,130.00	-		\$1,000.00	\$1,150.00
<b>NTEP Part#</b>	-	108155	-	163604	-	108154	163606	-	-
<b>NTEP List Price</b>	-	\$1,100.00	-	\$950.00	-	\$1,100.00	\$1,425.00	-	-
<b>Capacity</b>	220 g	420 g	820 g	1,200 g	3,200 g	4,200 g	6,200 g	8,200 g	12,000 g
<b>Resolution</b>	0.001 g	0.001 g	0.01 g	0.01 g	0.01 g	0.01 g	0.01 g	0.1 g	0.1 g
<b>Operating Modes</b>	Counting, Percentage, Limit Function (checkweighing)								
<b>Repeatability</b>	1 division								
<b>Linearity</b>	1 division								
<b>Operating Temperature</b>	41° F to 95° F (5° C to 35° C)								
<b>Pan Size</b>	Ø 4.6 in (116.8 mm)		6.6 in x 5.5 in (167.6 x 139.7 mm)			7 in x 6.2 in (177.8 x 157.5 mm)			
<b>Dimensions</b>	9.2 x 7.1 x 6.6 in (including windshield) (235 x 182 x 170 mm)		9.2 x 7.1 x 2.9 in (235 x 182 x 75 mm)			10.1 x 7.5 x 3.4 in (265 x 192 x 87 mm)			
<b>RS-232 Specifications</b>	Baud rate - 1200/2400/2800/9600; Data bits - 8, Connector - DIN 5-Pin								
<b>Est. Ship Weight</b>	2.9 lb (1.3 kg)				6.2 lb (2.8 kg)				
<b>Calibration Weight</b>	200 g	400 g	800 g	1,000 g	3,000 g	4,000 g	6,000 g	8,000 g	12,000 g
<b>Power</b>	120VAC adapter								
<b>Battery Option</b>	Nickel Cadmium battery, 12-hour run time, 24-hour charge time								
<b>Approvals</b>		NTEP CC 09-002 Class II e=0.01		NTEP CC 09-002 Class II e=0.1		NTEP CC 09-002 Class II e=0.1			
<b>Warranty</b>	Five-year limited warranty								
<b>Return Policy</b>	Rice Lake Standard Policy								
<b>Decimal Ounce</b>	7.7 x 0.00005 oz	14 x 0.001 oz	28 x 0.0005 oz	42 x 0.0005	110. x 0.0005 oz	140 x 0.01 oz	210 x 0.001	280 x 0.005 oz	420 X 0.005 oz
<b>Decimal Pound</b>	0.48 x 0.00001 lb	0.92 x 0.00001 lb	1.8 x 0.00005 lb	2.6 x 0.00005	7.0 x 0.00005 lb	9.2 x 0.0001 lb	13 x 0.0001	18 x 0.0005 lb	26 x 0.0005 lb
<b>Troy Ounce</b>	7 x 0.00005 ozt	16 x 0.0001 ozt	26 x 0.0005 ozt	38 x 0.0005	100 x 0.0005 ozt	130 x 0.001 ozt	190 x 0.001	260 x 0.005 ozt	380 x 0.005 ozt
<b>*Pennyweight</b>	140 x 0.001 dwt		520 x 0.01 dwt	770 x 0.01	2,000 x 0.01 dwt	2,700 x 0.01	3,900 x 0.01	5,200 x 0.1 dwt	7,700 x 0.1 dwt
<b>Carat</b>	1,100 x 0.01 ct	2,100 x 0.01 ct	4,100 x 0.05 ct	6,000 x 0.05	160,000 x 0.05 ct	21,000 x 0.1 ct	31,000 x 0.1	41,000 x 0.5 ct	60,000 x 0.5 ct
<b>Momme</b>	58 x 0.0005 mom		210 x 0.005 mom	320 x 0.005	850 x 0.01 mom	1100	1,600 x 0.01	2,100 x .05 mom	3,200 x 0.05 mom
<b>Grain Unit</b>	3,300 x 0.02 GN	6,400 x 0.02 GN	12,000 x 0.2GN	1,200 x 0.01	48,000 x 0.2GN	64,000 x 0.2GN	95,000 x 0.2	120,000 x 2GN	180,000 x 2GN
<b>Tael</b>	5.8 x 0.00005		21 x 0.0005		85 x 0.001		210 x 0.005		320 x 0.005
<b>Tola</b>	18 x 0.0001		70 x 0.001		100 x 0.001		270 x 0.001		530 x 0.001
<b>Measurable Unit Weight</b>	0.03 g	0.03 g	0.03 g	0.01 g	0.3 g	0.3 g	0.01 g	3 g	3 g

^Weighing Chamber \*Pennyweight is not an NTEP supported unit of measurement

**Part Number/Price**

PART #	MODEL #	DESCRIPTION	PRICE
107244	TP-220	220 g x 0.001 g	\$1,000.00
108155	TP-420NT	420 g x 0.001 g	1,100.00
107245	TP-820	820 g x 0.01 g	1,000.00
163604	TP-1200NT	1,200 g x 0.01 g	950.00
107246	TP-3200	3,200 g x 0.01 g	1,130.00
108154	TP-4200NT	4,200 g x 0.01 g	1,100.00
163606	TP-6200NT	6,200 g x 0.01 g	1,425.00
107247	TP-8200	8,200 g x 0.1 g	1,000.00
107248	TP-12K	12,000g x 0.1 g	1,150.00

**Options/Accessories**

PART #	DESCRIPTION	PRICE
107249	Rechargeable battery ≤ TP1200	\$100.00
107237	Rechargeable battery ≥ TP-3200	100.00
107250	In-use dust cover ≥ TP-3200	25.00
107240	In-use dust cover ≤ TP-1200	25.00
42566	115VAC adapter	50.00
42168	230VAC adapter	70.00
107251	Additional operating manual	15.00
75351	WinWedge Tal software	325.00
115303	5-Pin to 9-Pin DB female RS-232 cable	95.00
109236	Underweigh hook ≤ TP-1200	25.00
109292	Underweigh hook ≥ TP-3200	25.00
158056	Prove statistical printer (requires cable)	715.00
158583	Cable, RJ11 to 5-Pin DIN	65.00

## Tuning Fork Stainless Steel Washdown Balance

**Standard Features**

- Stainless steel, IP65 top housing
- Large, 18 mm liquid crystal display (LCD) with backlight
- Selectable modes
- 13 units of measurement
- Mono-Metal Tuning Fork Sensor (MMTS) provides quick response and stability
- Washdown with IP65 rating
- 115 VAC adapter included (230 VAC optional)
- Semi-automatic calibration, external weight
- RS-232 bidirectional

**Optional Features**

- Battery holder
- Underweigh hook
- Waterproof RS-232 cable

**Specifications**

	TS-620	TS-6200	TS-8200	
<b>Part#</b>	<b>108156</b>	<b>108157</b>	<b>112182</b>	
<b>List Price</b>	<b>\$1,300.00</b>	<b>\$1,400.00</b>	<b>\$1,475.00</b>	
Capacity	620 g	6,200 g	8,200 g	
<b>Resolution</b>	<b>0.01 g</b>	<b>0.1 g</b>	<b>0.1 g</b>	
Operating Modes	Counting, Percentage, Limit Function (Checkweighing), Weighing multiplied by coefficient, specific gravity, animal weighing, adding multiple measurements			
Repeatability	1 division			
Linearity	1 division			
Operating Temperature	0° C to 40° C 80% RH or less			
<b>Pan Size</b>	<b>Ø 140 mm (5.51 in)</b>	<b>190 x 190 mm (7.48 X 7.48 in)</b>		
RS-232 Specifications	Baud rate - 1200/2400/4800/9600/19200, Data bits 8/7; Connector - 9-Pin D-Sub M (not IP65 unless using PN 109238 cable)			
Dimensions	12.2 x 8.2 x 3.4 in (310 x 208 x 87 mm)			
Weight (Approx.)	10 lb (4.5 kg)			
Calibration Weight*	600 g	6,000 g	8,000 g	
Power	120-240 VAC adapter, multi-plug adapter			
Battery Option	Field installable, uses 4AA dry cell batteries			
Warranty	Five-year limited warranty			
Return Policy	Rice Lake Standard Policy			
<b>UNIT OF MEASURE</b>	Decimal Ounce	21 x 0.0005 oz	210 x 0.005 oz	280 x 0.005 oz
	Decimal Pound	1.3 x 0.00005 lb	13 x 0.0005 lb	18 x 0.0005 lb
	Troy Ounce	19 x 0.0005 ozt	190 x 0.005 ozt	260 x 0.005 ozt
	Pennyweight	390 x 0.01 dwt	3,900 x 0.1 dwt	5,200 x 0.1 dwt
	Carat	3,100 x 0.05 ct	31,000 x 0.5 ct	41,000 x 0.5 ct
	Momme	160 x 0.005 mom	1,600 x 0.05 mom	2,100 x 0.05 mom
	Grain Unit	9,500 x 0.2 GN	95,000 x 2 GN	120,000 x 2 GN

\* Calibration of balance does not require weight of full capacity (adjustable)

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## TS Series

Tuning Fork Stainless Steel Balance

### Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
108156	TS-620	620 g x 0.01 g	\$1,300.00
108157	TS-6200	6,200 g x 0.1 g	1,400.00
112182	TS-8200	8,200 g x 0.1 g	1,475.00

### Options/Accessories

PART #	DESCRIPTION	PRICE
108499	AC adapter, multi-range 110:230 VAC, 6VDC	\$50.00
72440	9-Pin D-sub F-25-Pin D-sub connector	65.00
22436	9-Pin D-sub F to blunt end	55.00
66535	Null modem cable	45.00
119064	Slimline adapter, null modem gender changer	10.50
109236	Under weigh hook	25.00
109238	Waterproof RS-232 cable	350.00
109050	Additional operating manual	15.00
112611	Battery operator manual	5.00
112516	Battery holder option requires 4 AA batteries (not included)	100.00
119919	AbleCable, requires null modem adapter	185.00

BALANCES

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RICE LAKE

## Standard Features

- Anti-electric 360° transparent windshield
- 8-digit, 16.5 mm-high liquid crystal display (LCD) with backlight
- Single-touch response setting for environment
- 40-step bar graph display
- RS-232C interface
- ISO/GLP/GMP compliant printing record
- Underweigh hook included
- Internal calibration
- Plastic housing



## Specifications

	TA-120 <sup>^</sup>	TA-220 <sup>^</sup>
<b>Part#</b>	<b>107396</b>	<b>107397</b>
<b>List Price</b>	<b>\$1,935.00</b>	<b>\$1,955.00</b>
Capacity	120 g	220 g
<b>Resolution</b>	<b>0.0001 g</b>	<b>0.0001 g</b>
Operating Modes	Counting, Percentage, Limit Function (Checkweighing), Specific gravity	
Repeatability	1 division	
Linearity	1 division	
Operating Temperature	50° F to 86° F (10° C to 30° C) 80% RH or lower	
RS232 Specifications	Baud rate - 1200/2400/4800/9600/19200 bps, 8/7 data bits, Parity bit-None/Odd/Even	
<b>Pan Size</b>	<b>Ø 3.15 in (80 mm)</b>	
Dimensions	11 x 7.9 x 12 in (290 x 200 x 306 mm)	
Weight (Approx.)	6.4 lb (2.9 kg)	
Calibration Weight	100 g	200 g
Power	120 VAC adapter	
Warranty	Five-year limited warranty	
Return Policy	Rice Lake Standard Policy	
UNIT OF MEASURE		
Decimal Ounce	4.2 x 0.000005 oz	7.7 x 0.000005 oz
Decimal Pound	0.26 x 0.000001 lb	.48 x 0.000001 lb
Troy Ounce	3.8 x 0.000005 ozt	7 x 0.000005 ozt
Pennyweight	77 x 0.0001 dwt	140 x 0.0001 dwt
Carat	600 x 0.0005 ct	1100 x 0.001 ct
Momme	32 x 0.00005 mom	58 x 0.00005 mom
Grain Unit	1,800 x 0.002 GN	3,300 x 0.002 GN
Tael	3.2 x 0.000005	5.8 x 0.00005
Tola	10 x 0.00001 to	18 x 0.00001 to

<sup>^</sup> Weighing Chamber

Rice Lake

## TA Series

Tuning Fork Compact Balance

### Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
107396	TA-120	120 g x 0.0001 g	\$1,935.00
107397	TA-220	220 g x 0.0001 g	1,955.00

### Options/Accessories

PART #	DESCRIPTION	PRICE
108255	115VAC adapter	\$50.00
108256	230VAC adapter	75.00
108257	In-use cover	50.00
107398	Additional operating manual	15.00
75351	WinWedge® Tal software	325.00
66535	Null modem RS-232 cable	45.00
119919	AbleCable, requires null modem adapter	185.00
158056	Prove statistical printer	715.00

BALANCES

www.ricelake.com | Phone: 800-472-6703

RICE LAKE

## Standard Features

- Super hybrid sensor technology
- Bright VFD display
- Manage ASTM and OIML weights
- Auto-centering pan options
- Underhook weighing
- Built-in calibration weight
- GLP/LIM/ISO compliant
- RS-232C standard



## Specifications

	MC-1000 <sup>^</sup>	MC-6100 <sup>^</sup>	MC-10K <sup>^</sup>	MC-30K <sup>^</sup>
<b>Part #</b>	<b>151262</b>	<b>151263</b>	<b>151264</b>	<b>151265</b>
<b>List Price</b>	<b>\$6,470.00</b>	<b>\$6,470.00</b>	<b>\$7,750.00</b>	<b>\$7,750.00</b>
Capacity	1,100 g	6,100 g	10.1 kg	31 kg
<b>Resolution</b>	<b>0.1 mg</b>	<b>0.001 g</b>	<b>0.001 g</b>	<b>0.01 g</b>
Operating Modes	Weighing, Percentage, Comparator			
Weighing Units	g, oz, lb, lb-oz, troy oz, ct, dwt, grain, momme			
Repeatability**	0.0005 g/1 kg/0.0004 g/500 g	0.004 g/5 kg/0.0015 g/2 kg	0.005 g/10 kg/0.004 g/5 kg	0.015 g/20 kg
Linearity	±0.002 g	±0.02 g	±0.03 g	±0.2 g
Stabilization Time	5 seconds			
Sensitivity Drift (10° C-30° C)	±2 ppm/° C			±3 ppm/0° C
Operating Temperature	41° F to 104° F (5° C to 40° C) 85% RH or less (no condensation)			
<b>Pan Size</b>	<b>128 x 128 mm</b>	<b>165 x 165 mm</b>	<b>270 x 210 mm</b>	
Physical Dimensions	210 x 317 x 86 mm		300 x 355 x 111 mm	
Weight	4.6 kg	5.1 kg	9.3 kg	
Ext. Cal. Mass (optional)	1,000 g	6,000 g	10 kg	30 kg
Power	120/240 AC adapter			
Warranty	Five-year limited warranty			
Return Policy	A&D Weighing Standard Policy - restock fee may apply			

<sup>^</sup> Weighing Chamber

\*\* Repeatability when auto-centering is used under good ambient conditions

### Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
151262	MC-1000	1,100 g x 0.1 mg, glass breeze break	\$6,470.00
151263	MC-6100	6,100 g x 0.001 g, glass breeze break	6,470.00
151264	MC-10K	10.1 kg x 0.001 g, breeze break	7,750.00
151265	MC-30K	31 kg x 0.01 g, breeze break	7,750.00

### Options/Accessories

PART #	MODEL #	DESCRIPTION	PRICE
151266	AX-MC1000PAN	Auto center pan, MC-1000	\$1,150.00
151267	AX-MC6100PAN	Auto center pan, MC-6100	1,150.00
151268	AX-MC10K-30KPAN	Auto center pan, MC-10/30K	1,470.00
151247	AD-1688	Data logger	304.00
97649	TB-248	AC adapter, 120/240V	43.00
97695	GX-04*	Comparator output, factory installed	365.00
97696	GX-06*	Analog output, factory installed	840.00
97699	GX-12	Animal weigh pan	185.00
97700	GX-13	Density determination for MC-1000	623.00
97607	AD-1682	External rechargeable battery pack	678.00
97612	SW-128	Foot switch	72.00
158785	AD-8121B	Impact dot-matrix printer, statistical function, includes 25-Pin cable and 25- to 9-Pin connector	891.00

\* Only one option may be installed and requires factory installation

A&D Weighing  
**Ion BM Series**

Micro, Semi-Micro Analytical Balances

Capacity: 520g    Readability: 0.000001g

BALANCES

### Standard Features

- Built-in fanless static eliminator
- Underhook weighing
- Anti-static glass
- Built-in motorized calibration weight
- One touch environmental filters
- GLP/LIM/ISO compliant
- RS-232C and WinCT software standard
- AD-1688 Weighing Data Logger included



### Specifications

	BM-20 <sup>^</sup>	BM-22 <sup>^</sup>	BM-252 <sup>^</sup>	BM-200 <sup>^</sup>	BM-300 <sup>^</sup>	BM-500 <sup>^</sup>	
<b>Part#</b>	150762	150763	150765	150766	150767	150768	
<b>List Price</b>	\$14,500.00	\$13,400.00	\$8,235.00	\$6,485.00	\$6,795.00	\$7,200.00	
Capacity	22g	22g/5.1g	250g	220g	320g	520g	
<b>Resolution</b>	<b>0.000001 g</b>	<b>0.00001 g/0.000001 g</b>	<b>0.00001 g</b>	<b>0.0001 g</b>	<b>0.0001 g</b>	<b>0.0001 g</b>	
Operating Modes	Percentage, Counting						
Repeatability	0.0025 mg	0.004 mg/0.01 mg	0.03 mg	0.1 mg	0.2 mg		
Linearity	±0.010 mg	±0.010 mg/0.02 mg	±0.010 mg	±0.2 mg	±0.3 mg	±0.5 mg	
Stabilization Time	10 seconds (typically)	8 to 10 seconds	8 seconds	Approx. 3.5 seconds			
Sensitivity Drift (10° C-30° C)	±2 ppm/° C (when automatic self calibration is not used)						
Operating Temperature	41° F to 104° F (5° C to 40° C), 85% RH or less (no condensation)						
<b>Pan Size</b>	<b>Ø 0.98 inches (25 mm)</b>		<b>Ø 3.6 inches (90 mm)</b>				
Physical Dimensions	(W x D x H) 10.2 x 18.3 x 12.8 in (259 x 466 x 326 mm)						
Weight	10 kg (ships by motor freight)						
Ext. Cal. Mass (optional)	20 g		200 g	200 g	300 g	500 g	
Power	120/240 AC Adapter						
Warranty	Five-year limited warranty						
Return Policy	A&D Weighing Standard Policy - restock fee may apply						
UNIT OF MEASURE	Decimal Ounce	0.776 x 0.00000001	0.18/0.776 x 0.0000001/0.000001	8.82 x 0.000001	7.76 x 0.00001	11.29 x 0.00001	18.34 x 0.000001
	Troy Ounce	0.707 x 0.0000001	0.164/0.707	8.03 x 0.0000001	7.07 x 0.000001	10.29 x 0.000001	16.72 x 0.000001
	Pennyweight	14.15 x 0.00001	3.28/14.15 x 0.00001 x 0.0001	160.7 x 0.00001	141.5 x 0.0001	20.58 x 0.0001	334.4 x 0.0001
	Carat	110 x 0.00001	25.5/110 x 0.00001/0.0001	1,250 x 0.0001	1,100 x 0.001	1,600 x 0.001	2,600 x 0.001
	Momme	5.87 x 0.000001	1.37/5.87 x 0.000001/0.00001	66.67 x 0.00001	58.7 x 0.0001	85.3 x 0.0001	138.7 x 0.0001
	Grain Unit	339.5 x 0.00002	78.71/339.5 x 0.00002/0.0002	3,858 x 0.0002	3,395 x 0.002	4,938 x 0.002	8,024 x 0.002

<sup>^</sup> Weighing Chamber

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RICE LAKE

A&D Weighing

## Ion BM Series

Micro, Semi-Micro Analytical Balances

### Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
150762	BM-20	22 g x 0.001 mg	\$14,500.00
150763	BM-22	5.1 g/22 g x 0.001 mg/0.01 mg	13,400.00
150765	BM-252	250 g x 0.01 mg	8,235.00
150766	BM-200	220 g x 0.1 mg	6,485.00
150767	BM-300	320 g x 0.1 mg	6,795.00
150768	BM-500	520 g x 0.1 mg	7,200.00

### Options/Accessories

PART #	MODEL #	DESCRIPTION	PRICE
150769	BM-08	Balance OPT, Ethernet BM	\$835.00
97606	AD-1653	Density determination kit (BM-252/200/300/500 only)	552.00
97609	AD-8922A	Remote controller	635.00
97608	AD-8920A	Universal remote display	270.00
97612	SW:128	Foot switch	72.00
97649	TB:248	AC adapter 120V/220V	43.00
158785	AD-8121B	Dot-matrix statistical printer, includes 25-Pin cable	891.00

BALANCES

www.ricelake.com | Phone: 800-472-6703

RICE LAKE

## Standard Features

- Simple and easy to operate, adapts to your environment
- GLP/GMP/GCP/ISO compliant which outputs the calibration data and ID number of the balance for calibration confirmation to the AD-8121B printer
- Internal calibration mass; full digital calibration
- System diagnostic to alert operator of abnormal weighing conditions
- Underhook weighing
- RS-232C bidirectional interface
- Data memory function
- Time and date function
- WinCT® communication tools software
- Liquid crystal display (LCD)



## Specifications

	GH-120 <sup>^</sup>	GH-200 <sup>^</sup>	GH-300 <sup>^</sup>	GH-202 <sup>^</sup>	GH-252 <sup>^</sup>	
<b>Part #</b>	<b>97597</b>	<b>97599</b>	<b>97600</b>	<b>97601</b>	<b>97602</b>	
<b>List Price</b>	<b>\$3,540.00</b>	<b>\$4,010.00</b>	<b>\$4,765.00</b>	<b>\$5,350.00</b>	<b>\$5,895.00</b>	
Capacity	120g	220g	320g	220g/51g	250g/101g	
<b>Resolution</b>	<b>0.0001 g</b>	<b>0.0001 g</b>	<b>0.0001 g</b>	<b>0.0001/ 0.00001 g</b>	<b>0.0001/ 0.00001 g</b>	
Operating Modes	Percentage, Counting					
Repeatability	±0.2 mg	±0.2 mg	±0.3 mg	±0.2 mg/±0.03 mg	±0.2 mg/±0.10 mg	
Linearity	0.1 mg	0.1 mg	0.2 mg	0.1 mg/0.02 mg	0.1 mg/0.03 mg	
Stabilization Time	Approx. 3.5 sec (0.1 mg)/8 sec (0.01 mg)					
Sensitivity Drift (10° C-30° C)	±2 ppm/° C (when automatic self calibration is not used)					
Operating Temperature	41° F to 104° F (5° C to 40 C) 85% RH or less (no condensation)					
<b>Pan Size</b>	<b>Ø 3.6 in (90 mm)</b>					
Physical Dimensions	(W x D x H) 8.54 x 17.4 x 12.24 in (217 x 442 x 316 mm)					
Weighing Chamber	(W x D x H) 6.45 x 4.87 x 9.88 in (164 x 148.5 x 251 mm)					
Weight	Approx. 18 lb (8.2 kg)					
Ext. Cal. Mass (optional)	50 g/100 g	100 g/200 g	100 g/200 g/300 g	20 g/50 g/100 g/200 g		
Power	120V AC (AC Adapter) 50 Hz/60 Hz, 11 VA (110, 220, 240 available by special order)					
Warranty	Five-year limited warranty					
Return Policy	A&D Weighing Standard Policy - restock fee may apply					
UNIT OF MEASURE	Decimal Ounce	4.23 x 0.00001 oz	7.76 x 0.00001 oz	11.29 x 0.00001 oz	7.76 x 0.00001/1.80 x 0.000001 oz	8.82 x 0.00001/3.56 x 0.000001 oz
	Troy Ounce	3.86 x 0.00001 ozt	7.07 x 0.00001 ozt	10.29 x 0.00001 ozt	7.07 x 0.00001/1.64 x 0.000001 ozt	8.04 x 0.00001/3.25 x 0.000001 ozt
	Pennyweight	77.2 x 0.0001 dwt	141.5 x 0.0001 dwt	205.8 x 0.0001 dwt	141.5 x 0.0001/32.8 x 0.000001 dwt	160.8 x 0.0001/64.9 x 0.000001 dwt
	Carat	600 x 0.001 ct	1,100 x 0.001 ct	1,600 x 0.001 ct	1,100 x 0.001/255 x 0.0001 ct	1,250 x 0.001/505 x 0.0001 ct
	Momme	32.0 x 0.0001 mom	58.7 x 0.0001 mom	85.3 x 0.0001 mom	58.7 x 0.0001/13.6 x 0.000001 mom	66.7 x 0.0001/26.9 x 0.000001 mom
	Grain Unit	1,852 x 0.002 GN	3,395 x 0.002 GN	4,938 x 0.002 GN	3,395 x 0.002/787 x 0.0002 GN	3,858 x 0.002/1559 x 0.0002 GN
	Tola	10.29 x 0.00001 to	18.86 x 0.00001 to	27.44 x 0.00001 to	18.86 x 0.00001/4.37 x 0.000001 to	21.43 x 0.00001/8.66 x 0.000001 to
	Tael	3.20 x 0.00001 TL	5.87 x 0.00001 TL	8.53 x 0.00001 TL	5.87 x 0.00001/1.36 x 0.000001 TL	6.67 x 0.00001/2.69 x 0.000001 TL

<sup>^</sup> Weighing Chamber

**Part Number/Price**

PART #	MODEL #	DESCRIPTION	PRICE
97597	GH-120	120 g x 0.0001 g	\$3,540.00
97599	GH-200	220 g x 0.0001 g	4,010.00
97600	GH-300	320 g x 0.0001 g	4,765.00
97601	GH-202	220/51 g x 0.0001/0.00001 g	5,350.00
97602	GH-252	250/101 g x 0.0001/0.00001 g	5,895.00

**Options/Accessories**

PART #	MODEL #	DESCRIPTION	PRICE
97604	GH-08	Ethernet option for GH	\$685.00
97605	AD-100-2	Anti theft device	73.00
97606	AD-1653	Density determination kit	552.00
97607	AD-1682	Rechargeable battery pack, external	678.00
97608	AD-8920	Universal remote display	270.00
97609	AD-8922	Remote controller	635.00
97610	AD-1683	Static eliminator	1,256.00
151247	AD-1688	Data logger	304.00
97612	SW:128	Foot switch	72.00
97649	TB:248	AC adapter (120V/220V)	43.00

## Standard Features

- GLP/GMP/GCP/ISO compliant software outputs the calibration data and ID number of the balance for calibration confirmation to the AD-8121B printer
- Easy access door system
- Automatic self-calibration
- Data memory function
- Underhook weighing
- Internal calibration
- Liquid crystal display (LCD)
- RS-232 bidirectional interface
- WinCT® communication tools software



## Specifications

	GR-120 <sup>^</sup>	GR-200 <sup>^</sup>	GR-300 <sup>^</sup>	GR-202 <sup>^</sup>	
<b>Part#</b>	<b>97625</b>	<b>97626</b>	<b>97627</b>	<b>97628</b>	
<b>List Price</b>	<b>\$3,015.00</b>	<b>\$3,495.00</b>	<b>\$4,320.00</b>	<b>\$4,930.00</b>	
Capacity	120 g	210 g	310 g	210/42 g	
<b>Resolution</b>	<b>0.0001 g</b>	<b>0.0001 g</b>	<b>0.0001 g</b>	<b>0.0001/ 0.00001 g</b>	
Operating Modes	Percentage, Counting				
Repeatability	0.0001 g	0.0001 g	0.0001 g	0.0001/0.00002 g	
Linearity	±0.0002 g	±0.0002 g	±0.0002 g	±0.0002/±0.00003 g	
Stabilization Time	Approx. 3.5 sec (0.1 mg)/8 sec (0.01 mg)				
Sensitivity Drift (10° C to 30° C)	±2 ppm/° C 50° F to 86° F (10° C to 30° C)				
Operating Temperature	41° F to 104° F (5° C to 40° C) 85% RH or less (no condensation)				
<b>Pan Size</b>	<b>Ø 3.3 in (85 mm)</b>				
Physical Dimensions	(W x D x H) 9.8 x 12.99 x 12.87 in (249 x 330 x 327 mm)				
Weighing Chamber	(W x D x H) 7.01 x 6.5 x 9.17 in (178 x 160 x 233 mm)				
Weight	Approx. 13.2 lb (6.0 kg)				
Ext. Cal. Mass (optional)	50 g/100 g	100 g/200 g	200 g/300 g	100 g/200 g	
Power	120V AC (AC Adapter) 50Hz/60 Hz, 11 VA (110, 220, 240 VAC adapter by special order)				
Warranty	Five-year limited warranty				
Return Policy	A&D Weighing Standard Policy - restock fee may apply				
UNIT OF MEASURE	Decimal Ounce	4.2 x 0.00001 oz	7.4 x 0.00001 oz	10 x 0.00001 oz	7.4 x 0.00001/1.4 x 0.000001 oz
	Troy Ounce	3.8 x 0.00001 ozt	6.7 x 0.00001 ozt	9.9 x 0.00001 ozt	6.7 x 0.00001/1.3 x 0.000001 ozt
	Pennyweight	77 x 0.0001 dwt	135 x 0.0001 dwt	199 x 0.0001 dwt	135 x 0.0001/27 x 0.00001 dwt
	Carat	600 x 0.001 ct	1,050 x 0.001 ct	1,550 x 0.001 ct	1,050 x 0.001/210 x 0.0001 ct
	Momme	32 x 0.0001 mom	56 x 0.0001 mom	82 x 0.0001 mom	56 x 0.0001/11 x 0.00001 mom
	Grain Unit	1,851 x 0.002 GN	3,240 x 0.002 GN	4,784 x 0.002 GN	3,240 x 0.002/648 x 0.0002 GN
	Tola	10 x 0.00001 to	18 x 0.00001 to	26 x 0.00001 to	18 x 0.00001/3.6 x 0.000001 to
	Tael	3.1 x 0.00001 TL	5.5 x 0.00001 TL	8.2 x 0.00001 TL	5.5 x 0.00001/1.1 x 0.000001 TL

<sup>^</sup> Weighing Chamber

### Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
97625	GR-120	120 g x 0.0001 g	\$3,015.00
97626	GR-200	210 g x 0.0001 g	3,495.00
97627	GR-300	310 g x 0.0001 g	4,320.00
97628	GR-202	210/42 g x 0.0001/0.00001 g	4,930.00

### Options/Accessories

PART #	A&D MODEL #	DESCRIPTION	PRICE
97605	AD-100-2	Anti-theft device	\$73.00
97606	AD-1653	Density determination kit	552.00
97607	AD-1682	Rechargeable battery pack	678.00
97608	AD-8920	Universal remote display	270.00
97609	AD-8922	Remote controller	635.00
97610	AD-1683	Static eliminator	1,256.00
97612	SW:128	Foot switch	72.00
97649	TB:248	AC adapter (120V/220V AC)	43.00
151247	AD-1688	Data logger	304.00
158785	AD-8121B	Impact dot matrix, statistical printer, includes cable	891.00

## Standard Features

- Fast stabilization time
- One-touch calibration in HR-AZ models
- Compact footprint size
- Rotary sliding doors
- Removable breeze break with anti-static coating.
- GLP/GMP/GCP/ISO compliant



## Specifications

	HR-100A <sup>^</sup>	HR-100AZ <sup>^</sup>	HR-150A <sup>^</sup>	HR-150AZ <sup>^</sup>	HR-250A <sup>^</sup>	HR-250AZ <sup>^</sup>	
<b>Part#</b>	<b>150777</b>	<b>150779</b>	<b>150780</b>	<b>150781</b>	<b>150782</b>	<b>150783</b>	
<b>List Price</b>	<b>\$1,795.00</b>	<b>\$2,240.00</b>	<b>\$1,920.00</b>	<b>\$2,350.00</b>	<b>\$2,085.00</b>	<b>\$2,555.00</b>	
Capacity (g)	102		152		252		
<b>Resolution (g)</b>	<b>0.0001</b>						
Operating Modes	Weighing, Percent Weighing, Parts Counting, Density						
Repeatability	0.1 mg			<200 mg 0.1 mg/>200 mg 0.2 mg			
Linearity	± 0.2 mg			± 0.3 mg			
Stabilization Time	3 seconds						
Operating Temperature	41° F to 104° F (5° C to 40° C), 85% RH or less (no condensation)						
<b>Pan Size</b>	<b>Ø 3.6 inches (90 mm)</b>						
Physical Dimensions	7.8 x 11.6 x 12.3 in (198 x 294 x 313 mm)						
Weight	8.6 lb (3.9 kg)						
Calibration Weight (g)	200		150		100		
Power	120/240 AC adapter						
Warranty	Five-year limited warranty						
Return Policy	A&D Weighing Standard Policy - restock fee may apply						
UNIT OF MEASURE	Decimal Ounce	3.59 x 0.00001	3.59 x 0.00001	5.36 x 0.00001	5.36 x 0.00001	8.88 x 0.00001	8.88 x 0.00001
	Troy Ounce	3.27 x 0.00001	3.27 x 0.00001	4.88 x 0.00001	4.88 x 0.00001	8.10 x 0.00001	8.10 x 0.00001
	Pennyweight	65.5 x 0.0001	65.5 x 0.0001	97.7 x 0.0001	97.7 x 0.0001	162 x 0.0001	162 x 0.0001
	Carat	510 x 0.001	510 x 0.001	760 x 0.001	760 x 0.001	1260 x 0.001	1260 x 0.001
	Momme	27.2 x 0.0001	27.2 x 0.0001	40.5 x 0.0001	40.5 x 0.0001	67.2 x 0.0001	67.2 x 0.0001
	Grain Unit	1,574 x 0.002	1,574 x 0.002	2,346 x 0.002	2,346 x 0.002	3,889 x 0.002	3,889 x 0.002
	Tola	8.74 x 0.00001	8.74 x 0.00001	13.0 x 0.00001	13.0 x 0.00001	21.6 x 0.00001	21.6 x 0.00001
	Tael	2.72 x 0.00001	2.72 x 0.00001	4.02 x 0.00001	4.02 x 0.00001	6.66 x 0.00001	6.66 x 0.0001

<sup>^</sup> Weighing Chamber

### Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
150777	HR-100A	102 g x 0.0001 g	\$1,795.00
150779	HR-100AZ	102 g x 0.0001 g	2,240.00
150780	HR-150A	152 g x 0.0001 g	1,920.00
150781	HR-150AZ	152 g x 0.0001 g	2,350.00
150782	HR-250A	252 g x 0.0001 g	2,085.00
150783	HR-250AZ	252 g x 0.0001 g	2,555.00

### Options/Accessories

PART #	A&D MODEL #	DESCRIPTION	PRICE
151247	AD-1688	Data logger	\$304.00
98027*	FXi-02	Quick USB interface with cable	87.00
98028*	FXi-08	Ethernet interface with WIN-CT Plus	480.00
98029*	FXi-09	Rechargeable battery	320.00
97649	TB:248	AC adapter	43.00

\*Only one option may be installed and factory installation required

A&D Weighing  
**Orion HR Series**

Capacity: 60g-320g    Readability: 0.00001 g-0.0001 g

Analytical/Semi-Micro

**Standard Features**

- GLP/GMP/GCP/ISO compliant software outputs the calibration data and ID number of the balance for calibration confirmation to the AD-8121B printer
- System diagnostics to alert operator of abnormal weighing conditions
- Underhook weighing
- Liquid crystal display (LCD)
- WinCT® communication tools software

Note: Orion HR series does have internal calibration



**Optional Features**

- Optional battery pack (HR-60, HR-120 and HR-200)

**Specifications**

	HR-60 <sup>^</sup>	HR-60C <sup>^</sup>	HR-120 <sup>^</sup>	HR-120C <sup>^</sup>	HR-200 <sup>^</sup>	HR-200/C <sup>^</sup>	HR-300I <sup>^</sup>	HR-202I <sup>^</sup>
<b>Part#</b>	-	-	97637	97638	97639	97640	97642	97641
<b>List Price</b>	-	-	\$2,420.00	\$2,500.00	\$2,575.00	\$2,680.00	\$4,185.00	\$4,645.00
<b>NTEP Part#</b>	97635	97636	-	-	-	-	-	-
<b>NTEP List Price</b>	\$1,950.00	\$2,055.00	-	-	-	-	-	-
<b>Capacity</b>	60 g		120 g		210 g		320 g	220/51 g
<b>Resolution</b>	0.0001 g (NTEP 0.001 g)		0.0001 g		0.0001 g		0.0001 g	0.0001/ 0.00001 g
<b>Operating Modes</b>	Percentage, Counting							
<b>Repeatability</b>	0.0001 g						±0.0003 mg	±0.0002/±0.00003 g
<b>Linearity</b>	±0.0002 g						0.0002 mg	0.0001/0.00002 g
<b>Stabilization Time</b>	3 seconds (typically)						Approx. 3.5 seconds	Approx. 3.5/8 seconds
<b>Sensitivity Drift (10° C-30° C)</b>	±2 ppm/° C (when automatic self calibration is not used)							
<b>Operating Temperature</b>	41° F to 104° F (5° C to 40° C) 85% RH or less (no condensation)							
<b>Pan Size</b>	Ø 3.3 in (85 mm)						Ø 3.6 in (90 mm)	
<b>Dimensions</b>	(W x D x H) 8.4 x 12.8 x 11.9 in (213 x 319 x 301 mm)						(W x D x H) 8.54 x 17.4 x 12.24 in (217 x 442 x 316 mm)	
<b>RS-232</b>	N	Y	N	Y	N	Y	Y	Y
<b>Weighing Chamber</b>	(W x D x H) 7.1 x 7.5 x 7.9 in (180 x 192 x 200 mm)						(W x D x H) 6.45 x 5.84 x 9.88 in (164 x 148.5 x 251 mm)	
<b>Weight</b>	Approx. 12.5 lb (5.7 kg)						Approx. 17.6 lb (8.0 kg)	
<b>Ext. Cal. Mass (optional)</b>	50 g		100 g		200 g		300 g/200 g/100 g	200 g/100 g/50 g/20 g
<b>Power</b>	120V AC (AC Adapter) 50 Hz/60 Hz (110, 220, 240V AC adapter available by special order)							
<b>Approvals</b>	NTEP CC 97-084							
<b>Warranty</b>	Five-year limited warranty							
<b>Return Policy</b>	A&D Weighing Standard Policy - restock fee may apply							
<b>Decimal Ounce</b>	2.1 x 0.000005 oz		4.2 x 0.000005 oz		7.4 x 0.000005 oz		11.29 x 0.00001 oz	7.76 x 0.00001/1.8 x 0.000001 oz
<b>Troy Ounce</b>	1.9 x 0.000005 ozt		3.8 x 0.000005 ozt		6.7 x 0.000005 ozt		10.3 x 0.00001 ozt	7.07 x 0.00001/1.64 x 0.000001 ozt
<b>Pennyweight</b>	38 x 0.0001 dwt		77 x 0.0001 dwt		135 x 0.0001 dwt		199 x 0.0001 dwt	141.5 x 0.0001/32.8 x 0.00001 dwt
<b>Carat</b>	300 x 0.001 ct		600 x 0.001 ct		1,050 x 0.001 ct		1,550 x 0.001 ct	1,100 x 0.001/255 x 0.0001 ct
<b>Momme</b>	16 x 0.00005 mom		32 x 0.00005 mom		56 x 0.00005 mom		82 x 0.0001 mom	58.7 x 0.0001/13.6 x 0.00001 mom
<b>Grain Unit</b>	925 x 0.002 GN		1,851 x 0.002 GN		3,240 x 0.002 GN		4,784 x 0.002 GN	3,395 x 0.002/787 x 0.0002 GN
<b>Tola</b>	5 x 0.00001 to		10 x 0.00001 to		18 x 0.00001 to		26 x 0.00001 to	18.8 x 0.00001/4.37 x 0.000001 to
<b>Tael</b>	1.5 x 0.000005 TL		3.1 x 0.000005 TL		5.5 x 0.000005 TL		8.2 x 0.00001 TL	5.87 x 0.00001/1.36 x 0.000001 TL

<sup>^</sup> Weighing Chamber

### Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
97635	HR-60	60 g x 0.0001 g (NTEP Certified 0.001 g)	\$1,950.00
97636	HR-60C	60 g x 0.0001 g (NTEP Certified 0.001 g)	2,055.00
97637	HR-120	120 g x 0.0001 g	2,420.00
97638	HR-120C	120 g x 0.0001 g	2,500.00
97639	HR-200	210 g x 0.0001 g	2,575.00
97640	HR-200/C	210 g x 0.0001 g	2,680.00
97642	HR-300i	320 g x 0.0001 g	4,185.00
97641	HR-202i	220/51 g x 0.0001/0.00001 g	4,645.00

### Options/Accessories

PART #	A&D MODEL #	DESCRIPTION	PRICE
97646	HR-03	Serial interface (RS-232C) for HR-60/120/200	\$180.00
97647	HR-05	20mA current loop interface for HR-60/120/200	125.00
97648	HR-09	NiCad battery pack for HR-60, HR-60-C, HR-120, HR-120-C, HR-200, HR-200-C only	480.00
97605	AD-100-2	Anti-theft device	73.00
97606	AD-1653	Density determination kit	552.00
97607	AD-1682	Rechargeable battery pack, external	678.00
97608	AD-8920	Universal remote display	270.00
97610	AD-1683	Static eliminator	1,256.00
97609	AD-8922	Remote controller	635.00
97649	TB:248	HR AC adapter (120V/220V)	43.00
151247	AD-1688	Data logger	304.00
158785	AD-8121B	Impact dot matrix statistical printer, includes cable	891.00

Analytical Balances

**Standard Features**

- Comparator output (Hi/OK/Lo) feature for manual or automatic operation as well as buzzer function
- GLP/GMP compliant software output
- Breeze break for maximum accuracy and fastest response
- Standard calibration weight
- Simple operator reference card provided
- Multi-weighing units
- Time and date clock function
- Data memory function for weighing, calibration, counting and Hi/OK/Lo values
- Counting and percent mode
- Super Hybrid Sensor Technology (SHS)
- WinCT® communication tools software
- RS-232C bidirectional interface



**Specifications**

	AD-4212A-100	AD-4212B-102	AD-4212A-200	AD-4212B-201
<b>Part#</b>	<b>97654</b>	<b>102925</b>	<b>97655</b>	<b>102926</b>
<b>List Price</b>	<b>\$5,660.00</b>	<b>\$8,750.00</b>	<b>\$4,970.00</b>	<b>\$6,695.00</b>
Capacity	110 g	110 g	210 g	210 g
<b>Resolution</b>	<b>0.0001 g</b>	<b>0.00001 g</b>	<b>0.001 g</b>	<b>0.0001 g</b>
Operating Modes	Counting, Percentage			
Repeatability (Std. Dev.)	0.00015 g	0.00015 g	0.001 g	
Linearity	±0.0003 g	±0.0003 g	±0.002 g	±0.002 g
Stabilization Time (typical)	0 g-30 g Approx. 1.1 sec	0 g-30 g Approx. 1.1 sec	0 g-30 g Approx. 0.8 sec	0 g-30 g Approx. 0.8 sec
	30 g-110 g Approx. 1.3 sec	30 g-110 g Approx. 1.3 sec	30 g- 210 g Approx. 1.0 sec	30 g-210 g Approx. 1.0 sec
Sensitivity Drift	±2 ppm/°C 10°C to 30°C (50°F to 86°F)			
Operating Temperature	41°F to 104°F (5°C to 40°C) 85% RH or less (no condensation)			
I/O Interface	RS-232C	Bidirectional 600-19,200		
	Comparator Output	3 level output with buzzer		
	External Contact Input	Re-zero and print		
Weighing Unit	Dimensions	(W x D x H) 3.2 x 9.1 x 3.5 in (80 x 230 x 90 mm)		
	<b>Weighing Pan</b>	<b>2 x 2 in (50 x 50 mm)</b>		
	Weight	Approx. 2 kg		
Display Unit	Dimensions	(W x D x H) 9.3 x 6.0 x 6.1 in (237 x 150 x 155 mm)		
	Weight	Approx. 2 kg		
	Connection Cable	Approx. 2 m (between weighing unit and display unit)		
Shipping Weight	8.5 lb (4 kg)			
Calibration Weight (OIML F1 (OPT))	50 g	50 g	100 g	100 g
Power Supply	120V AC Adapter, 11 VA			
Warranty	Five-year limited warranty			
Return Policy	A&D Weighing Standard Policy - restock fee may apply			
Milligram	110,000.0 x 0.1 mg	110,000.0 x 0.01 mg	2,100,000 x 1 mg	210,000 x 0.1 mg
Ounce	3.880135 x 0.000005 oz	3.880135 x 0.000005 oz	7.40755 x 0.00005 oz	7.40755 x 0.00005 oz
Troy Ounce	3.536580 x 0.000005 ozt	3.536580 x 0.000005 ozt	6.75165 x 0.00005 ozt	6.75165 x 0.00005 ozt
Carat	550.0 x 0.0005 ct	550.0 x 0.0005 ct	1,050.0 x 0.005 ct	1,050.0 x 0.005 ct
Momme	29.33335 x 0.00005 mom	29.33335 x 0.00005 mom	56.0 x 0.0005 mom	56.0 x 0.0005 mom
Pennyweight	70.7316 x 0.0001 dwt	70.7316 x 0.0001 dwt	135.033 x 0.001 dwt	135.033 x 0.001 dwt
Grain	1,697.56 x 0.002 GN	1,697.56 x 0.002 GN	3,240.80 x 0.02 GN	3,240.80 x 0.02 GN
Tael (HK Gen, Singapore)	2.910100 x 0.000005	2.910100 x 0.000005	5.55565 x 0.00005	5.55565 x 0.00005
Tael (HK jewelry)	2.938900 x 0.000005	2.938900 x 0.000005	5.61060 x 0.00005	5.61060 x 0.00005
Tael (Taiwan)	2.933335 x 0.000005	2.933335 x 0.000005	5.600 x 0.00005	5.600 x 0.00005
Tael (China)	3.520 x 0.00005	3.520 x 0.00005	6.7200 x 0.00005	6.7200 x 0.00005
Tola (India)	9.43089 x 0.00001	9.43089 x 0.00001	18.0044 x 0.0001	18.0044 x 0.0001
Messaghal	23.46665 x 0.00005	23.46665 x 0.00005	44.80 x 0.0005	44.80 x 0.0005

## Specifications

	AD-4212B-301		AD-4212A-600		AD-4212A-1000	
<b>Part #</b>	<b>102927</b>		<b>97656</b>		<b>97657</b>	
List Price	<b>\$7,440.00</b>		<b>\$5,485.00</b>		<b>\$5,690.00</b>	
<b>Capacity</b>	310 g		610 g		1100 g	
Resolution	<b>0.0001 g</b>		<b>0.001 g</b>			
Operating Modes	Counting, Percentage					
Repeatability (Std. Dev.)	0.001 g					
Linearity	±0.002 g			±0.0003 g		
Stabilization Time (typical)	0-30 g	Approx. 0.8 seconds	0-30 g	Approx. 0.9 seconds	0-30 g	Approx. 0.9 sec
	30-210 g	Approx. 1.0 second	30-610 g	Approx. 1.1 seconds	30-1100 g	Approx. 1.1 sec
Sensitivity Drift	±2 ppm/°C 50°F to 86°F (10°C to 30°C)					
Operating Temperature	41°F to 104°F (5°C to 40°C) 85% RH or less (no condensation)					
I/O Interface	RS-232C		Bidirectional 600-19,200			
	Comparator Output		3 level output with buzzer			
	External Contact Input		Re-zero and print			
Weighing Unit	Dimensions (W x D x H) 3.2 x 9.1 x 3.5 in (80 x 230 x 90 mm)					
	<b>Weighing Pan</b>	<b>2 x 2 in (50 x 50 mm)</b>		<b>2.8 x 2.8 in (70 x 70 mm)</b>		
	Weight		Approx. 2 kg			
Display Unit	Dimensions (W x D x H) 237 W x 150 D x 155 mm H					
	Weight		Approx. 2 kg			
	Connection Cable					
	Approx. 2 m (between weighing unit and display unit)					
Shipping Weight	8.5 lb (4 kg)					
Calibration Weight (OIML F1)(OPT)	100 g		200 g			
Power Supply	120V AC Adapter, 11 VA					
Warranty	Five-year limited warranty					
Return Policy	A&D Weighing Standard Policy - restock fee may apply					
UNIT OF MEASURE	Milligram	2,100,000 x 1 mg		660,000 x 0.00005 mg		1,210,000 x 0.00005 mg
	Ounce	7.40755 x 0.00005 oz		23.28081 x 0.00005 oz		42.681485 x 0.00005 oz
	Troy Ounce	6.75165 x 0.00005 ozt		21.21948 x 0.0005 ozt		38.90238 x 0.0005 ozt
	Carat	1050.0 x 0.005 ct		3300 x 0.005 ct		6050 x 0.005 ct
	Momme	56.0 x 0.0005 mom		176.0001 x 0.0005 mom		322.66685 x 0.0005 mom
	Pennyweight	135.033 x 0.001 dwt		424.3896 x 0.001 dwt		778.0476 x 0.001 dwt
	Grain	3,240.80 x 0.02 GN		10,185.36 x 0.02 GN		18,673.16 x 0.02 GN
	Tael (HK Gen, Singapore)	5.55565 x 0.00005		17.4606 x 0.00005		32.0111 x 0.00005
	Tael (HK jewelry)	5.61060 x 0.00005		17.6334 x 0.00005		32.3279 x 0.00005
	Tael (Taiwan)	5.600 x 0.00005		17.60001 x 0.00005		32.266685 x 0.00005
	Tael (China)	6.7200 x 0.00005		21.12 x 0.00005		38.72 x 0.00005
	Tola (India)	18.0044 x 0.0001		56.58534 x 0.0001		103.73979 x 0.0001
	Messaghal	44.80 x 0.0005		140.7999 x 0.0005		258.13315 x 0.0005

## Part Number/Price

PART #	A&D MODEL #	DESCRIPTION	PRICE
97654	AD-4212A-100	110 g x 0.0001 g	\$5,660.00
102925	AD-4212B-102	110 g x 0.00001 g	8,750.00
97655	AD-4212A-200	210 g x 0.001 g	4,970.00
102926	AD-4212B-201	210 g x 0.0001 g	6,695.00
102927	AD-4212B-301	210 g x 0.0001 g	7,440.00
97656	AD-4212A-600	610 g x 0.001 g	5,485.00
97657	AD-4212A-1000	1,100 g x 0.001 g	5,690.00

## Options/Accessories

PART #	A&D MODEL #	DESCRIPTION	PRICE
97672	AD-4212A-01	BCD output (factory installed, four month lead time)	\$577.00
97674	AD-4212A-07	Extension cable, 3 m	164.00
97675	AD-4212A-08	Ethernet Interface with WinCT	788.00
97676	AD-4212A-19	Stainless steel breeze break (200 g only)	106.00

## Standard Features

- Internal calibration weight
- Auto environmental compensation
- IP54 splash-proof operator keyboard
- RS-232C bidirectional interface
- WinCT® communication tools software
- GLP/GMP/ISO compliant to either AD-8121 printer or computer.
- Transmits date, time, ID number, serial number and calibration data
- Auto re-zero function
- Interval time setting; built-in time and date
- Rechargeable battery option for portable needs
- Data memory function
- Multiple weighing modes: Counting, Percentage and Comparator Modes
- Super Hybrid Sensor Technology (SHS)
- Vacuum Fluorescent Display (VFD)
- Optional glass breeze break
- Underhook weighing



## Specifications

	GX-200 <sup>^</sup>	GX-400 <sup>^</sup>	GX-600 <sup>^</sup>	GX-800 <sup>^</sup>	GX-1000 <sup>^</sup>
<b>Part#</b>	97685	97686	97687	97688	97689
<b>List Price</b>	\$1,950.00	\$2,430.00	\$2,880.00	\$3,050.00	\$3,240.00
Capacity	210 g	410 g	610 g	810 g	1100 g
<b>Resolution</b>	<b>0.001 g</b>	<b>0.001 g</b>	<b>0.001 g</b>	<b>0.001 g</b>	<b>0.001 g</b>
Modes	Animal weighing, comparator function, ACAI counting function, percentage function, density determination				
Repeatability	0.001 g				
Linearity	±0.002 g		±0.003 g		
Stabilization Time	Approx 1 second (typical in FAST mode)			Approx. 1.5 seconds	
Display Refresh	5 times per second (stable) / 10 times per second (unstable)				
Operating temperature	41°F to 104°F (5°C to 40°C) RH less than 85% (No condensation)				
<b>Pan Size</b>	<b>5.04 x 5.04 in (128 x 128 mm)</b>				
Physical Dimension	(W x D x H) 8.26 x 12.48 x 3.38 in (210 x 317 x 86 mm)				
Weighing Chamber	3.6 in H (91.3 mm H)				
Weight (Approx.)	2.15 lb (4.6 kg)				
Power	120/240 VAC adapter Approx 11 VA				
Warranty	Five-year limited warranty				
Return Policy	A&D Weighing Standard Policy - restock fee may apply				
<b>UNIT OF MEASURE</b>					
Decimal Ounce	7.40755 x 0.00005 oz	14.46230 x 0.00005 oz	21.51710 x 0.00005 oz	28.57190 x 0.00005 oz	38.80135 x 0.00005 oz
Decimal Pound	0.462970 x 0.000005 lb	0.903895 x 0.000005 lb	1.344820 x 0.000005 lb	1.785744 x 0.000005 lb	2.425084 x 0.000005 lb
Troy Ounce	6.75165 x 0.00005 ozt	13.18180 x 0.00005 ozt	19.61195 x 0.00005 ozt	26.04210 x 0.00005 ozt	35.36582 x 0.00005 ozt
Pennyweight	135.033 x 0.001 dwt	263.636 x 0.001 dwt	392.239 x 0.001 dwt	520.842 x 0.001 dwt	707.316 x 0.001 dwt
Carat	1,050.000 x 0.00 5 ct	2,050.000x 0.005 ct	3,050.000 x 0.005 ct	4,050.000 x 0.005 ct	5,500.000 x 0.005 ct
Momme	56.0000 x 0.0005 mom	109.3335 x 0.0005 mom	162.6665 x 0.0005 mom	215 x 0.0005 mom	270 x 0.0005 mom
Grain Unit	3,240.80 x 0.02 GN	6,327.26 x 0.02 GN	9,413.74 x 0.02 GN	12,500.21 x 0.02 GN	16,975.6 x 0.02 GN
Pound x Ounce 4 lb 10.08 oz	7.4 lb 1 oz	14 lb 46 oz	1 lb 5.52 oz	1 lb 12.80 oz	2 lb 4 oz

<sup>^</sup> Weighing Chamber

## Specifications

	GX-2000	GX-4000	GX-6100	GX-6000	GX-8000	
<b>Part#</b>	<b>97690</b>	<b>97691</b>	<b>97692</b>	<b>97693</b>	<b>97694</b>	
<b>List Price</b>	<b>\$1,950.00</b>	<b>\$2,620.00</b>	<b>\$2,925.00</b>	<b>\$2,250.00</b>	<b>\$2,460.00</b>	
Capacity	2,100 g	4,100 g	6,100 g	6,100 g	8,100 g	
<b>Resolution</b>	<b>0.01 g</b>	<b>0.01 g</b>	<b>0.01 g</b>	<b>0.1 g</b>	<b>0.1 g</b>	
Operating Modes	Animal weighing, comparator function, ACAI counting function, percentage function, density determination					
Repeatability	0.01 g			0.1 g		
Linearity	±0.02 g		±0.03 g		±0.1 g	
Stabilization Time	Approx. 1 sec (typical in FAST mode)		Approx. 1.5 seconds		Approx. 1 second	
Display Refresh	5 times per second (stable) / 10 times per second (unstable)					
Operating temperature	41°F to 104°F (5°C to 40°C) RH less than 85% (No condensation)					
<b>Pan Size</b>	<b>6.50 in x 6.50 in (165 x 165 mm)</b>					
Physical Dimension	(W x D x H) 8.26 x 12.48 x 3.38 in (210 x 317 x 86 mm)					
Weighing Chamber	3.6 in H (91.4 mm H)					
Weight (Approx.)	Approx 2.05 lb (5.1 kg)					
Power	120/240V by AC adapter Approx 11 VA					
Warranty	Five-year limited warranty					
Return Policy	A&D Weighing Standard Policy - restock fee may apply					
UNIT OF MEASURE	Decimal Ounce	74.0755 x 0.0005 oz	144.6230 x 0.0005 oz	215.1710 x 0.0005 oz	215.170 x 0.005 oz	285.720 x 0.005 oz
	Decimal Pound	4.62970 x 0.00005 lb	9.03895 x 0.00005 lb	13.44820 x 0.00005 lb	13.4480 x 0.0005 lb	17.8575 x 0.0005 lb
	Troy Ounce	67.5165 x 0.0005 ozt	131.8180 x 0.0005 ozt	196.1195 x 0.0005 ozt	196.120 x 0.005 ozt	260.420 x 0.0005 ozt
	Pennyweight	1,350.33 x 0.01 dwt	2,636.36 x 0.01 dwt	3,922.39 x 0.01 dwt	3,922.4 x 0.1 dwt	5,208.4 x 0.1 dwt
	Carat	10,500.00 x 0.05 ct	20,500.00 x 0.05 ct	30,500.00 x 0.05 ct	30,500.0 x 0.5 ct	40,500.0 x 0.5 ct
	Momme	560.000 x 0.005 mom	1,093.335 x 0.005 mom	1,626.665 x 0.005 mom	1,626.65 x 0.05 mom	2,160.00 x 0.05 mom
	Grain Unit	32,408.0 x 0.2 GN	63,272.6 x 0.2 GN	94,137.4 x 0.2 GN	94,136 x 2 GN	125,002 x 2 GN
	Pound x Ounce	4 lb 10.08 oz	9 lb 0.62 oz	13 lb 7.17 oz	13 lb 7.17 oz	17 lb 13.72 oz

## Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
97685	GX-200	210 g x 0.001 g	\$1,950.00
97686	GX-400	410 g x 0.001 g	2,430.00
97687	GX-600	610 g x 0.001 g	2,880.00
97688	GX-800	810 g x 0.001 g	3,050.00
97689	GX-1000	1,100 g x 0.001 g	3,240.00
97690	GX-2000	2,100 g x 0.01 g	1,950.00
97691	GX-4000	4,100 g x 0.01 g	2,620.00
97692	GX-6100	6,100 g x 0.01 g	2,925.00
97693	GX-6000	6,100 g x 0.1 g	2,250.00
97694	GX-8000	8,100 g x 0.1 g	2,460.00

## Options/Accessories

PART #	A&D MODEL #	DESCRIPTION	PRICE
97695	GX-04	Comparator output; factory installed only	\$265.00
97696	GX-06	Analog output; factory installed only	840.00
97697	GX-10	Glass breeze break for GX-200/400/600/800/1000	275.00
97698	GX-11	Glass breeze break for GX-2000/4000/6000/6100/8000	300.00
97699	GX-12	Animal weighing pan for GX-400/600/2000/4000/6100/6000/8000	185.00
97700	GX-13	Density determination kit for GX-200/400/600	640.00
97607	AD-1682	Rechargeable battery pack (external)	678.00
97608	AD-8920	Universal remote display	270.00
97605	AD-100-2	Anti-theft device	73.00
97612	SW:128	Foot switch	72.00
97703	AX:073003691-S	Protective in-use cover for GX-200/400/600	20.00
97704	AX:073003692-S	Protective in-use cover for GX-2000/4000/6100/6000/8000	20.00
97649	TB:248	AC adapter (120V/220V)	43.00
102891	GX-02	USB option	150.00
151247	AD-1688	Data logger	304.00
158785	AD-8121B	Impact dot matrix statistical printer, cable included	891.00

## Standard Features

- IP54 splash proof operator keyboard
- RS-232C bidirectional communication
- GLP/ISO/LIMS compliant to either AD-8121 printer or computer. Transmits date, time, ID number, serial number and calibration data
- Auto re-zero function
- Data collection software compatible
- WinCT® communication tools software
- Interval time setting
- Data memory function
- Multiple weighing units
- Rechargeable battery option for portable needs
- Vacuum fluorescent display (VFD)
- Optional glass breeze break
- Underhook weighing
- Super Hybrid Sensor Technology (SHS)
- External calibration



## APPROVALS



## Specifications

	GF-200 <sup>^</sup>	GF-300 <sup>^</sup>	GF-400 <sup>^</sup>	GF-600 <sup>^</sup>	GF-800 <sup>^</sup>	GF-1000 <sup>^</sup>	GF-1200	
<b>Part#</b>	97707	97709	97711	97712	97713	97714	97715	
<b>List Price</b>	\$1,385.00	\$1,555.00	\$1,840.00	\$2,480.00	\$2,720.00	\$2,835.00	\$1,340.00	
<b>NTEP Part# Class II</b>	97708	97710	-	-	-	-	97716	
<b>NTEP List Price</b>	\$1,435.00	\$1,595.00	-	-	-	-	\$1,500.00	
Capacity	210 g	310 g	410 g	610 g	810 g	1100 g	1210 g	
<b>Resolution</b>	<b>0.001 g</b> (NTEP 0.01 g)	<b>0.001 g</b> (NTEP 0.01 g)	<b>0.001 g</b>	<b>0.001 g</b>	<b>0.001 g</b>	<b>0.001 g</b>	<b>0.01 g</b> (NTEP 0.1 g)	
Operating Modes	Animal weighing, comparator function, ACAI counting function, percentage function, density determination							
Repeatability	0.001 g						0.01 g	
Linearity	±0.002 g		±0.003 g			±0.02 g		
Stabilization Time	Approx 1 second (typical in FAST mode)				Approx. 1.5 seconds		Approx. 1 sec (typical in FAST mode)	
Operating Temperature	41° F to 104° F (5° C to 40° C)							
Weighing Chamber	3.6 in H (91.4 mm H)							
<b>Pan Size</b>	<b>5.04 x 5.04 in (128 x 128 mm)</b>						<b>165 x 165 mm</b> (6.5 x 6.5 in)	
Dimensions	8.27 x 12.48 x 3.39 in (2100 x 317 x 86 mm)							
Weight (Approx.)	2.15 lb (4.6 kg)						Approx 2.05 lb (5.1 kg)	
Est. Ship Weight	11.2 lb (5.2 kg)							
Power	120/240VAC adapter, Approx. 11 VA							
Approvals	NTEP CC 03-005		-	-	-	-	NTEP CC 03-005	
Warranty	Five-year limited warranty							
Return Policy	A&D Weighing Standard Policy - restock fee may apply							
<b>UNIT OF MEASURE</b>	Decimal Ounce	7.40755 x 0.00005 oz	10.93493 x 0.00005 oz	14.46230 x 0.00005 oz	21.51710 x 0.00005 oz	28.57190 x 0.00005 oz	38.80135 x 0.00005 oz	42.68149 x 0.0005 oz
	Decimal Pound	0.462970 x 0.000005 lb	0.68343 x 0.000005 lb	0.903895 x 0.000005 lb	1.344820 x 0.000005 lb	1.785744 x 0.000005 lb	2.425084 x 0.000005 lb	2.66759 x 0.00005 lb
	Troy Ounce	6.75165 x 0.00005 ozt	9.96673 x 0.00005 ozt	13.18180 x 0.00005 ozt	19.61195 x 0.00005 ozt	26.04210 x 0.00005 ozt	35.36582 x 0.00005 ozt	38.90240 x 0.0005 ozt
	Pennyweight	135.033 x 0.001 dwt	199.33463 x 0.001 dwt	263.636 x 0.001 dwt	392.239 x 0.001 dwt	520.842 x 0.001 dwt	707.316 x 0.001 dwt	778.04807 x 0.01 dwt
	Carat	1050.000 x 0.005 ct	1550.000 x 0.005 ct	2050.000x 0.005 ct	3050.000 x 0.005 ct	4050.000 x 0.005 ct	5500.000 x 0.005 ct	6050 x 0.05 ct
	Momme	56.0000 x 0.0005 mom	81.3332 x 0.0005 mom	109.3335 x 0.0005 mom	162.6665 x 0.0005 mom	215 x 0.0005 mom	270 x 0.0005 mom	270.000 x 0.005 mom
	Grain Unit	3240.80 x 0.02 GN	4784.03 x 0.02 GN	6327.26 x 0.02 GN	9413.74 x 0.02 GN	12500.21 x 0.02 GN	16975.6 x 0.02 GN	18673.15 x 0.2 GN
	Pound x Ounce (x 0.01oz)	0.4 lb .01 oz	0.6 lb .01 oz	0.9 lb .01 oz	1.3 lb 0.01 oz	1 lb 0.1 oz	2 lb 0.1 oz	2 lb 1 oz

<sup>^</sup> Weighing Chamber

## Specifications

	GF-2000	GF-3000	GF-4000	GF-6100	GF-6000	GF-8000
<b>Part#</b>	97717	97719	97721	97722	97723	97725
<b>List Price</b>	\$1,390.00	\$1,555.00	\$1,985.00	\$2,510.00	\$1,850.00	\$2,170.00
<b>NTEP Part# Class II</b>	97718	97720	-	-	97724	-
<b>NTEP List Price</b>	\$1,540.00	\$1,675.00	-	-	\$1,950.00	-
Capacity	2,100 g	3,100 g	4,100 g	6,100 g	6,100 g	8,100 g
<b>Resolution</b>	<b>0.01 g</b> (NTEP 0.1 g)	<b>0.01 g</b> (NTEP 0.1 g)	<b>0.01 g</b>	<b>0.01 g</b> (NTEP 0.1 g)	<b>0.1 g</b>	<b>0.1 g</b>
Operating Modes	Animal weighing, comparator function, ACAI counting function, percentage function, density determination					
Repeatability	0.01 g				0.1 g	
Linearity	±0.02 g			±0.03 g		±0.1 g
Stabilization Time	Approx. 1 sec (typical in FAST mode)		Approx. 1.5 seconds		Approx. 1 second	
Operating Temperature	41° F to 104° F (5° C to 40° C)					
<b>Pan Size</b>	<b>6.5 x 6.5 in (165 x 165 mm)</b>					
Dimensions	8.27 x 12.48 x 3.39 in (2100 x 317 x 86 mm)					
Weight (Approx.)	Approx 2.05 lb (5.1 kg)					
Est. Ship Weight	11.2 lb (5.2 kg)					
Power	120/240VAC adapter, Approx. 11 VA					
Approvals	NTEP CC 03-005		-	NTEP CC 03-005		-
Warranty	Five-year limited warranty					
Return Policy	A&D Weighing Standard Policy - restock fee may apply					
<b>UNIT OF MEASURE</b>						
Decimal Ounce	74.0755 x 0.0005 oz	109.34928 x 0.0005 oz	144.6230 x 0.0005 oz	215.1710 x 0.0005 oz	215.170 x 0.005 oz	285.720 x 0.005 oz
Decimal Pound	4.62970 x 0.00005 lb	6.83433 x 0.00005 lb	9.03895 x 0.00005 lb	13.44820 x 0.00005 lb	13.4480 x 0.0005 lb	17.8575 x 0.0005 lb
Troy Ounce	67.5165 x 0.0005 ozt	99.66731 x 0.0005 ozt	131.8180 x 0.0005 ozt	196.1195 x 0.0005 ozt	196.120 x 0.005 ozt	260.420 x 0.0005 ozt
Pennyweight	1,350.33 x 0.01 dwt	1,993.35 x 0.01 dwt	2,636.36 x 0.01 dwt	3,922.39 x 0.01 dwt	3,922.4 x 0.1 dwt	5,208.4 x 0.1 dwt
Carat	10,500.00 x 0.05 ct	15,500.00 x 0.05 ct	20,500.00 x 0.05 ct	30,500.00 x 0.05 ct	30,500.0 x 0.5 ct	40,500.0 x 0.5 ct
Momme	560.000 x 0.005 mom	813.325 x 0.005 mom	1,093.335 x 0.005 mom	1,626.665 x 0.005 mom	1,626.65 x 0.05 mom	2,160.00 x 0.05 mom
Grain Unit	32,408.0 x 0.2 GN	47,840.31 GN	63,272.6 x 0.2 GN	94,137.4 x 0.2 GN	94,136 x 2 GN	125,002 x 2 GN
Pound x Ounce (x 0.01oz)	4 lb x 1 oz	7 lb x 0.1 oz	9 lb x 0.1 oz	13 lb x 0.1 oz	13 lb x 0.1 oz	17 lb x 0.1 oz

## Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
97707	GF-200	210 g x 0.001 g	\$1,385.00
97708	GF-200 (Class II)	210 g x 0.001 g (NTEP Certified 310 g x 0.01 g)	1,435.00
97709	GF-300	310 g x 0.001 g	1,555.00
97710	GF-300 (Class II)	310 g x 0.001 g (NTEP Certified 310 g x 0.01 g)	1,595.00
97711	GF-400	410 g x 0.001 g	1,840.00
97712	GF-600	610 g x 0.001 g	2,480.00
97713	GF-800	810 g x 0.001 g	2,720.00
97714	GF-1000	1,100 g x 0.001 g	2,835.00
97715	GF-1200	1,210 g x 0.01 g	1,340.00
97716	GF-1200 (Class II)	1,210 g x 0.01 g (NTEP Certified 1,210 g x 0.1 g)	1,500.00
97717	GF-2000	2,100 g x 0.01 g	1,390.00
97718	GF-2000 (Class II)	2,100 g x 0.01 g (NTEP Certified 2,100 g x 0.1 g)	1,540.00
97719	GF-3000	3,100 g x 0.01 g	1,555.00
97720	GF-3000 (Class II)	3,100 g x 0.01 g (NTEP Certified 3,100 g x 0.1 g)	1,675.00
97721	GF-4000	4,100 g x 0.01 g	1,985.00
97722	GF-6100	6,100 g x 0.01 g	2,510.00
97723	GF-6000	6,100 g x 0.1 g	1,850.00
97724	GF-6000N (Class II)	6,100 g x 0.1 g (NTEP Certified 6,100 g x 0.1 g)	1,950.00
97725	GF-8000	8,100 g x 0.1 g	2,170.00

## Options/Accessories

PART #	A&D MODEL #	DESCRIPTION	PRICE
97695	GX-04	Comparator output	\$265.00
97696	GX-06	Analog output; factory installed only	840.00
97697	GX-10	Glass breeze break for GF-200/300/400/600	275.00
97698	GX-11	Glass breeze break for GF-1200/2000/3000/6000	300.00
97699	GX-12	Animal weighing pan for GF-1200/2000/3000/6000	185.00
97700	GX-13	Density determination kit for GF-200/300	640.00
97607	AD-1682	Rechargeable battery pack, external	678.00
97608	AD-8920	Universal remote display	270.00
97605	AD-100-2	Anti-theft device	73.00
97612	SW:128	Foot switch	72.00
97703	AX:073003691-S	Protective in-use cover for GF-200/300/400/600	20.00
97704	AX:073003692-S	Protective in-use cover for GF-1200/2000/3000/4000/6100/6000/8000	20.00
97649	TB:248	AC adapter (120V/220V)	43.00
102891	GX-02	USB option	150.00
151247	AD-1688	Data logger	304.00
158785	AD-8121B	Dot matrix statistical printer, includes cable	891.00

## Standard Features

- Pill-counting feature also complies with Handbook 44 requirements
- Fast, Super Hybrid Sensor (SHS) gives you the ultimate in response speed; just one second
- 9 weighing modes
- GLP/GMP/ISO compliance
- WinCT® communication tools software included free
- Tough die-cast aluminum housing
- Removable stainless steel pan 5 in x 5 in (127 mm x 127 mm)
- NTEP Certified and Pharmacopoeia approved
- IP54 splash proof operator keyboard protects against dust and spills, stainless steel weigh pan
- Data memory function
- Vacuum Fluorescent Display (VFD)
- RS-232



## APPROVALS



## Specifications

	GF-200P <sup>^</sup>	GF-300P <sup>^</sup>
<b>NTEP</b>		
<b>Part #</b>	<b>97799</b>	<b>97800</b>
<b>List Price</b>	<b>\$1,385.00</b>	<b>\$1,540.00</b>
Capacity	210 g	310 g
<b>Resolution</b>	<b>0.001 g</b>	<b>0.001 g</b>
Operating Modes	<b>Weigh, count and percent</b>	
Decimal Ounce	7.40755 x 0.00005 oz	10.93493 x 0.00005 oz
Repeatability	0.001 g	
Linearity	±0.002 g	
Stabilization Time	Approx 1 second (typical in FAST mode)	
Operating Temperature	41°F to 104°F (5°C to 40°C)	
Weighing Chamber	3.6 in H (91.4 mm)	
<b>Pan Size</b>	<b>5 x 5 in (127 mm)</b>	
Dimensions	8.27 x 12.48 x 3.39 in (210 x 317 x 86 mm)	
Weight (Approx.)	2.15 lb (4.6 kg)	
Est. Ship Weight	11 lb (5.2 kg)	
Power	110/220V VAC adapter	
Approvals	NTEP CC 04-077 e=0.01g	
Warranty	Five-year limited warranty	
Return Policy	A&D Weighing Standard Policy - restock fee may apply	

<sup>^</sup> Weighing Chamber

### Part Number/ Price

PART #	MODEL #	DESCRIPTION (CAPACITY X RESOLUTION)	PRICE
97799	GF-200P	210 g x 0.001 g	\$1,385.00
97800	GF-300P	310 g x 0.001 g	1,540.00

### Options/Accessories

PART #	A&D MODEL #	DESCRIPTION	PRICE
97697	GX-10	Glass breeze break for GF-200 and 300	\$275.00
97703	AX:073003691-S	Protective in-use cover for GF-200/300 (each)	20.00
97649	TB:248	AC adapter (120V/220V) standard with unit	43.00
102891	GX-02	USB option	150.00

## Standard Features

- Compact Super Hybrid Sensor Technology (SHS)
- Vacuum Fluorescent Display (VFD)
- GLP/GMP/ISO compliant to either AD-8121 printer or computer. Transmits date, time, ID number, serial number and calibration data
- RS-232C bidirectional communication
- Multiple units of measurement
- Response indicator function
- LAN-Ethernet interface
- WinCT<sup>®</sup> communication tools software
- Underhook weighing

Note: FXi NTEP Certified and FXi models available by special order (internal calibration)



## Optional Features

- Built-in rechargeable battery
- Quick USB interface (FXi-02) option

## APPROVALS



Measurement  
 Canada  
 Approved

## Specifications

	FX-120i <sup>^</sup>	FX-200i <sup>^</sup>	FX-300i <sup>^</sup>	FX-300iNC <sup>^</sup>
Part#	98021	98022	98023	—
List Price	\$1,010.00	\$1,060.00	\$1,090.00	—
CANADA	Part#	—	—	168077
	List Price	—	—	\$1,140.00
Capacity	122 g	220 g	320 g	320 g
Resolution	0.001 g	0.001 g	0.001 g	0.001 g
Operating Modes	Weigh, count, percent, animal weigh, statistical, hold and comparator			
Repeatability	0.001 g			
Linearity	±0.002 g			
Stabilization Time	Approx. 1 second			
Sensitivity Drift	±2 ppm/° C			
Display Refresh Rate	5 times / second, 10 times / second or 20 times / second			
Operating Temperature	41° F to 104° F (5° C to 40° C) 85% RH or less (No condensation)			
Pan Size	130 mm (5.12 in)			
Dimensions	(W x D x H) 7.6 x 10.3 x 3.3 in (193 x 262.5 x 84.5 mm)			
Weight	Approx. 2.5 kg			
Est Ship Weight	8 lb (3.5 kg)			
External Calibration (weight optional)	100 g	200 g	300 g	300 g
Power Consumption	120/240V AC adapter, approx. 11 VA			
Approvals	-	-	-	e=0.01g, AM-5692
Warranty	Five-year limited warranty			
Return Policy	A&D Weighing Standard Policy - restock fee may apply			
UNIT OF MEASURE	Decimal Ounce	4.30 x 0.00005 oz	7.76 x 0.00005 oz	11.28 x 0.00005 oz
	Pound	0.268 x 0.000005 lb	0.485 x 0.000005 lb	0.705 x 0.000005 lb
	Pound x Ounce	0 lb, 4.30 oz x 0.01 oz	0 lb, 7.76 oz x 0.01 oz	0 lb, 11.29 oz x 0.01 oz
	Troy Ounce	3.92 x 0.00005 ozt	7.07 x 0.00005 ozt	10.28 x 0.00005 ozt
	Carat	610 x 0.005 ct	1,100 x 0.005 ct	1,600 x 0.005 ct
	Pennyweight	78.6 x 0.001 dwt	141.7 x 0.001 dwt	206.2 x 0.001 dwt
	Grain Unit	1,882 x 0.02 GN	3,395 x 0.02 GN	4,938 x 0.02 GN

<sup>^</sup>Weighing Chamber

## Specifications

	FX-1200i	1200iNC	FX-2000i	FX-3000i
<b>Part#</b>	98024	—	98025	98026
<b>List Price</b>	\$1,010.00	—	\$1,060.00	\$1,090.00
<b>NTEP</b>	<b>Part#</b>	163641	—	—
	<b>List Price</b>	\$1,065.00	—	—
<b>CANADA</b>	<b>Part#</b>	—	168076	—
	<b>List Price</b>	—	\$1,065.00	—
Capacity	1,220 g	1,220 g	2,200 g	3,200 g
<b>Resolution</b>	<b>0.01 g</b>	<b>0.01 g</b>	<b>0.01 g</b>	<b>0.01 g</b>
Operating Modes	Weigh, count, percent, animal weigh, statistical, hold and comparator			
Repeatability	0.01 g			
Linearity	±0.02 g			
Stabilization Time	Approx. 1 second			
Sensitivity Drift	±2 ppm/° C			
Display Refresh Rate	5 times / second, 10 times / second or 20 times / second			
Operating Temperature	41° F to 104° F (5° C to 40° C) 85% RH or less (No condensation)			
<b>Pan Size</b>	<b>150 mm (5.90 in)</b>			
Dimensions	(W x D x H) 7.6 x 10.3 x 3.3 in (193 x 262.5 x 84.5 mm)			
Weight	Approx. 2.5 kg			
Est Ship Weight	8 lb (3.5 kg)			
External Calibration (weight optional)	1,000 g	1,000 g	2,000 g	3,000 g
Power Consumption	120/240V AC adapter, approx. 11 VA			
Approvals	NTEP 08-45A2 e=0.1g	e=0.1g, AM-5692		
Warranty	Five-year limited warranty			
Return Policy	A&D Weighing Standard Policy - restock fee may apply			
<b>UNIT OF MEASURE</b>	Decimal Ounce	4.30 x 0.00005 oz	77.6 x 0.0005 oz	112.8 x 0.0005 oz
	Pound	0.268 x 0.000005 lb	4.85 x 0.00005 lb	7.05 x 0.00005 lb
	Pound x Ounce	0 lb, 4.30 oz x 0.01 oz	4 lb, 13.60 oz x 0.01 oz	7 lb, 0.88 oz x 0.01 oz
	Troy Ounce	3.92 x 0.00005 ozt	70.7 x 0.0005 ozt	102.8 x 0.0005 ozt
	Carat	610 x 0.005 ct	11,000 x 0.05 ct	16,000 x 0.05 ct
	Pennyweight	78.6 x 0.001 dwt	1,417 x 0.01 dwt	2,062 x 0.01 dwt
	Grain Unit	1,882 x 0.02 GN	33,951 x 0.2 GN	49,383 x 0.2 GN

^Weighing Chamber

## Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
98021	FX-120i	122 g x 0.001 g	\$1,010.00
98022	FX-200i	220 g x 0.001 g	1,060.00
98023	FX-300i	320 g x 0.001 g	1,090.00
168077	FX-300iNC	320 g x 0.001 g, Canada grams only	1,140.00
98024	FX-1200i	1,220 g x 0.01 g	1,010.00
163641	FX-1200iN	1,220 g x 0.01 g	1,065.00
168076	FX-1200iNC	1,220 g x 0.01 g, Canada grams only	1,065.00
98025	FX-2000i	2,200 g x 0.01 g	1,060.00
98026	FX-3000i	3,200 g x 0.01 g	1,090.00

## Options/Accessories

PART #	A&D MODEL #	DESCRIPTION	PRICE
98027*	FXi-02	Quick USB interface	\$87.00
98028*	FXi-08	Ethernet interface with WinCT® Plus software	480.00
98029*	FXi-09	Built-in rechargeable battery	320.00
98030	FXi-10	Small breeze break	77.00
98031	FXi-11	Large breeze break	130.00
97649	TB:248	AC adapter (120V/220V)	43.00
151247	AD-1688	Data logger	304.00
158785	AD-8121B	Dot matrix statical printer	891.00

\*Options FXi-02/FXi-08 and FXi-09 cannot be combined and are factory installed only.

## Standard Features

- Washdown IP65 rating
- Compact Super Hybrid Sensor Technology (SHS)
- Vacuum Fluorescent Display (VFD)
- GLP/GMP/ISO compliant to either AD-8121 printer or computer.  
Transmits date, time, ID number, serial number and calibration data
- RS-232C bidirectional communication
- Multiple units of measurement
- Response indicator function
- LAN-Ethernet interface
- WinCT® communication tools software
- Underhook weighing



## Optional Features

- Optional built-in rechargeable battery

## Specifications

	FX-120iWP <sup>^</sup>	FX-200iWP <sup>^</sup>	FX-300iWP <sup>^</sup>	FX-1200iWP	FX-2000iWP	FX-3000iWP
<b>Part#</b>	<b>102905</b>	<b>102906</b>	<b>102907</b>	<b>102908</b>	<b>102909</b>	<b>102910</b>
<b>List Price</b>	<b>\$1,485.00</b>	<b>\$1,565.00</b>	<b>\$1,670.00</b>	<b>\$1,480.00</b>	<b>\$1,565.00</b>	<b>\$1,665.00</b>
Capacity	122 g	220 g	320 g	1,220 g	2,200 g	3,200 g
<b>Resolution</b>	<b>0.001 g</b>	<b>0.001 g</b>	<b>0.001 g</b>	<b>0.01 g</b>	<b>0.01 g</b>	<b>0.01 g</b>
Repeatability		0.001 g			0.01 g	
Linearity		±0.002 g			±0.02 g	
Stabilization Time	Approx. 1 second					
Sensitivity Drift	±2 ppm/° C					
Display Refresh Rate	5 times / second, 10 times / second or 20 times / second					
Operating Temperature	41° F to 104° F (5° C to 40° C) 85% RH or less (No condensation)					
<b>Pan Size</b>	<b>Ø 5.12 in (130 mm)</b>			<b>Ø 5.90 in (150 mm)</b>		
Dimensions	(W x D x H) 6 x 10.3 x 3.3 in (193 x 262.5 x 84.5 mm)					
Weight	Approx. 2.5 kg					
Est Ship Weight	8 lb (3.5 kg)					
External Calibration (weight optional)	100 g	200 g	300 g	1,000 g	2,000 g	3,000 g
Power Consumption	120/240 VAC adapter, approx. 11 VA					
Warranty	Five-year limited warranty					
Return Policy	A&D Weighing Standard Policy - restock fee may apply					
<b>UNIT OF MEASURE</b>						
Decimal Ounce	4.30 x 0.00005 oz	7.76 x 0.00005 oz	11.28 x 0.00005 oz	43.0 x 0.0005 oz	77.6 x 0.0005 oz	112.8 x 0.0005 oz
Pound	0.268 x 0.000005 lb	0.485 x 0.000005 lb	0.705 x 0.000005 lb	2.68 x 0.00005 lb	4.85 x 0.00005 lb	7.05 x 0.00005 lb
Pound x Ounce	0 lb, 4.30 oz x 0.01 oz	0 lb, 7.76 oz x 0.01 oz	0 lb, 11.29 oz x 0.01 oz	2 lb, 11.03 oz x 0.01 oz	4 lb, 13.60 oz x 0.01 oz	7 lb, 0.88 oz x 0.01 oz
Troy Ounce	3.92 x 0.00005 ozt	7.07 x 0.00005 ozt	10.28 x 0.00005 ozt	39.2 x 0.0005 ozt	70.7 x 0.0005 ozt	102.8 x 0.0005 ozt
Carat	610 x 0.005 ct	1,100 x 0.005 ct	1,600 x 0.005 ct	6,100 x 0.05 ct	11,000 x 0.05 ct	16,000 x 0.05 ct
Pennyweight	78.6 x 0.001 dwt	141.7 x 0.001 dwt	206.2 x 0.001 dwt	786 x 0.01 dwt	1,417 x 0.01 dwt	2,062 x 0.01 dwt
Grain Unit	1,882 x 0.02 GN	3,395 x 0.02 GN	4,938 x 0.02 GN	18,827 x 0.2 GN	33,951 x 0.2 GN	49,383 x 0.2 GN

<sup>^</sup>Weighing Chamber

### Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
102905	FXi-120iWP	122 g x 0.001 g	\$1,485.00
102906	FXi-200iWP	220 g x 0.001 g	1,565.00
102907	FXi-300iWP	320 g x 0.001 g	1,670.00
102908	FXi-1200iWP	1,220 g x 0.01 g	1,480.00
102909	FXi-2000iWP	2,200 g x 0.01 g	1,565.00
102910	FXi-3000iWP	3,200 g x 0.01 g	1,665.00

### Options/Accessories

PART #	A&D MODEL #	DESCRIPTION	PRICE
98027*	FXi-02	Quick USB interface	\$87.00
98028*	FXi-08	Ethernet interface with WinCT® Plus software	480.00
98029*	FXi-09	Built-in rechargeable battery	320.00
98030	FXi-10	Small breeze break	77.00
98031	FXi-11	Large breeze break	130.00
97649	TB:248	AC adapter (120V/220V)	43.00

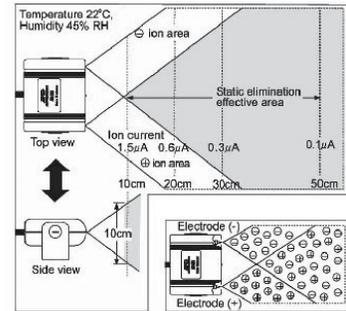
\*Options FXi-02/FXi-08 and FXi-09 cannot be combined and are factory installed only.

## Standard Features

- Can be easily and safely installed; requires no high-voltage wiring
- Eliminates static charges from quickly running or highly electrified work pieces
- Little or no reverse charge is induced by irradiated ions because of its excellent ion polarity or the potential of the charged object
- Achieves static elimination with a huge degree of efficiency regardless of the polarity or the potential of the charged object
- Suited for static elimination in narrow and remote places because of its lengthy ion irradiation distance
- Produces only a little amount of ozone thanks to its high ion generation efficiency
- A current limiting circuit is incorporated in the ion generating electrode to reduce the possibility of electric shock
- No swing in surface potential of the charged object



(Below) Example of AD-1683 installation showing static elimination area and an example of ion generation



## Specifications

<b>AD-1683</b>	
<b>Part #</b>	<b>97610</b>
<b>List Price</b>	<b>\$1,256.00</b>
Elimination Range	Distance: 10 cm to 30 cm from the electrode area: 30 cm x 30 cm
Static Elimination Method	DC corona discharge DUAL-DC
Static Eliminating Electrode	Tungsten emitter
Environmental Conditions	-5° C to 40° C, 35% to 85%RH (non-condensing)
Weight	300 g
Power	100-240V AC, 50/60 Hz, 1.5V AC
Warranty	One-year limited
Return Policy	A&D Weighing Standard Policy - restock fee may apply

## Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
97610	AD-1683	Static eliminator, balance accessory	\$1,256.00

## Standard Features

- Easy-to-read seven segment LCD display with backlight
- 10 units of measurement
- Battery operated (4 AA not included)
- Selectable modes: weight, count, percentage and specific gravity
- 115VAC adapter included (230VAC optional)



EJ 200



EJ 2000

## Specifications

	EJ-123 <sup>^</sup>	EJ-120	EJ-200	EJ-300	EJ-410	EJ-610
<b>Part#</b>	<b>163274</b>	<b>112410</b>	<b>112411</b>	<b>112412</b>	<b>112413</b>	<b>112414</b>
<b>List Price</b>	<b>\$530.00</b>	<b>\$280.00</b>	<b>\$310.00</b>	<b>\$380.00</b>	<b>\$435.00</b>	<b>\$540.00</b>
Capacity	120 g	120 g	210 g	310 g	410 g	610 g
<b>Resolution</b>	<b>0.001 g</b>	<b>0.01 g</b>	<b>0.01 g</b>	<b>0.01 g</b>	<b>0.01 g</b>	<b>0.01 g</b>
Operating Modes	Specific Gravity, Counting, Percentage, Checkweighing					
Repeatability	0.003 g	0.01 g				
Linearity	0.003 g	±0.01 g			±0.02 g	
Sensitivity Drift	20 ppm/° C 50° F to 86° F (10° C to 30° C)					
Display Type	7 segment LCD with backlight (character height 16 mm)					
Operating Temperature	14° F to 104° F (-10° C to 40° C) less than 85% R.H. (non-condensing)					
<b>Pan Size W x D</b>	<b>Ø 4.3 in (110 mm)</b>					
Physical Dimensions	(W x D x H) 7.5 x 8.6 x 2.2 in (190 x 218 x 55 mm)					
Weight (approx.)	850 g					
Calibration Mass (default setting)	100 g	100 g	200 g	300 g	400 g	600 g
Power	120VAC adapter (4 AA size dry-cell batteries - 70 hours operation)					
Warranty	Five-year limited warranty					
Return Policy	A&D Weighing Standard Policy - restock fee may apply					
Decimal Ounce	4.233 x 0.0001 oz	4.233 x 0.001 oz	7.408 x 0.001 oz	10.935 x 0.001 oz	14.462 x 0.001 oz	21.517 x 0.001 oz
Decimal Pound	N/A	N/A	N/A	N/A	0.9039 x 0.0001 lb	1.3448 x 0.0001 lb
Troy Ounce	3.858 x 0.0001 ozt	3.858 x 0.001 ozt	6.752 x 0.001 ozt	9.967 x 0.001 ozt	13.182 x 0.001 ozt	19.612 x 0.001 ozt
Pennyweight	77.16 x 0.001 dwt	77.16 x 0.01 dwt	135.03 x 0.01 dwt	199.33 x 0.01 dwt	263.64 x 0.01 dwt	392.24 x 0.01 dwt
Carat	600.00 x 0.005 ct	600.00 x 0.05 ct	1,050.00 x 0.05 ct	1,550.00 x 0.05 ct	2,050.0 x 0.05 ct	3,050.0 x 0.05 ct
Momme	N/A	32.000 x 0.005 mom	56.000 x 0.005 mom	82.665 x 0.005 mom	109.335 x 0.005 mom	162.665 x 0.05 mom
Grain Unit	1,851.8 x 0.2 GN	1,851.8 x 0.2 GN	3,240.8 x 0.2 GN	4,784.0 x 0.2 GN	6,327.2 x 0.2 GN	9,413.8 x 0.2 GN
Tael (HK General)	N/A	3.1745 x 0.0005 TL	5.5555 x 0.0005 TL	8.2010 x 0.0005 TL	10.8465 x 0.0005 TL	16.1380 x 0.0005 TL
Tola	N/A	10.288 x 0.001 to	18.004 x 0.001 to	26.578 x 0.001 to	35.151 x 0.001 to	52.299 x 0.001 to

<sup>^</sup>Weighing Chamber

UNIT OF MEASURE

## Specifications

	EJ-1500	EJ-2000	EJ-3000	EJ-4100	EJ-6100	
<b>Part#</b>	<b>112415</b>	<b>112416</b>	<b>112417</b>	<b>112418</b>	<b>112419</b>	
<b>List Price</b>	<b>\$275.00</b>	<b>\$330.00</b>	<b>\$400.00</b>	<b>\$460.00</b>	<b>\$490.00</b>	
Capacity	1,500 g	2,100 g	3,100 g	4,100 g	6100 g	
<b>Resolution</b>	<b>0.1 g</b>	<b>0.1 g</b>	<b>0.1 g</b>	<b>0.1 g</b>	<b>0.1 g</b>	
Operating Modes	Specific Gravity, Counting, Percentage, Checkweighing					
Repeatability	0.1 g					
Linearity	±0.1 g		±0.2 g			
Sensitivity Drift	20 ppm/°C 50°F to 86°F (10°C to 30°C)					
Display Type	7 segment LCD with backlight (character height 16 mm)					
Operating Temperature	14°F to 104°F (-10°C to 40°C) less than 85% R.H. (non-condensing)					
<b>Pan Size W x D</b>	<b>5 x 5.5 in (127 x 140 mm)</b>					
Physical Dimensions	(W x D x H) 7.5 x 8.6 x 2.2 in (190 x 218 x 55 mm)					
Weight (approx.)	1,100 g					
Calibration Mass (default setting)	1,500 g	2,000 g	3,000 g	4,000 g	6,000 g	
Power	120VAC adapter (4 AA size dry-cell batteries-70 hours operation)					
Warranty	Five-year limited warranty					
Return Policy	A&D Weighing Standard Policy - restock fee may apply					
UNIT OF MEASURE	Decimal Ounce	52.91 x 0.01 oz	74.08 x 0.01 oz	109.35 x 0.01 oz	144.62 x 0.01 oz	215.17 x 0.01 oz
	Decimal Pound	3.307 x 0.001 lb	4.630 x 0.001 lb	6.834 x 0.001 lb	9.039 x 0.001 lb	13.4488 x 0.001 lb
	Troy Ounce	48.23 x 0.01 ozt	67.52 x 0.01 ozt	99.67 x 0.01 ozt	131.82 x 0.01 ozt	196.12 x 0.01 ozt
	Pennyweight	964.5 x 0.1 dwt	1,350.3 x 0.1 dwt	1,993.3 x 0.1 dwt	2,636.4 x 0.1 dwt	3,922.4 x 0.1 dwt
	Carat	-	-	-	-	-
	Momme	4,000.00 x 0.05 mom	560.00 x 0.05 mom	826.65 x 0.05 mom	1,093.35 x 0.05 mom	1,626.65 x 0.05 mom
	Grain Unit	23,148 x 2 GN	32,408 x 2 GN	47,840 x 2 GN	63,272 x 2 GN	94,138 x 2 GN
	Tael (HK General)	39.685 x 0.005TL	55.555 x 0.005TL	82.01 x 0.005TL	108.465 x 0.005TL	161.380 x 0.005TL
	tola	128.6 x 0.01 to	180.04 x 0.01 to	265.78 x 0.01 to	351.51 x 0.01 to	522.99 x 0.01 to

## Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
163274	EJ-123	120 g X 0.001 g	\$530.00
112410	EJ-120	120 g x 0.01 g	280.00
112411	EJ-200	210 g x 0.01 g	310.00
112412	EJ-300	310 g x 0.01 g	380.00
112413	EJ-410	410 g x 0.01 g	435.00
112414	EJ-610	610 g x 0.01 g	540.00
112415	EJ-1500	1500 g x 0.1 g	275.00
112416	EJ-2000	2100 g x 0.1 g	330.00
112417	EJ-3000	3100 g x 0.1 g	400.00
112418	EJ-4100	4100 g x 0.1 g	460.00
112419	EJ-6100	6100 g x 0.1 g	490.00

## Options/Accessories

PART #	A&D MODEL #	DESCRIPTION	PRICE
112426	EJ-02	USB interface with cable	\$75.00
112427	EJ-03	RS-232 interface with cable	65.00
112428	EJ-07	Underhook for EJ-3000, EJ-4100 and EJ-6100	65.00
112429	EJ-08	Underhook for EJ-1500 and EJ-2000	65.00
112430	EJ-11	Breeze break	65.00
112431	EJ-12	Carrying case	65.00
112432	EJ-13	Density determination kit	75.00
97766	TB:163C	AC adapter, 120V	43.00
97767	TB:164	AC adapter, 220V	53.00
151247	AD-1688	Data logger	304.00

### Standard Features

- Backlit weight display
- Remote zeroing
- Easy to install NiCad battery option
- 9 weighing modes
- RS-232C bidirectional interface



### Approvals



### Specifications

	EK-120i	EK-200i	EK-300i	EK-410i	EK-610i	EK-600i	EK-1200i	
<b>Part#</b>	97747	97748	97749	97750	97751	-	-	
<b>List Price</b>	\$520.00	\$550.00	\$575.00	\$645.00	\$750.00	-	-	
<b>NTEP Part#</b>	-	-	-	-	-	97752	97753	
<b>NTEP List Price</b>	-	-	-	-	-	\$520.00	\$540.00	
Approvals	-						NTEP CC 04-019	
Capacity	120g	200g	300g	400g	600g	600g	1,200g	
<b>Resolution</b>	<b>0.01 g</b>	<b>0.01 g</b>	<b>0.01 g</b>	<b>0.01 g</b>	<b>0.01 g</b>	<b>0.1 g</b>	<b>0.1 g</b>	
Operating Modes	Counting, Percentage							
Repeatability	0.01 g					0.1 g		
Linearity	±0.01 g		±0.02 g			±0.1 g		
Sensitivity Drift	20 ppm/°C 50°F to 86°F (10°C to 30°C)							
Display Type	7 segment LCD with backlight (character height 16 mm)							
Operating Temperature	14°F to 104°F (-10°C to 40°C) less than 85% R.H. (non-condensing)							
<b>Pan Size W x D</b>	<b>Ø 4.3 in (110 mm)</b>					<b>5.2 in x 6.7 in (133 x 170 mm)</b>		
Physical Dimensions	(W x D x H) 7.5 x 8.6 x 2.2 in (190 x 218 x 55 mm)							
Weight (approx.)	2.4 lb (1.1 kg)					3.5 lb (1.5 kg)		
Calibration Mass (default setting)	120g	200g	300g	400g	600g	600g	1,200g	
Power	120VAC adapter (Optional Ni-MH battery pack)							
Warranty	Five-year limited warranty							
Return Policy	A&D Weighing Standard Policy - restock fee may apply							
<b>UNIT OF MEASURE</b>	Decimal Ounce	4.2330 x 0.0005 oz	7.0550 x 0.0005 oz	10.5820 x 0.0005 oz	14.110 x 0.001 oz	21.164 x 0.001 oz	21.165 x 0.005 oz	42.330 x 0.005 oz
	Decimal Pound	-	-	-	0.8818 x 0.0001 lb	1.3228 x 0.0001 lb	1.3230 x 0.0005 lb	2.6455 x 0.0005 lb
	Troy Ounce	3.8580 x 0.0005 ozt	6.4300 x 0.0005 ozt	9.6450 x 0.0005 ozt	12.860 x 0.001 ozt	19.290 x 0.001 ozt	19.290 x 0.005 ozt	38.580 x 0.005 ozt
	Pennyweight	77.16 x 0.01 dwt	128.60 x 0.01 dwt	192.90 x 0.01 dwt	257.21 x 0.01 dwt	385.81 x 0.01 dwt	385.8 x 0.1 dwt	771.6 x 0.1 dwt
	Carat	600.00 x 0.05 ct	1000.00 x 0.05 ct	1500.00 x 0.05 ct	2000.0 x 0.1 ct	3000.0 x 0.1 ct	3000.0 x 0.5 ct	6000.0 x 0.5 ct
	Momme	32.000 x 0.005 mom	53.335 x 0.005 mom	80.000 x 0.005 mom	106.665 x 0.005 mom	160.000 x 0.005 mom	160.00 x 0.05 mom	320.00 x 0.05 mom
	Grain Unit	1,851.8 x 0.2 GN	3,086.4 x 0.2 GN	4,629.8 x 0.2 GN	6,173.0 x 0.2 GN	9,259.4 x 0.2 GN	92,594 x 2 GN	18,518 x 2 GN
	Tael (HK General)	3.1745 x 0.0005 TL	5.2910 x 0.0005 TL	7.9365 x 0.0005 TL	10.5820 x 0.0005 TL	15.8735 x 0.0005 TL	15.875 x 0.005 TL	31.745 x 0.005 TL

## Specifications

	EK-2000i	EK-3000i	EK-4100i	EK-6100i	EK-6000i	EK-12Ki
<b>Part#</b>	97754	97755	97756	97757	—	—
<b>List Price</b>	\$565.00	\$605.00	\$725.00	\$885.00	—	—
<b>NTEP Part#</b>	—	—	—	—	97758	97759
<b>NTEP List Price</b>	—	—	—	—	\$565.00	\$730.00
Capacity	2,000 g	3,000 g	4,000 g	6,000g	6,000 g	12,000 g
Resolution	0.1 g	0.1 g	0.1 g	0.1 g	1 g	1 g
Operating Modes	Counting, Percentage					
Repeatability	0.1 g				1 g	
Linearity	±0.1 g	±0.2 g			±1 g	
Sensitivity Drift	20 ppm/° C 50° F to 86° F (10° C to 30° C)					
Display Type	7 segment LCD with backlight (character height 16 mm)					
Operating Temperature	14° F to 104° F (-10° C to 40° C) less than 85% R.H. (non-condensing)					
<b>Pan Size W x D</b>	<b>5.2 x 6.7 in (133 x 170 mm)</b>					
Physical Dimensions	(W x D x H) 7.5 x 8.6 x 2.2 in (190 x 218 x 55 mm)					
Weight (approx.)	3.5 lb (1.5 kg)					
Calibration Mass (default setting)	2,000 g	3,000 g	4,000 g	6,000 g	12 kg	
Power	120VAC adapter (Optional Ni-MH battery pack)					
Approvals	-				NTEP CC 04-019	
Warranty	Five-year limited warranty					
Return Policy	A&D Weighing Standard Policy - restock fee may apply					
<b>UNIT OF MEASURE</b>						
Decimal Ounce	70.550 x 0.005 oz	105.820 x 0.005 oz	141.10 x 0.01 oz	211.64 x 0.01 oz	211.65 x 0.05 oz	423.30 x 0.05 oz
Decimal Pound	4.4090 x 0.0005 lb	6.6140 x 0.0005 lb	8.818 x 0.001 lb	13.228 x 0.001 lb	13.230 x 0.005 lb	26.455 x 0.005 lb
Troy Ounce	64.300 x 0.005 ozt	96.450 x 0.005 ozt	128.60 x 0.01 ozt	192.90 x 0.01 ozt	192.90 x 0.05 ozt	385.80 x 0.05 ozt
Pennyweight	1,286.0 x 0.1 dwt	1,929.0 x 0.1 dwt	2,572.1 x 0.1 dwt	3,858.1 x 0.1 dwt	3,858 x 1 dwt	7,716 x 1 dwt
Carat	10,000.0 x 0.5 ct	15,000.0 x 0.5 ct	20,000 x 1 ct	30,000 x 1 ct	-	-
Momme	533.35 x 0.05 mom	800.00 x 0.05 mom	1,066.65 x 0.05 mom	1,600.00 x 0.05 mom	1,600.0 x 0.5 mom	3,200.0 x 0.5 mom
Grain Unit	30,864 x 2 GN	46,298 x 2 GN	61,730 x 2 GN	92,594 x 2 GN	-	-
Tael (HK General)	52.910 x 0.005 TL	79.365 x 0.005 TL	105.820 x 0.005 TL	158.735 x 0.005 TL	158.75 x 0.05 TL	317.45 x 0.05 TL

### Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
97747	EK-120i	120 g x 0.01 g	\$520.00
97748	EK-200i	200 g x 0.01 g	550.00
97749	EK-300i	300 g x 0.01 g	575.00
97750	EK-410i	400 g x 0.01 g	645.00
97751	EK-610i	600 g x 0.01 g	750.00
97752	EK-600i (NTEP Certified)	600 g x 0.1 g	520.00
97753	EK-1200i (NTEP Certified)	1,200 g x 0.1 g	540.00
97754	EK-2000i	2,000 g x 0.1 g	565.00
97755	EK-3000i	3,000 g x 0.1 g	605.00
97756	EK-4100i	4,000 g x 0.1 g	725.00
97757	EK-6100i	6,000 g x 0.1 g	885.00
97758	EK-6000i (NTEP Certified)	6,000 g x 1 g	565.00
97759	EK-12Ki (NTEP Certified)	12,000 g x 1 g	730.00

### Options/Accessories

PART #	A&D MODEL #	DESCRIPTION	PRICE
97760	EKW-04i	Comparator/relay outputs/buzzer	\$160.00
97761	EKW-07i	Underhook for EK-4100i/6100i/6000i/12Ki/EW-12Ki	52.00
97762	EKW-09i	NiCad battery pack	209.00
97764	AX:3005824-5S	Dust cover	13.00
97605	AD-100-2	Anti-theft device	73.00
97766	TB:163C	AC adapter (120V)	43.00
97767	TB:164	AC adapter (240V)	53.00
151247	AD-1688	Data logger	304.00

## Standard Features

- Backlit weight display
- Remote zeroing
- Easy-to-install NiCad battery option
- RS-232C bidirectional interface
- Counting/Percentage/Comparator modes
- Triple range



## Approvals



## Specifications

	EW-150i			EW-1500i			EW-12Ki		
<b>Part#</b>	97768			—			—		
<b>List Price</b>	\$425.00			—			—		
<b>NTEP Part#</b>	—			97769			97771		
<b>NTEP List Price</b>	—			\$425.00			\$425.00		
Capacity	30 g	60 g	150 g	300 g	600 g	1,500 g	3,000 g	6,000 g	12,000 g
<b>Resolution</b>	<b>0.01 g</b>	<b>0.02 g</b>	<b>0.05 g</b>	<b>0.1 g</b>	<b>0.2 g</b>	<b>0.5 g</b>	<b>1 g</b>	<b>2 g</b>	<b>5 g</b>
Operating Mode	Counting, Percentage								
Repeatability	0.01 g	0.02 g	0.05 g	0.1 g	0.2 g	0.5 g	1 g	2 g	5 g
Linearity	±0.01 g	±0.02 g	±0.05 g	±0.1 g	±0.2 g	±0.5 g	±1 g	±2 g	±5 g
Sensitivity Drift	20 ppm/°C (10° C to 30° C/50° F to 86° F)								
Operating temperature	14° F to 104° F (-10° C to 40° C) less than 85% R.H. (non-condensing)								
<b>Pan Size</b>	<b>Ø 4.3 in (110 mm)</b>			<b>5.2 x 6.7 in (133 x 170 mm)</b>					
Dimensions	(W x D x H) 7.5 x 8.6 x 2.2 in (190 x 218 x 55 mm)								
Weight	2.4 lb (1.1 kg)			3.5 lb (1.5 kg)					
Calibration Mass (default setting)	150 g			1,500 g			12 kg		
Power	AC adapter or Ni-MH battery pack (option)								
Approvals	-			NTEP CC 04-019			NTEP CC 04-019		
Warranty	Five-year limited warranty								
Return Policy	A&D Weighing Standard Policy - restock fee may apply								
Decimal Ounce	1.0580 x 0.0005 oz	2.116 x 0.001 oz	5.292 x 0.002 oz	10.580 x 0.005 oz	21.16 x 0.01 oz	52.92 x 0.02 oz	105.80 x 0.05 oz	211.6 x 0.1 oz	423.2 x 0.2 oz
Decimal Pound				0.6615 x 0.0005 lb	1.323 x 0.001 lb	3.306 x 0.002 lb	6.615 x 0.005 lb	13.23 x 0.01 lb	26.46 x 0.02 lb
Troy Ounce	0.9645 x 0.0005 ozt	1.929 x 0.001 ozt	4.822 x 0.002 ozt	9.645 x 0.005 ozt	19.29 x 0.01 ozt	48.22 x 0.02 ozt	96.45 x 0.05 ozt	192.9 x 0.1 ozt	385.8 x 0.2 ozt
Pennyweight	19.29 x 0.01 dwt	38.58 x 0.02 dwt	96.45 x 0.05 dwt	192.9 x 0.1 dwt	385.8 x 0.2 dwt	964.5 x 0.5 dwt	1,929 x 1 dwt	3,858 x 2 dwt	7,715 x 5 dwt
Carat	150.00 x 0.05 ct	300.0 x 0.1 ct	750.0 x 0.2 ct	1,500.0 x 0.5 ct	3000 x 1 ct	7500 x 2 ct	-	-	-
Momme	8.000 x 0.005 mom	16.00 x 0.01 mom	40.00 x 0.02 mom	80.00 x 0.05 mom	160.0 x 0.1 mom	400 x 0.2 mom	800 x 0.5 mom	1,600 x 1 mom	3,200 x 2 mom
Grain Unit	463.0 x 0.2 GN	926.0 x 0.5 GN	2,315 x 1 GN	4,630 x 2 GN	9,260 x 5 GN	23,150 x 10 GN	-	-	-
Tael (HK General)	0.7935 x 0.0005 TL	1.587 x 0.001 TL	3.968 x 0.002 TL	7.935 x 0.005 TL	15.87 x 0.01 TL	39.68 x 0.02 TL	79.35 x 0.05 TL	158.7 x 0.1 TL	317.4 x 0.2 TL

### Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
97768	EW-150i	30 g x 0.01 g / 60 g x 0.02 g / 150 g x 0.05 g	\$425.00
97769 (NTEP)	EW-1500i	300 g x 0.1 g / 600 g x 0.2 g / 1,500 g x 0.5 g	425.00
97771 (NTEP)	EW-12Ki	3,000 g x 1 g / 6,000 x 2 g / 12,000 g x 5 g	425.00

### Options/Accessories

PART #	A&D MODEL #	DESCRIPTION	PRICE
97760	EKW-04i	Comparator/relay outputs/buzzer	\$160.00
97761	EKW-07i	Underhook for EK-4100i/6100i/6000i/12Ki/EW-12Ki	52.00
97762	EKW-09i	NiCad battery pack	209.00
97764	AX:3005824-5S	Protective dust cover (not in use)	13.00
97605	AD-100-2	Anti-theft device	73.00
97766	TB:163C	AC adapter (120V)	43.00
97767	TB:164	AC adapter (240V)	53.00
151247	AD-1688	Data logger	304.00

## Standard Features

- Internal calibration
- Auto environmental compensation
- IP65/NEMA Type 4
- RS-232C bidirectional interface
- Data memory function
- Multiple weighing modes
- Quick reference operation card
- Time and date
- Vacuum Fluorescent Display (VFD)
- Underhook weighing



## Specifications

	GX-8K	GX-8K2	GX-10K	GX-12K
<b>Part #</b>	<b>97776</b>	<b>97775</b>	<b>97777</b>	<b>97778</b>
<b>List Price</b>	<b>\$3,570.00</b>	<b>\$3,085.00</b>	<b>\$3,800.00</b>	<b>\$3,240.00</b>
Capacity	8.1 kg	8.1 kg/2.1 kg	10.1 kg	12 kg
<b>Resolution</b>	<b>0.01 g</b>	<b>0.1 g / 0.01 g</b>	<b>0.01 g</b>	<b>0.1 g</b>
Operating Modes	Counting, percentage			
Repeatability	0.01 g	0.05 g/0.01 g	0.01 g	0.1 g
Linearity	±0.02 g	±0.1 g/±0.02 g	±0.03 g	±0.2 g
Sensitivity drift (-10° C to +30° C)	±2 ppm/° C	±3 ppm/° C	±2 ppm/° C	±3 ppm/° C
Stabilization time	Approx 1.5 seconds			
Operating temperature	41° F to 104° F (-5° C to 40° C)			
<b>Pan Size</b>	<b>10.62 x 8.26 in (270 x 210 mm)</b>			
Dimensions	(W x D x H) 11.81 x 13.98 x 4.37 in (300 x 355 x 111 mm)			
Weight	18.3 lb (8.3 kg)			
External cal mass	2, 3, 4, 5, 6, 7, 8 kg		10 kg	5, 10 kg
Power	120/240 V AC adapter			
Warranty	Five-year limited warranty			
Return Policy	A&D Weighing Standard Policy - restock fee may apply			
Decimal Ounces	285.7190 x 0.0005 oz	285.720 x 0.005/74.0755 x 0.0005 oz	370.4 x 0.0005 oz	423.290 x 0.005 oz
Troy Ounce	260.4210 x 0.0005 ozt	260.420 x 0.005/67.5165 x 0.0005 ozt	337.6 x 0.0005 ozt	385.810 x 0.005 ozt
Pennyweight	5,208.42 x 0.01 dwt	5,208.4 x 0.1/1350.33 x 0.01 dwt	6,751 x 0.01 dwt	7,716.2 x 0.1 dwt
Carat	40,500.00 x 0.05 ct	40,500.0 x 0.5/10,500.00 x 0.05 ct	50,500 x 0.05 ct	60,000 x 0.5 ct
Momme	2,160.000 x 0.005 mom	2,160.00 x 0.05/560.000 x 0.005 mom	2,800.000 x 0.005 mom	3,200.00 x 0.05 mom
Grain	125,002.2 x 0.2 GN	125,002 x 2/32,408.0 x 0.2 GN	162,040 x 0.2 GN	185,188 x 2 GN
Pound	17.85745 x 0.00005 lb	17.8575 x 0.0005/4.62970 x 0.00005 lb	23.15 x 0.00005 lb	26.4555 x 0.00005 lb
Pound/Ounce	17 lb x 0.001 oz	17 lb x 0.001 oz	23 lb x 0.001 oz	26 lb x 0.01 oz

UNIT OF MEASURE

## Specifications

	GX-20K	GX-30K	GX-32K	
<b>Part #</b>	<b>97779</b>	<b>97780</b>	<b>97781</b>	
<b>List Price</b>	<b>\$3,495.00</b>	<b>\$4,045.00</b>	<b>\$3,140.00</b>	
Capacity	20 kg	30 kg	30 kg/6.1 kg	
<b>Resolution</b>	<b>0.1 g</b>	<b>0.1 g</b>	<b>1/0.1 g</b>	
Operating Modes	Counting, percentage			
Repeatability	0.1 g	0.1 g	0.5 g / 0.1 g	
Linearity	±0.2 g	±0.2 g	±1 g / ±0.2 g	
Sensitivity drift (-10 to 30° C)	±3 ppm/° C		±5 ppm/° C	
Stabilization Time	Approx 1.5 seconds			
Operating Temperature	41°F - 104°F (-5°C - 40°C)			
<b>Pan Size</b>	<b>10.62 x 8.26 in (270 x 210 mm)</b>			
Dimensions	(W x D x H) 11.81 x 13.98 x 4.37 in (300 x 355 x 111 mm)			
Weight	18.3 lb (8.3 kg)			
External Cal Mass	10, 20 kg	20, 30 kg	20, 30 kg	
Power	120/240VAC adapter			
Warranty	Five-year limited warranty			
Return Policy	A&D Weighing Standard Policy - restock fee may apply			
UNIT OF MEASURE	Decimal Ounces	740.755 x 0.005 oz	1,093.495 x 0.005 oz	1,093.50 x 0.05/ 215.170 x 0.005 oz
	Troy Ounce	675.165 x 0.005 ozt	996.675 x 0.005 ozt	996.65 x 0.05/ 196.120 x 0.005 ozt
	Pennyweight	13,503.3 x 0.1 dwt	19,933.5 x 0.1 dwt	19,933 x 1/ 3,922.4 x 0.1 dwt
	Carat	105,000.0 x 0.5 ct	15,5000.0 x 0.5 ct	155,000 x 5/ 30,500.0 x 0.5 ct
	Momme	5,600.00 x 0.05 mom	8,266.65 x 0.05 mom	8,266.5 x 0.5/ 1,626.65 x 0.05 mom
	Grain	324,080 x 2 GN	478,404 x 2 GN	-
	Pound	46.2970 x 0.0005 lb	68.3435 x 0.0005 lb	68.345 x 0.005/ 13.4480 x 0.0005 lb
	Pound/Ounce	46 lb x 0.01 oz	68 lb x 0.01 oz	68 lb x 0.1 oz/13 lb x 0.01 oz

## Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
97776	GX-8K	8.1 kg x 0.01 g	\$3,570.00
97775	GX-8K2	8.1/2.1 kg x 0.1/0.01 g	3,085.00
97777	GX-10K	10.0 kg x 0.01 g	3,800.00
97778	GX-12K	12 kg x 0.1 g	3,240.00
97779	GX-20K	20 kg x 0.1 g	3,495.00
97780	GX-30K	30 kg x 0.1 g	4,045.00
97781	GX-32K	30/6.1 kg x 1/0.1 g	3,140.00

## Options/Accessories

PART #	A&D MODEL #	DESCRIPTION	PRICE
97782	GX-04K*	Comparator/output and RS-232C/20 mA interface	\$365.00
97783	GX-06K*	Analog output/20 mA interface	840.00
97784	GX-07K**	Waterproof cable for standard RS-232C	310.00
97605	AD-100-2	Anti-theft device	73.00
97785	AX-073007197A	Protective in-use cover	20.00
97649	TB:248	AC adapter (120/240V)	43.00
102898	GXK-31	Draft shield	115.00
102899	GXK-12	Animal weighing pan	835.00
151247	AD-1688	Data logger	304.00
158785	AD-8121B	Dot matrix statistical printer, includes cable	891.00

\*GX-04K, GX-06K, replace standard RS-232C and cannot be used at the same time. IP65 rating does not apply when the GX-04K or the GX-06K is installed.

\*\*Use the GX-07K optional waterproof RS-232C cable, in order to use the standard RS-232 interface for water and dust proof (IP65)

## Standard Features

- IP65/NEMA Type 4
- RS-232C bidirectional interface
- Multiple weighing modes
- Quick reference operation card
- Time and date
- Vacuum fluorescent display (VFD)
- Interval time setting
- Underhook weighing



## Specifications

	GF-8K	GF-8K2	GF-10K	GF-12K
<b>Part#</b>	<b>97793</b>	<b>97792</b>	<b>97794</b>	<b>97795</b>
<b>List Price</b>	<b>\$3,375.00</b>	<b>\$2,860.00</b>	<b>\$3,600.00</b>	<b>\$3,035.00</b>
Capacity	8.1 kg	2.1 kg/8.1 kg	10.1 kg	12 kg
<b>Resolution</b>	<b>0.01 g</b>	<b>0.01 g/0.1 g</b>	<b>0.01 g</b>	<b>0.1 g</b>
Operating Modes	Counting, Percentage			
Linearity	±0.02 g	±0.1 g/±0.02 g	±0.03 g	±0.2 g
Stabilization Time	Approx. 1.5 seconds (typical in FAST mode)			
Repeatability	0.01 g	0.05 g/0.01 g	0.01 g	0.1 g
Sensitivity Drift (10° C to 30° C)	±2 ppm/° C	±3 ppm/° C	±2 ppm/° C	±3 ppm/° C
Display Refresh	5 times per second/10 times per second			
Operating Temperature	41° F to 104° F (5° C to 40° C) RH less than 85% (No condensation)			
<b>Pan Size (W x D)</b>	<b>Stainless steel 10.62 x 8.26 in (270 x 210 mm)</b>			
Dimensions	(W x D x H) 11.81 x 13.98 x 4.37 in (300 x 355 x 111 mm)			
Weight	18.3 lb (8.3 kg)			
External Cal. Mass	2, 3, 4, 5, 6, 7, 8 kg		10 kg	5, 10 kg
Power	120/240V AC adapter			
Warranty	Five-year limited warranty			
Return Policy	A&D Weighing Standard Policy - restock fee may apply			
Decimal Ounces	285.7190 x 0.0005 oz	285.720 x 0.005/74.0755 x 0.0005 oz	370.4 x 0.0005 oz	423.290 x 0.005 oz
Troy Ounce	260.4210 x 0.0005 ozt	260.420 x 0.005/67.5165 x 0.0005 ozt	337.6 x 0.0005 ozt	385.810 x 0.005 ozt
Pennyweight	5,208.42 x 0.01 dwt	5,208.4 x 0.1/1,350.33 x 0.01 dwt	6,751 x 0.01 dwt	7,716.2 x 0.1 dwt
Carat	40,500.00 x 0.05 ct	40,500.0 x 0.5/10,500.00 x 0.05 ct	50,500 x 0.05 ct	60,000 x 0.5 ct
Momme	2,160.000 x 0.005 mom	2,160.00 x 0.05/560.000 x 0.005 mom	2,800.000 x 0.005 mom	3,200.00 x 0.05 mom
Grain	125,002.2 x 0.2 GN	125,002 x 2/32,408.0 x 0.2 GN	162,040 x 0.2 GN	185,188 x 2 GN
Pound	17.85745 x 0.00005 lb	17.8575 x 0.0005/4.62970 x 0.00005 lb	23.15 x 0.00005 lb	26.4555 x 0.0005 lb
Pound/Ounce	17 lb x 0.001 oz	17 lb x 0.01 oz/4 lb x 0.001 oz	23 lb x 0.001 oz	26 lb x 0.01 oz

UNIT OF MEASURE

## Specifications

	GF-20K	GF-30K	GF-32K	
<b>Part#</b>	<b>97796</b>	<b>97797</b>	<b>97798</b>	
<b>List Price</b>	<b>\$3,240.00</b>	<b>\$3,800.00</b>	<b>\$2,880.00</b>	
Capacity	21 kg	31 kg	6.1/31 kg	
<b>Resolution</b>	<b>0.1 g</b>	<b>0.1 g</b>	<b>0.1/1 g</b>	
Operating Modes	Counting, Percentage			
Linearity	±0.2 g		±1 g/0.2 g	
Stabilization time	Approx. 1.5 seconds (typical in FAST mode)			
Repeatability	0.1 g		0.5 g/0.1 g	
Sensitivity Drift (10° C to 30° C)	±3 ppm/° C		±5 ppm/° C	
Display refresh	5 times per second/10 times per second			
Operating Temperature	41° F to 104° F (5° C to 40° C) RH less than 85% (No condensation)			
<b>Pan Size (W x D)</b>	<b>Stainless steel 10.62 x 8.26 in (270 x 210 mm)</b>			
Dimensions	(W x D x H) 11.81 x 13.98 x 4.37 in (300 x 355 x 111 mm)			
Weight	18.3 lb (8.3 kg)			
External Cal. Mass	10, 20 kg	20, 30 kg		
Power	120/240VAC adapter			
Warranty	Five-year limited warranty			
Return Policy	A&D Weighing Standard Policy - restock fee may apply			
UNIT OF MEASURE	Decimal Ounces	740.755 x 0.005 oz	1,093.495 x 0.005 oz	1,093.50 x 0.05/215.170 x 0.005 oz
	Troy Ounce	675.165 x 0.005 ozt	996.675 x 0.005 ozt	996.65 x 0.05/196.120 x 0.005 ozt
	Pennyweight	13,503.3 x 0.1 dwt	19,933.5 x 0.1 dwt	19,933 x 1/3,922.4 x 0.1 dwt
	Carat	105,000.0 x 0.5 ct	155,000.0 x 0.5 ct	155,000 x 5/30,500.0 x 0.5 ct
	Momme	5,600.00 x 0.05 mom	8,266.65 x 0.05 mom	8,266.5 x 0.5/1,626.65 x 0.05 mom
	Grain	324,080 x 2 GN	478,404 x 2 GN	N/A
	Pound	46.2970 x 0.0005 lb	68.3435 x 0.0005 lb	68.345 x 0.005/13.4480 x 0.0005 lb
	Pound/Ounce	46 lb x 0.01 oz	68 lb x 0.01 oz	68 lb x 0.1 oz/17 lb x 0.01 oz

## Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
97792	GF-8K2	2.1 kg/8.1 kg x 0.01 g/0.1 g	\$2,860.00
97793	GF-8K	8.1 kg x 0.01 g	3,375.00
97794	GF-10K	10.1 kg x 0.01 g	3,600.00
97795	GF-12K	12 kg x 0.1 g	3,035.00
97796	GF-20K	21 kg x 0.1 g	3,240.00
97797	GF-30K	31 kg x 0.1 g	3,800.00
97798	GF-32K	31 kg/6.1 kg x 1 g/0.1 g	2,880.00

## Options/Accessories

PART #	A&D MODEL #	DESCRIPTION	PRICE
97782	GX-04K*	Comparator/output and RS-232C/20 mA interface	\$365.00
97783	GX-06K*	Analog output/20 mA interface	840.00
97784	GX-07K**	Waterproof cable for standard RS-232C	310.00
97605	AD-100-2	Anti-theft device	73.00
97785	AX:073007197A	Protective in-use cover	20.00
97649	TB:237	AC adapter (120V/220V)	43.00
102898	GXK-31	Draft shield	115.00
102899	GXK-12	Animal weighing pan	835.00
151247	AD-1688	Data logger	304.00
158785	AD-8121B	Impact dot matrix statistical printer, includes cable	891.00

\*GX-04K, GX-06K, replace standard RS-232C and cannot be used at the same time. IP65 rating does not apply when the GX-04K or the GX-06K is installed.

\*\*Use the GX-07K optional waterproof RS-232C cable, in order to use the standard RS-232 interface for water and dust proof (IP65)

## Standard Features

- IP65/NEMA Type 4
- Internal calibration weight with manual, interval or auto-environmental compensation
- RS-232C bidirectional interface
- Data-collection software
- Auto re-zero function
- Multiple weighing modes
- Time and date
- Bright blue fluorescent display
- Adjustable swing arm display
- Die cast aluminum body with stainless weighing pan
- Detached digital weight indicator (KS models only)



## Specifications

	GP-12K	GP-20K	GP-30K	GP-30KS*	GP-32K	GP-32KS*	GP-40K	
<b>Part#</b>	<b>97802</b>	<b>97803</b>	<b>97805</b>	<b>97810</b>	<b>97804</b>	<b>102901</b>	<b>97806</b>	
<b>List Price</b>	<b>\$3,500.00</b>	<b>\$3,840.00</b>	<b>\$4,580.00</b>	<b>\$4,825.00</b>	<b>\$3,115.00</b>	<b>\$3,480.00</b>	<b>\$4,150.00</b>	
Capacity	12 kg	21 kg	31 kg		31 kg/6 kg		41 kg	
<b>Resolution</b>	<b>0.1 g</b>	<b>0.1 g</b>	<b>0.1 g</b>		<b>1/0.1 g</b>		<b>0.5 g</b>	
Operating Modes	Counting, percentage							
Repeatability	0.1 g	0.1 g	0.1 g	-	0.5g/0.1 g	-	0.5 g	
Linearity	±0.2g	±0.2g	±0.2g	-	±1 / ±2g	-	±1 g	
Sensitivity Drift (-10° C to +30 ° C)	±3 ppm/° C				±5 ppm/° C			
Stabilization Time	Approx. 1.5 seconds (typical in FAST mode)							
Operating Temperature	41° F to 104° F (5° C to 40° C) RH less than 85% (No condensation)							
<b>Pan Size (W x D)</b>	<b>Stainless steel 15 x 13 in (384 x 344 mm)</b>							
Dimensions	(W x D x H) 14.6 x 24.2 x 5.1 in 372 x 615 x 130 mm		(W x D x H) 13.5 x 17.4 x 5.5 in (344 x 442 x 139 mm)		(W x D x H) 14.6 x 24.2 x 5.1 in (372 x 615 x 130 mm)			
Height with Column	652 mm							
Weight	Approx 37.4 lb (17 kg)							
External Cal Mass	5 kg/10 kg	10 kg/20 kg	20 kg/30 kg				20/30/40 kg	
Warranty	Five-year limited warranty							
Return Policy	A&D Weighing Standard Policy - restock fee may apply							
UNIT OF MEASURE	Decimal Ounces	423.290 x 0.005 oz	740.755 x 0.005 oz	1,093.495 x 0.005 oz		1,093.50 x 0.05/215.170 x 0.005 oz		1,446.24 x 0.02 oz
	Troy Ounce	385.810 x 0.005 ozt	675.165 x 0.005 ozt	996.675 x 0.005 ozt		996.65 x 0.05/196.120 x 0.005 ozt		1,318.18 x 0.02 ozt
	Pennyweight	7,716.2 x 0.1 dwt	13,503.3 x 0.1 dwt	19,933.5 x 0.1 dwt		19,933 x 1/3922.4 x 0.1 dwt		26,363.5 x 0.5 dwt
	Carat	60,000 x 0.5 ct	105,000.0 x 0.5 ct	155000.0 x 0.5 ct		155,000 x 5/30,500.0 x 0.5 ct		205,000 x 5 ct
	Momme	3,200.00 x 0.05 mom	5,600.00 x 0.05 mom	8,266.65 x 0.05 mom		8,266.5 x 0.5/1,626.65 x 0.05 mom		10,933.4 x 0.2 mom
	Grain	185,188 x 2 GN	324,080 x 2 GN	478,404 x 2 GN		-		-
	Pound	26.4555 x 0.0005 lb	46.2970 x 0.0005 lb	68.3435 x 0.0005 lb		68.345 x 0.005/13.4480 x 0.0005 lb		90.390 x 0.002 lb
	Pound/Ounce	26 lb x 0.01 oz	46 lb x 0.01 oz	68 lb x 0.01 oz		68 lb x 1 oz/13 lb x 0.01 oz		90 lb x 0.1 oz

\*S designates remote indicator

## Specifications

	GP-60K	GP-60KS*	GP-61K	GP-61KS*	GP-100K	GP-100KS*	GP-102K	
<b>Part #</b>	<b>97807</b>	<b>102902</b>	<b>102900</b>	<b>102903</b>	<b>97808</b>	<b>97811</b>	<b>97809</b>	
<b>List Price</b>	<b>\$5,100.00</b>	<b>\$5,350.00</b>	<b>\$5,560.00</b>	<b>\$5,690.00</b>	<b>\$5,500.00</b>	<b>\$5,825.00</b>	<b>\$4,940.00</b>	
Capacity	61 kg		61 kg		100 kg	101 kg	101 kg/61 kg	
<b>Resolution</b>	<b>1 g</b>		<b>0.1 g</b>		<b>1 g</b>		<b>10/1 g</b>	
Operating Modes	Counting, Percentage							
Repeatability	0.7 g	-	0.2 g	-	1 g	-	(5/1) g	
Linearity	±1 g	-	±0.5 g	-	±2 g	-	±10 / ±2 g	
Sensitivity Drift (-10 to +30 ° C)	±6 ppm/° C						±10 ppm/° C	
Stabilization Time	Approx. 1.5 seconds (typical in FAST mode)							
Operating Temperature	41°F to 104°F (5°C to 40°C) RH less than 85% (No condensation)							
<b>Pan Size (W x D)</b>	<b>Stainless steel 15 x 13 in (384 x 344 mm)</b>			-	<b>Stainless steel 15 x 13 in (386 x 346 mm)</b>			
Dimensions	(W x D x H) 14.6 x 24.2 x 5.1 in (372 x 615 x 130 mm)							
Height with Column	25.7 in (652 mm)							
Weight	Approx 37.4 lb (17 kg)				Approx 39.7 lb (18 kg)			
External Cal Mass	30/40/50/60 kg		20/30/40/50/60 kg		60/80/100 kg			
Warranty	Five-year limited warranty							
Return Policy	A&D Weighing Standard Policy - restock fee may apply							
<b>UNIT OF MEASURE</b>	Decimal Ounces	2,151.7 x 0.05 oz		2,151.7 x 0.005 oz		3,562.65 x 0.05 oz		3,562.5/2,151.7 x 0.5/0.05 oz
	Troy Ounce	1,961.2 x 0.05 ozt		1,961.2 x 0.005 ozt		3,247.25 x 0.05 ozt		3,247/1,961.2 x 0.5/0.05 ozt
	Pennyweight	39,224 x 1 dwt		39,224 x 0.1 dwt		-		-
	Carat	305,000 x 5 ct		305,000 x 0.5 ct		-		-
	Momme	16,266.5 x 0.5 mom		16,266.5 x 0.05 mom		26,933.5 x 0.5 mom		26,935/16,266.5 x 5/0.5 mom
	Pound	134.480 x 0.005 lb		134.480 x 0.0005 lb		222.665 x 0.005 lb		222.65/134.48 x 0.05/0.005 lb
	Pound/Ounce	134 lb x 0.1 oz		134 lb x 0.01 oz		222 lb x 1 oz		222 lb x 1 oz

\*S designates remote indicator

## Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
97802	GP-12K	12 kg x 0.1 g	\$3,500.00
97803	GP-20K	21 kg x 0.1 g	3,840.00
97805	GP-30K	31 kg x 0.1 g	4,580.00
97810	GP-30KS	31 kg x 0.1 g	4,825.00
97804	GP-32K	31 kg/6 kg x 1 g/0.1 g	3,115.00
102901	GP-32KS	31 kg/6 kg x 1 g/0.1 g	3,480.00
97806	GP-40K	41 kg x 0.5 g	4,150.00
97807	GP-60K	61 kg x 1 g	5,100.00
102902	GP-60KS	61 kg x 1 g	5,350.00
102900	GP-61K	61 kg x 0.1 g	5,560.00
102903	GP-61KS	61 kg x 0.1 g	5,690.00
97808	GP-100K	100 kg x 1 g	5,500.00
97811	GP-100KS	101 kg x 1 g	5,825.00
97809	GP-102K	101 kg/61 kg x 10 g/1 g	4,940.00

## Options/Accessories

PART #	A&D MODEL #	DESCRIPTION	PRICE
97607	AD-1682	Rechargeable battery pack	\$678.00
97608	AD-8920	Universal remote display	270.00
97813	GP-04	Comparator output with buzzer	255.00
97814	GP-06	Analog output (replaces standard RS-232C)	835.00
97815	GP-07	GP extension cable (factory installed 120 day lead time)	312.00
97816	GP-20	Underhook GP-12 kg thru 40 kg	180.00
97817	GP-21	Underhook GP-60 kg thru 102 kg	180.00
97818	GP-22	AD-8121B printer support	160.00
97605	AD-100-2	Anti-theft device	73.00
97820	07:3004753	Protective in-use cover	18.00
97613	TB:136	AC adapter (120V) standard with unit	43.00
97614	TB:137	AC adapter (220V)	52.00
97609	AD-8922	Remote controller	635.00
102904	GP-12	Animal weighing pan	1,675.00
151247	AD-1688	Data logger	304.00
97612	SW:128	Foot switch	72.00
158785	AD-8121B	Dot matrix statistical printer	891.00

## Standard Features

- Fast and uniform heating with halogen lamp and uniquely designed (secondary radiation assist) SRA filter
- WinCT® communication tools software
- Sodium tartrate dihydrate is provided as a stable moisture content for accuracy checks of the analyzer
- 5 measurement programs: standard, automatic, timer, manual and quick
- Vacuum fluorescent display (VFD)
- Glass window for heating check and easy cleaning
- Self-check function
- Quick reference card
- Standard bidirectional RS-232C
- GLP/ GMP/GCP/ISO compliant with time and date, ID, calibration data and check record outputs



## Specifications

	MS-70	MX-50	MF-50	ML-50
<b>Part#</b>	<b>97821</b>	<b>97822</b>	<b>97823</b>	<b>112408</b>
<b>List Price</b>	<b>\$5,815.00</b>	<b>\$3,630.00</b>	<b>\$2,935.00</b>	<b>\$2,470.00</b>
Capacity	71 g	51 g	51 g	51 g
<b>Resolution</b>	<b>0.0001 g</b>	<b>0.001 g</b>	<b>0.002 g</b>	<b>0.005 g</b>
Moisture Content Display	0.001%/0.01%/0.1%	0.01%/0.1%	0.05%/0.1%/1%	0.1%/1%
Moisture Content Accuracy over 1g	0.05%	0.10%	0.20%	0.50%
Over 5g	0.01%	0.02%	0.05%	0.10%
Heating Technology	Halogen lamp (straight type, 400 Watt max, 5,000 hours)			
Drying Temperature	30° C to 200° C	50° C to 200° C (1° increment)		
Measurement Program Memories	20 sets		10 sets	5 sets
Data Memory	100		50	30
Measurement Programs	Standard/Automatic/Timer/Manual			
Measurement Modes	Wet base/Dry base/Solid content/Ratio			
Operating Temperature	40° F to 104° F (5° C to 40° C)			
<b>Sample Pan Size</b>	<b>Ø 2.16 in (85 mm)</b>			
Dimensions	(W x D x H) 8.46 x 12.6 x 6.8 in (215 x 320 x 173 mm)			
Weight	13 lb (5.9 kg)			
Power	120VAC			
Warranty	Five-year limited warranty			
Return Policy	A&D Weighing Standard Policy - restock fee may apply			

A&D Weighing

## MS-70/MX-50/MF-50 Series

Moisture Analyzers

BALANCES

### Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
97821	MS-70	71 g x 0.0001 g	\$5,815.00
97822	MX-50	51 g x 0.001 g	3,630.00
97823	MF-50	51 g x 0.002 g	2,935.00
112408	ML-50	51 g x 0.005 g	2,470.00

### Options/Accessories

PART #	A&D MODEL #	DESCRIPTION	PRICE
97824	AX-31	Sample pans (washable, 100 each)	\$95.00
97825	AX-32-2	Glass fiber sheets (100 each)	52.00
97826	AX-33	Sodium tartrate dehydrate test samples (30 x 12 g)	83.00
97827	AX-34	Halogen lamp (replacement)	63.00
97828	AX-35	Pan handles (2 each)	27.00
97829	AX-36	Tweezers (2 each)	17.00
97830	AX-37	Spoons (2 each)	21.00
97831	AX-38	Protective in-use covers (5 each)	42.00
97832	AX-39	Dust cover	17.00
97833	AX-42	WinCT® Moisture (standard for MS-70 and MX-50, option for MF-50)	237.00
97834	AD-1700-20G	Calibration mass (20 g)	150.00
97837	AX-43	Temperature calibrator (MS-70 and MX-50 only)	450.00
151247	AD-1688	Data logger	304.00
158785	AD-8121B	Dot matrix statistical printer, includes cable	891.00

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RICE LAKE



### Standard Features

- Easy-to-clean analytical draft shield
- Up-front level indicator
- Selectable environment settings
- Flexibility of available options
- Removable doors for easy cleaning and access
- Up-front level bubble for easy reference
- Selectable environmental settings
- Integral underweigh hook
- Standard security bracket
- Standard RS-232C
- Security menu lock
- Multiple application modes and units of measure
- Backlight display



### Approvals



### Specifications

	PA84^	PA124^	PA224^	PA163	PA323	PA523
<b>Part#</b>	<b>167603</b>	<b>167604</b>	<b>167605</b>	<b>167606</b>	<b>167607</b>	<b>167608</b>
<b>List Price</b>	<b>\$1,637.00</b>	<b>\$1,965.00</b>	<b>\$2,183.00</b>	<b>\$982.00</b>	<b>\$1,146.00</b>	<b>\$1,365.00</b>
Capacity	85 g	120 g	220 g	160 g	320 g	520 g
<b>Resolution</b>	<b>0.1 mg</b>	<b>0.1 mg</b>	<b>0.1 mg</b>	<b>0.001 g</b>	<b>0.001 g</b>	<b>0.001 g</b>
Weighing Modes	Milligram, Gram, Carat, Ounce, Troy Ounce, Grain, Pennyweight, Momme, Tels, Tical, Tola, Baht, Mesghal, Newton, Custom Unit					
Operating Modes	Weighing, Parts Counting, Percent, Density Determination, Dynamic Weighing					
Repeatability (mg)	0.1			1		
Linearity (mg)	0.2		0.3		2	
Stabilization Time	Three seconds					
Operating Temperature	50°F to 104°F (10°C to 40°C)					
<b>Pan Size</b>	<b>3.54 in (90 mm)</b>			<b>4.72 in (120 mm)</b>		
Dimensions	(W x D x H) 7.7 x 11.3 x 12.6 in ( 19.6 x 28.7 x 32 cm)					
Weight (Approx.)	10 lb (4.5 kg)					
Calibration Weight (g)	50/80	50/100	100/200	100/150	200/300	200/500
Power	120 VAC adapter (220-240 VAC adapter by special order), 50/60 Hz					
Warranty	Two-year limited warranty					
Return Policy	OHAUS Standard Policy - restock fee may apply					

^Weighing Chamber

### Specifications

	PA1602	PA2202	PA3202	PA4202	PA2201	PA4201
<b>Part#</b>	<b>167609</b>	<b>167610</b>	<b>167611</b>	<b>167612</b>	<b>167613</b>	<b>167614</b>
<b>List Price</b>	<b>\$883.00</b>	<b>\$1,037.00</b>	<b>\$1,256.00</b>	<b>\$1,419.00</b>	<b>\$928.00</b>	<b>\$1,091.00</b>
Capacity	1,600 g	2,200 g	3,200 g	4,200 g	2,200 g	4,200 g
<b>Resolution</b>	<b>0.01 g</b>	<b>0.01 g</b>	<b>0.01 g</b>	<b>0.01 g</b>	<b>0.1 g</b>	<b>0.1 g</b>
Weighing Modes	Milligram, Gram, Carat, Ounce, Troy Ounce, Grain, Pennyweight, Momme, Tels, Tical, Tola, Baht, Mesghal, Newton, Custom Unit					
Operating Modes	Weighing, Parts Counting, Percent, Density Determination, Dynamic Weighing					
Repeatability (mg)	10			100		
Linearity (mg)	20			100		
Stabilization Time	Three seconds					
Operating Temperature	50°F to 104°F (10°C to 40°C)					
<b>Pan Size</b>	<b>7.1 in (180 mm)</b>					
Dimensions	(W x D x H) 7.7 x 11.3 x 12.6 in ( 19.6 x 28.7 x 32 cm)					
Weight (Approx.)	7.3 lb (3.3 kg)					
Calibration Weight (g)	1,000/1,500	1,000/2,000	2,000/3,000	2,000/4,000	1,000/2,000	2,000/4,000
Power	120 VAC adapter (220-240 VAC adapter by special order) , 50/60 Hz					
Warranty	Two-year limited warranty					
Return Policy	OHAUS Standard Policy - restock fee may apply					

## Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
167603	PA84	85 g x 0.1 mg	\$1,637.00
167604	PA124	120 g x 0.1 mg	1,965.00
167605	PA224	220 g x 0.1 mg	2,183.00
167606	PA163	160 g x 0.001 g	982.00
167607	PA323	320 g x 0.001 g	1,146.00
167608	PA523	520 g x 0.001 g	1,365.00
167609	PA1602	1,600 g x 0.01 g	883.00
167610	PA2202	2,200 g x 0.01 g	1,037.00
167611	PA3202	3,200 g x 0.01 g	1,257.00
167612	PA4202	4,200 g x 0.01 g	1,419.00
167613	PA2201	2,200 g x 0.1 g	928.00
167614	PA4202	4,200 g x 0.1 g	1,091.00

## Options/Accessories

PART #	MODEL #	DESCRIPTION	PRICE
104767	80252042	Compact impact printer, 42 column	\$725.00
67413	SW12W	TAL software WinWedge®	425.00
104770	80251932	Paper for printer	13.00
104771	80251933	Ribbon for printer	39.00
71960	80500571	RS-232 cable, printer to Pioneer	140.00
70406	80500525	RS-232 cable, PC 9-Pin to Pioneer	140.00
77712	80500524	RS-232 cable, PC 25-Pin to Pioneer	140.00
102798	80850045	Density determination kit for Pioneer analytical balances (0.1 mg and 1 mg)	560.00
35263	76288-01	Security device for Pioneer	165.00
102799	128-00	Forceps, 2.75 in (70 mm)	20.00
102800	129-00	Forceps, 3.5 in (89 mm)	20.00
33455	5076-00	Aluminum scoop, 1.5 in x 2 in (3.8 cm x 5.1 cm), weight 4 g	28.00
33456	5077-00	Gold scoop, 2.25 in x 3 in (5.7 cm x 7.6 cm), weight 10 g	28.00
33454	4590-30	Black scoop, aluminum 4 in x 3.5 in (10.2 cm x 8.9 cm), weight 24 g	28.00
33451	3369-10	Polypropylene Maxi-Scoop™ 10 in dia. x 2.5 in deep (25.4 cm dia. x 6.4 cm deep) with pouring spout, weight 145 g	39.00
102801	71147059	Plastic scoop, 1.3 in x 1.5 in x 0.4 in (33 mm x 38 mm x 10 mm) deep with pouring spout, weight 1.2 g	20.00
97250	80250400	Stainless steel scoop 11.9 in x 7.38 in x 1.69 in	53.00
100292	80250954	Stainless steel scoop 17.2 in x 11 in x 3.4 in (44 cm x 28 cm x 8.5 cm)	66.00
156234	46001724	AC adapter (requires PN 166574 plugs)	42.00
166574	46001776	US plug set	15.00
156235	46001780	International plug set	15.00

## Standard Features

- Intuitive SmarText™ software
- 4 programmable touchless sensors
- Color touchscreen display
- Memory for up to 99 items
- Real-time clock for GLP/GMP data collection
- Audible stability alert
- Autocal automatic calibration



## Specifications

MODEL	EX125D <sup>^</sup>	EX125 <sup>^</sup>	EX225D <sup>^</sup>	EX225D/AD <sup>^</sup>	EX225/AD <sup>^</sup>
Part Number	171347	171348	171349	171350	171351
List Price	\$5,100.00	\$6,400.00	\$6,200.00	\$9,000.00	\$9,800.00
Capacity	52 g/120 g	120 g	120 g/220 g	120 g/220 g	220 g
Resolution	0.01 mg/0.1 mg	0.01 mg	0.01 mg/ 0.1 mg	0.01 mg/ 0.1 mg	0.01 mg
Weighing Units	Gram, milligram, Carat, Ounce, Ounce Troy, Pound, Pennyweight, Grain, Newton, Mom, Mesghal, Tical, Tola, Baht, Tael, 3 Custom Units				
Operating Modes	Weighing, Percent Weighing, Parts Counting, Checkweighing, Dynamic/Animal Weighing, Filling, Totalization, Formulation, Differential Weighing, Density Determination, Peak Hold, Pipette adjustment, SQC				
Repeatability (20 g) std	±0.015 mg				
Repeatability (100 g) std	0.1 mg	0.02 mg	0.02 mg/0.1 mg	0.02 mg/0.1 mg	0.03 mg
Linearity (mg)	±0.1 mg				
Stabilization Time	0.1 mg ≤ 0.3 seconds; 0.01 mg ≤ 8 second				
Min-Weight (typical)	20.0 mg fine range (USP, u=0.10%, k=2)				
Operating Temperature Range	14° F to 86° F (-10° C to 30° C)				
Pan Size	80 mm				
Dimensions	(W x D x H) 9 x 15.4 x 13.8 in (230 x 393 x 350 mm)				
Shipping Weight	25 lb (12.5 kg)				
Calibration	Auto Cal internal calibration				
Power Requirements	AC adapter input: 100-240 VAC 0.6A 50-60 Hz				
Warranty	Two-year limited				
Return Policy	OHAUS Standard Policy - restock fee may apply				

<sup>^</sup>Weighing Chamber

## Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
171347	EX125D	52g/120g x /0.01 mg/0.1 mg	\$5,100.00
171348	EX125	120 g x 0.01 mg	6,400.00
171349	EX225D	120g/220g x 0.01 mg/0.1 mg	6,200.00
171350	EX225D/AD	120g/220g x 0.01 mg/0.1 mg	9,000.00
171351	EX225/AD	2,200g x 0.01 g	9,800.00

## Options/Accessories

PART #	MODEL #	DESCRIPTION	PRICE
67422	80253384	Density determination kit	\$560.00
104767	80252042	Compact dot matrix impact printer	725.00
70406	80500525	RS-232 cable, PC 9-Pin to EX	140.00
156234	-	AC adapter	42.00
156235	-	International plug set	15.00

## Standard Features

- Automatic calibration via AutoCal™
- Communication RS-232C
- On-screen prompts
- Spill channel
- Applications library to store and quickly recall past procedures
- Brilliant backlit, high-resolution dot matrix display with simple navigation windows and menus to guide you through balance functions
- User selectable GLP outputs via RS-232 to meet traceability requirements
- User selectable filter, stability indicator and auto-zero tracking for use in difficult environments
- Five-language operation display text
- Standard underweigh capability
- Protective in-use cover and security bracket
- Optional Features
- Autocal™ automatic calibration
- NTEP Certified, Legal for Trade models by special order



## Specifications

MODEL	EX124 <sup>^</sup>	EX224 <sup>^*</sup>	EX324 <sup>^*</sup>
<b>Part Number</b>	<b>121192</b>	<b>121193</b>	<b>121194</b>
<b>List Price</b>	<b>\$3,967.00</b>	<b>\$4,505.00</b>	<b>\$5,120.00</b>
Capacity	120 g	220 g	320 g
<b>Resolution</b>	<b>0.0001 g</b>		
Weighing Units	Gram, Milligram, Kilogram, Carat, Ounce, Ounce Troy, Pound, Pennyweight, Grain, Newton, Momme, Mesghal, Hong Kong Tael, Singapore Tael, Taiwan Tael, Tical, Tola, Baht, 3 Custom Units		
Operating Modes	Weighing, Percent Weighing, Parts Counting, Checkweighing, Dynamic/Animal Weighing, Filling, Totalization, Formulation, Differential Weighing, Density Determination, Peak Hold, Ingredient Costing, Pipette Adjustment, SQC		
Repeatability	±0.0001 g		
Linearity	±0.0002 g		
Stabilization Time	≤2 seconds		≤3 seconds
Operating Temperature Range	50° F to 86° F (10° C to 30° C)		
Weighing Chamber	(W x D x H) 9.5 x 7.5 x 6.5 in (241.3 x 190.5 x 165.1 mm)		
<b>Pan Size</b>	<b>Ø 3.5 in (90 mm)</b>		
Display Housing Dimensions	(W x D x H) 7.7 x 3.5 x 6.0 in (195 x 90 x 154 mm)		
Dimensions Base	9.1 x 13.8 x 15.5 in (230 x 350 x 393 mm)		
Shipping Weight	21.1 lb (9.6 kg)		
Calibration	AutoCal™ on Δ1.5° C temperature change, 11 hours, and external calibration		
Power Requirements	AC adapter input: 100-240 VAC 0.6A 50-60 Hz		
Warranty	Two-year limited warranty		
Return Policy	OHAUS Standard Policy - restock fee may apply		

<sup>^</sup>Weighing Chamber

<sup>\*</sup>NTEP and Measurement Canada models available by special order

## Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
121192	EX124	120 g x 0.0001 g	\$3,967.00
121193	EX224	220 g x 0.0001 g	4,505.00
121194	EX324	320 g x 0.0001 g	5,120.00

## Options/Accessories

PART #	MODEL #	DESCRIPTION	PRICE
67422	80253384	Density determination kit	\$560.00
35263	76288-01	Security device for EX	165.00
104767	80252042	Compact dot matrix impact printer	725.00
77712	80500524	RS-232 cable, PC 25-Pin to EX	140.00
70406	80500525	RS-232 Cable, PC 9-Pin to EX	140.00
156234	46001724	Multi-range AC adapter	42.00
156235	46001780	International plug set	15.00

## Standard Features

- Capacities from 220 g to 10.2 kg with Readability to 0.001 g
- Large, 5.7 full-color touchscreen display with intuitive set up and application software
- AutoCal™ automatic internal calibration for optimized weighing performance
- 14 application modes, 11 weighing units and 5 display languages for a wide variety of applications
- 4 programmable touchless sensors for hands-free operation
- 0.001 g models feature frameless draftshield with anti-static glass, flip-top and large side entry doors on top-mounted bearings



## Optional Features

- External calibration models

## Specifications

MODEL	EX223 <sup>^</sup>	EX423 <sup>^*</sup>	EX623 <sup>^</sup>	EX1103 <sup>^*</sup>	EX2202	EX4202*	EX6202	EX10202*	EX6201	EX10201*
Part Number	121195	121196	121197	121198	121199	121200	121201	121202	121203	121204
List Price	\$3,116.00	\$3,393.00	\$3,706.00	\$4,485.00	\$3,127.00	\$3,393.00	\$3,711.00	\$4,505.00	\$3,178.00	\$3,414.00
Capacity	220 g	420 g	620 g	1,100 g	2,200 g	4,200 g	6,200 g	10,200 g	6,200 g	10,200 g
Resolution	0.001 g				0.01 g			0.1 g		
Weighing Units	Gram, Milligram, Kilogram, Carat, Ounce, Ounce Troy, Pound, Pennyweight, Grain, Newton, Momme, Mesghal, Hong Kong Tael, Singapore Tael, Taiwan Tael, Tical, Tola, Baht, 3 Custom Units									
Operating Modes	Weighing, Percent Weighing, Parts Counting, Checkweighing, Dynamic/Animal Weighing, Filling, Totalization, Formulation, Differential Weighing, Density Determination, Peak Hold, Ingredient Costing, Pipette Adjustment, SQC									
Repeatability	±0.001				±0.01 g			±0.1 g		
Linearity	±0.002 g				±0.02 g			±0.1 g		
Stabilization Time	≤1.5 seconds				≤1 seconds					
Operating Temperature Range	50° F to 86° F (10° C to 30° C)									
Weighing Chamber	(W x D x H) 9.5 x 7.5 x 6.5 in			N/A						
Pan Size	Ø 5.1 in (130 mm)				7.5 x 7.9 in (190 x 200 mm)					
Display Housing Dimensions	(W x D x H) (7.7 x 3.5 x 6.0 in (195 x 90 x 154 mm))									
Dimensions Base	(W x D x H) 9.1 x 13.8 x 15.5 in (230 x 350 x 393 mm)					(W x D x H) 9.1 x 3.9 x 15.5 in (230 x 98 x 393 mm)				
Shipping Weight	21.1 lb (9.6 kg)				15 lb (6.8 kg)			16.3 lb (7.4 kg)		
Calibration	AutoCal™ on Δ1.5° C temperature change, 11 hours, and external calibration									
Power Requirements	AC adapter input: 100-240 VAC 0.6A 50-60 Hz									
Warranty	Two-year limited warranty									
Return Policy	OHAUS Standard Policy - restock fee may apply									

<sup>^</sup>Weighing Chamber

<sup>\*</sup>NTEP models available by special request

## Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
121195	EX223^	220 g x 0.001 g	\$3,116.00
121196	EX423^	420 g x 0.001 g	3,393.00
121197	EX623^	620 g x 0.001 g	3,706.00
121198	EX1103^	1,100 g x 0.001 g	4,485.00
121199	EX2202	2,200 g x 0.01 g	3,127.00
121200	EX4202	4,200 g x 0.01 g	3,393.00
121201	EX6202	6,200 g x 0.01 g	3,711.00
121202	EX10202	10,200 g x 0.01 g	4,505.00
121203	EX6201	6,200 g x 0.1 g	3,178.00
121204	EX10201	10,200 g x 0.1 g	3,414.00

^Weighing Chamber

## Options/Accessories

PART #	MODEL #	DESCRIPTION	PRICE
67422	80253384	Densitydetermination kit (for 410 g capacity and below)	\$560.00
35263	76288-01	Security device for EX	165.00
104767	80252042	Compact dot matrix impact printer	725.00
77712	80500524	RS-232 cable, PC 25-Pin to EX	140.00
70406	80500525	RS-232 cable, PC 9-Pin to EX	140.00
156234	46001724	Multi-range AC adapter	42.00
156235	46001780	International plug set	15.00

OHAUS

# Explorer® Pro

High Capacity

Capacity: 12,000g-35,000g Readability: 0.1g

BALANCES

## Standard Features

- Touchless IR (infrared) sensors minimize keypad use
- Program IR sensor to control operations including print, tare and other selectable functions
- Color VGA, 5.7-in display with icons for simple menu navigation
- Multiple application modes designed for versatility
- AutoCal™ Calibration
- Robust IP 54 die-cast metal bottom housing with stainless steel pan
- Integral weigh below hook
- ENERGY STAR qualified adapter



## APPROVALS



Measurement  
Canada  
Approved

## Specifications

	EX12001	EX24001	EX35001
<b>Part#</b>	<b>157235</b>	<b>157236</b>	<b>157237</b>
<b>List Price</b>	<b>\$3,770.00</b>	<b>\$4,631.00</b>	<b>\$5,491.00</b>
Capacity	12,000g	24,000g	35,000g
<b>Resolution</b>	<b>0.1g</b>		
Weighing Modes	Gram, Kilogram, Carat, Ounce, Troy Ounce, Pound,, Pennyweight, Mommies, Grain, Tical, Tola, Newton, Mesghal, 3 Custom Units		
Operating Modes	Weighing, Counting, Animal/Dynamic weighing, Checkweighing, Percent weighing, Filling, Parts Counting, Totalization, Formulation, Differential Weighing, Density Determination, Peak Hold, Ingredient Costing, SQC		
Repeatability	±0.1g		
Linearity	±0.2g		
Stabilization Time	≤1		
Operating Temperature	14° F to 140° F (-10° C to 60° C)		
<b>Pan Size</b>	<b>14.84 x 12.24 in (377 x 311 mm)</b>		
Display Housing Dimensions	(W x D x H) 7.7 x 3.5 x 6.0 in (195 x 90 x 154 mm)		
Dimensions Base	(W x D x H) 14.84 x 4.72 x 17.44 in (377 x 120 x 443 mm)		
Weight (Approx.)	25 lb (12.5 kg)		
Calibration	Auto Cal internal calibration		
Power	AC adapter input: 100-240VAC 0.6A 50-60 Hz		
Warranty	Two-year limited warranty		
Return Policy	OHAUS Standard Policy - restock fee may apply		
Approvals	NTEP CC 14-082 / Measurement Canada AM-5957		

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RICE LAKE

### Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
157235	EX12001	12,000 g x 0.1 g	\$3,770.00
157236	EX24001	24,000 g x 0.1 g	4,631.00
157237	EX35001	35,000 g x 0.1 g	5,491.00

### Options/Accessories

PART #	MODEL #	DESCRIPTION	PRICE
157238	30078082	Tower mount display	\$115.00
104767	80252042	Compact dot matrix impact printer	725.00
77712	80500524	RS-232 cable, PC 25-Pin to EX	140.00
70406	80500525	RS-232 cable, PC 9-Pin to EX	140.00
156234	46001724	Multi-range AC adapter	42.00
156235	46001780	International plug set	15.00

OHAUS

# Adventurer Pro®

Precision Balances

Capacity: 120g-8,200g Readability: 0.0001g-0.1g

BALANCES

## Standard Features

- Stable, accurate and fast operation, ensuring optimal weighing results
- Color touchscreen with 4.3 in (109 mm) display size
- Dual USB ports and RS-232 provide connectivity options
- Space-saving top-mounted draft shield on analytical models
- Real time clock with GLP/GMP data
- Below minimum sample weight indication with minimum weight feature
- AutoCal™



## APPROVALS



Measurement  
Canada  
Approved

## Specifications

	AX124 ^	AX224 ^	AX324^	AX223^	AX423^	AX523^	AX622	AX1502
<b>Part Number</b>	164622	164623	164625	164626	164628	164630	164633	164635
<b>List Price</b>	\$3,000.00	\$3,300.00	\$3,600.00	\$1,700.00	\$2,000.00	\$2,300.00	\$1,400.00	\$1,700.00
<b>NTEP Part Number</b>	N/A	164624	N/A	164627	164629	164632	164634	164636
<b>NTEP List Price</b>	N/A	\$3,465.00	N/A	\$1,625.00	\$2,100.00	\$2,200.00	\$1,260.00	\$1,575.00
<b>NTEP Certified Approvals</b>	—	I (0.001 g) AM-5957, CC 14-082	—	II (0.01 g) AM-5957, CC 14-082	II (0.01 g) AM-5957, CC 14-082	II (0.01g) AM-5957, CC 14-082	II (0.1g) AM-5957, CC 14-082	
<b>Capacity (g)</b>	120 g	220 g	320 g	220 g	420 g	520 g	620 g	1,520 g
<b>Resolution (g)</b>	0.0001 g	0.0001 g	0.0001 g	0.001 g	0.001 g	0.001 g	0.01 g	0.01 g
<b>Weighing Modes</b>	Milligram, Gram, Kilogram, Ounce, Pound, Carat, Pennyweight, Troy Ounce, Grain, Newton, Hong Kong Tael, Singapore Tael, Taiwan Tael, Momme, Tical, Baht, Mesgal, Tola, custom							
<b>Operating Modes</b>	Counting, Weighing, Dynamic weighing, Checkweighing, Percent Weighing, Totalization, Display hold, Density Determination, Formulation							
<b>Repeatability</b>	1 mg			0.001 g				
<b>Linearity</b>	0.2 mg			0.002				
<b>Operating Temperature</b>	10° C to 30° C (50° F to 86° F)							
<b>Pan Size</b>	3.5 in (90 mm)			5.1 in (130 mm)			6.9 x 7.7 in (175 x 195 mm)	
<b>Dimensions Base Housing</b>	(W x D x H) 13.93 x 13.39 x 9.05 in (354 x 340 x 230 mm)						(W x D x H) 13.93 x 3.94 x 9.05 in (354 x 100 x 230 mm)	
<b>Weight (Approx.)</b>	17.2 lb (7.8 kg)			12.8 lb (5.8 kg)			14.4 lb (6.5 kg)	
<b>Calibration Weight (g)</b>	100	200	300	200	400	500	600	1500
<b>Power</b>	100 - 240 VAC, 0.3A, 50-60 HZ AC adapter							
<b>Warranty</b>	Two-year limited warranty							

\* NTEP Certified models have reduced resolution

^Weighing Chamber

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RICE LAKE

## Specifications

	AX2202	AX4202	AX5202	AX4201	AX8201
<b>Part Number</b>	164637	164639	164641	164642	164643
<b>List Price</b>	\$1,900.00	\$2,200.00	\$2,400.00	\$1,300.00	\$1,450.00
<b>NTEP Part Number</b>	164638	164640	N/A	N/A	164644
<b>NTEP List Price</b>	\$1,800.00	\$2,100.00	N/A	N/A	\$1,300.00
Capacity (g)	2,200 g	4,200 g	5,200 g	4,200 g	8,200 g
<b>Resolution (g)</b>	<b>0.01 g</b>	<b>0.01 g</b>	<b>0.01 g</b>	<b>0.1 g</b>	<b>0.1 g</b>
NTEP Certified Class	II (0.1 g)	II (0.1 g)			II (1 g)
Weighing Modes	Gram, Kilogram, Ounce, Pound, Carat, Pennyweight, Troy Ounce, Grain, Newton, Hong Kong Tael, Singapore Tael, Taiwan Tael, Momme, Tical, Baht, Mesgal, Tola, Custom				
Operating Modes	Weighing, Dynamic weighing, Checkweighing, Percent Weighing, Totalization, Display hold, Density Determination, Formulation				
Repeatability	0.01 g				
Linearity	0.002				
<b>Operating Temperature</b>	<b>10° C to 30° C (50° F to 86° F)</b>				
<b>Pan Size</b>	<b>175 x 195 mm (6.9 x 7.7 in)</b>				
Dimensions Base Housing	(W x D x H) 13.93 x 3.94 x 9.05 in (354 x 100 x 230 mm)				
Weight (Approx.)	14.4 lb (6.5 kg)				12.6 lb (5.7 kg)
Calibration Weight (g)	2,000	4,000	5,000	4,000	8,000
Power	100-240 VAC, 0.3A, 50-60 HZ AC adapter				
Warranty	Two-year limited warranty				

\* NTEP Certified models have reduced resolution

## Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
164622	AX124	120 g x 0.0001 g	\$3,000.00
164623	AX224	220 g x 0.0001 g	3,300.00
164624	AX224 N	220 g x 0.001 g	3,465.00
164625	AX324	320 g x 0.0001 g	3,600.00
164626	AX223	320 g x 0.001 g	1,700.00
164627	AX223 N/E	220 g x 0.001 g	1,625.00
164628	AX423	420 g x 0.001 g	2,300.00
164629	AX423 N/E	420 g x 0.01 g	2,100.00
164630	AX523	520 g x 0.001 g	2,300.00
164632	AX523 N/E	520 g x 0.01 g	2,200.00
164633	AX622	620 g 0.001 g	1,400.00
164634	AX622 N/E	620 g x 0.01 g	1,260.00
164635	AX1502	1,520 g x 0.01 g	1,700.00
164636	AX1502 N/E	1,520 g x 0.1 g	1,575.00
164637	AX2202	2,200 g x 0.01 g	1,900.00
164638	AX2202 N/E	2,200 g x 0.1 g	1,800.00
164639	AX4202	4,200 g 0.01 g	220.00
164640	AX4202 N/E	4,200 g x 0.1 g	2,100.00
164641	AX5202	5,200 g x 0.01 g	2,400.00
164642	AX4201	4,200 g x 0.1 g	1,300.00
164643	AX8201	8,200 g x 0.1 g	1,450.00
164644	AX8201 N/E	8,200 g x 1 g	1,300.00

## Options/Accessories

PART #	MODEL #	DESCRIPTION	PRICE
67422	80253384	Density determination kit	\$560.00
156809	AK87421-1-R	USB cable, Type A to B	50.00
67423	80850043	Security device (laptop lock)	165.00
77712	80500524	25-Pin RS-232 cable (PC)	140.00
70406	80500525	9-Pin RS-232 cable (PC)	140.00

## Standard Features

- Fast halogen heating element provides uniform infrared heating and durability for extended use
- Superior weighing performance with readability up to 0.001 g, 0.01% moisture
- Powerful software for simple operation
- Large, backlit 128 x 64 pixel liquid crystal display (LCD) for easy viewing
- GLP/GMP compliant format when printed results are required
- RS-232 port for easy communication with printer or computer
- Multi-language display text (English, Spanish, French)



MB45

## Approvals



## Specifications

	MB23	MB25	MB35	MB45
<b>Part #</b>	<b>109522</b>	<b>109521</b>	<b>70858</b>	<b>70390</b>
<b>List Price</b>	<b>\$2,754.00</b>	<b>\$3,284.00</b>	<b>\$3,824.00</b>	<b>\$4,365.00</b>
Capacity	110 g	110 g	35 g	45 g
<b>Resolution</b>	<b>0.01 g</b>	<b>0.005 g</b>	<b>0.002 g</b>	<b>0.001 g</b>
Repeatability	3 g sample-0.3%; 10 g sample-0.1%	3 g sample-0.2%; 10 g sample-0.05%	3 g sample-0.18%; 10 g sample-0.05%	3 g sample-0.05%; 10 g sample-0.015%
Moisture Range	0.1% - 100%	0.05% - 100%	0.05% to 100%	0.01% to 100% (0.01% to 100% for regain mode)
Heater Type	Infrared (no glass)	Halogen		
Timer	1-99 minutes, 30 second increments to 60 min		1-120 min in 30 second -60 min increments, 1 min increments from 60-120 min	1-120 min in 10 second increments
Temperature Settings	50° C to 160° C x 5° C (increments)			50° C-200° C x 1° C (increments)
Operating Temperature	41° F to 104° F (5° C to 40° C)		50° F to 104° F (10° C to 40° C)	
<b>Pan Size</b>	<b>Ø 9 cm (3.5 in)</b>			
Dimensions	(W x D x H) 7.5 x 6.0 x 14 in (165 x 127 x 279 mm)		(W x D x H) 7.5 x 6 x 14 in (190.5 x 152.4 x 355.6 mm)	
Est. Ship Weight	14 lb (6.3 kg)			
Power	120V AC Adapter			
Warranty	Two-year limited warranty			
Return Policy	OHAUS Standard Policy - restock fee may apply			

OHAUS  
**MB Series**  
 Moisture Balance

### Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
109522	MB23	110 g x 0.01 g (0.1% IR)	\$2,754.00
109521	MB25	100 g x 0.005 g (0.05% Halogen Heat)	3,284.00
70858	MB35	35 g x 0.002 g (0.05% Halogen Heat)	3,824.00
70390	MB45	45 g x 0.001 g (0.01% Halogen Heat)	4,365.00

### Options/Accessories

PART #	MODEL #	DESCRIPTION	PRICE
70401	11113857	Temperature calibration kit	\$415.00
70402	80850087	Pads, glass fiber, 200/box	75.00
70403	80850086	Sample pans, 50/box, 90 mm diameter	45.00
70404	80850088	Reusable sample pans, 3/box	160.00
70405	80850085	In-use cover	60.00
70406	80500525	Cable, 9-Pin serial extension	140.00
67423	470004-010	Security device	165.00
67413	SW12W	WinWedge® TAL Software	425.00
70860	11113873	Sample pan handler (MB-35 only)	100.00
104767	—	Impact printer	725.00
71960	80500571	Cable for PN 104767	140.00
104770	—	Paper for PN 104767	13.00
104771	—	Ribbon for PN 104767	39.00

OHAUS

**Scout® NEW**

Portable Electronic Balances

Capacity: 120-8,200g    Readability: 0.001-1g



SPX Round Pan

STX Rectangular Pan

## Standard Features

- ABS housing and stainless steel pan
- Display type (SPX): backlit LCD, 6-digit, 7-segment with white LED backlight
- Display type (STX): full-color touchscreen WQVGA graphic LCD
- Battery or AC operation (AC adaptor included)

## Specifications

LCD Model	SPX123 <sup>^</sup>	SPX223 <sup>^</sup>	SPX222	SPX422	SPX622	SPX1202
Part#	171984	171985	171986	171987	171988	171989
List Price	\$584.00	\$654.00	\$428.00	\$600.00	\$702.00	\$802.00
Touchscreen Model	STX123 <sup>^</sup>	STX223 <sup>^</sup>	STX222	STX422	STX622	STX1202
Part#	171996	171998	171999	172000	172001	172002
List Price	\$654.00	\$732.00	\$479.00	\$672.00	\$786.00	\$898.00
Capacity	120 g	220 g	220 g	420 g	620 g	1,200 g
Resolution	0.001 g	0.001 g	0.01 g	0.01 g	0.01 g	0.01 g
Unit of Measure	g, kg, ct, N, oz, ozt, dwt, lb, lb:oz, grn, hkt, sgt, twt, tical, tola, STX models: mg and customer unit					
Operating Modes	Weighing, Parts Counting, Percent Weighing, Checkweighing, Totalization, Display Hold, Only available on STX models: Animal/Dynamic Weighing, Density Determination, Mole Weighing					
Repeatability	2d	2d	1d	1d	1d	2d
Linearity	0.003g	0.001 g	0.01 g	0.01 g	0.01 g	0.01 g
Stabilization Time	1 second	1 second	1 second	1 second	1 second	1 second
Operating Temperature	50° F to 104° F / 10° C to 40° C; 10% to 85% at 31° C, decreasing linearly to 50% at 40° C, non-condensing					
Typical Battery Life (STX)	7 hours					
Typical Battery Life (SPX)	80 hours		120 hours	80 hours		
Pan Size	Ø 3.7 in (93 mm)		Ø 4.7 in (120 mm)			6.7 x 5.5 in (170 x 140 mm)
Dimensions	(W x D x H) 8 x 8.7 x 4.1 in (202 x 222 x 103 mm)		(W x D x H) 8 x 8.8 x 2.1 in (202 x 224 x 54 mm)			
Weight (Approx.)	1 kg					
Est. Ship Weight	2.8 lb (1.24 kg)					
Calibration Weight	100 g	200 g	200 g	400 g	600 g	1,000 g
Power	Multi-range, multi-plug AC power or battery (uses 4-AA batteries not included)					
Warranty	<b>One-year limited warranty</b>					
Return Policy	<b>Ohaus standard policy - restock fee may apply</b>					

<sup>^</sup>Weighing Chamber

**Specifications**

LCD Model	SPX2202	SPX421	SPX621	SPX2201	SPX6201	SPX8200
Part#	191990	171991	171992	171993	171994	171995
List Price	\$902.00	\$236.00	\$349.00	\$441.00	\$728.00	\$366.00
Touchscreen Model	STX2202	STX421	STX621	STX2201	STX6201	STX8200
Part#	172003	172004	172005	172006	172007	172008
List Price	\$1,010.00	\$271.00	\$401.00	\$507.00	\$815.00	\$421.00
Capacity	2,200 g	420 g	620 g	2,200 g	6,200 g	8,200 g
Resolution	0.01 g	0.1 g	0.1 g	0.1 g	0.1 g	1 g
Unit of Measure	g, kg, ct, N, oz, ozt, dwt, lb, lb:oz, grn, hkt, sgt, twt, tical, tola, STX models: mg and customer unit					
Operating Modes	Weighing, Parts Counting, Percent Weighing, Checkweighing, Totalization, Display Hold, Only available on STX models: Animal/Dynamic Weighing, Density Determination,					
Repeatability	2d	1d	1d	1d	1d	1d
Linearity	0.01 g	0.1 g	0.1 g	0.1 g	0.2 g	1 g
Stabilization Time	1 second	1 second	1 second	1 second	1 second	1 second
Operating Temperature	50° F to 104° F / 10° C to 40° C; 10% to 85% at 31° C, decreasing linearly to 50% at 40° C, non-condensing					
Typical Battery Life (STX)	7 hours					
Typical Battery Life (SPX)	80 hours	120 hours	120 hours	120 hours	80 hours	120 hours
Pan Size	6.7 x 5.5 in (170 x 140 mm)	Ø 4.7 in (120 mm)	6.7 x 5.5 in (170 x 140 mm)			
Dimensions	(W x D x H) 8 x 8.8 x 2.1 in (202 x 224 x 54 mm)					
Weight (Approx.)	1 kg					
Est. Ship Weight	2.8 lb (1.24 kg)					
Calibration Weight	2,000 g	400 g	600 g	2,000 g	6,000 g	8,000 g
Power	Multi-range, multi-plug AC power or battery (uses 4-AA batteries not included)					
Warranty	<b>One-year limited warranty</b>					
Return Policy	<b>Ohaus standard policy - restock fee may apply</b>					

OHAUS

**Scout®**

Portable Electronic Balances

BALANCES

### Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
171984	SPX123	120 g x 0.001 g	\$584.00
171985	SPX223	220 g x 0.001 g	654.00
171986	SPX222	220 g x 0.01 g	428.00
171987	SPX422	420 g x 0.01 g	600.00
171988	SPX622	620 g x 0.01 g	702.00
171989	SPX1202	1,200 g x 0.01 g	802.00
171990	SPX2202	2,200 g x 0.01 g	902.00
171991	SPX421	420 g x 0.1 g	236.00
171992	SPX621	620 g x 0.1 g	349.00
171993	SPX2201	2,200 g x 0.1 g	441.00
171994	SPX6201	6,200 g x 0.1 g	728.00
171995	SPX8200	8,200 g x 1 g	366.00
171996	STX123	120 g x 0.001 g	654.00
171998	STX223	220 g x 0.001 g	732.00
171999	STX222	220 g x 0.01 g	479.00
172000	STX422	420 g x 0.01 g	672.00
172001	STX622	620 g x 0.01 g	786.00
172002	STX1202	1,200 g x 0.01 g	898.00
172003	STX2202	2,200 g x 0.01 g	1,010.00
172004	STX421	420 g x 0.1 g	271.00
172005	STX621	620 g x 0.1 g	401.00
172006	STX2201	2,200 g x 0.1 g	507.00
172007	STX6201	6,200 g x 0.1 g	815.00
172008	STX8200	8,200 g x 1 g	421.00

### Options/Accessories

PART #	MODEL #	DESCRIPTION	PRICE
67413	SW12W	WinWedge® TAL Software	\$425.00
104767	—	Impact printer	725.00
104770	—	Paper for PN 104767	13.00
104771	—	Ribbon for PN 104767	39.00
156234	46001724	110/220V AC power supply (requires PN 156235)	42.00
156235	46001780	Plug set	15.00

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RICE LAKE

## Standard Features

- Superior RF protection
- Reliable, stable results
- CE listed and FCC Class B Part 15 operation
- Large, removable stainless steel weighing platform
- Low-profile design
- Standard AC adapter
- Easy operation
- Low-battery indicator
- Auto shut-off feature
- Overload protection
- Push-button calibration



## Specifications

	CS200	CS2000	CS5000	CS2000P*	CS5000P*	CS200P*
<b>Part#</b>	53493	53494	53495	53496	53497	83225
<b>List Price</b>	\$136.00	\$136.00	\$160.00	\$146.00	\$174.00	\$146.00
Capacity	200 g	2,000 g	5,000 g	2,000 g	5,000 g	200 g
<b>Resolution</b>	<b>0.1 g</b>	<b>1 g</b>	<b>1 g</b>	<b>1 g</b>	<b>1 g</b>	<b>0.1 g</b>
Weighing Modes	g, lb:oz, Newton			4 lb:6.55 oz x 0.05 oz	11 lb:0.4 oz x 0.1 oz	0 lb:7 oz x 0.01 oz
Repeatability	0.1 g	1 g	1 g	1 g	1 g	0.1 g
Linearity	±0.1 g	±1 g	±1 g	±1 g	±1 g	±0.1 g
Stabilization Time	3 seconds					
Operating Temperature	64° F to 77° F (18° C to 25° C)					
<b>Pan Size</b>	<b>5.75 x 5.25 in (14.5 x 13.3 cm)</b>					
Dimensions	(W x D x H) 8.0 x 5.5 x 1.5 in (20.3 x 14.0 x 3.8 cm)					
Weight (Approx.)	0.91 lb (0.47 kg)					
Power	3 AA alkaline batteries (included) or AC adapter (included)					
Battery Life	300 hours					
Warranty	One-year limited warranty					
Return Policy	OHAUS Standard Policy - restock fee may apply					

\*Includes US postal chart

## Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
53493	CS200	200 g x 0.1 g	\$136.00
53494	CS2000	2,000 g x 1 g	136.00
53495	CS5000	5,000 g x 1 g	160.00
53496	CS2000P*	2,000 g x 1 g	146.00
53497	CS5000P*	5,000 g x 1 g	174.00
83225	CS200P*	200 g x 0.1 g	146.00

## Options/Accessories

PART #	MODEL #	DESCRIPTION	PRICE
156234	90524-66	110/240 VAC AC power supply (requires PN 156235)	\$42.00
70434	80850075	Bowl, 1,050 mL	38.00
70435	80850076	Stainless steel weighing pan cover	41.00
156235	-	Plug set	15.00

## Standard Features

- Basic weighing with simple 2-button keypad
- Superior RF protection
- Large weighing platform
- Stackable design with integrated shipping lock
- Low battery indicator
- Auto shut-off feature
- Mechanical and software overload protection
- External push-button calibration
- Battery (standard) or AC adapter (optional) operation



## Specifications

	CL201	CL2000	CL5000
<b>Part#</b>	<b>103101</b>	<b>103102</b>	<b>103103</b>
<b>List Price</b>	<b>\$89.00</b>	<b>\$89.00</b>	<b>\$122.00</b>
Capacity	200 g	2,000 g	5,000 g
<b>Resolution</b>	<b>0.1 g</b>	<b>1 g</b>	<b>1 g</b>
Weighing Modes	g, lb:oz, ozt, dwt		
Repeatability	0.1 g	1 g	1 g
Linearity	± 0.1 g	± 1 g	± 1 g
Stabilization Time	3 seconds		
Operating Temperature	65°F to 77°F (18°C to 25°C)		
<b>Pan Size</b>	<b>Ø 4.75 in (12.0cm)</b>		
Dimensions	(W x D x H) 5.5 x 1.6 x 7.9 in (14 x 4.0 x 20 cm)		
Weight (Approx.)	0.875 lb (0.4 kg)		
Power	3 AA batteries (included) (AC adapter is optional)		
Battery Life	300 hours		
Warranty	One-year limited warranty		
Return Policy	OHAUS Standard Policy - restock fee may apply		

## Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
103101	CL201	200 g x 0.1 g	\$89.00
103102	CL2000	2,000 g x 1 g	89.00
103103	CL5000	5,000 g x 1 g	122.00

## Options/Accessories

PART #	MODEL #	DESCRIPTION	PRICE
70434	80850075	Bowl for CS compact scales (1,050 ml)	\$38.00
156234	90524-66	AC adapter for CL	42.00
103521	80010624	Carrying case for CS and CL scales	45.00
33455	5076-00	Aluminum scoop, 1.5 x 2 in (3.8 x 5.1 cm), weight 4 g	28.00
33456	5077-00	Gold scoop, 2.25 x 3 in (5.7 x 7.6 cm), weight 10 g	28.00
33454	4590-30	Black scoop, aluminum 4 x 3.5 in (10.2 x 8.9 cm), weight 24 g	28.00
156235	-	Plug set	15.00

OHAUS

## HH Series

Handheld Compact Scale

Capacity: 60g-320g    Readability: 0.1 g-0.2g

BALANCES

### Standard Features

- Weighing modes: g (HH120D); g, oz, dwt, ozt (HH120, HH320)
- Large, 0.4 in (10.16 mm) high-contrast backlit liquid crystal display (LCD)
- Low-battery indicator
- Overload and underload indicators
- Auto shut-off
- Protective snap-on cover
- Rugged plastic construction



### HH120/320 Additional Features

- Push-button luminescent display and soft tactile feedback keypad with protective cover

### Specifications

	HH120D	HH120	HH320
<b>Part #</b>	<b>52541</b>	<b>64055</b>	<b>52540</b>
<b>List Price</b>	<b>\$146.00</b>	<b>\$174.00</b>	<b>\$217.00</b>
Capacity	60 g/120 g	120 g	320 g
<b>Resolution</b>	<b>0.1 g/0.2 g</b>	<b>0.1 g</b>	<b>0.1 g</b>
Weighing Modes	-	Grams, Ounces, Pennyweight, Troy Ounces	
Maximum overload	150% of capacity		
Linearity	±0.1 g/±0.2 g	±0.1 g	±0.2 g
Stabilization Time	3 seconds		
<b>Pan Size</b>	<b>3.25 x 3.2 in (82.55 x 76.2 mm)</b>		
Dimensions	(W x D x H) 5.35 x 3.25 x 0.8 in (13.6 x 8.5 x 2 cm)		
Weight (Approx.)	0.34 lb (0.16 kg)		
Calibration	Factory set	Calibration with keypad	
Auto Shutoff	Two minutes no activity		
Power	Battery operated		
Warranty	One-year limited warranty		
Return Policy	OHAUS Standard Policy - restock fee may apply		

### Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
52541	HH120D	60 g/120 g x 0.1 g/0.2 g	\$146.00
64055	HH120	120 g x 0.1 g	174.00
52540	HH320	320 g x 0.1 g	217.00

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OHAUS

**YA Series**

Pocket Scale

Capacity: 100g-500g    Readability: 0.01 g-0.1 g

BALANCES

**Standard Features**

- Smaller size than most pocket scales allows a comfortable fit in your pocket
- Clamshell case designs protects scale during transport
- Weighs in g, oz, ct and grain
- Bright blue backlit LCD display



**Specifications**

	YA102	YA302
<b>Part#</b>	<b>103106</b>	<b>103107</b>
<b>List Price</b>	<b>\$89.00</b>	<b>\$76.00</b>
Capacity	100 g	300 g
<b>Resolution</b>	<b>0.01 g</b>	<b>0.05 g</b>
Weighing Modes	Grams, Ounces, Carats and Grains	
Calibration	External	
Auto Shutoff	10 to 30 seconds	
Power	2 AAA batteries	
Warranty	One-year limited warranty	
Return Policy	OHAUS Standard Policy - restock fee may apply	

**Part Number/Price**

PART #	MODEL #	DESCRIPTION	PRICE
103106	YA102	100 g x 0.01 g	\$89.00
103107	YA302	300 g x 0.05 g	76.00

**Options/Accessories**

PART #	MODEL #	DESCRIPTION	PRICE
33455	5076-00	Aluminum scoop, 1.5 x 2 in (3.8 x 5.1 cm), weight 4 g	\$28.00
33456	5077-00	Gold scoop, 2.25 x 3 in (5.7 x 7.6 cm), weight 10 g	28.00
33454	4590-30	Black scoop, aluminum 4 x 3.5 in (10.2 x 8.9 cm), weight 24 g	28.00

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**RICE LAKE**

OHAUS

# Triple Beam

Mechanical Balance

Capacity: 610g-2,610g    Readability: 0.1 g

BALANCES

## Standard Features

- Notched and tiered beams for easy reading
- Positive poise positioning for repeatability
- Magnetically damped
- Zero adjust compensator
- Choice of five weighing platforms: stainless steel pan, polypropylene scoop, stainless steel scoop, aluminum animal box, stainless steel plate
- Optional tare beam vernier dial



Triple Pro Beam with Attachment Weight

TP26II



## Specifications

	710-00	710-T0	720-00	750-S0	760-00	720-S0
<b>Part#</b>	33350	33351	33352	33355	33357	33353
<b>List Price</b>	\$234.00	\$287.00	\$277.00	\$321.00	\$243.00	\$321.00
Capacity	610g	610g	610g	610g	610g	610g
<b>Resolution</b>	<b>0.1 g</b>	<b>0.1 g</b>	<b>0.1 g</b>	<b>0.1 g</b>	<b>0.1 g</b>	<b>0.1 g</b>
Tare Range	-	225 g	-	-	225 g	-
Pan Design	Stainless steel pan	Stainless steel pan with tare	Polypropylene scoop	Stainless steel plate	Stainless steel plate with tare	Stainless steel scoop
<b>Pan Size</b>	<b>Ø 6 in (152.4 mm)</b>		-	<b>Ø 6 in (152.4 mm)</b>		-
Dimensions	(W x D x H) 18 x 12 x 9 in (457.2 x 304.8 x 228.6 mm)					
Weight (Approx.)	8 lb					
Calibration	Front beam 10 x 0.1 g, Middle beam 500 x 100 g, Rear beam 100 x 10 g					
Warranty	Five-year limited warranty					
Return Policy	OHAUS Standard Policy - restock fee may apply					

	730-00	1650-00*	1650-W0*	1610-00*	TP2611
<b>Part#</b>	33354	33361	33362	33360	103109
<b>List Price</b>	\$347.00	\$306.00	\$352.00	\$352.00	\$187.00
Capacity	610g	610g	2,610g	610g	2,610g
<b>Resolution</b>	<b>0.1 g</b>	<b>0.1 g</b>	<b>0.1 g</b>	<b>0.1 g</b>	<b>0.1 g</b>
Tare Range	-	225 g	225 g	225 g	-
Pan Design	Aluminum weight boat	Stainless steel plate with tare			Stainless steel pan with rod and clamp
<b>Pan Size</b>	-	<b>6 in (152.4 mm)</b>			<b>5.8 x 5.8 in (147.3 x 147.3 mm)</b>
Dimensions	(W x D x H) 18 x 12 x 9 in (457.2 x 304.8 x 228.6 mm)				
Weight (Approx.)	8 lb (3.6 kg)				
Calibration	Front beam 10 g x 0.1 g, Middle beam 500 g x 100 g, Rear beam 100 g x 10 g				
Warranty	Five-year limited warranty				
Return Policy	OHAUS Standard Policy - restock fee may apply				

\*Dial-O-Gram models

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RICE LAKE

OHAUS

# Triple Beam

Mechanical Balance

BALANCES

## Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
33350	710-00	610g x 0.1 g	\$234.00
33351	710-T0	610g x 0.1 g	287.00
33352	720-00	610g x 0.1 g	277.00
33355	750-S0	610g x 0.1 g	321.00
33357	760-00	610g x 0.1 g	243.00
33353	720-S0	610g x 0.1 g	321.00
33354	730-00	610g/2,610g x 0.1 g	347.00
33361	1650-00	610g x 0.1 g	306.00
33362	1650-W0	2,610g x 0.1 g	352.00
33360	1610-00	610g x 0.1 g	352.00
103109	TP2611	2,610g x 0.1 g	187.00

## Options/Accessories

PART #	MODEL #	DESCRIPTION	PRICE
33417	183-00	Rod and clamp assembly	\$53.00
33446	703-00	Polypropylene scoop, 12 x 6 x 2.75 in (304 x 152 x 70 mm) footed and counterweighted for balance with out tare	39.00
33447	703-S0	Stainless steel scoop, 12 x 6 x 2.75 in (304 x 152 x 70 mm) footed and counterweighted for balance with out tare	93.00
33448	704-00	Polypropylene Maxi-Scoop®, 10 in (254 mm) dia. x 2.5 in (70 mm) deep with pouring spout and counterweight	40.00
33463	706-00	Vinyl dust cover	28.00
33414	707-00	Attachment weight set, metric	55.00

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RICE LAKE

OHAUS

# Harvard Trip Balance

Mechanical Beam

Capacity: 2,000g    Readability: 0.1 g

## Standard Features

- Highly versatile, rugged and accurate
- Two-pan design ideal for comparative weighing
- Built-in sliding masses
- Roberval principle
- Magnetic damping
- Comparative weighing
- Five-year limited warranty



## Specifications

	1450-SD	1550-SD	1560-SD
<b>Part#</b>	<b>33364</b>	<b>33367</b>	<b>33368</b>
<b>List Price</b>	<b>\$316.00</b>	<b>\$339.00</b>	<b>\$354.00</b>
Capacity	2,000 g	2,000 g	2,000 g
<b>Resolution</b>	<b>0.1 g</b>	<b>0.1 g</b>	<b>0.1 g</b>
Pan Design	Two pan design; stainless steel plate		
<b>Pan Size</b>	<b>6 in (152.4 mm)</b>		
Dimensions	(W x D x H) 25 x 18 x 22 in (63.5 x 45.8 x 55.9 cm)		
Calibration	Top beam 10 lb x 0.1 lb; Bottom beam 200 g x 10 g		
Warranty	Five-year limited warranty		
Return Policy	OHAUS Standard Policy - restock fee may apply		

## Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
33364	1450-SD	2,000 g x 0.1 g, single beam	\$316.00
33367	1550-SD	2,000 g x 0.1 g, two beam	339.00
33368	1560-SD	2,000 g x 0.1 g, two beam with tare	354.00

## Options/Accessories

PART #	MODEL #	DESCRIPTION	PRICE
33461	106-00	Vinyl dust cover for Harvard Trip Balances	\$30.00
33417	183-00	Rod and clamp assembly for Triple Beam or Harvard Trip	53.00

OHAUS

# Dial-O-Gram® and Cent-O-Gram®

Capacity: 310g-311g Readability: 0.01g

Mechanical Balances

BALANCES

## Standard Features

- 0.01 g or 0.1 g sensitivity
- Equipped for specific gravity weighing
- Four-tiered notched beams
- Easy-to-read vernier dial on model 310
- See-through poise on model 311
- High precision and remarkable value
- Three-point beam eliminates need for level adjustment
- Quick-zeroing with zero adjust knob
- Five-year limited warranty



## Specifications

	310-00	311-00
<b>Part #</b>	<b>33371</b>	<b>33370</b>
<b>List Price</b>	<b>\$338.00</b>	<b>\$279.00</b>
Capacity	310 g	311 g
<b>Resolution</b>	<b>0.01 g</b>	<b>0.01 g</b>
Operating Mode	Dial	Poise
<b>Pan Size</b>	<b>6 in (152.4 mm)</b>	
Platform	Stainless steel (removable) 3.5 x 0.5 in (88.9 x 12.7 mm)	
Calibrations	Front beam-225 g tare; middle beam-500 g x 100 g; rear beam-100 g x 10 g; dial-10 g x 0.1 g	
Weight (Approx.)	5 lb (2.3 kg)	
Warranty	Five-year limited warranty	
Return Policy	OHAUS Standard Policy - restock fee may apply	

## Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
33371	310-00	310 g x 0.01 g	\$338.00
33370	311-00	311 g x 0.01 g	279.00

## Options/Accessories

PART #	MODEL #	DESCRIPTION	PRICE
33420	76912-01	Test tube kit	\$55.00
33462	110-00	Vinyl dust cover	28.00
Additional OHAUS Mechanical Balance Accessories			
33414	707-00	Metric attachment mass set	55.00
33450	1101-20	Polypropylene scoop, 12 in x 6 in 2.75 in (304 x 152 x 70 mm) footed, tare 125 g	28.00
33451	3369-10	Polypropylene Maxi-Scoop®, 10 in (254 mm) dia. x 2.5 in (63 mm) D with pouring spout	39.00
33454	4590-30	Black scoop, aluminum, 4 in x 3.5 in (102 x 89 mm)	28.00
33455	5076-00	Aluminum scoop, 1.5 in x 2 in (38 x 51 mm)	28.00
33456	5077-00	Gold scoop, 2.25 in x 3 in (57 x 76 mm)	28.00

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RICE LAKE

OHAUS

# Field Test Scale

Mechanical Balance

Capacity: 16 kg, 36 lb    Readability: 5 g-0.01 lb

BALANCES

## Standard Features

- Affordable compact industrial scale
- Large, stabilized pan can hold oversized samples without tipping
- Readings up to 500 g are taken from a single sliding-weight beam, while a set of slotted weights, stored in the base, can extend the capacity up to 36 lb
- Five-year limited warranty



## Specifications

	2400-11	2400-12
<b>Part #</b>	<b>33379</b>	<b>33380</b>
<b>List Price</b>	<b>\$1,212.00</b>	<b>\$1,256.00</b>
Capacity	16 kg	36 lb
<b>Resolution</b>	<b>5 g</b>	<b>0.01 lb</b>
Operating Mode	Poise	Poise
Platform	11 in (27.9 cm)	
Calibrations	Bottom beam-500 g x 5 g; top beam-1 lb x 0.01 lb	
Weight (Approximate)	12 lb (5.4 kg)	
Warranty	Five-year limited warranty	
Return Policy	OHAUS Standard Policy - restock fee may apply	

## Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
33379	2400-11	16 kg x 5 g	\$1,212.00
33380	2400-12	36 lb x 0.01 lb	1,256.00

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RICE LAKE

OHAUS

# Heavy Duty Solution

Mechanical Balance

Capacity: 20kg    Readability: 1g

BALANCES

## Standard Features

- Sets an industry standard for precision in high-capacity weighing
- Durable enough to resist corrosion
- Sensitive enough to weigh with a feather's touch
- Large stainless steel platform
- Lockable tare for containers up to 2,270 g
- Self-aligning bearings assure a long, maintenance-free life
- Five-year limited warranty



## Specifications

1119-D0	
<b>Part #</b>	<b>33378</b>
<b>List Price</b>	<b>\$1,971.00</b>
Capacity	20 kg
<b>Resolution</b>	<b>1 g</b>
Operating Mode	Poise
<b>Pan Size</b>	—
Platform	11 in (27.9 cm)
Calibrations	Front beam-100 g x 1 g; rear beam-1000 g x 100 g
Weight (Approx.)	12 lb
Warranty	Five-year limited warranty
Return Policy	OHAUS Standard Policy - restock fee may apply

## Options/Accessories

PART #	MODEL #	DESCRIPTION	PRICE
33378	1119-D0	20 kg x 1 g	\$1,971.00

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RICE LAKE

OHAUS

# FD Series

Food Portioning Scale

Capacity: 6lb-30lb    Readability: 0.0002lb-0.01lb

## Standard Features

- Designed for food service and other industrial applications with a focus on speed, durability and cleanliness
- All stainless steel, high-quality formed construction for sanitary cleaning and durability
- Checkweighing function for food packaging and preparation
- Internal rechargeable battery assures excellent portability
- Stainless steel housing and pan with non-slip rubber feet
- Checkweighing mode with 3-LED indicator and audible alarm
- Bright backlit LCD display
- Stable weight display within 2 seconds
- Multiple weighing units: lb, decimal/fractional oz, kg, g and lb
- AC power or internal rechargeable lead acid battery
- NSF-certified, USDA-AMS accepted, supports HACCP compliance
- EC/OIML type approved

*Note: NTEP Certified and Measurement Canada 3000e approved resolution is specific only to model without the "H" suffix. Units ship in non-NTEP Certified resolution*



## Approvals



Measurement  
Canada  
Approved

## Specifications

	FD3H	FD3	FD6H	FD6	FD15H	FD15
<b>Part#</b>	102774	—	102775	—	102776	—
<b>List Price</b>	\$775.00	—	\$775.00	—	\$775.00	—
<b>NTEP Part#</b>	—	87824	—	87825	—	87826
<b>NTEP List Price</b>	—	\$699.00	—	\$699.00	—	\$699.00
<b>Approvals</b>	NSF listed/Certified to NSF C-2, UL C-US listed, NTEP CC 05-072A1 Class III, Measurement Canada AM-5582					
<b>Capacity</b>	6 lb	6 lb	15 lb	15 lb	30 lb	30 lb
<b>Resolution</b>	0.0002 lb	0.002 lb	0.001 lb	0.005 lb	0.001 lb	0.01 lb
<b>Overload capacity</b>	150%					
<b>Operating Modes</b>	Weighing, Checkweighing					
<b>Repeatability</b>	0.2 g		0.4 g		2 g	
<b>Linearity</b>	±0.2 g		±0.4 g		±0.2 g	
<b>Stabilization Time</b>	< 2 seconds					
<b>Operating Temperature</b>	14° F to 104° F (-10° C to 40° C) 10% to 85% relative humidity, non-condensing					
<b>Environmental</b>	IP43					
<b>Pan Size</b>	8.2 x 8.2 in (209 x 209 mm)					
<b>Dimensions</b>	(W x D x H) 9 x 12 x 2.8 in (300 x 223 x 71 mm)					
<b>Weight (Approx.)</b>	8 lb (3.6 kg)					
<b>Est. Ship Weight</b>	11 lb (5 kg)					
<b>Power</b>	120V AC adapter, 9V DC 0.5A 50/60Hz (Other adapters available by special request)					
<b>Battery life</b>	Maximum 120 hours					
<b>Warranty</b>	One-year limited warranty					
<b>Return Policy</b>	OHAUS Standard Policy - restock fee may apply					
<b>UNIT OF MEASURE</b>						
Kilogram	3 x 0.0001 kg	3 x 0.001 kg	6 x 0.0002 kg	6 x 0.002 kg	15 x 0.005 kg	15 x 0.005 kg
Grams	3,000 x .1 g	3,000 x 1 g	6,000 x 0.2 g	6,000 x 2 g	-	15,000 x 5 g
Ounce	96 oz x 0.005 oz; 96 oz x 1/4 oz	96 oz x 0.05 oz or 1/4 oz	240 oz x 0.01 oz; 240 oz x 1/4 oz	240 oz x 0.1 oz or 1/4 oz	480 oz x 0.02 oz or 1/4 oz	480 oz x 0.2 oz or 1/4 oz
Pound x Ounce	6 lb 0 oz x 1/4 oz; 6 lb 0 oz x 0.1 oz	N/A	15 lb 0 oz x 0.1 oz; 15 lb 0 oz x 1/4 oz	N/A	30 lb 0 oz x 0.1 oz or 1/4 oz	N/A

BALANCES

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RICE LAKE

OHAUS

## FD Series

Food Portioning Scale

BALANCES

### Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
102774	FD3H	6 lb x 0.0002 lb	\$775.00
87824	FD3 (NTEP)	6 lb x 0.002 lb	699.00
102775	FD6H	15 lb x 0.001 lb	775.00
87825	FD6 (NTEP)	15 lb x 0.005 lb	699.00
102776	FD15H	30 lb x 0.001 lb	775.00
87826	FD15 (NTEP)	30 lb x 0.01 lb	699.00

### Options/Accessories

PART #	MODEL #	DESCRIPTION	PRICE
103118	80251394	Hard shell carrying case for FD	\$93.00
87827	71169633	Foot tare switch for FD	133.00
103116	80251141	Flat pan for FD or Valor 5000	45.00
103117	80251140	In-use cover for FD or Valor 5000	28.00
33451	3369-10	Polypropylene Maxi-Scoop™ 10 dia x 2.5 in deep (25.4 dia x 6.4 cm deep) with pouring spout, weight 145 g	39.00
97250	80250400	Stainless steel scoop 11.9 x 7.4 x 1.7 in (30 x 18.7 x 4.3 cm)	53.00
100292	80250954	Stainless steel scoop 17.2 x 11 x 3.4 in (44 x 28 x 8.5 cm)	66.00
98020	80500435	AC Adapter	53.00

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RICE LAKE

OHAUS

# Navigator™ XT

Battery-Operated Compact Scale

Capacity: 1,600g - 16,000g Readability: 0.1g - 1g

## Standard Features

- Touchless IR (infrared) sensors minimize keypad use
- Program IR sensor to control zero, print tare, backlight and power functions
- Backlit 0.8 in LCD display for high visibility
- Illuminated level indicator at start-up
- Integrated transportation and calibration lock switch
- Hygienic design for easy cleanup in food, laboratory and industrial applications
- IP43 rating
- Impact-resistant ABS plastic housing with polished stainless steel spill-resistant pan
- Non-skid leveling feet
- Internal rechargeable battery



## Specifications

	NVT1601/1	NVT3201/1	NVT6401/1	NVT10001/1	NVT16000/1
<b>Part Number</b>	<b>117909</b>	<b>117910</b>	<b>117911</b>	<b>117912</b>	<b>117913</b>
<b>List Price</b>	<b>\$462.00</b>	<b>\$462.00</b>	<b>\$445.00</b>	<b>\$462.00</b>	<b>\$462.00</b>
Capacity	1,600 g	3,200 g	6,400 g	10,000 g	16,000 g
<b>Resolution</b>	<b>0.1 g</b>	<b>0.2 g</b>	<b>0.5 g</b>	<b>0.5 g</b>	<b>1 g</b>
Weighing Modes	Pound, Ounce, Pound: Ounce, Kilogram, Gram, Troy Ounce, Grain, Newton, Carat, Pennyweight, Tael (Hong Kong, Taiwan, Singapore), Tical, Tola				
Operating Modes	Weighing, Percent, Parts counting, Checkweighing, Display Hold, Accumulation/Totalization				
Linearity	0.1 g/±0.2 g	0.2 g/±0.4 g	0.5 g/±1 g	0.5 g/±1 g	1 g/±2 g
Stabilization Time	1 second				
Operating Temperature	50° F to 104° F (10° C to 40° C) at 20%-85% RH				
<b>Pan Size</b>	<b>9 x 6.9 in (230 x 174 mm)</b>				
Dimensions	(W x D x H) 9.5 x 9.8 x 2.8 in (240 x 250 x 70 mm)				
Weight (Approx.)	4.3 lb (2.0 kg)				
Est. Shipping Weight	6.1 lb (2.8 kg)				
Ext. Cal. Mass (optional)	2 lb (1 kg)	5 lb (2 kg)	10 lb (5 kg)	10 lb (5 kg)	20 lb (10 kg)
Power	12 VDC 0.42A AC adapter, 100-240V, internal rechargeable battery 100-hr operation with 12-hr full charge				
Warranty	One-year limited warranty				
Return Policy	OHAUS Standard Policy - restock fee may apply				
Approvals	NTEP CC 13-022				

## Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
117909	NVT1601/1	1,600 g x 0.1 g	\$462.00
117910	NVT3201/1	3,200 g x 0.2 g	462.00
117911	NVT6401/1	6,400 g x 0.5 g	445.00
117912	NVT10001/1	10,000 g x 0.5 g	462.00
117913	NVT16000/1	16,000 g x 1 g	462.00

## Options/Accessories

PART #	MODEL #	DESCRIPTION	PRICE
118779	83032107	RS-232 interface kit, Navigator series	\$120.00
118780	83032108	USB interface kit	120.00
118781	83032109	Ethernet interface kit	120.00
118782	83032221	In-use cover	22.00
118783	83032224	Carrying case	84.00
156236	46001802	Universal AC adapter	40.00
156235	46001780	Universal plug set	15.00
166574	46001776	US plug	15.00

BALANCES

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RICE LAKE

OHAUS

# Valor® 7000

Compact Bench Scales

Capacity: 1.5kg-30kg    Readability: 0.00005kg-0.001 kg

BALANCES

## Standard Features

- Touchless sensors
- Backlit dual LCD display
- Illuminated up-front level indicator
- Internal rechargeable battery
- ABS plastic housing
- Skid-resistant leveling feet
- Menu lock switch
- Multiple application modes
- RS-232 standard
- Fast stabilizing time



## Approvals



## Specifications

	V71P1502T	V71P3T	V71P6T	V71P15T	V71P30T
<b>Part#</b>	<b>157316</b>	<b>157317</b>	<b>157318</b>	<b>157319</b>	<b>157320</b>
<b>List Price</b>	<b>\$545.00</b>	<b>\$545.00</b>	<b>\$545.00</b>	<b>\$545.00</b>	<b>\$545.00</b>
Capacity	1.5 kg	3 kg	6 kg	15 kg	30 kg
<b>Resolution</b>	<b>0.00005 kg</b>	<b>0.0001 kg</b>	<b>0.0002 kg</b>	<b>0.0005 kg</b>	<b>0.001 kg</b>
Weighing Modes	Weighing, Percent, Checkweighing, Accumulation				
Units of Measures	Pound, Ounce, Kilogram, Gram				
Pounds	3 lb x 0.0001 lb	6 lb x 0.0002 lb	15 lb x 0.0005 lb	30 lb x 0.001 lb	60 lb x 0.002 lb
Grams	1,500 g x 0.05 g	3,000 g x 0.1 g	6,000 g x 0.2 g	15,000 g x 0.5 g	30,000 g x 1 g
Ounces	48 oz x 0.002 oz	96 oz x 0.005 oz	240 oz x 0.01 oz	480 oz x 0.02 oz	960 oz x 0.05 oz
NTEP Resolution	3 lb x 0.001 lb	6 lb x 0.002 lb	15 lb x 0.005 lb	30 lb x 0.01 lb	60 lb x 0.02 lb
Operating Temperature	14° F to 104° F/-10° C to 40° C				
<b>Pan Size</b>	<b>11.8 x 8.9 in (300 x 225 mm)</b>				
Dimensions	(W x D x H) 12.2 x 12.9 x 4.6 in (311 x 327 x 117 mm)				
Weight (Approx.)	9.2 lb. (4.2 kg)				
Power	100-240V, internal rechargeable battery 210-hr operation with 12-hr full charge				
Approvals	CC 13-022A1				
Warranty	One-year limited warranty				
Return Policy	OHAUS Standard Policy - restock fee may apply				

## Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
157316	V71P15025	1.5 kg x 0.00005 kg	\$545.00
157317	V71P3T	3 kg x 0.0001 kg	545.00
157318	V71P6T	6 kg X 0.0002 kg	545.00
157319	V71P15T	15 kg X 0.0005 kg	545.00
157320	V71P30T	30 kg X 0.001 kg	545.00

## Options/Accessories

PART #	MODEL #	DESCRIPTION	PRICE
154638	30037447	Ethernet kit	\$110.00

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RICELAKE

## Standard Features

- Full 304 stainless steel housing with chemical resistant keypad
- Removable stainless steel weighing pan
- USDA approved
- Supports HACCP
- Resolutions up to 20,000d
- SmarText™ user interface
- Standard AC Power adapter
- Bright backlit LCD display
- Convenient up-front level device
- NSF Listed
- NTEP Certified models available by special order



## Specifications

	V31XH202	V31XH402	V31X501	V31XH2	V31X3	V31XH4	V31X6
<b>Part #</b>	100283	117790	117789	100284	100285	117792	100286
<b>List Price</b>	\$622.00	\$804.00	\$455.00	\$622.00	\$413.00	\$854.00	\$413.00
Capacity	200 g	400 g	500 g	2 g	3 kg	4 kg	6 kg
<b>Resolution</b>	<b>0.01 g</b>	<b>0.01 g</b>	<b>0.1 g</b>	<b>0.1 kg</b>	<b>1 g</b>	<b>0.1 g</b>	<b>1 g</b>
Weighing Modes	Pounds, Decimal or fractional Ounces, lb:oz, fluid oz (of water); Kilogram, Gram						
Operating Modes	Weighing, Percent weighing, Combined zero/tare, Specific gravity						
Protection rating	Non-washdown models						
Stabilization Time	< 3 seconds						
Operating Temperature	32° F to 104° F (0° C to 40° C)						
<b>Pan Size (W x D)</b>	<b>4.7 in (120 mm)</b>			<b>5.8 x 6.2 in (146 x 158 mm)</b>			
Dimensions	(W x D x H) 8.5 x 7.3 x 3 in (218 x 186 x 72 mm)						
Weight (Approx.)	2.6 lb (1.2 kg)			2.9 lb (1.3 kg)			
Est. Ship Weight	10 lb (4.8 kg)						
Calibration	Digital external calibration						
Power	120V AC adapter (9V DC, 0.5A), four 1.5 Volt C batteries (not included)						
Battery life	50 hours with alkaline cells			120 hours with alkaline cells			
Warranty	One-year limited warranty						
Return Policy	OHAUS Standard Policy - restock fee may apply						

## Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
100283	V31XH202	200 g x 0.01 g	\$622.00
117790	V31XH402	400 g x 0.01 g	804.00
117789	V31X501	500 g x 0.1 g	455.00
100284	V31XH2	2 kg x 0.1 g	622.00
100285	V31X3	3 kg x 1 g	413.00
117792	V31XH4	4 kg x 0.1 g	854.00
100286	V31X6	6 kg x 1 g	413.00

## Options/Accessories

PART #	MODEL #	DESCRIPTION	PRICE
103119	80251216	Hard shell carrying case for FD and Valor	\$93.00
102756	80251147	Sandwich pan, 11 x 5.9 in (280 x 150 mm) for Valor Xtreme	58.00
102757	80251148	French fries holder pan for Valor 3000 Xtreme	58.00
102758	80251149	Ice cream cone holder for Valor 3000 Xtreme	58.00
33451	3369-10	Polypropylene Maxi-Scoop™ 10 dia x 2.5 in deep (25.4 dia x 6.4 cm deep) with pouring spout, weight 145 g	39.00
100292	80250954	Stainless steel scoop 17.2 x 11 x 3.4 in (44 x 28 x 8.5 cm)	66.00
97250	80250400	Stainless steel scoop 11.9 x 7.4 x 1.7 in (30 x 18.7 x 4.3 cm)	53.00

OHAUS

# Valor® 3000 Xtreme

Compact Washdown Scales

Capacity: 300g-6kg    Readability: 0.01g-1g

BALANCES

## Standard Features

- Full 304 stainless steel housing with chemical resistant keypad
- Removable stainless steel weighing pan
- USDA approved
- Supports HACCP
- IP65
- NTEP Certified models available



## Specifications

	V31XW301	V31XW3	V31XW6
<b>Part#</b>	<b>100287</b>	—	—
<b>List Price</b>	<b>\$489.00</b>	—	—
<b>NTEP</b>	<b>Part#</b>	<b>100288</b>	<b>100289</b>
	<b>List Price</b>	<b>\$489.00</b>	<b>\$489.00</b>
Capacity	300 g	3 kg	6 kg
<b>Resolution</b>	<b>0.1 g</b>	<b>1 g</b>	<b>2 g</b>
Weighing Modes	Pounds, Decimal or Fractional Ounces, lb:oz, Fluid oz (of water); Kilogram, Gram		
Operating Modes	Weighing, Percent Weighing, Combined Zero/Tare, Specific Gravity		
Protection Rating	IP65		
Stabilization Time	< 3 seconds		
Operating Temperature	32° F to 104° F (0° C to 40° C)		
<b>Pan Size (W x D)</b>	<b>5.8 x 6.2 in (146 x 158 mm)</b>		
Dimensions	(W x D x H) 8.5 x 7.3 x 3 in (218 x 186 x 72 mm)		
Weight (Approx.)	2.9 lb (1.3 kg)		
Est. Ship Weight	10 lb (4.8 kg)		
Calibration	Digital external calibration		
Power	120V AC adapter (9V DC, 0.5A), Four 1.5 Volt C batteries (not included)		
Battery Life	50 hours with alkaline cells	120 hours with alkaline cells	
Warranty	One-year limited warranty		
Return Policy	OHAUS Standard Policy - restock fee may apply		

## Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
100287	V31XW301	300 g x 0.1g	\$489.00
100288	V31XW3	3 kg x 1 g	489.00
100289	V31XW6	6 kg x 2 g	489.00

## Options/Accessories

PART #	MODEL #	DESCRIPTION	PRICE
103119	80251216	Hard shell carrying case for FD and Valor	\$93.00
102756	80251147	Sandwich pan, 11 in x 5.9 in (280 x 150 mm) for Valor Xtreme	58.00
102757	80251148	French fries holder pan for Valor 3000 Xtreme	58.00
102758	80251149	Ice cream cone holder for Valor 3000 Xtreme	58.00
33451	3369-10	Polypropylene Maxi-Scoop™ 10 dia x 2.5 in deep (25.4 cm dia x 6.4 cm deep) with pouring spout, weight 145 g	39.00
100292	80250954	Stainless steel scoop 17.2 x 11 x 3.4 in (44 x 28 x 8.5 cm)	66.00
97250	80250400	Stainless steel scoop 11.9 x 7.4 x 1.7 in (30 x 18.7 x 4.3 cm)	53.00
Consult	46001803	AC adapter	Consult
156235	46001780	International plug set	15.00

www.ricelake.com | Phone: 800-472-6703

RICE LAKE

OHAUS

# Valor® 2000

Compact Washdown Scales

Capacity: 3 kg-15 kg    Readability: 0.5g-2g

BALANCES

## Standard Features

- IPX8 protection rating
- Front and rear dual display, 0.8 in (20.5 mm)
- Removable stainless steel platform cover
- Fast 0.5 second stabilization time
- SmarText™ interface
- Knife-proof keypad
- AC adapter and battery included



## Approvals



## Specifications

	V22XWE3T	V22XWE6T	V22XWE15T
<b>Part#</b>	<b>102771</b>	<b>102772</b>	<b>102773</b>
<b>List Price</b>	<b>\$450.00</b>	<b>\$450.00</b>	<b>\$450.00</b>
Capacity	3 kg	6 kg	15 kg
<b>Resolution</b>	<b>0.5 g</b>	<b>1 g</b>	<b>2 g</b>
Weigh Units	Kilograms, Pounds, Grams, Ounces, Pound and Ounce		
Operating Modes	Weigh, Checkweigh		
Construction	ABS plastic housing, stainless steel pan		
Protection Rating	IPX8		
Safe Overload	150% of capacity		
Stabilization Time	< 1 second		
Operating Temperature	14° F to 104° F (-10° C to 40° C)		
<b>Pan Size</b>	<b>7.5x 9.5 in (242 x 190 mm)</b>		
Dimensions	(W x D x H) 10.1 x 11.3 x 4.9 in (256 x 288 x 124 mm)		
Weight (Approx.)	8.6 lb (3.9 kg)		
Calibration	Digital external calibration		
Power	Universal AC adapter, 12V DC 0.7A internal rechargeable lead acid battery		
Battery Life	50 hours with 1 hour recharge time		
Warranty	One-year limited warranty		
Return Policy	OHAUS Standard Policy - restock fee may apply		

^Weighing Chamber

## Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
102771	V22XWE3T	3 kg x 0.5 g	\$450.00
102772	V22XWE6T	6 kg x 1 g	450.00
102773	V22XWE15T	15 kg x 2 g	450.00

## Options/Accessories

PART #	MODEL #	DESCRIPTION	PRICE
33451	3369-10	Polypropylene Maxi-Scoop™ 10 dia x 2.5 in deep (25.4 dia x 6.4 cm deep) with pouring spout, weight 145 g	\$39.00
97250	80250400	Stainless steel scoop 11.9 x 7.4 x 1.7 in (30 x 18.7 x 4.3 cm)	53.00
100292	80250954	Stainless steel scoop 17.2 x 11 x 3.4 in (44 x 28 x 8.5 cm)	66.00
156237	46001812	Universal AC adapter	40.00
156235	46001780	Universal plug set	15.00

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RICE LAKE

OHAUS

# Valor® 1000

Compact Precision Scales

Capacity: 3 kg-30 kg    Readability: 0.001 g-0.005 g

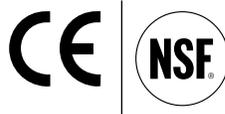
BALANCES

## Standard Features

- Removable stainless steel platform cover
- Mid-profile ABS plastic housing
- Front-mounted leveling device
- Long-lasting internal rechargeable battery (standard)
- Compact footprint
- Fast response time
- Easy to clean



## Approvals



## Specifications

	V11P3	V11P6	V11P15	V11P30
<b>Part#</b>	<b>102767</b>	<b>102768</b>	<b>102769</b>	<b>102770</b>
<b>List Price</b>	<b>\$225.00</b>	<b>\$225.00</b>	<b>\$225.00</b>	<b>\$225.00</b>
Capacity	3 kg	6 kg	15 kg	30 kg
<b>Resolution</b>	<b>0.5 g</b>	<b>1 g</b>	<b>2 g</b>	<b>5 g</b>
Decimal Ounce	105 oz x 0.02 oz	210 oz x 0.05 oz	520 oz x 0.1 oz	1058 oz x 0.5 oz
Decimal Pound	6.6 lb x 0.001 lb	13 lb x 0.002 lb	33 lb x 0.01 lb	66 lb x 0.02 lb
Grams	3,000 g x 0.5 g	6,000 g x 1 g	15,000 g x 2 g	30,000 g x 5 g
Operating Modes	Weigh, accumulate, checkweigh			
Construction	ABS plastic housing, stainless steel pan			
Stabilization Time	≤3 seconds			
Operating Temperature	32° F to 104° F (0° C to 40° C) at 10% to 95% relative humidity non-condensing, up to 2.5 miles/4,000 m above sea level			
Scale Overload	120% of capacity			
<b>Pan Size (W x D)</b>	<b>9.9 x 7.1 in (250 x 180 mm)</b>			
Dimensions	(W x D x H) 10 x 12 x 4.3 in (250 x 307 x 110 mm)			
Weight (Approx.)	7 lb (3.2 kg)			
Est. Ship Weight	8.8 lb (4.0 kg)			
Power	Universal AC adapter included (9V DC 500 mA); internal rechargeable sealed lead acid battery (included)			
Battery life	80/100 hours (with/without backlight on) with 12-hour recharge time			
Warranty	One-year limited warranty			
Return Policy	OHAUS Standard Policy - restock fee may apply			

## Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
102767	V11P3	3 kg x 0.5 g	\$225.00
102768	V11P6	6 kg x 1 g	225.00
102769	V11P15	15 kg x 2 g	225.00
102770	V11P30	30 kg x 5 g	225.00

^Weighing Chamber

## Options/Accessories

PART #	MODEL #	DESCRIPTION	PRICE
33451	3369-10	Polypropylene Maxi-Scoop™ 10 dia x 2.5 in deep (25.4 dia x 6.4 cm deep) with pouring spout, weight 145 g	\$39.00
97250	80250400	Stainless steel scoop 11.9 x 7.4 x 1.7 in (30 x 18.7 x 4.3 cm)	53.00
100292	80250954	Stainless steel scoop 17.2 x 11 x 3.4 in (44 x 28 x 8.5 cm)	66.00
156237	46001812	AC adapter	40.00
156235	46001780	Universal plug set	15.00

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RICELAKE

## Standard Features

- Module design
- User configurable and custom designed to meet changing applications
- Meets advanced Pharma compliance including user/password management for security, audit trail function logs, and integrated alibi memory
- Q-guide enables tasks and work
- Electrically conductive coating on glass panels of draft shield
- RS-232 and USB communication

### Choice of Display

- MSE-Large, 19 mm LCD display segments and easy menu system
- MSU-Monochrome graphic display, positive click on keys to activate functions, Ethernet, and SD card reader
- MSA-TFT color touchscreen, Ethernet, and SD card reader



The modular system offers you a choice of display and control units, weighing modules and draft shields

## Specifications

	2.7S-000-DM^	2.7S-000-DF^	6.6S-000-DM^	6.6S-000-DF^	3.6P-000-DM^
<b>MSE*</b>	<b>Part#</b>	<b>126044</b>	<b>126046</b>	<b>126048</b>	<b>126049</b>
	<b>List Price</b>	<b>\$31,155.00</b>	<b>\$31,990.00</b>	<b>\$24,370.00</b>	<b>\$25,205.00</b>
<b>MSU**</b>	<b>Part#</b>	<b>126043</b>	<b>126045</b>	<b>126047</b>	<b>126050</b>
	<b>List Price</b>	<b>\$32,205.00</b>	<b>\$33,040.00</b>	<b>\$25,420.00</b>	<b>\$26,255.00</b>
<b>MSA***</b>	<b>Part#</b>	<b>126034</b>	<b>126039</b>	<b>126040</b>	<b>126041</b>
	<b>List Price</b>	<b>\$32,730.00</b>	<b>\$33,565.00</b>	<b>\$25,945.00</b>	<b>\$26,780.00</b>
Capacity	2.1 g	2.1 g	5.1 g	5.1 g	1.1 g/2.1 g/3.1 g
<b>Resolution</b>	<b>0.0001 mg</b>	<b>0.0001 mg</b>	<b>0.001 mg</b>	<b>0.001 mg</b>	<b>0.001 mg/0.002 mg/0.005 mg</b>
Weighing Modes	Grams, Kilograms, Carats, Pounds, Ounces, Troy Ounces, Hong Kong Taels, Singapore Taels, Grains, Pennyweights, Milligrams, Parts per Pound, Chinese Taels, Momme, Austrian Carats, Tola, Baht, Mesghal				
Operating Modes (*)	Counting, Checkweighing, Percent Weighing, Unit Toggle, Animal Weighing, Net Total, Formulation, Statistics, Calculation, Timer, Backweighing, Density Determination, Memory (300), Diameter Determination				
Repeatability	0.25 µg		0.001 mg		0.003/0.004/0.005 mg
Linearity	0.9 µg		4 µg		4 µg
Stabilization Time	7 seconds		5 seconds		5 seconds
Operating Temperature	41° F to 104° F (5° C to 40° C)				
Weighing Chamber (DE)	2.75 in (70 mm) H	0.6 in (15 mm) H	2.75 in (70 mm) H	0.6 in (15 mm) H	2.75 in (70 mm) H
<b>Pan Size</b>	<b>Ø 0.8 in (20 mm)</b>	<b>Ø 1.9 in (50 mm) dia</b>	<b>Ø 1.2 in (30 mm)</b>	<b>Ø 1.9 in (50 mm)</b>	<b>Ø 1.2 in (30 mm)</b>
Dimensions	192 mm x 323 mm x 88 mm				
Weight (Approx.)	17 lb				17 lb
Est. Ship Weight	28 lb				40 lb
Calibration Weight	2 g		5 g		3 g
Power	100 - 240V Power Supply				
Warranty	Two-year limited warranty				
Return Policy	Sartorius Standard Policy - restock fee may apply				

^Weighing Chamber

\* MSE Large LCD display and easy-to-use menu system

\*\*MSU Monochrome graphic display, positive click on keys to activate functions, Ethernet and SD card reader

\*\*\*MSA TFT color touchscreen, Ethernet and SD card reader

DF-SS manual draft shield for weighing filters

## Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
126044*	MSE2.7S-000-DM	2.1 g x 0.0001 mg	\$31,155.00
126043**	MSU2.7S-000-DM	2.1 g x 0.0001 mg	32,205.00
126034***	MSA2.7S-000-DM	2.1 g x 0.0001 mg	32,730.00
126046*	MSE2.7S-000-DF	2.1 g x 0.0001 mg	31,990.00
126045**	MSU2.7S-000-DF	2.1 g x 0.0001 mg	33,040.00
126039***	MSA2.7S-000-DF	2.1 g x 0.0001 mg	33,565.00
126048*	MSE6.6S-000-DM	6.1 g x 0.001 mg	24,370.00
126047**	MSU6.6S-000-DM	6.1 g x 0.001 mg	25,420.00
126040***	MSA6.6S-000-DM	6.1 g x 0.001 mg	25,945.00
126049*	MSE6.6S-000-DF	6.1 g x 0.001 mg	25,205.00
126050**	MSU6.6S-000-DF	6.1 g x 0.001 mg	26,255.00
126041***	MSA6.6S-000-DF	6.1 g x 0.001 mg	26,780.00
126052*	MSE3.6P-000-DM	1.1 g/2.1 g/3.1 g x 0.001 mg/0.002 mg/0.005 mg	18,600.00
126051**	MSU3.6P-000-DM	1.1 g/2.1 g/3.1 g x 0.001 mg/0.002 mg/0.005 mg	19,650.00
126042***	MSA3.6P-000-DM	1.1 g/2.1 g/3.1 g x 0.001 mg/0.002 mg/0.005 mg	20,175.00

## Options/Accessories

PART #	MODEL #	DESCRIPTION	PRICE
112261	YDP20-OCE	Data printer with statistics and time/date functions (included cable fits RS-232)	\$1,035.00
31103	6906937	Paper for data printer, 5 pack	44.00
31106	6906918	Replacement ribbon for data printer	52.00
Consult	IB	Bluetooth® wireless interface (factory installed)	Consult
Consult	IP	Additional RS-232, 9-Pin connection with PS2 port (factory installed)	Consult
152036	–	Multi-range power supply, does not include line cord	85.00
156908	6900900	Power cord, 220V (EU)	35.00

\*Large LCD display and easy-to-use menu system

\*\*Monochrome graphic display, positive click on keys to activate functions, Ethernet and SD card reader

\*\*\*TFT color touchscreen, Ethernet and SD card reader

## Standard Features

- Module design
- User configurable and custom designed to meet changing applications
- Meets advanced Pharma compliance including user/password management for security, audit trail function logs and integrated alibi memory
- Q-guide enables tasks and work (MSA display)
- Electrically conductive coating on glass panels of draft shield
- RS-232 and USB communication
- Easy cleaning by removing glass doors
- Underweigh hook included
- Draft shield

### Choice of display

- MSE-large LCD display and easy menu system
- MSU-monochrome graphic display, positive click on keys to activate functions, Ethernet and SD card reader, auto leveling feature
- MSA-TFT color touchscreen, Ethernet and SD card reader, auto leveling feature



## Optional Features

- DA motor-driven draft shield
- DI draft shield eliminates electrostatic charges

## Specifications

	225S	225P	125P	324S	224S	324P	124S	524S	524P	
MSE*	Part#	109776	109777	109778	109779	109780	109781	109782	156269	156270
	List Price	\$11,030.00	\$9,480.00	\$6,830.00	\$6,940.00	\$6,195.00	\$6,145.00	\$5,095.00	\$8,410.00	\$6,830.00
MSU**	Part#	109783	109786	109788	109794	109790	109791	109792	156267	156268
	List Price	\$12,080.00	\$10,530.00	\$7,880.00	\$7,990.00	\$7,245.00	\$7,195.00	\$6,145.00	\$9,460.00	\$7,880.00
MSA***	Part#	109795	109796	109797	109798	109799	109800	109801	156265	156266
	List Price	\$12,605.00	\$11,055.00	\$8,405.00	\$8,515.00	\$7,770.00	\$7,720.00	\$6,670.00	\$9,985.00	\$8,405.00
Capacity	220 g	60/120/220 g	60/120 g	320 g	220 g	80/160/320 g	120 g	520 g	120/240/520 g	
Resolution	0.01 mg	0.01/0.02/0.05 mg	0.01/0.1 mg	0.1 mg	0.1 mg	0.1/0.2/0.5 mg	0.1 mg	0.1 mg	0.1/0.2/0.5 mg	
Weighing Modes	Grams, Kilograms, Carat, Pounds, Ounces, Troy Ounce, Tael Hong Kong, Tael Singapore, Tael Taiwan, Grain, Pennyweight, Milligram, Parts per Pound, Tael China, Mommies, Austrian Carat, Tola, Baht, Mesghal, Ton, Pound:Ounces, Newton, Micrograms									
Operating Modes	Mass Unit Conversion, SQ Min Function, ISO-Cal Function, Density Determination (Buoyancy method only with MSE), Calculation, Averaging, Formulation, Percent Weighing, Totalizing, Counting, Customized Identification, Statistics, Time Control Function, Second Tare Memory, Over/Under Checkweighing									
Repeatability	0.025 mg	0.015/0.04 mg	0.015/0.06 mg	0.1 mg	0.07 mg	0.1/0.2/0.4 mg	0.1 mg	0.1 mg	0.1/0.2/0.5 mg	
Linearity	0.1 mg	0.15 mg	0.15 mg	0.3 mg	0.2 mg	0.5 mg	0.2 mg	0.4 mg	0.5 mg	
Stabilization Time (sec.)	2	2	2	1	1	1	1	1	1	
Operating Temperature	41° F to 104° F (5° C to 40° C)									
Weighing Chamber	(W x D x H) 8 x 8 x 10.2 in (205 x 205 x 261 mm)									
Pan Size(W x D)	3.3 x 3.3 in (85 x 85 mm)									
Dimensions	(W x D x H) 16 x 9.8 x 14.6 in (410 x 249 x 370.4 mm) (with manual draft shield)									
Weight (Approx.)	18 lb									
Est. Ship Weight	31.9 lb					29.7 lb				
Calibration Weight	200 g	200 g	100 g	300 g	200 g	300 g	100 g	500 g		
Power	120V AC adapter auto ranging									
Warranty	Two-year limited warranty									
Return Policy	Sartorius Standard Policy - restock fee may apply									

\*MSE Large LCD display and easy-to-use menu system

\*\*MSU Monochrome graphic display, positive click on keys to activate functions, Ethernet and SD card reader

\*\*\*MSA TFT color touchscreen, Ethernet and SD card reader

## Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
109776*	MSE225S-100-DU	220 g x 0.01 mg	\$11,310.00
109777*	MSE225P-100-DU	60 g/120 g/220 g x 0.01 mg/0.02 mg/0.05 mg	9,480.00
109778*	MSE125P-100-DU	60 g/120 g x 0.01 mg/0.1 mg	6,830.00
109779*	MSE324S-100-DU	320 g x 0.1 mg	6,940.00
156269	MSE524S-100-DU	520 g x 0.1 mg	8,410.00
156270	MSE524P-100-DU	520 g/240 g/120 g x 0.5 mg/0.2 mg/0.1 mg	6,830.00
109780*	MSE224S-100-DU	220 g x 0.1 mg	6,195.00
109781*	MSE324P-100-DU	80 g/160 g/320 g x 0.1 mg/0.2 mg/0.5 mg	6,145.00
109782*	MSE124S-100-DU	120 g x 0.1 mg	5,095.00
109783**	MSU225S-100-DU	220 g x 0.01 mg	12,080.00
109786**	MSU225P-100-DU	60 g/120 g/220 g x 0.01 mg/0.02 mg/0.05 mg	10,530.00
109788**	MSU125P-100-DU	60 g/120 g x 0.01 mg/0.1 mg	7,880.00
156267	MSU524S-100-DU	520 g x 0.1 mg	9,460.00
156268	MSU524P-100-DU	520 g/240 g/120 g x 0.5 mg/0.2 mg/0.1 mg	7,880.00
109794**	MSU324S-100-DU	320 g x 0.1 mg	7,990.00
109790**	MSU224S-100-DU	220 g x 0.1 mg	7,245.00
109791**	MSU324P-100-DU	80 g/160 g/320 g x 0.1 mg/0.2 mg/0.5 mg	7,195.00
109792**	MSU124S-100-DU	120 g x 0.1 mg	6,145.00
109795***	MSA225S-100-DU	220 g x 0.01 mg	12,605.00
109796***	MSA225P-100-DU	60 g/120 g/220 g x 0.01 mg/0.02 mg/0.05 mg	11,055.00
109797***	MSA125P-100-DU	60 g/120 g x 0.01 mg/0.1 mg	8,405.00
156265	MSA524S-100-DU	520 g x 0.1 mg	9,985.00
156266	MSA524P-100-DU	520 g/240 g/120 g x 0.5 mg/0.2 mg/0.1 mg	8,405.00
109798***	MSA324S-100-DU	320 g x 0.1 mg	8,515.00
109799***	MSA224S-100-DU	220 g x 0.1 mg	7,770.00
109800***	MSA324P-100-DU	80 g/160 g/320 g x 0.1 mg/0.2 mg/0.5 mg	7,720.00
109801***	MSA124S-100-DU	120 g x 0.1 mg	6,670.00

\*Large LCD display and easy-to-use menu system

\*\*Monochrome graphic display, positive click on keys to activate functions, Ethernet and SD card reader

\*\*\*TFT color touchscreen, Ethernet and SD card reader

## Options/Accessories

PART #	MODEL #	DESCRIPTION	PRICE
Consult	DA	Automatic motorized draft shield for analytical balances (factory installed)	Consult
Consult	DI	Automatic motorized draft shield for analytical balances, with integrated ionizer (factory installed)	Consult
Consult	TR	Certificate of compliance and full factory test report (factory installed)	Consult
Consult	IR	Additional RS-232, 25-Pin connection (factory installed)	Consult
156906	6971987	Power supply, 100-240V	\$165.00
156908	6900900	Cord, power 220V EU	35.00
Consult	IB	Bluetooth® wireless interface	Consult
Consult	IP	Additional RS-232, 9-Pin connection with PS2 port	Consult

## Standard Features

- Module design
- User configurable and custom designed to meet changing applications
- Meets advanced Pharma compliance including user/password management for security, audit trail function logs and integrated alibi memory
- Q-guide enables tasks and work (MSA display)
- Electrically conductive coating on glass panels of draft shield
- RS-232 and USB communication
- Easy cleaning by removing glass doors
- Underweigh hook included
- Draft shield

### Choice of display

- MSE-large 19 mm LCD display segments and easy menu system
- MSU-monochrome graphic display, positive click on keys to activate functions, Ethernet and SD card reader
- MSA-TFT color touchscreen, Ethernet and SD card reader options



The modular system offers you a choice of display and control units, weighing modules and draft shields

## Optional Features

- Bluetooth® wireless technology

## Specifications

	3203S	2203S	2203P	1203S	5203S	5203P	623S	623P	323S	
<b>MSE*</b>	Part#	109803	109804	109805	109806	156315	156316	109807	109808	109809
	List Price	\$7,530.00	\$7,275.00	\$7,020.00	\$6,355.00	\$8,705.00	\$8,295.00	\$4,930.00	\$4,315.00	\$4,215.00
<b>MSU**</b>	Part#	109810	109811	109812	109813	156313	156314	109814	109815	109816
	List Price	\$8,580.00	\$8,325.00	\$8,070.00	\$7,405.00	\$9,755.00	\$9,345.00	\$5,980.00	\$5,365.00	\$5,265.00
<b>MSA***</b>	Part#	109817	109818	109819	109820	156310	156312	109821	109822	109823
	List Price	\$9,105.00	\$8,850.00	\$8,595.00	\$7,930.00	\$10,280.00	\$9,870.00	\$6,505.00	\$5,890.00	\$5,790.00
Capacity	3,200 g	2,200 g	1,010/2,200 g	1,200 g	5,200 g	5,200/2,400/1,200 g	620 g	150/300/620 g	320 g	
Resolution	1 mg	1 mg	1/10 mg	1 mg	1 mg	5/2/1 mg	1 mg	1, 2, 5 mg	1 mg	
Weighing Modes	Grams, Kilograms, Carat, Pounds, Ounces, Troy Ounce, Tael Hong Kong, Tael Singapore, Tael Taiwan, Grain, Pennyweight, Milligram, Parts per Pound, Tael China, Mommies, Austrian Carat, Tola, Baht, Mesghal, Ton, Pound:Ounces, Newton, Micrograms									
Operating Modes (*)	Mass Unit Conversion, SQ Min Function, ISO-Cal Function, Density Determination (Buoyancy method only with MSE), Calculation, Averaging, Formulation, Percent Weighing, Totalizing, Counting, Customized Identification, Statistics, Time Control Function, Second Tare Memory, Over/Under Checkweighing									
Repeatability	1/6 mg	1 mg	1/6 mg	0.7 mg	1 mg	1 mg	0.7 mg	1/2/4 mg	0.7 mg	
Linearity	5 mg	3 mg	5 mg	2 mg	5 mg	5 mg	2 mg	5 mg	2 mg	
Stabilization Time	1 second	1 second	1 second	1 second	1 second	1 second	0.8 seconds	0.8 seconds	0.8 seconds	
Operating Temperature	41° F to 104° F (5° C to 40° C)									
Weighing Chamber (DE)	(W x D x H) 8 x 8 x 7 in (from pan) (200 x 200 x 179 mm)									
Pan Size(W x D)	5.5 x 5.5 in (140 x 140 mm)									
Dimensions	(W x D x H) 16 x 9.8 x 11 in (410 x 249 x 281.4 mm) (with manual draft shield)									
Weight (Approx.)	17 lb									
Est. Ship Weight	27 lb							25 lb		
Calibration Weight	2,000 g	2,000 g	1,000 g	1,000 g	500 g	500 g	500 g	500 g	200 g	
Power	120V AC adapter (auto ranging)									
Warranty	Two-year limited warranty									
Return Policy	Sartorius Standard Policy - restock fee may apply									

\* MSE Large LCD display and easy-to-use menu system

\*\* MSU Monochrome graphic display, positive click on keys to activate functions, Ethernet and SD card reader

\*\*\* MSA TFT color touchscreen, Ethernet and SD card reader

## Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
109803*	MSE3203S-100-DE	3,200 g x 1 mg	\$7,530.00
109804*	MSE2203S-100-DE	2,200 g x 1 mg	7,275.00
109805*	MSE2203P-100-DE	1,010 g/2,200 g x 1 mg/10 mg	7,020.00
109806*	MSE1203S-100-DE	1,200 g x 1 mg	6,355.00
156315	MSE5203S-100-DE	5,200 g x 0.001 g	8,705.00
156316	MSE5203P-100-DE	5,200 g/2,400 g/1,200 g x 0.005 g/0.002 g/0.001 g	8,295.00
109807*	MSE623S-100-DE	620 g x 1 mg	4,930.00
109808*	MSE623P-100-DE	150 g/300 g/620 g x 1 mg/2 mg/5 mg	4,315.00
109809*	MSE323S-100-DE	320 g x 1 mg	4,215.00
109810**	MSU3203S-100-DE	3,200 g x 1 mg	8,580.00
109811**	MSU2203S-100-DE	2,200 g x 1 mg	8,325.00
109812**	MSU2203P-100-DE	1,010 g/2,200 g x 1 mg/10 mg	8,070.00
109813**	MSU1203S-100-DE	1,200 g x 1 mg	7,405.00
156313	MSU5203S-100-DE	5,200 g x 0.001 g	9,755.00
156314	MSU5203P-100-DE	5,200 g/2,400 g/1,200 g x 0.005 g/0.002 g/0.001 g	9,345.00
109814**	MSU623S-100-DE	620 g x 1 mg	5,980.00
109815**	MSU623P-100-DE	150 g/300 g/620 g x 1 mg/2 mg/5 mg	5,365.00
109816**	MSU323S-100-DE	320 g x 1 mg	5,265.00
109817***	MSA3203S-100-DE	3,200 g x 1 mg	9,105.00
109818 ***	MSA2203S-100-DE	2,200 g x 1 mg	8,850.00
109819 ***	MSA2203P-100-DE	1,010 g/2,200 g x 1 mg/10 mg	8,595.00
109820 ***	MSA1203S-100-DE	1,200 g x 1 mg	7,930.0
156310	MSA5203S-100-DE	5,200 g x 0.001 g	10,280.00
156312	MSA5203P-100-DE	5,200 g/2,400 g/1,200 g x 0.005 g/0.002 g/0.001 g	9,870.00
109821 ***	MSA623S-100-DE	620 g x 1 mg	6,505.00
109822 ***	MSA623P-100-DE	150 g/300 g/620 g x 1 mg/2 mg/5 mg	5,890.00
109823 ***	MSA323S-100-DE	320 g x 1 mg	5,790.00

\*Large LCD display and easy to use menu system

\*\*Monochrome graphic display, positive click on keys to activate functions, Ethernet and SD card reader

\*\*\*TFT color touchscreen, Ethernet and SD card reader

## Options/Accessories

PART #	MODEL #	DESCRIPTION	PRICE
Consult	TR	Certificate of compliance and full factory test report (factory installed)	Consult
Consult	IR	Additional RS-232, 25-Pin connection (factory installed)	Consult
156906	6971987	Power supply, 100-240V	\$165.00
156908	6900900	Cord, power 220V EU	35.00
Consult	IB	Bluetooth® wireless interface (factory installed)	Consult
Consult	IP	Additional RS-232, 9-Pin connection with PS2 port (factory installed)	Consult
Consult	DA, DR, DI or DU	Other draft shields available	Consult

## Standard Features

- Fast stabilization time
- Module design
- User configurable and custom designed to meet changing applications
- Meets advanced Pharma compliance including user/password management for security, audit trail function logs and integrated alibi memory
- Q-guide enables tasks and work
- Electrically conductive coating on glass panels of draft shield
- RS-232 and USB communication
- Easy cleaning by removing glass doors
- Underweigh hook included

### Choice of display

- MSE-large LCD display and easy menu system
- MSU-monochrome graphic display, positive click on keys to activate functions, Ethernet and SD card reader
- MSA-TFT color touchscreen, Ethernet and SD card reader options



The modular system offers you a choice of display and control units, weighing modules and draft shields

## Optional Features

- Bluetooth® wireless technology

## Specifications

	1202S	2202S	4202S	6202P	6202S	8202S	10202S	
<b>MSE*</b>	Part#	109832	109831	109830	109829	109828	109827	109826
	List Price	\$3,155.00	\$3,525.00	\$3,890.00	\$4,045.00	\$4,525.00	\$5,145.00	\$5,990.00
<b>MSU**</b>	Part#	109842	109841	109840	109839	109838	109837	109836
	List Price	\$4,205.00	\$4,575.00	\$4,940.00	\$5,095.00	\$5,575.00	\$6,195.00	\$7,040.00
<b>MSA***</b>	Part#	109852	109851	109850	109849	109848	109847	109846
	List Price	\$4,730.00	\$5,100.00	\$5,465.00	\$5,620.00	\$6,100.00	\$6,720.00	\$7,565.00
Capacity	1,200 g	2,200 g	4,200 g	1,500/3,000/6,200 g	6,200 g	8,200 g	10,200 g	
Resolution	10 mg	10 mg	10 mg	10/20/50 mg	10 mg	10 mg	10 mg	
Weighing Modes	Grams, Kilograms, Carat, Pounds, Ounces, Troy Ounce, Tael Hong Kong, Tael Singapore, Tael Taiwan, Grain, Pennyweight, Milligram, Parts per Pound, Tael China, Mommies, Austrian Carat, Tola, Baht, Mesghal, Ton, Pound:Ounces, Newton, Micrograms							
Operating Modes (*)	Mass Unit Conversion, SQ Min Function, ISO-Cal Function, Density Determination (Buoyancy method only with MSE), Calculation, Averaging, Formulation, Percent Weighing, Totalizing, Counting, Customized Identification, Statistics, Time Control Function, Second Tare Memory, Over/Under Checkweighing							
Repeatability	7 mg	7 mg	7 mg	7 mg/20 mg/1940 mg	7 mg	7 mg	7 mg	
Linearity	20 mg	20 mg	20 mg	20 mg	20 mg	20 mg	20 mg	
Stabilization Time	0.8 seconds	0.8 seconds	0.8 seconds	1 second	1 second	1 second	1 second	
Operating Temperature	41° F to 104° F (5° C to 40° C)							
Pan Size (W x D)	8.1 x 8.1 in (206 x 206 mm)							
Dimensions	(W x D x H) 16 x 9.8 x 3.5 in (410 x 249 x 87.7 mm)							
Weight (Approx.)	16 lb							
Est. Shipping Weight	21 lb							
Calibration Weight	1 kg	2 kg	2 kg	5 kg	5 kg	5 kg	10 kg	
Power	120V AC adapter (auto ranging)							
Warranty	Two-year limited warranty							
Return Policy	Sartorius Standard Policy - restock fee may apply							

\*MSE Large LCD display and easy-to-use menu system

\*\*MSU Monochrome graphic display, positive click on keys to activate functions, Ethernet and SD card reader

\*\*\*MSA TFT color touchscreen, Ethernet and SD card reader

## Specifications

	5201S	5202S	8201S	12201S	14202S	14202P	
<b>MSE*</b>	<b>Part#</b>	<b>109835</b>	<b>156322****</b>	<b>109834</b>	<b>109833</b>	<b>156324</b>	<b>156327</b>
	<b>List Price</b>	<b>\$2,575.00</b>	<b>\$4,990.00</b>	<b>\$3,575.00</b>	<b>\$3,995.00</b>	<b>\$7,410.00</b>	<b>\$6,360.00</b>
<b>MSU**</b>	<b>Part#</b>	<b>109845</b>	<b>156321****</b>	<b>109844</b>	<b>109843</b>	<b>156323</b>	<b>156329</b>
	<b>List Price</b>	<b>\$3,625.00</b>	<b>\$6,040.00</b>	<b>\$4,625.00</b>	<b>\$5,045.00</b>	<b>\$8,460.00</b>	<b>\$7,410.00</b>
<b>MSA***</b>	<b>Part#</b>	<b>109855</b>	<b>156318****</b>	<b>109854</b>	<b>109853</b>	<b>156319</b>	<b>156320</b>
	<b>List Price</b>	<b>\$4,150.00</b>	<b>\$6,565.00</b>	<b>\$5,150.00</b>	<b>\$5,570.00</b>	<b>\$8,985.00</b>	<b>\$7,935.00</b>
Capacity	5,200 g	5,200 g	8,200 g	12,200 g	14,200 g	14,200 g/7,000 g/3,500 g	
<b>Resolution</b>	<b>100 mg</b>	<b>0.01 g</b>	<b>100 mg</b>	<b>100 mg</b>	<b>0.01 g</b>	<b>0.05/0.02/0.01 g</b>	
Weighing Modes	Grams, Kilograms, Carat, Pounds, Ounces, Troy Ounce, Tael Hong Kong, Tael Singapore, Tael Taiwan, Grain, Pennyweight, Milligram, Parts per Pound, Tael China, Mommies, Austrian Carat, Tola, Baht, Mesghal, Ton, Pound:Ounces, Newton, Micrograms						
Operating Modes	Mass Unit Conversion, SQ Min Gunction, ISO-Cal Gunction, Density Determination (Buoyancy method only with MSE), Calculation, Averaging, Formulation, Percent Weighing, Totalizing, Counting, Customized Identification, Statistics, Time Control Function, Second Tare Memory, Over/Under Checkweighing						
Repeatability	50 mg	0.006 g	50 mg	50 mg	0.01 g	0.01 g/0.02 g/0.01 g	
Linearity	100 mg	0.01 g	100 mg	200 mg	0.03 g	0.05 g	
Stabilization Time	0.8 seconds	1 second	0.8 seconds	0.8 seconds	1 second	1 second	
Operating Temperature	41° F to 104° F (5° C to 40° C)						
<b>Pan Size (W x D)</b>	<b>8.1 x 8.1 in (206 x 206 mm)</b>						
Dimensions	(W x D x H) 16 x 9.8 x 3.5 in (410 x 249 x 87.7 mm)						
Weight (Approx.)	16 lb						
Est. Shipping Weight	21 lb						
Calibration Weight	5 kg	5000 g	5 kg	10 kg	10 kg	10 kg	
Power	120V AC adapter auto ranging						
Warranty	Two-year limited warranty						
Return Policy	Sartorius Standard Policy - restock fee may apply						

\*MSE Large LCD display and easy-to-use menu system

\*\*MSU Monochrome graphic display, positive click on keys to activate functions, Ethernet and SD card reader

\*\*\*MSA TFT color touchscreen, Ethernet and SD card reader

\*\*\*\*DR - Draft stainless steel shield

## Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
156324	MSE14202S-000-D0	14,200 g x 0.01 g	\$7,410.00
156327	MSE14202P-000-D0	14,200 g/7,000 g/3,500 g x 0.05 g/0.02 g/0.01 g	6,360.00
109826*	MSE10202S-000-D0	10,200 g x 10 mg	5,990.00
109827*	MSE8202S-000-D0	8,200 g x 10 mg	5,145.00
109828*	MSE6202S-100-D0	6,200 g x 10 mg	4,525.00
109829*	MSE6202P-100-D0	1,500 g/3,000 g/6,200 g x 10 mg/20 mg/50 mg	4,045.00
156322	MSE5202S-100-DR	5,200 g x 0.01 g	4,990.00
109830*	MSE4202S-100-D0	4,200 g x 10 mg	3,890.00
109831*	MSE2202S-100-D0	2,200 g x 10 mg	3,525.00
109832*	MSE1202S-000-D0	1,200 g x 10 mg	3,155.00
109833*	MSE12201S-000-D0	12,200 g x 100 mg	3,995.00
109834*	MSE8201S-000-D0	8,200 g x 100 mg	3,575.00
109835*	MSE5201S-100-D0	5,200 g x 100 mg	2,575.00
156323	MSU14202S-000-D0	14,200 g x 0.01 g	8,460.00
156329	MSU14202P-1000-D0	14,200 g/7,000 g/3,500 g x 0.05 g/0.02 g/0.01 g	7,410.00
109836**	MSU10202S-000-D0	10,200 g x 10 mg	7,040.00
109837**	MSU8202S-000-D0	8,200 g x 10 mg	6,195.00
109838**	MSU6202S-100-D0	6,200 g x 10 mg	5,575.00
109839**	MSU6202P-100-D0	1,500 g/3,000 g/6,200 g x 10 mg/20 mg/50 mg	5,095.00
156321	MSU5202S-100-DR	5,200 g x 0.01 g	6,040.00
109840**	MSU4202S-100-D0	4,200 g x 10 mg	4,940.00
109841**	MSU2202S-100-D0	2,200 g x 10 mg	4,575.00
109842**	MSU1202S-100-D0	1,200 g x 10 mg	4,205.00
109843**	MSU12201S-000-D0	12,200 g x 100 mg	5,045.00
109844**	MSU8201S-000-D0	8,200 g x 100 mg	4,625.00
109845**	MSU5201S-100-D0	5,200 g x 100 mg	3,625.00
156319	MSA14202S-000-D0	14,200 g x 0.01 g	8,985.00
156320	MSA14202P-000-D0	14,200 g/7,000 g/3,500 g x 0.05 g/0.02 g/0.01 g	7,935.00
109846***	MSA10202S-000-D0	10,200 g x 10 mg	7,565.00
109847***	MSA8202S-000-D0	8,200 g x 10 mg	6,720.00
109848***	MSA6202S-100-D0	6,200 g x 10 mg	6,100.00
109849***	MSA6202P-100-D0	1,500 g/3,000 g/6,200 g x 10 mg/20 mg/50 mg	5,620.00
156318	MSA5202S-100-DR	5,200 g x 0.01 g	6,565.00
109850***	MSA4202S-100-D0	4,200 g x 10 mg	5,465.00
109851***	MSA2202S-100-D0	2,200 g x 10 mg	5,100.00
109852***	MSA1202S-100-D0	1,200 g x 10 mg	4,730.00
109853***	MSA12201S-000-D0	12,200 g x 100 mg	5,570.00
109854***	MSA8201S-000-D0	8,200 g x 100 mg	5,150.00
109855***	MSA5201S-100-D0	5,200 g x 100 mg	4,150.00

\*Large LCD display and easy-to-use menu system

\*\*Monochrome graphic display, positive click on keys to activate functions, Ethernet and SD card reader

\*\*\*TFT color touchscreen, Ethernet and SD card reader

## Options/Accessories

PART #	MODEL #	DESCRIPTION	PRICE
Consult	TR	Certificate of compliance and full factory test report (factory installed)	Consult
Consult	IR	Additional RS-232, 25-Pin connection (factory installed)	Consult
156906	6971987	Power supply, 100-240V	\$165.00
156908	6900900	Cord, power 220V EU	35.00
Consult	IB	Bluetooth® wireless interface (factory installed)	Consult
Consult	IP	Additional RS-232, 9-Pin connection with PS2 port (factory installed)	Consult

## Standard Features

- All models have built-in internal calibration weights
- Automatic calibration at present time or temperature intervals
- RS-232C bidirectional interface port on all models
- High-contrast, blue backlit display
- Monolithic weigh cell provides stability and fast response



## Specifications

CPA26P <sup>^</sup>	
<b>Part #</b>	<b>105570</b>
<b>List Price</b>	<b>\$16,155.00</b>
Capacity	5/21 g
<b>Resolution</b>	<b>2/10 µg</b>
Weighing Modes	Grams, Kilograms, Carats, Pounds, Ounces, Troy Ounces, Hong Kong Taels, Singapore Taels, Taiwanese Taels, Grains, Pennyweights, Milligrams, Parts per Pound, Chinese Taels, Mommies, Austrian Carats, Tola, Baht, Menghal
Operating Modes	Counting, Percent Weighing, Animal Weighing, Unit Toggle, Net Total
Repeatability	+/-4 g
Linearity	+/-8 g
Stabilization Time	10 seconds
Operating Temperature	50° F to 86° F (10° C to 30° C)
Weighing Chamber	(W x D x H) 8 x 9.5 x 7 in (206 x 242 x 178 mm)
<b>Pan Size (W x D)</b>	<b>Ø 2 in (50 mm)</b>
Dimensions	(W x D x H) 8.3 x 13.5 x 10.6 in (213 x 342 x 270 mm)
Weight (Approx.)	16.7 lb
Est. Ship Weight	22 lb
Calibration Weight	20 g
Power	120V AC adapter (Other adapters available by special order)
Warranty	Two-year limited warranty
Return Policy	Sartorius Standard Policy - restock fee may apply

<sup>^</sup> Weighing Chamber

## Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
105570	CPA26P	5g/21 g x 2/10 µg	\$16,155.00

## Options/Accessories

PART #	MODEL #	DESCRIPTION	PRICE
112261	YDP20-OCE	Data printers	\$1,035.00
98038	YCC01-USBM2	Printer cable, 25-Pin to USB	310.00
31103	6906937	Paper, printer 5 rls/pk	44.00
31082	—	Density kit, analytical (0.1 mg) software not included	1,047.00
152036	6971991	Power supply, no cord	85.00

## Standard Features

- Color capacitive touch with swipe technology
- Simple touch technology
- Monolithic and strain gauge technology
- Aluminum die-cast base, ABS housing
- Integrated level-control
- Mini-USB
- Weigh below hook
- isoCAL/fully automatic, external calibration
- GLP conformance with built-in time and date
- Time and Date

### Secura Additional Features

- Internal calibration
- Opto-electronic leveling system
- Sqmin safety program
- Analytical draft support ring



## Specifications

QUINTIX	QUINTIX65-1S <sup>^</sup>	QUINTIX125D-1S <sup>^</sup>	–	–	–
<b>Part Number</b>	<b>170634</b>	<b>170635</b>	–	–	–
<b>List Price</b>	<b>\$5,045.00</b>	<b>\$5,255.00</b>	–	–	–
SECURA	–	–	SECURA125-1S <sup>^</sup>	SECURA225D-1S <sup>^</sup>	SECURA324-1S <sup>^</sup>
<b>Part Number</b>	–	–	<b>170636</b>	<b>170380</b>	<b>170637</b>
<b>List Price</b>	–	–	<b>\$5,900</b>	<b>\$6,200</b>	<b>\$4,700</b>
Capacity	60 g	60 g/120 g	60 g/120 g	120 g/220 g	320 g
Readability	0.01 mg	0.01/0.1 mg	0.01/0.1 mg	0.01/0.1 mg	0.1 mg
Repeatability	0.04 mg	0.04/0.07 mg	0.001 g	0.001 g	0.001 g
Linearity (+/-)	0.1 mg	0.1/0.2 mg	0.1 mg	0.1/0.2 mg	0.3 mg
Minimum Weight per USP	N/A	N/A	25 mg	25 mg	160 mg
External Calibration Weight	50 g	100 g	100 g	200 g	300 g
Weighing Modes	Gram, Kilogram, Carat, Pound, Ounce, Troy Ounce, Hong Kong, Tael, Singapore Tael, Taiwan Tael, Grain, Pennyweights, Milligram, Parts per Pound, China Teal, Mommies, Austrian Carat, Tola, Baht, Mesghal and Newton				
Applications	Mass Unit Conversion, Counting, Percent Weighing, Averaging				
Display Type	LCD				
Operating Humidity	Less than 95% RH				
Operating Temperature	41° F to 113° F (5° C to 45° C)				
Stabilization Time (typical)	6 seconds	6/2 seconds	6 seconds	6/2 seconds	2 seconds
Net Weight (kg/lb)	7.8 kg (18 lbs)				
<b>Pan Size/Type</b>	<b>80 mm (3.5 in) diameter pan, stainless steel</b>				<b>90 mm (3.5 in) diameter pan, stainless steel</b>
Weighing Chamber Height	218 mm (8.5 in)				
Dimensions (WxDxH)	376 x 214 x 316 mm (14.8 x 8.4 x 12.4 in)				
Power Requirements	12-15V DC, 4.5 W				
AC Power Requirements	AC adapter, 115V-240V				
Frequency	50-60 Hz				
Optional Accessories	Calibration weights, RS-232 interface cable				
<b>Warranty</b>	<b>Two-year Manufacturers Warranty</b>				

<sup>^</sup>Breeze Break

### Part Number/Price

PART NUMBER	MODEL	DESCRIPTION	PRICE
170634	QUINTIX65-1S	60 g x 0.01 mg	\$5,045.00
170635	QUINTIX125D-1S	60 g/120 g x 0.01 mg/0.1 mg	5,255.00
170636	SECURA125-1S	120 g x 0.01 mg	5,900.00
170380	SECURA225D-1S	120 g/220 g x 0.01 mg/0.1 mg	6,200.00
170637	SECURA324-1S	320 g x 0.1 mg	4,700.00

### Options/Accessories

PART #	MODEL #	DESCRIPTION	PRICE
155847	YCC03-D09	Data cable, mini USB/RS-232, 9-pin	\$55.00

## Standard Features

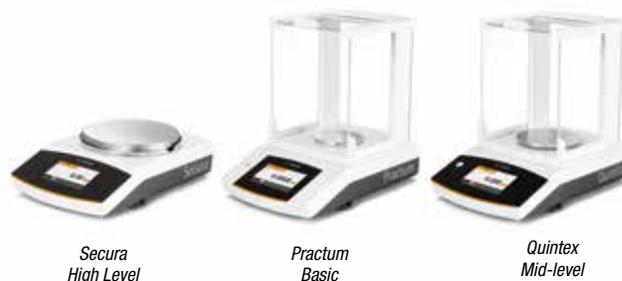
- Simple, color capacitive touch with swipe technology
- Monolithic and strain gauge technology
- Aluminum die-cast base, ABS housing
- Front level bubble
- Mini-USB
- Weigh below hook

### Quintix and Secura Additional Features

- isoCAL/fully automatic, external calibration
- GLP conformance with built-in time and date

### Secura Additional Features

- Internal calibration
- Opto-electronic leveling system
- Sqmin safety program
- Analytical draft support ring



## Specifications

PRACTUM	124-1S	224-1S	213-1S	313-1S	-
Part Number	153983	153984	153985	153986	-
List Price	\$2,270.00	\$2,495.00	\$1,295.00	\$1,395.00	-
QUINTIX	124-1S	224-1S	213-1S	313-1S	513-1S
Part Number	153992	153993	153994	153995	153996
List Price	\$3,185.00	\$3,605.00	\$1,885.00	\$2,015.00	\$2,730.00
SECURA	124-1S	224-1S	213-1S	313-1S	513-1S
Part Number	154005	154006	154007	154008	154009
List Price	\$3,600.00	\$3,995.00	\$2,200.00	\$2,400.00	\$3,000.00
Capacity	120 g	220 g	210 g	310 g	510 g
Resolution	0.1 mg	0.1 mg	0.001 g	0.001 g	0.001 g
Repeatability	±0.1 mg	±0.1 mg	0.001 g	0.001 g	0.001 g
Linearity ±	±0.3 mg (0.2 mg Secura & Quintix)	±0.3 mg (0.2 mg Secura & Quintix)	3 mg (2 mg Secura & Quintix)	3 mg (2 mg Secura & Quintix)	2 mg
External Calibration Weight	100 g	200 g			500 g
Weighing Modes	Gram, Kilogram, Carat, Pound, Ounce, Troy Ounce, Hong Kong, Tael, Singapore Tael, Taiwan Tael, Grain, Pennyweights, Milligram, Parts per Pound, China Teal, Mommies, Austrian Carat, Tola Baht, Mesghal and Newton				
Applications	Mass Unit Conversion, Counting, Percent Weighing, Averaging,				
Display Type	LCD				
Operating Humidity	Less than 95% RH				
Operating Temperature	50° F to 86° F (10° C to 30° C)				
Stabilization Time (typical)	3 seconds				
Net Weight (kg/lb)	4.5 kg (11 lb)				
Pan Size/Type	90 mm (3.5 in) diameter pan, stainless steel		120 mm (4.75 in) diameter pan, stainless steel		
Weighing Chamber Height	209 mm (7.9 in)				
Dimensions (W x D x H)					
Power Requirements	10-20V				
AC Power Requirements	AC adapter, 115V-240V				
Frequency	50-60 Hz				
Optional Accessories	Calibration weights, RS-232 interface cable				
Warranty	Two-year Manufacturers Warranty				

Sartorius

# Practum/Quintix/Secura

Analytical

BALANCES

## Part Number/Price

PART NUMBER	MODEL	DESCRIPTION	PRICE
153983	Practum 124-1S	120 g x 0.1 mg	\$2,270.00
153992	Quintix 124-1S	120 g x 0.1 mg	3,185.00
154005	Secura 124-1S	120 g x 0.1 mg	3,600.00
153984	Practum 224-1S	220 g x 0.1 mg	2,495.00
153993	Quintix 224-1S	220 g x 0.1 mg	3,605.00
154006	Secura 224-1S	220 g x 0.1 mg	3,995.00
153985	Practum 213-1S	210 g x 0.001 g	1,295.00
153994	Quintix 213-1S	210 g x 0.001 g	1,885.00
154007	Secura 213-1S	210 g x 0.001 g	2,200.00
153986	Practum 313-1S	310 g x 0.001 g	1,395.00
153995	Quintix 313-1S	310 g x 0.001 g	2,015.00
154008	Secura 313-1S	310 g x 0.001 g	2,400.00
153996	Quintix 513-1S	510 g x 0.001 g	2,730.00
154009	Secura 513-1S	510 g x 0.001 g	3,000.00

## Options/Accessories

PART #	MODEL #	DESCRIPTION	PRICE
154749	6971790	AC adapter, 110-240V, six power plugs	\$118.00
155847	YCC04-D09	Adapter cable, USB to RS-232	55.00

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RICE LAKE

## Standard Features

- Simple, color capacitive touch with swipe technology
- Monolithic and strain gauge technology
- Aluminum die-cast base, ABS housing
- Front level bubble
- Mini-USB
- Weigh below hook

### Quintix and Secura Additional Features

- isoCAL/fully automatic, external calibration
- GLP conformance with built-in time and date
- Time and date

### Secura Additional Features

- Internal calibration
- Opto-electronic leveling system
- Sqmin safety program
- Analytical draft support ring

Secura  
High Level

## Specifications

PRAC TUM	612-1S	1102-1S	2102-1S	N/A	N/A	5101-1S	5100-1S
Part Number	153987	153988	153989	N/A	N/A	153991	153990
List Price	\$1,015.00	\$1,120.00	\$1,175.00	N/A	N/A	\$1,195.00	\$920.00
QUINTIX	612-1S	1102-1S	2102-1S	3102-1S	5102-1S	5101-1S	5100-1S
Part Number	153998	153999	154000	154001	154003	154004	154002
List Price	\$1,590.00	\$1,805.00	\$2,015.00	\$2,230.00	\$2,760.00	\$1,590.00	\$1,270.00
SECURA	N/A	1102-1S	2102-1S	3102-1S	5102-1S	N/A	N/A
Part Number	N/A	154010	154011	154012	154013	N/A	N/A
List Price	N/A	\$2,100.00	\$2,500.00	\$2,700.00	\$3,100.00	N/A	N/A
Capacity	610 g	1,100 g	2,100 g	3,100 g	5,100 g	5,100 g	5,100 g
Resolution	0.01 g	0.01 g	0.01 g	0.01 g	0.01 g	0.1 g	1.0 g
Repeatability	±10 mg	±10 mg	±10 mg	±10 mg	±10 mg	0.1 g	1.0 g
Linearity ±	30 mg (20 mg Quintix & Secura)	30 mg (20 mg Quintix & Secura)	30 mg (20 mg Quintix & Secura)	20 mg	20 mg	0.3 g (0.2 g Quintix)	3.0 g (2.0 g Quintix)
External Calibration Weight	500 g	1000 g	2,000 g		5,000 g		
Weighing Modes	Gram, Kilogram, Carat, Pound, Ounce, Troy Ounce, Hong Kong, Tael, Singapore Tael, Taiwan Tael, Grain, Pennyweights, Milligram, Parts per Pound, China Teal, mommes, Austrian carat, tola baht, mesghal and Newton						
Applications	Mass Unit Conversion, Counting, Percent Weighing, Averaging						
Display Type	LCD						
Operating Humidity	Less than 95% RH						
Operating Temperature	50° F to 86° F (10° C to 30° C)						
Operating Temperature	41° F to 104° F (5° C to 40° C)						
Stabilization Time (typical)	3 seconds						
Net Weight (kg/lb)	9 lb (4.5 kg)						
Pan Size/Type	7 in (180 mm) diameter pan, stainless steel						
Dimensions (W x D x H)	14.1 x 8.5 x 12.6 in (360 x 216 x 320 mm)						
AC Power Requirements	AC adapter, 115V-240V						
Frequency	50-60 Hz						
Warranty	Two-year limited warranty						

Sartorius

# Practum/Quintix/Secura

Precision

BALANCES

## Part Number/Price

PART NUMBER	MODEL	DESCRIPTION	PRICE
153987	Practum 612-1S	610g x 0.01g	\$1,015.00
153998	Quintix 612-1S	610g x 0.01g	1,590.00
153988	Practum 1102-1S	1,100g x 0.01g	1,120.00
153999	Quintix 1102-1S	1,100g x 0.01g	1,805.00
154010	Secura 1102-1S	1,100g x 0.01g	2,100.00
153989	Practum 2102-1S	2,110g x 0.01g	1,175.00
154000	Quintix 2102-1S	2,110g x 0.01g	2,015.00
154011	Secura 2102-1S	2,110g x 0.01g	2,500.00
154001	Quintix 3102-1S	3,100g x 0.01g	2,230.00
154012	Secura 3102-1S	3,100g x 0.01g	2,700.00
154003	Quintix 5102-1S	5,100g x 0.01g	2,760.00
154013	Secura 5102-1S	5,100g x 0.01g	3,100.00
153991	Practum 5101-1S	5,100g x 0.1g	1,195.00
154004	Quintix 5101-1S	5,100g x 0.1g	1,590.00
153990	Practum 5100-1S	5,100g x 1.0g	920.00
154002	Quintix 5100-1S	5,100g x 1.0g	1,270.00

## Options/Accessories

PART #	MODEL #	DESCRIPTION	PRICE
154749	6971790	AC adapter, 110-240V, six power plugs	\$100.00
155847	YCC04-D09	Adapter cable, USB to RS-232	55.00

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RICE LAKE

## Standard Features

- User-friendly operation
- Basic applications
- Monolithic weighing systems
- Aluminum die-cast base, ABS housing
- Front level bubble
- RS-232 standard
- Below balance weighing



## Specifications

	ENTRIS64-1S <sup>^</sup>	ENTRIS124-1S <sup>^</sup>	ENTRIS224-1S <sup>^</sup>	ENTRIS153-1S <sup>^</sup>	ENTRIS323-1S <sup>^</sup>	ENTRIS423-1S <sup>^</sup>
<b>Part#</b>	<b>160679</b>	<b>160680</b>	<b>160681</b>	<b>160682</b>	<b>160683</b>	<b>160684</b>
<b>List Price</b>	<b>\$1,685.00</b>	<b>\$2,020.00</b>	<b>\$2,245.00</b>	<b>\$1,010.00</b>	<b>\$1,180.00</b>	<b>\$1,405.00</b>
Capacity	60 g	120 g	220 g	150 g	320 g	420 g
<b>Readability</b>	<b>0.0001 g</b>	<b>0.0001 g</b>	<b>0.0001 g</b>	<b>0.001 g</b>	<b>0.001 g</b>	<b>0.001 g</b>
Repeatability	±0.0001 g	±0.0001 g	±0.0001 g	±0.001 g	±0.001 g	±0.001 g
Linearity ±	±0.0002 g	±0.0002 g	±0.0002 g	±0.002 g	±0.002 g	±0.00 g
<b>External Calibration Weight</b>	<b>50 g</b>	<b>100 g</b>	<b>200 g</b>	<b>100 g</b>	<b>200 g</b>	<b>200 g</b>
Weighing Modes	Gram, Kilogram, Carat, Pound, Ounce, Troy Ounce, Hong Kong, Tael, Singapore Tael, Taiwan Tael, Grain, Pennyweights, Milligram, Parts per Pound, China Teal, Mommies, Austrian Carat, Tola Baht, Mesghal, Tons, Pounds:Ounces, and Newton					
Applications	Weighing, Density, Percentage, Counting, Mass Unit Conversion					
Display Type	Backlit LCD white, 15-mm digits					
Operating Humidity	15% to 80% for temperatures up to 31° C					
Operating Temperature	50° F to 86° F (10° C to 30° C)					
Stabilization Time (typical)	2.5 seconds			1.3 seconds	1.1 seconds	1.0 seconds
Net Weight (kg/lbs)	5.4 kg (12 lb)	5.4 kg (12 lb)	5.4 kg (12 lb)	5 kg (11 lb)	5.4 kg (12 lb)	5.4 kg (12 lb)
Pan Size/Type	90 mm (3.5 in) diameter pan, stainless steel			150 mm (4.5 in) diameter pan, stainless steel		
Dimensions (W x D x H)	230 x 303 x 330 mm (9.1 x 11.9 x 13 in)			230 x 303 x 136 mm (9.1 x 11.9 x 5.4 in)		
AC Power Requirements	AC adapter, 115V-240V, US plug					
Warranty	Two-year limited warranty					

<sup>^</sup>Weighing Chamber

## Specifications

	ENTRIS623-1S <sup>^</sup>	ENTRIS822-1S	ENTRIS2202-1S	ENTRIS3202-1S	ENTRIS4202-1S	ENTRIS-6202-1S
<b>Part#</b>	<b>160685</b>	<b>160686</b>	<b>160687</b>	<b>160688</b>	<b>160689</b>	<b>160690</b>
<b>List Price</b>	<b>\$1,630.00</b>	<b>\$960.00</b>	<b>\$1,070.00</b>	<b>\$1,295.00</b>	<b>\$1,460.00</b>	<b>\$1,685.00</b>
Capacity	620 g	820 g	2,200 g	3,200 g	4,200 g	6,200 g
<b>Readability</b>	<b>0.001 g</b>	<b>0.01 g</b>	<b>0.01 g</b>	<b>0.01 g</b>	<b>0.01 g</b>	<b>0.01 g</b>
Repeatability	±0.001 g	±0.01 g	±0.01 g	±0.01 g	±0.01 g	±0.01 g
Linearity ±	±0.002 g	±0.03 g	±0.03 g	±0.03 g	±0.03 g	±0.03 g
<b>External Calibration Weight</b>	<b>500 g</b>	<b>500 g</b>	<b>2,000 g</b>	<b>2,000 g</b>	<b>2,000 g</b>	<b>5,000 g</b>
Weighing Modes	Gram, kilogram, Carat, Pound, Ounce, Troy Ounce, Hong Kong, Tael, Singapore Tael, Taiwan Tael, Grain, Pennyweights, Milligram, Parts per Pound, China Teal, Mommies, Austrian Carat, Tola Baht, Mesghal, Tons, Pounds:Ounces, and Newton					
Applications	Weighing, Density, Percentage, Counting, Mass Unit Conversion					
Display Type	Backlit LCD white, 15-mm digits					
Operating Humidity	15% to 80% for temperatures up to 31° C					
Operating Temperature	50° F to 86° F (10° C to 30° C)					
Stabilization Time (typical)	1.0 seconds	1.5 seconds				
Net Weight (kg/lb)	5.4 kg (12 lb)	4.5 kg (9 lb)	5.4 kg (12 lb)	5.4 kg (12 lb)	5.4 kg (12 lb)	5.4 kg (12 lb)
Pan Size/Type	90 mm (3.5 in) diameter pan, stainless steel	150 mm (5.9 in) pan, stainless steel	(W x D x H) 230 x 303 x 91 mm (9.1 x 11.9 x 3.6 in)			
Dimensions (W x D x H)	230 x 303 x 330 mm (9.1 x 11.9 x 13 in)	230 x 303 x 87 mm (9.1 x 11.9 x 3.4 in)	(W x D x H) 230 x 303 x 136 mm (9.1 x 11.9 x 5.4 in)			
AC Power Requirements	AC adapter, 115V-240V, US plug					
Warranty	Two-year limited warranty					

<sup>^</sup>Weighing Chamber

## Specifications

	ENTRIS2201-1S	ENTRIS5201-1S	ENTRIS8201-1S
<b>Part #</b>	<b>160691</b>	<b>160692</b>	<b>160693</b>
<b>List Price</b>	<b>\$960.00</b>	<b>\$1,125.00</b>	<b>\$1,235.00</b>
Capacity	2,200 g	5,200 g	8,200 g
<b>Readability</b>	<b>0.1 g</b>	<b>0.1 g</b>	<b>0.1 g</b>
Repeatability	±0.1 g	±0.1 g	±0.1 g
Linearity ±	±0.3 g	±0.3 g	±0.3 g
<b>External Calibration Weight</b>	<b>2,000 g</b>	<b>5,000 g</b>	<b>5,000 g</b>
Weighing Modes	Gram, Kilogram, Carat, Pound, Ounce, Troy Ounce, Hong Kong, Tael, Singapore Tael, Taiwan Tael, Grain, Pennyweights, Milligram, Parts per Pound, China Teal, Mommies, Austrian Carat, Tola Baht, Mesghal, Tons, Pounds:Ounces, and Newton		
Applications	Weighing, Density, Percentage, Counting, Mass Unit Conversion		
Display Type	Backlit LCD white, 15-mm digits		
Operating Humidity	15% to 80% for temperatures up to 31° C		
Operating Temperature	50° F to 86° F (10° C to 30° C)		
Stabilization Time (typical)	1.0 seconds	1.5 seconds	
Net Weight (kg/lb)	5.4 kg (12 lb)	5.4 kg (12 lb)	5.4 kg (12 lb)
Pan Size/Type	(W x D x H) 230 x 303 x 91 mm (9.1 x 11.9 x 3.6 in)		
Dimensions (W x D x H)	230 x 303 x 330 mm (9.1 x 11.9 x 13 in)	230 x 303 x 87 mm (9.1 x 11.9 x 3.4 in)	230 x 303 x 136 mm (9.1 x 11.9 x 5.4 in)
AC Power Requirements	AC adapter, 115V-240V, US plug		
Warranty	Two-year limited warranty		

## Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
160679	ENTRIS64-1S	60 g x 0.1 mg	\$1,685.00
160680	ENTRIS124-1S	120 g x 0.1 mg	2,020.00
160681	ENTRIS224-1S	220 g x 0.1 mg	2,245.00
160682	ENTRIS153-1S	150 g x 0.001 g	1,010.00
160683	ENTRIS323-1S	320 g x 0.001 g	1,180.00
160684	ENTRIS423-1S	420 g x 0.001 g	1,405.00
160685	ENTRIS623-1S	620 g x 0.001 g	1,630.00
160686	ENTRIS822-1S	820 g x 0.001 g	900.00
160687	ENTRIS2202-1S	2,200 g x 0.01 g	1,070.00
160688	ENTRIS3202-1S	3,200 g x 0.01 g	1,295.00
160689	ENTRIS4202-1S	4,200 g x 0.01 g	1,460.00
160690	ENTRIS6202-1S	6,200 g x 0.01 g	1,685.00
160691	ENTRIS2201-1S	2,200 g x 0.1 g	960.00
160692	ENTRIS5201-1S	5,200 g x 0.1 g	1,125.00
160693	ENTRIS8201-1S	8,200 g x 0.1 g	1,235.00

## Options/Accessories

PART #	MODEL #	DESCRIPTION	PRICE
112261	YDP20-OCE	Data printer	\$1,035.00
31103	6906937	Paper rolls, one roll	44.00
31106	6906918	Ink ribbon cassette	52.00
31071	YRB05Z	Battery pack, external rechargeable	650.00
155805	YCC01-USBM2	Data cable RS-232/USB	265.00
154749	6971790	AC adapter with interchangeable plugs	118.00

Sartorius

# MA37 and MA160 NEW

Moisture Analyzer

## Standard Features

- High-speed measurements
- Effortless cleaning
- User-friendly operation
- Display of process status



MA37



MA160

BALANCES

## Specifications

	MA37	MA160
<b>Part #</b>	<b>165963</b>	<b>165964</b>
<b>List Price</b>	<b>\$2,985.00</b>	<b>\$4,115.00</b>
Capacity (g)	70 g	200 g
<b>Resolution (g)</b>	<b>0.001 g</b>	<b>0.01 g</b>
Heating Element	Infrared metal heating element	Infrared radiation by an AURI heater, 600 W
Heating Mode	Standard drying	Standard drying, gentle drying
Display Modes for Results	Moisture content in % M and g; dry matter in % S and g; ATRO in % M/S	Moisture content in % M and g; dry matter in % S and g; ATRO in % M/S
Repeatability	For initial sample weight approx >1 ± 0.2%; for initial sample weight >5 ± 0.05%	
Temperature Range and Settings	40° C to 160° C	
Data Interface	Mini USB	Mini USB
Operating Temperature	10° C to 30° C	
Pan Size	90 mm	
Housing Dimensions	(W x D x H) 215 x 400 x 210 mm	(W x D x H) 215 x 400 x 210 mm
Weight (approx.)	6.2 kg	6.2 kg
Calibration Weight (g)	50 g	200 g
Power	120/230 VAC multi-range adapter	
Warranty	Two-year limited warranty	

## Part Number/Price

PART #	MODEL #	DESCRIPTION	PRICE
165963	MA37	70 x 0.001 g	\$2,985.00
165964	MA160	200 x 0.01 g	4,115.00

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RICE LAKE

## Standard Features

- Converts serial data such as bar code reader or scale into keyboard input to software program
- Works with PC and MAC® computers
- Requires no driver installation (identifies itself as additional HID keyboard)
- Cable draws power from USB port (no external power supply needed)
- Test cable to be connected with adapter scale cable or connector
- Bluetooth® version allows Bluetooth® connection to devices like iPad®, Playbook, Android® tablets and smart cell phones

## Specifications

**Baud Rate:**

9600

**Color:**

Black

**Cable Length:**

74 in (1,880 mm)

**Bluetooth Cable Length:**

16 in (406 mm)

**Power:**

USB power, no external power supply

**Host:**

PC and MAC compliant

**Connection:**

DB9 male connector, Pin 2 RX, Pin 3 TX and Pin 5 Ground USBA connector



## Part Number/Price

PART #	DESCRIPTION	WEIGHT	PRICE
119919	RS-232/USB serial cable	1 lb	\$185.00
132452	RS-232/USB serial cable plus Bluetooth®	1 lb	260.00

## Options/Accessories

PART #	DESCRIPTION	PRICE
119064	Slimline null modem, gender changer DB9 female to female	\$10.50
22436	Blunt-end to DB9 female, straight cable	55.00
50749	DB9 female to DB9 female	55.00
130789	Null model DB9 adapter female to male	12.00

### Standard Features

- LED on board for testing data transmission
- Captures data and stores it on a USB flash drive up to 8GB (not included)
- Transfer data to your PC using the USB flash drive

### Specifications

**Baud Rate:**

9600

**Data Bits:**

8

**Parity:**

None

**Power:**

Requires 5VDC

**Customer Supplied:**

Power and USB flash drive

**Industrial Enclosure Option:**

7.5 x 7.5 x 4.5 in (19 x 19 x 12 mm)

Latch for lock

**Desktop Model:**

DB 9-Pin Male

**Warranty:**

One-year limited warranty

**Text file examples (actual text will be dependent on transmitted file)**

02:50PM	
11/13/2012	
GROSS	58 lb
02:50PM	
11/13/2012	
GROSS	68 lb



### Part Number/Price

PART #	DESCRIPTION	PRICE
153265	go-between board, requires 5 Volts	\$410.00
153266	go-between industrial enclosure, requires 5 Volts	500.00
153267	go-between desk enclosure, power supply included	500.00

### Options/Accessories

PART #	DESCRIPTION	PRICE
154797	Adapter, power 5VDC 2A 90-264VAC, U.S. plug, UL/CUL	\$35.00
125077	USB flash drive, 1 GB	20.00
130789	Null model DB9 adapter female to male	12.00
119064	Null modem adapter, DB9 F/F	10.50
50764	Straight cable, DB9 F/F	48.00
66535	Null modem DB9 F/F	45.00
22436	DB9 cable to blunt end	55.00
15493	Cable four-conductor	1.25/ft

# Standard Balance Slab

Kasota Stone



PN 83779

*Reduces vibration and shock, ideal where tables will not fit*

## Part Number/Price

PART #	DESCRIPTION	PRICE
<b>Standard Balance Slab, Kasota Stone</b>		
83779	15 in x 20 in x 3 in, 100 lb	\$450.00
<b>Clean Room Table</b>		
83780	24 in x 35 in x 32 in, 600 lb	2,700.00
<b>Standard Balance Table, Kasota Stone</b>		
83778	24 in x 35 in x 32 in, 700 lb	1,200.00
<b>Anti-Vibration Pad</b>		
75263	Anti-vibration pad 4 x 4 1/2 in.-thick	15.00

## Clean Room Table

Granite



PN 83789

*Mass, Density and Vibration damping properties for most applications. (Four damping pads included)*

## Standard Balance Table

Kasota Stone



PN 83778

*Provides the most stable surface possible for precision instruments. Legs are reinforced with support pipe.*

## Anti-Vibration



PN 75263

## Scoops



PN 33447



PN 33455



PN 33451



PN 33454



PN 33456

## Part Number/Price

PART #	DESCRIPTION	PRICE
33455	Aluminum, 1.5 x 2.0 in (3.8 x 5.1 cm)	\$28.00
33446	Polypropylene, 12 x 6 x 2.75 in (304 x 152 x 70 mm)	39.00
33447	Stainless steel, 12 x 6 x 2.75 in (304 x 152 x 70 mm)	93.00
33448	Polypropylene Maxi-scoop, 10 in (254 mm) diameter x 2.5 in (70 mm) deep with pouring spout	40.00
33456	Gold, 2.25 x 3.0 in (5.7 x 7.6 cm)	28.00
33454	Black, aluminum 4.0 x 3.5 in (10.2 x 8.9 cm)	28.00
33451	Polypropylene Maxi-scoop	39.00
97250	Stainless steel scoop 11.9 x 7.4 x 1.7 in	53.00
100292	Stainless steel scoop 17.2 x 11 x 3.4 in	66.00

# Prove™ Statistical Printer

## Specifications

**Printing System:**

Direct thermal line head

**Max. Characters (per line):**

48, 32, (24 default)

**Character Matrix:**

24 x 8, 24 x 12 or 24 x 16

**Character Size:**

0.1 x 0.08 in, 0.1 x 0.06 in, or 0.1 x 0.04 in  
(approx. 13, 17 or 25 cpi) horizontal dot pitch  
3 x 2 mm, 3 x 1.5 mm, or 3 x 1 mm  
(approx. 13, 17 or 25 cpi) horizontal dot pitch:

**Horizontal Dot Pitch:**

0.005 in (0.125 mm) approximately 200 dpi

**Vertical Dot Pitch:**

0.005 in (0.125 mm)

**Text Line Composition:**

24 x 384 dots

**Printing Width:**

1.9 in (48 mm)

**Average Print Speed:**

10 lines per second, max.

**Dimensions:**

3.4 x 5.9 x 2.2 in (85.5 x 150 x 55 mm) (W x D x H)

**Weight:**

400 g approx. (includes batteries and paper)

**Paper Width:**

2.3 in (58 mm)

**Paper Capacity:**

1.8 in diameter, 1 in standard printer  
45 mm diameter, 25 m standard printer

**Character Set:**

ASCII

**Country Codes:**

USA

**Data Format:**

RS-232C (8 Data, 1 Stop, No Parity)

**Connector**

6-way RJ12 socket

**Baud Rate:**

9600

**Handshaking Hardware:**

(CTS line) or software (XON/XOFF)

**Buffer Size:**

5 Kbytes

**Environmental Changes:**

Operating Range: 32° F to 120° F (0° C to 50° C)

Storage Range: -4° F to 140° F (-20° C to 60° C)

Charging Range: 32° F to 113° F (10° C to 45° C)

**Charge Life:**

Approximately 6,000 lines (18 m) of continuous printing

**Warranty:**

One-year limited warranty



## Standard Features

- Statistical Printer – Rice Lake balances TA, TP, Equipoise, A&D GF balance, CW90 checkweigher
- Statistical information provided: MAX, MIN, AVERAGE, standard deviation and coefficient of variable
- Easy-load paper feature
- RS-232 interface
- Maintenance-free
- Ultra-compact and light weight
- High reliability line head mechanism
- Low-power mode
- Range of configurable options
- Low-profile paper lid and range of mounting options available
- Rechargeable NiMH batteries
- Multi-ranging AC with changeable plugs

## Part Number/Price

PART #	DESCRIPTION	PRICE
158056	Prove statistical printer, 110-240VAC with universal AC adapter	\$715.00

## Options/Accessories

PART #	DESCRIPTION	PRICE
130789	Null modem adapter, DBF/M (required for Equipoise)	\$12.00
158583	RJ11 to 5-Pin DIN (required for TP balance)	65.00
41279	RS-232 cable, 25-Pin 9-Pin	65.00
75947	Thermal paper	6.00



# Static Solutions

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# Static Brushes/Ionizing Strips and Accessories

- NRD is the industry leader for providing advanced ionization products to eliminate electrostatic discharge and static attraction. The success of NRD devices is based on unique and extremely effective ionization sources that use alpha-energy to neutralize static electricity. Unlike electrical ionization systems, NRD ion sources don't just control static, they eliminate it by providing a constant balance of  $\pm$ zero volts.
- The ion sources are entirely self-powered and never require any calibration or adjustment. Therefore, there are no operating costs associated with them throughout their lifetime.
- Because NRD ion sources do not require electricity and are completely safe, they are ideal for use in any application, including highly-volatile environments.
- Static charge buildup is the cause of many production problems including downtime, reduced product quality, and ultimately increased costs



1 in Static Brush



3 in Static Brush



1 in x 1 in Ionizing Strip



1 in x 3 in Ionizing Strip



Mini-fan Ionizer



Stand Ionizer

and reduced profits. Although the static charges cannot be seen, they are quite noticeable. Thousands of volts of electricity can easily accumulate on the surfaces of in-process materials. This buildup can ignite combustibles, shock personnel, destroy sensitive electronic components and cause many types of production problems. In addition, static attraction of dirt, dust and other foreign matter contaminates products and process equipment, which intensifies processing problems.

- NRD alpha-energy devices rapidly neutralize charged materials. This is accomplished by emitting a flood of both positively and negatively charged ions in the vicinity of the affected material. The charged material then attracts a sufficient quantity of oppositely charged ions to completely eliminate its static charge.
- NRD alpha-energy ion sources totally eliminate static buildup, not just reduce it, as with other methods of static control. As with all types of ion sources, ionized air has absolutely no adverse effects on personnel.

## Ionizers

PART #	STATICMASTER PART #	DESCRIPTION	PRICE
164648	4068	Mini-fan ionizer	\$130.00
164649	6105	I-beam stand ionizer	1,015.00

## Static Brushes - 1 inch

PART #	STATICMASTER PART #	DESCRIPTION	PRICE
76669	1C200	Static brush, 1 in	\$131.00
76670	1C200R	Replacement cartridge	85.00

## Static Brushes - 3 inch

PART #	STATICMASTER PART #	DESCRIPTION	PRICE
76671	3C500	Static brush, 3 in	\$199.00
76672	3C500R	Replacement cartridge	134.00

## Ionizing Strips - 1 inch

PART #	STATICMASTER PART #	DESCRIPTION	PRICE
76677	1U400	Ionizing unit 1 in	\$134.00
76678	1U200	Ionizing unit 1 in	85.00

## Ionizing Strips - 3 inch

PART #	STATICMASTER PART #	DESCRIPTION	PRICE
76676	2U500	Ionizing unit 1 in x 3 in	\$134.00

## Ionizing Strip Accessories

PART #	STATICMASTER PART #	DESCRIPTION	PRICE
76679	BF1	Ionizer positioner	\$69.00
76680	BF2	Ionizer positioner only - C bracket	98.00
163601	BF3	EZ-Mount, 2U500 BF3 option mounts 2U500 to balance chamber	15.00
163602	5060	Grounding kit, 2U500 5060 enhances static eliminating power staticmaster 2U500	30.00

# Test Weights

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## Weight and Calibration Specifications

Rice Lake Weighing Systems metrology staff has participated in basic, intermediate and advanced NIST/OWM training seminars, regional metrology groups such as MidMap and round-robin metrology programs with state labs.

Rice Lake's calibration lab has direct traceability to NIST.

### Weights:

Rice Lake offers cast iron weights and three designs of stainless steel weights. Due to varying configurations, the actual appearance of your product may be slightly different than shown on the catalog page. Serial numbers are available for an additional charge. Individual leaf weights should be ordered with protective vial (individual leaf weights are for custom-designed kits).

### Weight Sets:

Rice Lake offers many configurations for weight sets. Class F weights have many set configurations to assist in calibration of scales; higher accuracy sets are available in 5-2-2-1 and 5-3-2-1. A standard set would be as follows:

5-2-2-1 – (1) 50g, (2) 20g and (1) 10g

5-3-2-1 – (1) 50g, (1) 30g, (1) 20g and (1) 10g

Custom sets are available as build-to-order to meet your specific requirements.

Each weight set consists of the weights, case and/or small weight case (as appropriate), and appropriate lifting design consisting of one or more lifters, tweezers and white cotton gloves.

OIML and ASTM weights sets larger than 500 grams or one pound include a hardwood case with velvet-lined pockets. Cases are available to replace wooden cases if portability is required. Weight sets with the largest weight of 500 grams include a precision-machined polyvinyl, crush resistant case.

Serial numbers are not stamped on polished weights or milligram weights.

The correct class weight is dependent on the use. Weights should be more accurate than the precision of the weighing device and it is recommended that a weight has an accuracy of one-third (1/3) of the weighing device readability.

### Weights Kits:

All cylindrical ASTM kits (excluding grip handle weights) include their own protective case and glove set for safe handling.

### Calibration Certificates

Rice Lake offers several different calibration certificates including the Total Measure Assurance Program (TMAP) certification.

Calibration Certification, NVLAP accredited certificate, is for weight classes ASTM 0-3, OIML E1, E2, F1 and F2.

The calibration is performed per NIST Mass Dissemination and meets ISO/IEC 17025 certification for ASTM Class 0-3 and OIML E1, E2, F1 and F2 SOP 5, 3-in-1 weighing design and SOP 28 advanced weighing designs.

Traceable Calibration Certificate, NVLAP accredited certificate, meets requirements of ISO/IEC 17025 for ASTM 4-7, NIST F, OIML M1, M2, and M3. The calibration is performed per SOP 8 (following Rice Lake Work Instruction WI05-0023).

Rice Lake's Mass Value Certificate is not an accredited certificate, as found, as left data with environmental conditions reported. Uncertainty to Tolerance of 3:1 is not guaranteed for weight classes ASTM 1-3, OIML F1 and F2 per SOP 8 (following Rice Lake Work Instruction WI05-0023). Additional time may be required for ASTM Class 0 weight certification.

Serial numbers are included in the cost of all certificates with the exception of the Statement of Accuracy. Certificates are included in the box with the weights at time of shipment. Replacement documentation is a fee of \$50 plus shipping.

## Weight and Calibration Specifications

### **Total Measurement Assurance Program (TMAP)**

TMAP has been part of the Rice Lake metrology brand almost since its inception. TMAP covers all phases of our weight manufacturing and metrology groups to ensure that metrology services meet all requirements.

### **Metrology Staff**

The metrology staff has participated in basic, intermediate and advanced NIST/OWM training seminars, regional metrology groups such as MidMap and round-robin metrology programs with state labs.

### **Sales Staff**

Weights sales group receives continuous training to be of assistance in weight selection, configuration, tolerance recommendations and consultations.

### **Traceability**

Rice Lake's calibration lab has direct traceability to NIST.

### **Weight Design and Manufacturing**

Rice Lake offers cast iron weights and three (3) different designs of stainless steel weights.

Stainless steel weights are available as electronic balance, grip-handle, precision (screw-knob design) or OIML precision (one-piece design).

### **Calibration Services**

Calibration Certification is available for weight classes ASTM 0-3, OIML E1, E2, F1 and F2. The calibration is performed per NIST Mass Dissemination and meets ISO/IEC 17025 certification.

Traceable Calibration Certificate weight classes ASTM 4-7, NIST F, OIML M1, M2, and M3.

# CAST IRON

## Painted weights

with adjusting cavity for sealing

### Classes Available:

**NIST** Class F

**ASTM** Class 6 and 7

**OIML** Class M1 and M2



### Applications:

- Field standards for testing industrial devices Class III, Class III L or Class III I
- Testing for non-marked scales without Class designation
- Verifying scales are within specified accuracy and tolerances

### Styles Available:

- Grip-handle design for easy handling
- Nesting slab weights for heavy-capacity weighing
- Slotted weights and hangers for suspended weighing

- Counterpoise weights for ratio weighing

### Features:

- Nominal value marked on weight
- Weight capacities of 10kg/20lb and up meet NIST Handbook 105-1 and Handbook 44 specifications
- Metric weights designated by gold paint
- Avoirdupois (pound) weights designated by silver paint
- Serial numbers may be stamped on weights (optional)

# Cast Iron

## Grip-handle and Nesting Slab Weights

### NIST CLASS F

OPTIONAL

Weight	Part #	Width	Length	Height	Slot Width	Slot Depth*	Price	Traceable Certificate
3,000 lb	<b>12872</b>	20 3/4in (527.1 mm)	20 3/4in (527.1 mm)	29in (736.6 mm)	3 1/2in (88.9 mm)	2 3/4in (69.9 mm)	\$8,700.00	\$300.00
2,500 lb	<b>12854</b>	20 3/4in (527.1 mm)	20 3/4in (527.1 mm)	24 3/4in (628.65 mm)	3 31/32in (100.8 mm)	2 3/4in (69.9 mm)	7,800.00	225.00
2,000 lb	<b>12868</b>	20 3/4in (527.05 mm)	20 3/4in (527.05 mm)	19 1/2in (495.3 mm)	3 1/2in (88.9 mm)	2 3/4in (69.9 mm)	6,900.00	225.00
1,500 lb	<b>12864</b>	15 1/8in (384.2 mm)	15 1/8in (384.2 mm)	26 7/8in (682.6 mm)	2 1/2in (63.5 mm)	2 1/4in (57.2 mm)	6,250.00	225.00
1,250 lb	<b>12858</b>	15in (381.0 mm)	15in (381.0 mm)	23 3/4in (603.3 mm)	2 1/2in (63.5 mm)	2 1/4in (57.2 mm)	5,220.00	225.00
1,000 lb	<b>12850</b>	15in (381.0 mm)	15 1/2in (393.7 mm)	18 11/16in (474.7 mm)	2 3/4in (69.9 mm)	2 29/32in (73.8 mm)	2,500.00	225.00
500 lb	<b>12844</b>	11 1/2in (292.1 mm)	12in (304.8 mm)	15 3/4in (400.1 mm)	2 1/2in (63.5 mm)	1 29/32in (48.4 mm)	1,570.00	225.00
250 lb	<b>12892</b>	9 3/4in (247.65 mm)	9 3/4in (247.65 mm)	12in (304.8 mm)	2 1/2in (63.5 mm)	2in (50.8 mm)	1,435.00	225.00
200 lb	<b>12890</b>	9 3/4in (247.65 mm)	9 3/4in (247.65 mm)	10in (254 mm)	2 1/2in (63.5 mm)	2in (50.8 mm)	1,250.00	225.00
100 lb	<b>12862</b>	9 1/8in (231.8 mm)	7in (177.8 mm)	7 7/8in (200.0 mm)	4 1/2in (114.3 mm)	1 1/2in (38.1 mm)	550.00	100.00
50 lb	<b>12839</b>	7 29/32in (200.8 mm)	5 1/2in (139.7 mm)	6 9/16in (166.7 mm)	4 1/2in (114.3 mm)	1 21/32in (42.1 mm)	130.00	75.00
30 lb	<b>12878</b>	8 1/4in (209.6 mm)	4 29/32in (124.6 mm)	4 1/2in (114.3 mm)	4 15/32in (113.5 mm)	31/32in (24.6 mm)	170.00	75.00
25 lb	<b>12833</b>	6 1/2in (165.1 mm)	4 1/2in (114.3 mm)	4 15/16in (125.4 mm)	3 5/8in (92.1 mm)	31/32in (24.6 mm)	115.00	75.00
20 lb	<b>12870</b>	5 3/4in (146.1 mm)	4 15/32in (113.5 mm)	5 3/32in (129.4 mm)	3 31/32in (100.8 mm)	1 5/32in (29.4 mm)	92.00	75.00

### ASTM CLASS 7

OPTIONAL

Weight	Part #	Width	Length	Height	Price	Traceable Certificate
10 lb	<b>12828</b>	5in (127.0 mm)	3 1/4in (82.6 mm)	4 1/32in (102.4 mm)	\$72.00	\$75.00
5 lb	<b>12823</b>	4in (101.6 mm)	2 9/16in (65.1 mm)	3 7/32in (81.8 mm)	55.00	75.00
2 lb	<b>12874</b>	3in (76.2 mm)	2 1/8in (54.0 mm)	1 3/4in (44.5 mm)	52.00	60.00
1 lb	<b>12876</b>	2 1/2in (63.5 mm)	1 11/16in (42.9 mm)	1 13/32in (35.7 mm)	48.00	60.00

### NESTING SLAB NIST CLASS F

OPTIONAL

Weight	Part #	Width	Length	Height	Slot Width	Slot Depth*	Price	Traceable Certificate
2,500 lb	<b>12860</b>	42in (1066.8 mm)	30in (762 mm)	8 1/4in (209.5 mm)	2in (50.8 mm)	2 1/4in (57.15 mm)	\$7,800.00	\$225.00
1,000 lb	<b>34563</b>	29 1/2in (749.3 mm)	19 1/2in (495.3 mm)	7 1/4in (184.15 mm)	2in (50.8 mm)	2 1/4in (57.15 mm)	3,945.00	225.00

\* Slot depth refers to distance between lifting bars and castings

### ADDITIONAL ACCESSORIES

Part #	Description	Price
<b>36092</b>	Statement of Accuracy	\$45.00
<b>25836</b>	Serial number	15.00



Nesting Slab PN 12860



Grip-handle

# Cast Iron

## Grip-handle Weights

### NIST CLASS F

OPTIONAL

Weight	Part #	Width	Length	Height	Slot Width	Slot Depth*	Price	Traceable Certificate
1,000kg	<b>12801</b>	20 1/2in (520.7 mm)	20 1/2in (520.7 mm)	22in (558.8 mm)	3 1/2in (88.9 mm)	2 3/4in (69.85 mm)	\$6,900.00	\$300.00
500 kg	<b>12797</b>	15 1/8in (384.2 mm)	15 1/8in (384.2 mm)	20 3/4in (527 mm)	2 1/2in (63.5 mm)	2in (50.8 mm)	2,550.00	225.00
250kg	<b>12782</b>	11 1/2in (292.1 mm)	12 1/2in (317.5 mm)	20 1/2in (520.7 mm)	2 1/2in (63.5 mm)	1 7/8in (47.6 mm)	1,600.00	225.00
200kg	<b>12793</b>	11 1/2in (292.1 mm)	12in (304.8 mm)	14 1/4in (362 mm)	2 1/2in (63.5 mm)	1 7/8in (47.6 mm)	1,375.00	225.00
100 kg	<b>12817</b>	9 7/8in (250.8 mm)	9 7/8in (250.8 mm)	11in (279.4 mm)	2 1/2in (63.5 mm)	2in (50.8 mm)	1,265.00	225.00
50 kg	<b>12803</b>	9 7/32in (234.2 mm)	7in (177.8 mm)	8 13/16in (223.8 mm)	4 15/32in (113.5 mm)	1 29/32in (48.4 mm)	550.00	125.00
35 kg	<b>12805</b>	7 7/8in (200.0 mm)	5 1/2in (139.7 mm)	9 15/32in (252.4 mm)	4 15/32in (113.5 mm)	1 1/16in (27.0 mm)	390.00	125.00
25kg	<b>12775</b>	7 21/32in (194.5 mm)	5 1/2in (139.7 mm)	7 3/32in (180.2 mm)	4 7/16in (112.7 mm)	1 13/16in (46.0 mm)	150.00	70.00
20kg	<b>12771</b>	7 5/8in (193.7 mm)	5 19/32in (142.1 mm)	5 29/32in (150.0 mm)	4 5/8in (117.5 mm)	1 19/32in (40.5 mm)	125.00	70.00
10kg	<b>12767</b>	6in (152.4 mm)	4 1/2in (114.3 mm)	5in (127.0 mm)	3 3/4in (95.3 mm)	1 1/16in (27.0 mm)	120.00	70.00

### ASTM CLASS 7

OPTIONAL

Weight	Part #	Width	Length	Height	Price	Traceable Certificate
5 kg	<b>12786</b>	5 15/32in (138.9 mm)	3 13/32in (86.5 mm)	4 1/8in (104.8 mm)	\$72.00	\$70.00
2kg	<b>12809</b>	3 31/32in (100.8 mm)	2 9/16in (65.1 mm)	2 13/16in (71.4 mm)	60.00	70.00
1 kg	<b>12813</b>	3in (76.2 mm)	2 1/8in (54.0 mm)	1 27/32in (46.8 mm)	52.00	50.00
500g	<b>12815</b>	2 1/2in (63.5 mm)	1 5/8in (41.3 mm)	1 17/32in (38.9 mm)	48.00	50.00

### OIML CLASS M1

OPTIONAL

Weight	Part #	Width	Length	Height	Slot Width	Slot Depth*	Price	Traceable Certificate
500 kg	<b>156304</b>	15 1/8in (384.2 mm)	15 1/8in (384.2 mm)	20 3/4in (527 mm)	2 1/2in (63.5 mm)	2in (50.8 mm)	\$2,800.00	\$225.00
250 kg	<b>156305</b>	15 1/8in (384.2 mm)	15 1/8in (384.2 mm)	20 3/4in (527 mm)	2 1/2in (63.5 mm)	1 7/8in (47.6 mm)	1,600.00	225.00
100 kg	<b>156306</b>	15 1/8in (384.2 mm)	15 1/8in (384.2 mm)	20 3/4in (527 mm)	2 1/2in (63.5 mm)	2in (50.8 mm)	1,300.00	225.00
50 kg	<b>105417</b>	9 7/32in (234.2 mm)	7in (177.8 mm)	8 13/16in (223.8 mm)	4 15/32in (113.5 mm)	1 29/32in (48.4 mm)	585.00	125.00
20kg	<b>105416</b>	7 5/8in (193.7 mm)	5 19/32in (142.1 mm)	5 29/32in (150.0 mm)	4 5/8in (117.5 mm)	1 19/32in (40.5 mm)	155.00	70.00
10kg	<b>105415</b>	6in (152.4 mm)	4 1/2in (114.3 mm)	5in (127.0 mm)	3 3/4in (95.3 mm)	1 1/16in (27.0 mm)	120.00	70.00
5 kg	<b>105414</b>	5 15/32in (138.9 mm)	3 13/32in (86.5 mm)	4 1/8in (104.8 mm)	-	-	90.00	70.00

\* Slot depth refers to distance between lifting bars and castings

### ADDITIONAL ACCESSORIES

Part #	Description	Price
<b>36092</b>	Statement of Accuracy	\$45.00
<b>25836</b>	Serial number	15.00



Grip-handle

# Cast Iron

## Slotted Interlocking and Hanger Weights

### SLOTTED ASTM CLASS 6

OPTIONAL

Weight	Part #	Slot Width	Diameter	Height	Price	Traceable Certificate
100 lb	<b>40828</b>	1 in (25.4 mm)	17 in (431.8 mm)	1 15/16 in (49.2 mm)	\$565.00	\$100.00
50 lb	<b>12856</b>	3/4 in (9 mm)	10 5/8 in (269.9 mm)	2 11/16 in (68.3 mm)	220.00	75.00
20 lb	<b>12831</b>	13/16 in (20.6 mm)	8 1/8 in (206.4 mm)	1 31/32 in (50.0 mm)	95.00	75.00

### SLOTTED ASTM CLASS 7

OPTIONAL

Weight	Part #	Slot Width	Diameter	Height	Price	Traceable Certificate
10 lb	<b>12826</b>	13/16 in (20.6 mm)	6 1/8 in (155.6 mm)	1 11/16 in (42.9 mm)	\$80.00	\$75.00
5 lb	<b>12852</b>	11/16 in (17.5 mm)	5 1/8 in (130.2 mm)	1 5/16 in (33.3 mm)	65.00	75.00
2 lb	<b>12848</b>	9/16 in (14.3 mm)	5 in (127.0 mm)	23/32 in (18.3 mm)	55.00	60.00
1 lb	<b>12842</b>	9/16 in (14.3 mm)	5 in (127.0 mm)	15/32 in (11.9 mm)	55.00	60.00
1/2 lb	<b>12837</b>	9/16 in (14.3 mm)	3 3/4 in (95.3 mm)	7/16 in (11.1 mm)	44.00	35.00

### HANGER ASTM CLASS 7

OPTIONAL

Weight	Capacity	Part #	Total Length	Operational Length	Diameter	Price	Traceable Certificate
5 lb*	500 lb	<b>12846</b>	37 1/4 in (946.2 mm)	35 in (889.0 mm)	4 in (101.6 mm)	\$260.00	\$75.00
2 lb	200 lb	<b>12841</b>	21 13/32 in (543.7 mm)	19 in (482.6 mm)	3 3/4 in (95.3 mm)	130.00	60.00
2 lb	200 lb	<b>12835</b>	10 1/4 in (260.4 mm)	8 in (203.2 mm)	3 3/4 in (95.3 mm)	124.00	60.00
1 lb	200 lb	<b>12830</b>	21 29/32 in (556.4 mm)	20 7/32 in (513.6 mm)	3 3/4 in (95.3 mm)	110.00	60.00
1 lb	200 lb	<b>12825</b>	9 5/16 in (236.5 mm)	7 9/16 in (192.1 mm)	3 3/4 in (95.3 mm)	90.00	60.00

\* Stainless steel

### SLOTTED ASTM CLASS 6

OPTIONAL

Weight	Part #	Slot Width	Diameter	Height	Price	Traceable Certificate
20 kg	<b>12819</b>	21/32 in (16.7 mm)	10 5/16 in (261.9 mm)	2 11/32 in (59.5 mm)	\$220.00	\$70.00
10 kg	<b>12811</b>	3/4 in (19.1 mm)	8 3/16 in (208.0 mm)	2 1/16 in (52.4 mm)	122.00	70.00

### SLOTTED ASTM CLASS 7

OPTIONAL

Weight	Part #	Slot Width	Diameter	Height	Price	Traceable Certificate
5 kg	<b>12807</b>	13/16 in (20.6 mm)	6 3/16 in (157.2 mm)	1 13/16 in (46.0 mm)	\$110.00	\$70.00
2 kg	<b>12799</b>	9/16 in (14.3 mm)	5 1/8 in (130.2 mm)	1 3/16 in (30.2 mm)	65.00	70.00
1 kg	<b>12795</b>	9/16 in (14.3 mm)	5 1/16 in (128.6 mm)	3/4 in (19.1 mm)	57.00	50.00
500 g	<b>12791</b>	9/16 in (14.3 mm)	5 in (127.0 mm)	15/32 in (11.9 mm)	55.00	50.00
200 g	<b>12780</b>	5/8 in (15.9 mm)	3 21/32 in (92.9 mm)	7/16 in (11.1 mm)	45.00	50.00

### HANGER ASTM CLASS 7

OPTIONAL

Weight	Capacity	Part #	Total Length	Operational Length	Diameter	Price	Traceable Certificate
2 kg	250 kg	<b>12788</b>	37 1/4 in (946.2 mm)	35 in (889.0 mm)	4 in (101.6 mm)	\$260.00	\$70.00
1 kg	100 kg	<b>12784</b>	21 13/32 in (543.7 mm)	19 in (482.6 mm)	3 3/4 in (95.3 mm)	125.00	50.00
1 kg	100 kg	<b>12777</b>	10 1/4 in (260.4 mm)	8 in (203.2 mm)	3 3/4 in (95.3 mm)	124.00	50.00
500 g	100 kg	<b>12773</b>	21 29/32 in (556.4 mm)	20 7/32 in (513.6 mm)	3 3/4 in (95.3 mm)	110.00	50.00
500 g	100 kg	<b>12769</b>	9 5/16 in (236.5 mm)	7 9/16 in (192.1 mm)	3 3/4 in (95.3 mm)	100.00	50.00

### ADDITIONAL ACCESSORIES

Part #	Description	Price
<b>36092</b>	Statement of Accuracy	\$45.00
<b>25836</b>	Serial number	15.00



# Cast Iron

Counterpoise and Hanger Weights

## ROUND ASTM CLASS 7

Ratio	Weight	Part #	Diameter	Fairbanks Part #	Price
1 lb - 100lb	50lb x 1/2lb	<b>10154</b>	2 7/8in (73.0mm)	PA48	\$35.00
1 lb - 100lb	100lb x 1 lb	<b>10156</b>	4 1/16in (103.2mm)	PA32	40.00
1 lb - 100lb	200lb x 2lb	<b>10158</b>	4 1/16in (103.2mm)	PA21	35.00
1 lb - 100lb	500lb x 5lb	<b>10160</b>	3 3/4in (95.3mm)	PB52	40.00
1/2lb - 100lb	100lb x 1/2lb	<b>10152</b>	2 7/8in (73.0mm)	PBC32	35.00
1/2lb - 100lb	200lb x 1 lb	<b>10168</b>	3 17/32in (89.7mm)	PBC21	45.00
1/2lb - 100lb	300lb x 1 1/2lb	<b>10189</b>	3 1/2in (88.9mm)	-	35.00
1/2lb - 100lb	500lb x 2 1/2lb	<b>10170</b>	3 1/2in (88.9mm)	PBC52	50.00
1/2lb - 100lb	1,000lb x 5lb	<b>10196</b>	3 7/8in (98.4mm)	-	60.00

## HANGERS - ROUND AND SQUARE ASTM CLASS 7

Approx. Weight	Part #	Total Length	Operational Length	Diameter	Price
<b>Round</b>					
7 oz	<b>10188</b>	7 1/16in (179.4mm)	5 1/8in (130.2mm)	3 31/32in (100.8mm)	\$65.00
10 oz (Fairbanks® only)	<b>10184</b>	7 1/16in (179.4mm)	5 1/8in (130.2mm)	3 31/32in (100.8mm)	65.00
12 oz	<b>10185</b>	7 1/16in (179.4mm)	5 1/8in (130.2mm)	3 31/32in (100.8mm)	65.00
17 oz	<b>10186</b>	7 1/16in (179.4mm)	5 1/8in (130.2mm)	4in (101.6mm)	65.00
21 oz	<b>10187</b>	7 1/16in (179.4mm)	5 1/8in (130.2mm)	4in (101.6mm)	65.00
<b>Square</b>					
21 oz	<b>10193</b>	8 7/16in (214.3mm)	6 5/16in (160.3mm)	-	65.00

## HEXAGON ASTM CLASS 7

Weight	Part #	Diameter	Price
10kg x 100g	<b>10266</b>	2in (50.8mm)	\$40.00
25kg x 250g	<b>10268</b>	2 13/16in (71.4mm)	40.00
50kg x 500g	<b>10270</b>	4in (101.6mm)	44.00
100kg x 1kg	<b>10272</b>	4in (101.6mm)	47.00
200kg x 2kg	<b>10274</b>	4in (101.6mm)	52.00

## SQUARE ASTM CLASS 7

Ratio	Weight	Part #	Diameter	Fairbanks Part #	Price
1 lb - 100lb	50lb x 1/2lb	<b>10191</b>	2 5/16in (58.7mm)	1A2349	\$40.00
1 lb - 100lb	100lb x 1 lb	<b>10162</b>	3 1/2in (88.9mm)	1A1469	40.00
1 lb - 100lb	200lb x 2lb	<b>10164</b>	3 1/2in (88.9mm)	1A1470	45.00
1 lb - 100lb	500lb x 5lb	<b>10166</b>	3 1/2in (88.9mm)	1A1471	75.00



Fairbanks Round Individual and Hanger



Fairbanks Square Individual and Hanger



Cast Iron - NIST, ASTM and OIML  
**Avoirdupois**  
 Counterpoise and Hanger Weights

**ROUND ASTM CLASS 7**

Ratio	Weight	Part #	Diameter	Howe™ Part #	Price
-	50 lb x 1/2 lb	<b>10367</b>	3 in (76.2 mm)	42071831	\$45.00
-	100 lb x 1 lb	<b>10369</b>	2 7/8 in (73.0 mm)	42076188	45.00
-	200 lb x 2 lb	<b>10371</b>	2 31/32 in (75.4 mm)	42076189	45.00
-	300 lb x 3 lb	<b>10373</b>	2 31/32 in (75.4 mm)	42076190	45.00
-	500 lb x 5 lb	<b>10385</b>	3 1/8 in (79.4 mm)	42078947	45.00
For Counting Scales					
99 - 1	100 lb x 1 1/99 lb	<b>10387</b>	3 in (76.2 mm)	40810545	50.00
99 - 1	500 lb x 5 5/99 lb	<b>10391</b>	3 3/32 in (78.6 mm)	42111567	50.00
8 - 1	10 lb x 1 1/4 lb	<b>10427</b>	2 15/16 in (74.6 mm)	-	50.00
8 - 1	5 lb x 5/8 lb	<b>10425</b>	2 15/16 in (74.6 mm)	-	50.00
8 - 1	2 lb x 1/4 lb	<b>10411</b>	2 7/32 in (56.4 mm)	-	45.00
50 - 1	80 lb x 1 3/5 lb	<b>10421</b>	3 in (76.2 mm)	-	45.00
50 - 1	40 lb x 4/5 lb	<b>10419</b>	2 13/16 in (71.4 mm)	-	45.00
50 - 1	20 lb x 2/5 lb	<b>10417</b>	2 31/32 in (75.4 mm)	-	50.00
50 - 1	10 lb x 1/5 lb	<b>10415</b>	2 in (50.8 mm)	-	45.00
50 - 1	5 lb x 1/10 lb	<b>10413</b>	1 1/2 in (38.1 mm)	-	45.00
64 - 1	100 lb x 1 9/16 lb or 25 oz	<b>10409</b>	3 in (76.2 mm)	42111417	45.00
61 - 1	50 lb x 28/32 lb or 12 1/2 oz	<b>10407</b>	2 15/16 in (74.6 mm)	40807082	45.00
64 - 1	25 lb x 25/64 lb or 6 1/4 oz	<b>10405</b>	2 31/32 in (75.4 mm)	40807092	45.00
64 - 1	10 lb x 5/32 lb or 2 1/2 oz	<b>10404</b>	1 1/2 in (38.1 mm)	42111454	45.00

**ROUND HANGER ASTM CLASS 7**

Approx. Weight	Part #	Total Length	Operational Length	Diameter	Price
7 oz	<b>10382</b>	8 1/4 in (209.6 mm)	6 3/16 in (157.2 mm)	2 31/32 in (75.4)	\$60.00
10 oz	<b>10379</b>	8 1/4 in (209.6 mm)	6 3/16 in (157.2 mm)	2 31/32 in (75.4)	60.00
12 oz	<b>10380</b>	8 1/4 in (209.6 mm)	6 3/16 in (157.2 mm)	2 31/32 in (75.4)	100.00
16 oz	<b>10381</b>	8 1/4 in (209.6 mm)	6 3/16 in (157.2 mm)	2 31/32 in (75.4)	100.00

**TRIANGLE ASTM CLASS 7**

Approx. Weight	Part #	Toledo® Part #	Price
100 lb x 1 lb	<b>11417</b>	49868	\$35.00
200 lb x 2 lb	<b>11419</b>	49869	40.00
500 lb x 5 lb	<b>11421</b>	49870	60.00

**TRIANGLE HANGER ASTM CLASS 7**

Approx. Weight	Part #	Total Length	Operational Length	Toledo Part #	Price
14 oz	<b>11423</b>	8 1/4 in (209.6 mm)	6 3/16 in (157.2 mm)	49857	\$60.00



Howe Round Individual and Hangers



Toledo Triangle Individual and Hangers

# STAINLESS STEEL

**NIST** Class F



## Applications:

- Field standards for Class III scales or balances
- Testing non-classified scale equipment
- Tolerance checking

## Styles Available:

- Cylindrical
- Grip handle
- Dish weights



## Product Configuration:

- Individual weight
- Weight set: weights, case and handling equipment
- Weight set configuration: 5-2-2-1 or 5-3-2-1  
Example: (1) 50 g, (2) 20 g and (1) 10 g or (1) 50 g, (1) 30 g, (1) 20 g and (1) 10 g
- Appropriate lifting device, tweezer and/or glove

## Features:

- Stainless steel weights designed to meet NIST Handbook 44 and 105-1
- Class F tolerances
- Sealing cavity for adjustment for most weights
- Serial numbers may be stamped on weights (optional)
- Nominal value marked on weights

# Metric Individual Weights

## GRIP HANDLE CLASS F

OPTIONAL

Weight	Part #	Height	Diameter	Price	Traceable Certificate
30kg	<b>12572</b>	9 3/16 in (233.3 mm)	6 in (152.4 mm)	\$1,055.00	\$75.00
25kg	<b>12571</b>	7 3/16 in (182.5 mm)	6 in (152.4 mm)	835.00	70.00
20kg	<b>12569</b>	6 7/16 in (163.5 mm)	6 in (152.4 mm)	720.00	70.00
10kg	<b>12567</b>	5 3/16 in (131.7 mm)	5 in (127.0 mm)	510.00	70.00
8kg	<b>12565</b>	4 13/32 in (111.9 mm)	5 in (127.0 mm)	475.00	70.00
5kg	<b>12564</b>	3 7/32 in (81.8 mm)	5 in (127.0 mm)	275.00	70.00

## CYLINDRICAL CLASS F

OPTIONAL

OPTIONAL CASES

Weight	Part #	Height	Diameter	Price	Traceable Certificate	Part #	Price
5kg	<b>12521</b>	4 13/32 in (111.9 mm)	3 1/2 in (88.9 mm)	\$200.00	\$70.00	<b>11462</b>	\$42.00
4kg	<b>12519</b>	3 3/16 in (96.7 mm)	3 3/8 in (85.0 mm)	185.00	70.00	<b>11463</b>	42.00
3kg	<b>12517</b>	3 23/32 in (94.5 mm)	3 in (76.2 mm)	165.00	70.00	<b>11464</b>	42.00
2kg	<b>12515</b>	3 5/16 in (83.7 mm)	2 5/8 in (66.2 mm)	120.00	70.00	<b>11465</b>	42.00
1kg	<b>12513</b>	2 11/16 in (68.2 mm)	2 in (50.4 mm)	70.00	50.00	<b>11468</b>	42.00
500g	<b>12511</b>	2 1/8 in (53.8 mm)	1 5/8 in (40.9 mm)	65.00	50.00	<b>11470</b>	42.00
400g	<b>12531</b>	2 1/32 in (51.6 mm)	1 1/2 in (38.1 mm)	60.00	50.00	<b>11471</b>	42.00
300g	<b>12529</b>	1 13/16 in (45.9 mm)	1 3/8 in (34.5 mm)	60.00	50.00	<b>11472</b>	42.00
200g	<b>12509</b>	1 21/32 in (42.1 mm)	1 3/16 in (30.2 mm)	50.00	50.00	<b>11473</b>	42.00
150g	<b>12549</b>	1 9/32 in (32.5 mm)	1 3/16 in (30.2 mm)	45.00	50.00	<b>11475</b>	42.00
100g	<b>12507</b>	1 3/16 in (30.2 mm)	1 in (25.4 mm)	42.00	35.00	<b>11476</b>	42.00
50g	<b>12527</b>	31/32 in (24.6 mm)	3/4 in (19.1 mm)	38.00	35.00	<b>11480</b>	42.00
30g	<b>12525</b>	11/16 in (16.7 mm)	11/16 in (17.4 mm)	35.00	35.00	<b>11481</b>	42.00
20g	<b>12523</b>	5/8 in (15.9 mm)	19/32 in (15.1 mm)	35.00	35.00	<b>11482</b>	42.00
10g	<b>12505</b>	19/32 in (15.1 mm)	7/16 in (11.1 mm)	35.00	35.00	<b>11483</b>	42.00
5g	<b>12503</b>	13/32 in (10.3 mm)	3/8 in (9.5 mm)	30.00	35.00	-	-
3g	<b>12533</b>	3/8 in (9.3 mm)	5/16 in (7.5 mm)	30.00	35.00	-	-
2g	<b>12501</b>	5/16 in (7.9 mm)	9/32 in (7.1 mm)	30.00	35.00	-	-
1g	<b>12499</b>	1/4 in (6.4 mm)	7/32 in (5.6 mm)	30.00	35.00	-	-

## MILLIGRAM CLASS F

OPTIONAL

Weight	Part #	Price	Traceable Certificate
500mg	<b>12913</b>	\$18.00	\$35.00
300mg	<b>12914</b>	18.00	35.00
200mg	<b>12915</b>	18.00	35.00
100mg	<b>12916</b>	18.00	35.00
50mg	<b>12917</b>	18.00	35.00
30mg	<b>12918</b>	18.00	35.00
20mg	<b>12919</b>	18.00	35.00
10mg	<b>12920</b>	18.00	35.00
5mg	<b>12921</b>	18.00	35.00
3mg	<b>12922</b>	18.00	35.00
2mg	<b>12923</b>	18.00	35.00
1mg	<b>12924</b>	18.00	35.00

## ADDITIONAL ACCESSORIES

Part #	Description	Price
<b>36092</b>	Statement of Accuracy	\$45.00
<b>25836</b>	Serial number	15.00



Grip-handle



Cylindrical



Leaf

# Avoirdupois Individual Weights

## GRIP HANDLE CLASS F

OPTIONAL

Weight	Part#	Height	Diameter	Price	Traceable Certificate
50lb	<b>12677</b>	6 21/32 in (169.1 mm)	6 in (127.0 mm)	\$785.00	\$75.00
30lb	<b>12676</b>	6 11/16 in (169.0 mm)	5 in (126.4 mm)	595.00	75.00
25lb	<b>12675</b>	5 3/4 in (145.9 mm)	5 in (126.4 mm)	500.00	75.00
20lb	<b>12674</b>	4 27/32 in (123.0 mm)	5 in (127.0 mm)	460.00	75.00
10lb	<b>12673</b>	3 1/32 in (77.0 mm)	5 in (127.0 mm)	275.00	75.00

## CYLINDRICAL CLASS F

OPTIONAL

OPTIONAL CASES

Weight	Part #	Height	Diameter	Price	Traceable Certificate	Part #	Price
10lb	<b>12606</b>	4 1/16 in (103.0 mm)	3 1/2 in (88.1 mm)	\$190.00	\$75.00	<b>152299</b>	\$42.00
5lb	<b>12604</b>	3 11/16 in (93.2 mm)	2 5/8 in (66.2 mm)	120.00	75.00	<b>11496</b>	42.00
4lb	<b>12602</b>	3 1/16 in (77.0 mm)	2 5/8 in (66.2 mm)	115.00	75.00	<b>11465</b>	42.00
3lb	<b>12600</b>	2 15/16 in (74.4 mm)	2 1/4 in (56.8 mm)	110.00	75.00	<b>11495</b>	42.00
2lb	<b>12598</b>	2 15/32 in (62.7 mm)	2 in (50.8 mm)	65.00	60.00	<b>11468</b>	42.00
1lb	<b>12596</b>	2 9/32 in (57.9 mm)	1 1/2 in (38.1 mm)	55.00	60.00	<b>82983</b>	42.00
12oz	<b>12626</b>	2 1/16 in (51.6 mm)	1 3/8 in (34.5 mm)	50.00	35.00	-	-
8oz	<b>12594</b>	1 21/32 in (42.1 mm)	1 1/4 in (31.8 mm)	45.00	35.00	<b>11491</b>	42.00
4oz	<b>12592</b>	1 11/32 in (34.1 mm)	1 in (25.4 mm)	40.00	35.00	<b>11494</b>	42.00
2oz	<b>12590</b>	15/16 in (23.8 mm)	13/16 in (20.6 mm)	38.00	35.00	<b>11479</b>	42.00
1oz	<b>12587</b>	13/16 in (20.2 mm)	5/8 in (15.5 mm)	35.00	35.00	<b>11493</b>	42.00
1/2oz	<b>12584</b>	21/32 in (16.7 mm)	1/2 in (12.7 mm)	35.00	35.00	<b>11492</b>	42.00
1/4oz	<b>12581</b>	5/8 in (15.9 mm)	3/8 in (9.6 mm)	30.00	35.00	-	-
1/8oz	<b>12578</b>	7/16 in (10.8 mm)	5/16 in (7.5 mm)	30.00	35.00	-	-
1/16oz	<b>12575</b>	3/8 in (9.6 mm)	1/4 in (6.4 mm)	30.00	35.00	-	-
1/32oz	<b>12608</b>	11/32 in (8.7 mm)	3/16 in (4.8 mm)	30.00	35.00	-	-
0.5oz	<b>12647</b>	21/32 in (16.7 mm)	1/2 in (12.7 mm)	35.00	35.00	-	-
0.3oz	<b>12645</b>	17/32 in (13.5 mm)	7/16 in (11.1 mm)	35.00	35.00	-	-
0.2oz	<b>12643</b>	1/2 in (12.8 mm)	3/8 in (9.1 mm)	35.00	35.00	-	-
0.1oz	<b>12641</b>	3/8 in (9.0 mm)	5/16 in (7.5 mm)	35.00	35.00	-	-
0.05oz	<b>12639</b>	5/16 in (7.4 mm)	1/4 in (6.0 mm)	35.00	35.00	-	-
0.5lb	<b>12624</b>	1 21/32 in (42.1 mm)	1 1/4 in (31.8 mm)	45.00	35.00	-	-
0.3lb	<b>12622</b>	1 3/16 in (30.2 mm)	1 1/8 in (28.2 mm)	45.00	35.00	-	-
0.2lb	<b>12610</b>	1 7/32 in (31.0 mm)	15/16 in (23.8 mm)	38.00	35.00	-	-
0.1lb	<b>12612</b>	7/8 in (21.8 mm)	3/4 in (18.7 mm)	38.00	35.00	-	-
0.05lb	<b>12614</b>	23/32 in (18.3 mm)	19/32 in (15.1 mm)	38.00	35.00	-	-
0.03lb	<b>12620</b>	5/8 in (15.7 mm)	1/2 in (12.3 mm)	38.00	35.00	-	-
0.02lb	<b>12616</b>	9/16 in (13.7 mm)	7/16 in (10.7 mm)	38.00	35.00	-	-
0.01lb	<b>12618</b>	17/32 in (13.5 mm)	5/16 in (7.9 mm)	38.00	35.00	-	-

## DISH CLASS F

OPTIONAL

Weight	Part #	Price	Traceable Certificate
0.005lb	<b>12909</b>	\$35.00	\$35.00
0.003lb	<b>12912</b>	35.00	35.00
0.002lb	<b>12910</b>	35.00	35.00
0.001lb	<b>12911</b>	35.00	35.00



Dish Weights  
0.005 lb - 0.001 lb



Grip-handle



Cylindrical



Stainless Steel - NIST

# Metric Sets

Range: 100g

TEST WEIGHTS

### CLASS F

Set Size	Part #	Price	OPTIONAL Traceable Certificate	REPLACEMENT CASES Part #	Price
100g - 1 mg	<b>12510</b>	\$215.00	\$485.00	<b>11512</b>	\$30.00
100g - 10mg	<b>12508</b>	205.00	380.00	<b>11512</b>	30.00
100g - 1 g	<b>12506</b>	185.00	205.00	<b>11512</b>	30.00

### WEIGHT SET CONTENTS

100g - 1 mg	100g - 10mg	100g - 1 g
1 - 100g	1 - 100g	1 - 100g
1 - 50g	1 - 50g	1 - 50g
2 - 20g	2 - 20g	2 - 20g
1 - 10g	1 - 10g	1 - 10g
1 - 5g	1 - 5g	1 - 5g
2 - 2g	2 - 2g	2 - 2g
1 - 1g	1 - 1g	1 - 1g
1 - 500mg	1 - 500mg	-
2 - 200mg	2 - 200mg	-
1 - 100mg	1 - 100mg	-
1 - 50mg	1 - 50mg	-
2 - 20mg	2 - 20mg	-
1 - 10mg	1 - 10mg	-
1 - 5mg	-	-
2 - 2mg	-	-
1 - 1mg	-	-
<b>Piece Count</b>		
21	17	9
<b>Total Weight</b>		
211.11g	211.19g	210.000g
<b>Part #</b>	<b>Part #</b>	<b>Part #</b>
<b>12510</b>	<b>12508</b>	<b>12506</b>

### CASE INSERT\*

Size	Part #	Price
100g - 1 mg	<b>11519</b>	\$30.00
100g - 10mg	<b>11519</b>	30.00
100g - 1 g	<b>11518</b>	30.00

\* Leaf weight cover not included

### ADDITIONAL ACCESSORIES

Part #	Description	Price
<b>36092</b>	Statement of Accuracy	\$45.00
<b>11758</b>	Leaf weight cover	35.00
<b>65640</b>	Tweezer	15.00
<b>25836</b>	Serial number	15.00
<b>152414</b>	Premium tweezer	35.00



100g to 1 mg PN 12510

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RICELAKE

Stainless Steel - NIST

# Metric Sets

Range: 500g

## CLASS F

Set Size	Part #	Price
500g - 1mg	<b>12516</b>	\$395.00
500g - 10mg	<b>12514</b>	355.00
500g - 1g	<b>12512</b>	315.00

## OPTIONAL

Traceable Certificate
\$575.00
485.00
300.00

## REPLACEMENT CASES

Part #	Price
<b>11520</b>	\$60.00
<b>11520</b>	60.00
<b>11520</b>	60.00

## WEIGHT SET CONTENTS

500g - 1mg	500g - 10mg	500g - 1g
1 - 500g	1 - 500g	1 - 500g
2 - 200g	2 - 200g	2 - 200g
1 - 100g	1 - 100g	1 - 100g
1 - 50g	1 - 50g	1 - 50g
2 - 20g	2 - 20g	2 - 20g
1 - 10g	1 - 10g	1 - 10g
1 - 5g	1 - 5g	1 - 5g
2 - 2g	2 - 2g	2 - 2g
1 - 1g	1 - 1g	1 - 1g
1 - 500mg	1 - 500mg	-
2 - 200mg	2 - 200mg	-
1 - 100mg	1 - 100mg	-
1 - 50mg	1 - 50mg	-
2 - 20mg	2 - 20mg	-
1 - 10mg	1 - 10mg	-
1 - 5mg	-	-
2 - 2mg	-	-
1 - 1mg	-	-
<b>Piece Count</b>		
24	20	12
<b>Total Weight</b>		
1.11111 kg	1.1111 kg	1.110 kg
<b>Part #</b>	<b>Part #</b>	<b>Part #</b>
<b>12516</b>	<b>12514</b>	<b>12512</b>

## SECONDARY LEATHERETTE CASE

Size	Part #	Price
100g - 1mg	<b>11512</b>	\$30.00
100g - 10mg	<b>11512</b>	30.00
100g - 1g	<b>11512</b>	30.00

## CASE INSERT\*

Size	Part #	Price
100g - 1mg	<b>11519</b>	\$30.00
100g - 10mg	<b>11519</b>	30.00
100g - 1g	<b>11518</b>	30.00

\* Leaf weight cover not included

## ADDITIONAL ACCESSORIES

Part #	Description	Price
<b>36092</b>	Statement of Accuracy	\$45.00
<b>11758</b>	Leaf weight cover	35.00
<b>65640</b>	Tweezer	15.00
<b>25836</b>	Serial number	15.00
<b>152414</b>	Premium tweezer	35.00



500g to 1g PN 12512

**Metric Sets**

Range: 1 kg

**CLASS F**

Set Size	Part #	Price
1 kg - 1 mg	<b>12522</b>	\$440.00
1 kg - 10 mg	<b>12520</b>	435.00
1 kg - 1 g	<b>12518</b>	405.00

**OPTIONAL**

Traceable Certificate
\$600.00
520.00
335.00

**REPLACEMENT CASES**

Part #	Price
<b>11521</b>	\$60.00
<b>11521</b>	60.00
<b>11521</b>	60.00

**WEIGHT SET CONTENTS**

1 kg - 1 mg	1 kg - 10 mg	1 kg - 1 g
1 - 1 kg	1 - 1 kg	1 - 1 kg
1 - 500g	1 - 500g	1 - 500g
2 - 200g	2 - 200g	2 - 200g
1 - 100g	1 - 100g	1 - 100g
1 - 50g	1 - 50g	1 - 50g
2 - 20g	2 - 20g	2 - 20g
1 - 10g	1 - 10g	1 - 10g
1 - 5g	1 - 5g	1 - 5g
2 - 2g	2 - 2g	2 - 2g
1 - 1g	1 - 1g	1 - 1g
1 - 500mg	1 - 500mg	-
2 - 200mg	2 - 200mg	-
1 - 100mg	1 - 100mg	-
1 - 50mg	1 - 50mg	-
2 - 20mg	2 - 20mg	-
1 - 10mg	1 - 10mg	-
1 - 5mg	-	-
2 - 2mg	-	-
1 - 1mg	-	-
<b>Piece Count</b>		
25	21	13
<b>Total Weight</b>		
2.11111 kg	2.1111 kg	2.11 kg
<b>Part #</b>	<b>Part #</b>	<b>Part #</b>
<b>12522</b>	<b>12520</b>	<b>12518</b>

**SECONDARY LEATHERETTE CASE**

Size	Part #	Price
100g - 1 mg	<b>11512</b>	\$30.00
100g - 10 mg	<b>11512</b>	30.00
100g - 1 g	<b>11512</b>	30.00

**CASE INSERT\***

Size	Part #	Price
100g - 1 mg	<b>11519</b>	\$30.00
100g - 10 mg	<b>11519</b>	30.00
100g - 1 g	<b>11518</b>	30.00

\* Leaf weight cover not included

**ADDITIONAL ACCESSORIES**

Part #	Description	Price
<b>36092</b>	Statement of Accuracy	\$45.00
<b>11758</b>	Leaf weight cover	35.00
<b>65640</b>	Tweezer	15.00
<b>25836</b>	Serial number	15.00
<b>152414</b>	Premium tweezer	35.00

Stainless Steel - NIST

# Metric Sets

Range: 2kg

CLASS F			OPTIONAL	REPLACEMENT CASES	
Set Size	Part #	Price	Traceable Certificate	Part #	Price
2kg - 1mg	<b>12528</b>	\$540.00	\$610.00	<b>11522</b>	\$145.00
(5) 2kg - 1mg	<b>12534</b>	850.00	778.00	<b>11523</b>	200.00
2kg - 10mg	<b>12526</b>	510.00	560.00	<b>11522</b>	145.00
(5) 2kg - 10mg	<b>12532</b>	845.00	700.00	<b>11523</b>	200.00
2kg - 1g	<b>12524</b>	470.00	380.00	<b>11522</b>	145.00
(5) 2kg - 1g	<b>12530</b>	785.00	545.00	<b>11523</b>	200.00

WEIGHT SET CONTENTS					
2kg - 1mg	(5) 2kg - 1mg	2kg - 10mg	(5) 2kg - 10mg	2kg - 1g	(5) 2kg - 1g
1 - 2kg	5 - 2kg	1 - 2kg	5 - 2kg	1 - 2kg	5 - 2kg
1 - 1kg	—	1 - 1kg	—	1 - 1kg	—
1 - 500g	5 - 500g	1 - 500g	5 - 500g	1 - 500g	5 - 500g
2 - 200g	2 - 200g	2 - 200g	2 - 200g	2 - 200g	2 - 200g
1 - 100g	1 - 100g	1 - 100g	1 - 100g	1 - 100g	1 - 100g
1 - 50g	1 - 50g	1 - 50g	1 - 50g	1 - 50g	1 - 50g
2 - 20g	2 - 20g	2 - 20g	2 - 20g	2 - 20g	2 - 20g
1 - 10g	1 - 10g	1 - 10g	1 - 10g	1 - 10g	1 - 10g
1 - 5g	1 - 5g	1 - 5g	1 - 5g	1 - 5g	1 - 5g
2 - 2g	2 - 2g	2 - 2g	2 - 2g	2 - 2g	2 - 2g
1 - 1g	1 - 1g	1 - 1g	1 - 1g	1 - 1g	1 - 1g
1 - 500mg	1 - 500mg	1 - 500mg	1 - 500mg	-	-
2 - 200mg	2 - 200mg	2 - 200mg	2 - 200mg	-	-
1 - 100mg	1 - 100mg	1 - 100mg	1 - 100mg	-	-
1 - 50mg	1 - 50mg	1 - 50mg	1 - 50mg	-	-
2 - 20mg	2 - 20mg	2 - 20mg	2 - 20mg	-	-
1 - 10mg	1 - 10mg	1 - 10mg	1 - 10mg	-	-
1 - 5mg	1 - 5mg	-	-	-	-
2 - 2mg	2 - 2mg	-	-	-	-
1 - 1mg	1 - 1mg	-	-	-	-
<b>Piece Count</b>					
26	33	22	29	14	21
<b>Total Weight</b>					
4.11111 kg	13.11111 kg	4.1111 kg	13.1111 kg	4.110 kg	13.11kg
<b>Part #</b>	<b>Part #</b>	<b>Part #</b>	<b>Part #</b>	<b>Part #</b>	<b>Part #</b>
<b>12528</b>	<b>12534</b>	<b>12526</b>	<b>12532</b>	<b>12524</b>	<b>12530</b>

SECONDARY LEATHERETTE CASE		
Size	Part #	Price
100g - 1mg	<b>11512</b>	\$30.00
100g - 10mg	<b>11512</b>	30.00
100g - 1g	<b>11512</b>	30.00

CASE INSERT*		
Size	Part #	Price
100g - 1mg	<b>11519</b>	\$30.00
100g - 10mg	<b>11519</b>	30.00
100g - 1g	<b>11518</b>	30.00

\* Leaf weight cover not included



2kg to 1mg PN 12528

TEST WEIGHTS

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RICE LAKE

# Metric Sets

Range: 5 kg

### CLASS F

Set Size	Part #	Price
5 kg - 1 mg	<b>12537</b>	\$725.00
(2) 5 kg - 1 mg	<b>12542</b>	985.00
5 kg - 10 mg	<b>12536</b>	670.00
(2) 5 kg - 10 mg	<b>12539</b>	935.00
5 kg - 1 g	<b>12535</b>	635.00
(2) 5 kg - 1 g	<b>12538</b>	915.00
(3) 5 kg	<b>12562</b>	810.00

### OPTIONAL

Traceable Certificate
\$740.00
760.00
650.00
680.00
470.00
500.00
210.00

### REPLACEMENT CASES

Part #	Price
<b>11524</b>	\$200.00
<b>11525</b>	200.00
<b>11524</b>	200.00
<b>11525</b>	200.00
<b>11524</b>	200.00
<b>11525</b>	200.00
<b>11558</b>	200.00

### WEIGHT SET CONTENTS

5 kg - 1 mg	(2) 5 kg - 1 mg	5 kg - 10 mg	(2) 5 kg - 10 mg	5 kg - 1 g	(2) 5 kg - 1 g	(3) 5 kg
1 - 5kg	2 - 5kg	1 - 5kg	2 - 5kg	1 - 5kg	2 - 5kg	3 - 5kg
2 - 2kg	2 - 2kg	2 - 2kg	2 - 2kg	2 - 2kg	2 - 2kg	-
1 - 1kg	1 - 1kg	1 - 1kg	1 - 1kg	1 - 1kg	1 - 1kg	-
1 - 500g	5 - 500g	1 - 500g	5 - 500g	1 - 500g	5 - 500g	-
2 - 200g	2 - 200g	2 - 200g	2 - 200g	2 - 200g	2 - 200g	-
1 - 100g	1 - 100g	1 - 100g	1 - 100g	1 - 100g	1 - 100g	-
1 - 50g	1 - 50g	1 - 50g	1 - 50g	1 - 50g	1 - 50g	-
2 - 20g	2 - 20g	2 - 20g	2 - 20g	2 - 20g	2 - 20g	-
1 - 10g	1 - 10g	1 - 10g	1 - 10g	1 - 10g	1 - 10g	-
1 - 5g	1 - 5g	1 - 5g	1 - 5g	1 - 5g	1 - 5g	-
2 - 2g	2 - 2g	2 - 2g	2 - 2g	2 - 2g	2 - 2g	-
1 - 1g	1 - 1g	1 - 1g	1 - 1g	1 - 1g	1 - 1g	-
1 - 500mg	1 - 500mg	1 - 500mg	1 - 500mg	-	-	-
2 - 200mg	2 - 200mg	2 - 200mg	2 - 200mg	-	-	-
1 - 100mg	1 - 100mg	1 - 100mg	1 - 100mg	-	-	-
1 - 50mg	1 - 50mg	1 - 50mg	1 - 50mg	-	-	-
2 - 20mg	2 - 20mg	2 - 20mg	2 - 20mg	-	-	-
1 - 10mg	1 - 10mg	1 - 10mg	1 - 10mg	-	-	-
1 - 5mg	1 - 5mg	-	-	-	-	-
2 - 2mg	2 - 2mg	-	-	-	-	-
1 - 1mg	1 - 1mg	-	-	-	-	-

#### Piece Count

28	33	24	29	16	21	3
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#### Total Weight

11.11 kg	18.11 kg	11.1111 kg	18.1111 kg	11.11 kg	18.110 kg	15 kg
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| Part #       |
|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| <b>12537</b> | <b>12542</b> | <b>12536</b> | <b>12539</b> | <b>12535</b> | <b>12538</b> | <b>12562</b> |

### SECONDARY LEATHERETTE CASE

Size	Part #	Price
100g - 1 mg	<b>11512</b>	\$30.00
100g - 10 mg	<b>11512</b>	30.00
100g - 1 g	<b>11512</b>	30.00

### CASE INSERT\*

Size	Part #	Price
100g - 1 mg	<b>11519</b>	\$30.00
100g - 10 mg	<b>11519</b>	30.00
100g - 1 g	<b>11518</b>	30.00

\* Leaf weight cover not included

### ADDITIONAL ACCESSORIES

Part #	Description	Price
<b>36092</b>	Statement of Accuracy	\$45.00
<b>11758</b>	Leaf weight cover	35.00
<b>65640</b>	Tweezer	15.00
<b>25836</b>	Serial number	15.00
<b>152414</b>	Premium tweezer	35.00



(2) 5 kg to 1 mg PN 12542

Stainless Steel - NIST  
**Avoirdupois Set**

Range: 4 oz

CLASS F			OPTIONAL	REPLACEMENT CASES	
Set Size	Part #	Price	Traceable Certificate	Part #	Price
4oz - 1/32 oz	<b>12623</b>	\$170.00	\$205.00	<b>11510</b>	\$30.00
4oz - 0.05 oz	<b>12625</b>	190.00	185.00	<b>11510</b>	30.00
0.2lb - 0.001 lb	<b>12576</b>	180.00	250.00	<b>11512</b>	30.00
0.3lb - 0.001 lb	<b>12654</b>	410.00	250.00	<b>11565</b>	170.00

WEIGHT SET CONTENTS			
4 oz - 1/32 oz	4 oz - 0.05 oz	0.2lb - 0.001 lb	0.3lb - 0.001 lb
1 - 4oz	1 - 4oz	2 - 0.2lb	1 - 0.3lb
1 - 2oz	1 - 2oz	1 - 0.1lb	1 - 0.2lb
1 - 1oz	1 - 1oz	1 - 0.05lb	1 - 0.1lb
1 - 1/2oz	1 - 0.5oz	2 - 0.02lb	1 - 0.05lb
1 - 1/4 oz	2 - 0.2oz	1 - 0.01lb	1 - 0.03lb
1 - 1/8 oz	1 - 0.1 oz	1 - 0.005lb	1 - 0.02lb
1 - 1/16 oz	1 - 0.05oz	2 - 0.002lb	1 - 0.01lb
2 - 1/32oz	-	1 - 0.001 lb	1 - 0.005lb
-	-	-	1 - 0.003lb
-	-	-	1 - 0.002lb
-	-	-	2 - 0.001 lb
<b>Piece Count</b>			
9	8	11	12
<b>Total Weight</b>			
1/2lb	1 lb 0.05oz	0.61 lb	0.722lb
<b>Part #</b>	<b>Part #</b>	<b>Part #</b>	<b>Part #</b>
<b>12623</b>	<b>12625</b>	<b>12576</b>	<b>12654</b>

CASE INSERT		
Size	Part #	Price
4oz - 1/32 oz	<b>11552</b>	\$20.00
4oz - 0.05 oz	<b>11553</b>	20.00
0.2oz - 0.001 lb	<b>11541</b>	20.00

ADDITIONAL ACCESSORIES		
Part #	Description	Price
<b>36092</b>	Statement of Accuracy	\$45.00
<b>25836</b>	Serial number	15.00

Stainless Steel - NIST  
**Avoirdupois Set**

Range: 1 lb

TEST WEIGHTS

**CLASS F**

Set Size	Part #	Price	OPTIONAL Traceable Certificate	REPLACEMENT CASES Part #	Price
1 lb - 1/32 oz (fractional)	<b>12591</b>	\$285.00	\$270.00	<b>11544</b>	\$65.00
1 lb - 0.001 lb (decimal)	<b>12593</b>	330.00	315.00	<b>11544</b>	65.00
1 lb - 0.05 oz (combination)	<b>12595</b>	300.00	245.00	<b>11544</b>	65.00

**WEIGHT SET CONTENTS**

1 lb - 1/32 oz	1 lb - 0.001 lb	1 lb - 0.05 oz
1 - 1 lb	1 - 1 lb	1 - 1 lb
1 - 8 oz	1 - 0.5 lb	1 - 8 oz
1 - 4 oz	2 - 0.2 lb	1 - 4 oz
1 - 2 oz	1 - 0.1 lb	1 - 2 oz
1 - 1 oz	1 - 0.05 lb	1 - 1 oz
1 - 1/2 oz	2 - 0.02 lb	1 - 0.5 oz
1 - 1/4 oz	1 - 0.01 lb	2 - 0.2 oz
1 - 1/8 oz	1 - 0.005 lb	1 - 0.1 oz
1 - 1/16 oz	2 - 0.002 lb	1 - 0.05 oz
2 - 1/32 oz	1 - 0.001 lb	-
<b>Piece Count</b>		
11	13	10
<b>Total Weight</b>		
2 lb	2.1110 lb	1.990625 lb
<b>Part #</b>	<b>Part #</b>	<b>Part #</b>
<b>12591</b>	<b>12593</b>	<b>12595</b>

**SECONDARY CASE**

Size	Part #	Price
1 lb - 1/32 oz	<b>11510</b>	\$30.00
1 lb - 0.001 lb	<b>11512</b>	30.00
1 lb - 0.05 oz	<b>11510</b>	30.00

**CASE INSERT**

Size	Part #	Price
1 lb - 1/32 oz	<b>11552</b>	\$20.00
1 lb - 0.001 lb	<b>11553</b>	20.00
1 lb - 0.05 oz	<b>11541</b>	20.00



1 lb to 1/32 oz PN 12591

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**RICE LAKE**

Stainless Steel - NIST

# Avoirdupois Set

Range: 2lb

## CLASS F OPTIONAL REPLACEMENT CASES

Set Size	Part #	Price	Traceable Certificate	Part #	Price
2 lb - 1/32 oz (fractional)	<b>12597</b>	\$370.00	\$310.00	<b>11547</b>	\$65.00
(2) 2 lb - 1/32 oz (fractional)	<b>12603</b>	480.00	350.00	<b>11548</b>	65.00
2 lb - 0.001 lb (decimal)	<b>12599</b>	380.00	350.00	<b>11547</b>	65.00
(2) 2 lb - 0.001 lb (decimal)	<b>12605</b>	480.00	400.00	<b>11548</b>	65.00
2 lb - 0.05 oz (decimal)	<b>12601</b>	405.00	260.00	<b>11547</b>	65.00
(2) 2 lb - 0.05 oz (combination)	<b>12607</b>	480.00	300.00	<b>11548</b>	65.00

### WEIGHT SET CONTENTS

2 lb - 1/32 oz	(2) 2 lb - 1/32 oz	2 lb - 0.001 lb	(2) 2 lb - 0.001 lb	2 lb - 0.05 oz	(2) 2 lb - 0.05 oz
1 - 2 lb	2 - 2 lb	1 - 2 lb	2 - 2 lb	1 - 2 lb	2 - 2 lb
1 - 1 lb	1 - 1 lb	1 - 1 lb	1 - 1 lb	1 - 1 lb	1 - 1 lb
1 - 8 oz	1 - 8 oz	1 - 0.5 lb	1 - 0.5 lb	1 - 8 oz	1 - 8 oz
1 - 4 oz	1 - 4 oz	2 - 0.2 lb	2 - 0.2 lb	1 - 4 oz	1 - 4 oz
1 - 2 oz	1 - 2 oz	1 - 0.1 lb	1 - 0.1 lb	1 - 2 oz	1 - 2 oz
1 - 1 oz	1 - 1 oz	1 - 0.05 lb	1 - 0.05 lb	1 - 1 oz	1 - 1 oz
1 - 1/2 oz	1 - 1/2 oz	2 - 0.02 lb	2 - 0.02 lb	1 - 0.5 oz	1 - 0.5 oz
1 - 1/4 oz	1 - 1/4 oz	1 - 0.01 lb	1 - 0.01 lb	2 - 0.2 oz	2 - 0.2 oz
1 - 1/8 oz	1 - 1/8 oz	1 - 0.005 lb	1 - 0.005 lb	1 - 0.1 oz	1 - 0.1 oz
1 - 1/16 oz	1 - 1/16 oz	2 - 0.002 lb	2 - 0.002 lb	1 - 0.05 oz	1 - 0.05 oz
2 - 1/32 oz	2 - 1/32 oz	1 - 0.001 lb	1 - 0.001 lb	-	-
<b>Piece Count</b>					
12	14	14	15	11	11
<b>Total Weight</b>					
4 lb	6 lb	4.108 lb	6.1100 lb	4.7875 lb	6 lb 0.05 oz
<b>Part #</b>	<b>Part #</b>	<b>Part #</b>	<b>Part #</b>	<b>Part #</b>	<b>Part #</b>
<b>12597</b>	<b>12603</b>	<b>12599</b>	<b>12605</b>	<b>12601</b>	<b>12607</b>

### SECONDARY CASE

Size	Part #	Price
4 oz - 1/32 oz	<b>11510</b>	\$30.00
0.2 lb - 0.001 lb	<b>11512</b>	30.00
4 oz - 0.05 oz	<b>11510</b>	30.00

### CASE INSERT

Size	Part #	Price
2 lb - 1/32 oz	<b>11552</b>	\$20.00
2 lb - 0.001 lb	<b>11553</b>	20.00
2 lb - 0.05 oz	<b>11541</b>	20.00

### ADDITIONAL ACCESSORIES

Part #	Description	Price
<b>36092</b>	Statement of Accuracy	\$45.00
<b>25836</b>	Serial number	15.00

Stainless Steel - NIST  
**Avoirdupois Set**

Range: 5 lb

**CLASS F**

Set Size	Part #	Price
5 lb - 1/32oz	<b>12615</b>	\$470.00
5 lb - 1/32oz	<b>12579</b>	965.00
5 lb - 0.001 lb	<b>12617</b>	475.00
5 lb - 0.001 lb (combination)	<b>12582</b>	990.00
5 lb - 0.001 lb	<b>12634</b>	990.00
5 lb - 0.05 oz (combination)	<b>12619</b>	485.00
(5) 5 lb - 0.05 oz (combination)	<b>12636</b>	930.00
5 lb - 1 GN (21 lb fractional U.S. Postal Service)	<b>12627</b>	985.00
5 lb - 1 GN (31 lb 55 GN)	<b>12661</b>	1,125.00
5 lb x (6) (30lb)	<b>12640</b>	870.00

**REPLACEMENT CASES**

Traceable Certificate	Part #	Price
\$395.00	<b>11550</b>	\$195.00
670.00	<b>11542</b>	195.00
440.00	<b>11550</b>	195.00
715.00	<b>11542</b>	195.00
715.00	<b>11542</b>	195.00
370.00	<b>11550</b>	195.00
620.00	<b>11542</b>	195.00
750.00	<b>11554</b>	195.00
870.00	<b>11570</b>	195.00
450.00	<b>11559</b>	195.00

**SECONDARY CASE**

Size	Part #	Price
5 lb - 1/32oz	<b>11510</b>	\$30.00
(5) 5 lb - 1/32oz	<b>11510</b>	30.00
5 lb - 0.001 lb	<b>11512</b>	30.00
(5) 5 lb - 0.001 lb (combination)	<b>11510 and 11512</b>	30.00
(5) 5 lb - 0.001 lb	<b>11512</b>	30.00
5 lb - 0.05 oz	<b>11510</b>	30.00
(5) 5 lb - 0.05 oz	<b>11510</b>	30.00
5 lb - 1 GN	<b>11510</b>	30.00

**ADDITIONAL ACCESSORIES**

Part #	Description	Price
<b>36092</b>	Statement of Accuracy	\$45.00
<b>25836*</b>	Serial number	15.00



5 lb to 0.001 lb PN 12582

Stainless Steel - NIST  
**Avoirdupois Set**

Range: 5lb

**WEIGHT SET CONTENTS**

5 lb - 1/32 oz	5 lb - 1/32 oz	5 lb - 0.001 lb	5 lb - 0.001 lb	5 lb - 0.001 lb	5 lb - 0.05 oz	(5) 5 lb - 0.05 oz	5 lb - 1 GN	5 lb - 1GN	(6) 5 lb
1 - 5lb	5 - 5lb	1 - 5lb	5 - 5lb	5 - 5lb	1 - 5lb	5 - 5lb	3 - 5lb	5 - 5lb	6 - 5lb
2 - 2lb	5 - 1lb	2 - 2lb	5 - 1lb	5 - 1lb	2 - 2lb	5 - 1lb	5 - 1lb	5 - 1lb	-
1 - 1lb	1 - 8oz	1 - 1lb	1 - 8oz	1 - 0.5lb	1 - 1lb	1 - 8oz	1 - 8oz	1 - 8oz	-
1 - 8oz	1 - 4oz	1 - 0.5lb	1 - 4oz	2 - 0.2lb	1 - 8oz	1 - 4oz	1 - 4oz	1 - 4oz	-
1 - 4oz	1 - 2oz	2 - 0.2lb	2 - 0.2lb	1 - 0.1lb	1 - 4oz	1 - 2oz	1 - 2oz	1 - 2oz	-
1 - 2oz	1 - 1oz	1 - 0.1lb	1 - 2oz	1 - 0.05lb	1 - 2oz	1 - 1oz	1 - 1oz	1 - 1oz	-
1 - 1oz	1 - 1/2oz	1 - 0.05lb	1 - 0.1lb	2 - 0.02lb	1 - 1oz	1 - 0.5oz	1 - 1/2oz	1 - 1/2oz	-
1 - 1/2oz	1 - 1/4oz	2 - 0.02lb	1 - 1oz	1 - 0.01lb	1 - 0.5oz	2 - 0.20oz	1 - 1/4oz	1 - 1/4oz	-
1 - 1/4oz	1 - 1/8oz	1 - 0.01lb	1 - 0.05lb	1 - 0.005lb	2 - 0.20oz	1 - 0.05oz	1 - 1/8oz	1 - 1/8oz	-
1 - 1/8oz	1 - 1/16oz	1 - 0.005lb	1 - 1/2oz	2 - 0.002lb	1 - 0.1oz	-	1 - 1/16oz	1 - 1/16oz	-
1 - 1/16oz	2 - 1/32oz	2 - 0.002lb	2 - 0.02lb	1 - 0.001lb	1 - 0.05oz	-	2 - 1/32oz	2 - 1/32oz	-
2 - 1/32oz	-	1 - 0.001lb	1 - 1/4oz	-	-	-	2 - 10GN	1 - 20GN	-
-	-	-	1 - 0.01lb	-	-	-	2 - 5GN	2 - 10GN	-
-	-	-	1 - 1/8oz	-	-	-	2 - 2GN	2 - 5GN	-
-	-	-	1 - 0.005lb	-	-	-	1 - 1GN	2 - 2GN	-
-	-	-	1 - 1/16oz	-	-	-	-	1 - 1GN	-
-	-	-	2 - 0.002lb	-	-	-	-	-	-
-	-	-	2 - 1/32oz	-	-	-	-	-	-
-	-	-	1 - 0.001lb	-	-	-	-	-	-
<b>Piece Count</b>									
14	20	16	31	22	13	18	26	28	6
<b>Total Weight</b>									
11 lb	31 lb	11.11 lb	31.61 lb	31.11 lb	11 lb 0.05 oz	31 lb 0.05 oz	21 lb 55 GN	31 lb 55 GN	30 lb
<b>Part #</b>	<b>Part #</b>	<b>Part #</b>	<b>Part #</b>	<b>Part #</b>	<b>Part #</b>	<b>Part #</b>	<b>Part #</b>	<b>Part #</b>	<b>Part #</b>
<b>12615</b>	<b>12579</b>	<b>12617</b>	<b>12582</b>	<b>12634</b>	<b>12619</b>	<b>12636</b>	<b>12627</b>	<b>12661</b>	<b>12640</b>

Stainless Steel - NIST  
**Avoirdupois Set**

Range: 10lb

**CLASS F**

Set Size	Part #	Price
(3) 10lb	<b>12638</b>	\$750.00
10 lb - 1/32oz	<b>12609</b>	690.00
10 lb - 0.001 lb	<b>12611</b>	675.00
10 lb - 0.05 oz (21 lb x 0.05 oz)	<b>12613</b>	730.00
10 lb - 1/4 oz	<b>12573</b>	1,070.00
10 lb - 1/32oz	<b>12642</b>	980.00
10 lb - 0.001 lb	<b>12588</b>	1,175.00
10 lb - 0.001 lb	<b>12644</b>	930.00
10 lb - 0.001 lb (combination)	<b>12648</b>	1,110.00
10 lb - 0.05 oz (combination)	<b>12646</b>	1,065.00
10 lb - 1/32oz	<b>12628</b>	1,275.00
10 lb - 0.001 lb	<b>12621</b>	1,395.00
10 lb - 0.05 oz (combination)	<b>12632</b>	1,420.00
10 lb - 0.001 lb (51.61 lb combination)	<b>12650</b>	1,435.00

**OPTIONAL**

Traceable Certificate
\$225.00
445.00
490.00
400.00
455.00
445.00
740.00
490.00
535.00
400.00
715.00
760.00
695.00
760.00

**REPLACEMENT CASES**

Part #	Price
<b>11558</b>	\$200.00
<b>11549</b>	195.00
<b>11549</b>	195.00
<b>11549</b>	195.00
<b>11540</b>	195.00
<b>11562</b>	195.00
<b>11543</b>	195.00
<b>11562</b>	195.00
<b>11562</b>	195.00
<b>11555</b>	195.00
<b>11555</b>	195.00
<b>11555</b>	195.00
<b>11563</b>	195.00

**SECONDARY CASE**

Size	Part #	Price
10 lb - 0.001 lb	<b>11512</b>	\$30.00
10 lb - 1/32oz	<b>11510</b>	30.00

**CASE INSERT**

Size	Part #	Price
10 lb - 0.001 lb	<b>11541</b>	\$20.00
10 lb - 1/32oz	<b>11552</b>	20.00
10 lb - 0.05 oz	<b>11553</b>	20.00

**ADDITIONAL ACCESSORIES**

Part #	Description	Price
<b>36092</b>	Statement of Accuracy	\$45.00
<b>11758</b>	Leaf weight cover	35.00
<b>65640</b>	Tweezer	15.00
<b>25836</b>	Serial number	15.00
<b>152414</b>	Premium tweezer	35.00



Stainless Steel - NIST  
**Avoirdupois Set**  
 Range: 10lb

**WEIGHT SET CONTENTS**

(3) 10lb	10lb - 1/32oz	10lb - 0.001lb	10lb - 0.05oz	10lb - 1/4oz	10lb - 1/32oz	10lb - 0.001lb	10lb - 0.001lb	10lb - 0.001lb	10lb - 0.05oz (Combination)	10lb - 1/32oz	10lb - 0.001lb	10lb - 0.05oz	10lb - 0.001lb
3-10lb	1 - 10lb	1 - 10lb	1 - 10lb	2 - 10lb	2 - 10lb	2 - 10lb	2 - 10lb	2 - 10lb	2 - 10lb	3 - 10lb	3 - 10lb	3 - 10lb	3 - 10lb
-	1 - 5lb	1 - 5lb	1 - 5lb	1 - 5lb	1 - 5lb	1 - 5lb	1 - 5lb	1 - 5lb	1 - 5lb	3 - 5lb	3 - 5lb	3 - 5lb	3 - 5lb
-	2 - 2lb	2 - 2lb	2 - 2lb	5 - 1lb	2 - 2lb	5 - 1lb	2 - 2lb	2 - 2lb	2 - 2lb	5 - 1lb	5 - 1lb	5 - 1lb	5 - 1lb
-	1 - 1lb	1 - 1lb	1 - 1lb	3 - 4oz	1 - 1lb	3 - 4oz	1 - 1lb	1 - 1lb	1 - 1lb	1 - 8oz	1 - 0.5lb	1 - 8oz	1 - 8oz
-	1 - 8oz	1 - 0.5lb	1 - 8oz	3 - 1oz	1 - 8oz	2 - 0.2lb	1 - 0.5lb	1 - 8oz	1 - 8oz	1 - 4oz	2 - 0.2lb	1 - 4oz	1 - 4oz
-	1 - 4oz	2 - 0.2lb	1 - 4oz	2 - 1/2oz	1 - 4oz	1 - 0.1lb	2 - 0.2lb	1 - 4oz	1 - 4oz	1 - 2oz	1 - 0.1lb	1 - 2oz	2 - 0.2lb
-	1 - 2oz	1 - 0.1lb	1 - 2oz	2 - 1/4oz	1 - 2oz	3 - 1oz	1 - 0.1lb	1 - 2oz	1 - 2oz	1 - 1oz	1 - 0.05lb	1 - 1oz	1 - 2oz
-	1 - 1oz	1 - 0.05lb	1 - 1oz	-	1 - 1oz	1 - 0.05lb	1 - 0.05lb	1 - 1oz	1 - 1oz	1 - 1/2oz	2 - 0.02lb	1 - 0.5oz	1 - 0.1lb
-	1 - 1/2oz	2 - 0.02lb	1 - 0.5oz	-	1 - 1/2oz	2 - 1/2oz	2 - 0.02lb	1 - 1/2oz	1 - 0.5oz	1 - 1/4oz	1 - 0.01lb	2 - 0.20oz	1 - 1oz
-	1 - 1/4oz	1 - 0.01lb	1 - 0.2oz	-	1 - 1/4oz	2 - 0.02lb	1 - 0.01lb	1 - 1/4oz	2 - 0.2oz	1 - 1/8oz	1 - 0.005lb	1 - 0.1oz	1 - 0.05lb
-	1 - 1/8oz	1 - 0.005lb	1 - 0.1oz	-	1 - 1/8oz	2 - 1/4oz	1 - 0.005lb	1 - 1/8oz	1 - 0.1oz	1 - 1/16oz	2 - 0.002lb	1 - 0.05oz	1 - 1/2oz
-	1 - 1/16oz	2 - 0.002lb	1 - 0.05oz	-	1 - 1/16oz	1 - 0.01lb	2 - 0.002lb	1 - 1/16oz	1 - 0.05oz	2 - 1/32oz	1 - 0.001lb	-	2 - 0.02lb
-	2 - 1/32oz	1 - 0.001lb	-	-	2 - 1/32oz	1 - 0.005lb	1 - 0.001lb	2 - 1/32oz	-	-	-	-	1 - 1/4oz
-	-	-	-	-	-	2 - 0.002lb	-	2 - 0.2lb	-	-	-	-	1 - 0.01lb
-	-	-	-	-	-	1 - 0.001lb	-	1 - 0.1lb	-	-	-	-	1 - 1/8oz
-	-	-	-	-	-	-	-	1 - 0.05lb	-	-	-	-	1 - 0.005lb
-	-	-	-	-	-	-	-	2 - 0.02lb	-	-	-	-	1 - 1/16oz
-	-	-	-	-	-	-	-	1 - 0.01lb	-	-	-	-	2 - 0.002lb
-	-	-	-	-	-	-	-	1 - 0.005lb	-	-	-	-	2 - 1/32oz
-	-	-	-	-	-	-	-	2 - 0.002lb	-	-	-	-	1 - 0.001lb
-	-	-	-	-	-	-	-	1 - 0.001lb	-	-	-	-	-

**Piece Count**

3	15	17	13	18	16	29	18	27	15	21	23	20	32
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**Total Weight**

30lb	21lb	21.11lb	21lb 0.05oz	31lb 1/2oz	31lb	31lb 1/2oz	31.1100lb	31lb	31lb 0.05oz	51lb	51.11lb	51lb 0.05oz	51.6100lb
<b>Part #</b>	<b>Part #</b>	<b>Part #</b>	<b>Part #</b>	<b>Part #</b>	<b>Part #</b>	<b>Part #</b>	<b>Part #</b>	<b>Part #</b>	<b>Part #</b>	<b>Part #</b>	<b>Part #</b>	<b>Part #</b>	<b>Part #</b>
12638	12609	12611	12613	12573	12642	12588	12644	12648	12646	12628	12621	12632	12650

# SPECIALTY WEIGHTS

Unique weights designed or built for custom applications or tolerances

**NIST**  
**ASTM**



## Applications:

- Tolerance test or checking
- Equipment verification in unique units of measurement
- Slotted weights for suspended verification of weight
- Forklift weights for accuracy checking of forklift scale

## Styles Available:

- Cube
- Ring
- Lift truck weights
- Hook weights
- Stainless steel slotted weights

## Unique Units of Measures:

- Pennyweight
- Grain
- Troy ounce

## Features:

- Nominal value marked on weights
- Cavity for adjustment
- Cube weight sets—designed as sealer's kits for calibration adjustments

# Metric Cube and Ring Weights; Avoirdupois Ring Weights

## CUBE CLASS F

Weight	Part #	Width	Length	Height	Price	Traceable Certificate
2 lb	<b>12649</b>	2.4 in (mm)	1 in (25.4 mm)	3 in (76.2 mm)	\$130.00	\$60.00
1 lb	<b>12651</b>	1.2 in (mm)	1 in (25.4 mm)	3 in (76.2 mm)	120.00	60.00
8 oz	<b>12653</b>	1 9/10 in (48.3 mm)	1 in (25.4 mm)	1 in (25.4 mm)	105.00	50.00
2 oz	<b>12658</b>	0.70	0.60	1 in (25.4 mm)	75.00	50.00
4 oz	<b>12655</b>	73/100 in (18.5 mm)	1 in (25.4 mm)	309/1000 in (33.3 mm)	85.00	50.00
1 kg	<b>12557</b>	1 in (25.4 mm)	3 3/8 in (85.6 mm)	2 1/2 in (62.8 mm)	130.00	50.00
500 g	<b>12552</b>	1 in (25.4 mm)	3 13/32 in (86.5 mm)	1 1/4 in (31.8 mm)	105.00	50.00
300 g	<b>12547</b>	2 1/32 in (51.6 mm)	1 1/4 in (31.8 mm)	1 in (25.4 mm)	95.00	50.00
200 g	<b>12544</b>	1 1/4 in (31.0 mm)	1 3/8 in (34.8 mm)	1 in (25.4 mm)	85.00	50.00
100 g	<b>12541</b>	3/4 in (19.1 mm)	1 7/32 in (31.0 mm)	1 in (25.4 mm)	75.00	35.00

## OPTIONAL

## RING CLASS F

Weight	Part #	Outside Dia.	Height	Inside Dia.	Price	Traceable Certificate
500 g	<b>12566</b>	3 in (76.2 mm)	37/64 in (14.7 mm)	25/64 in (9.9 mm)	\$115.00	\$50.00
200 g	<b>12563</b>	2 in (50.8 mm)	17/32 in (13.5 mm)	25/64 in (9.9 mm)	90.00	50.00
100 g	<b>12561</b>	1 1/2 in (38.1 mm)	1/2 in (12.7 mm)	25/64 in (9.9 mm)	75.00	35.00
50 g	<b>12560</b>	1 1/2 in (38.1 mm)	1/4 in (6.4 mm)	25/64 in (9.9 mm)	65.00	35.00
25 g	<b>12559</b>	1 in (25.4 mm)	5/16 in (7.9 mm)	25/64 in (9.9 mm)	50.00	35.00

## OPTIONAL

## RING CLASS F

Weight	Part #	Outside Dia.	Height	Inside Dia.	Price	Traceable Certificate
5 lb	<b>12672</b>	4 in (101.6 mm)	1 7/16 in (36.5 mm)	25/64 in (9.9 mm)	\$100.00	\$75.00
3 lb	<b>12671</b>	3 in (76.2 mm)	1 35/64 in (36.3 mm)	25/64 in (9.9 mm)	80.00	75.00
2 lb	<b>12670</b>	3 in (76.2 mm)	1 1/32 in (26.2 mm)	25/64 in (9.9 mm)	65.00	60.00
1 lb	<b>12669</b>	3 in (76.2 mm)	33/64 in (13.1 mm)	25/64 in (9.9 mm)	65.00	60.00
8 oz	<b>12668</b>	2 in (50.8 mm)	39/64 in (15.5 mm)	25/64 in (9.9 mm)	31.00	35.00
4 oz	<b>12667</b>	1 1/2 in (38.1 mm)	9/16 in (14.3 mm)	25/64 in (9.9 mm)	31.00	35.00
2 oz	<b>12666</b>	1 1/2 in (38.1 mm)	9/32 in (7.1 mm)	25/64 in (9.9 mm)	31.00	35.00
1 oz	<b>12665</b>	1 in (25.4 mm)	11/32 in (8.7 mm)	25/64 in (9.9 mm)	31.00	35.00
1/2 oz	<b>12664</b>	1 in (25.4 mm)	11/64 in (4.4 mm)	25/64 in (9.9 mm)	60.00	35.00
1/4 oz	<b>12663</b>	1 in (25.4 mm)	3/32 in (2.4 mm)	25/64 in (9.9 mm)	80.00	35.00

## OPTIONAL

## ADDITIONAL ACCESSORIES

Part #	Description	Price
<b>36092</b>	Statement of Accuracy	\$45.00
<b>25836</b>	Serial number	15.00



## Troy Cylindrical/Leaf Weights

## TROY OUNCE CLASS F

## OPTIONAL

Weight	Part #	Height	Diameter	Price	Traceable Certificate
500oz t	12719	6 5/16 in (160.3 mm)	5 in (127.0 mm)	\$975.00	\$75.00
200oz t	12718	3 3/4 in (95.3 mm)	4 25/32 in (121.4 mm)	425.00	75.00
100oz t	12717	3 13/16 in (96.1 mm)	3 in (75.4 mm)	255.00	75.00
50oz t	12716	2 5/8 in (66.7 mm)	2 21/32 in (67.5 mm)	145.00	75.00
20oz t	12715	2 1/4 in (56.6 mm)	1 3/4 in (44.1 mm)	75.00	60.00
10oz t	12714	1 3/8 in (34.9 mm)	1 29/32 in (48.4 mm)	60.00	35.00
5oz t	12713	1 3/16 in (30.2 mm)	1 13/32 in (35.7 mm)	60.00	35.00
2oz t	12712	7/8 in (22.2 mm)	31/32 in (24.6 mm)	35.00	35.00
1oz t	12711	7/8 in (21.2 mm)	5/8 in (15.9 mm)	32.00	35.00
1/4oz t	12709	11/16 in (16.8 mm)	3/8 in (9.1 mm)	40.00	35.00
1/8oz t	12708	5/16 in (7.9 mm)	15/32 in (11.9 mm)	40.00	35.00
1/16oz t	12707	3/8 in (9.1 mm)	1/4 in (6.2 mm)	40.00	35.00
1/32oz t	12706	5/16 in (7.7 mm)	3/16 in (4.7 mm)	40.00	35.00
0.5oz t	12705	1/2 in (12.7 mm)	23/32 in (18.3 mm)	40.00	35.00
0.2oz t	12704	1/2 in (12.6 mm)	3/8 in (9.3 mm)	40.00	35.00
0.1oz t	12703	5/16 in (7.9 mm)	13/32 in (10.3 mm)	40.00	35.00
0.05oz t*	12702	1/4 in (6.4 mm)	11/32 in (8.7 mm)	40.00	35.00
0.02oz t*	12701	W x L (0.375 in x 0.287 in)	-	30.00	35.00
0.01oz t*	12700	W x L (0.312 in x 0.270 in)	-	30.00	35.00
0.005oz t*	12699	W x L (0.25 in x 0.22 in)	-	30.00	35.00

\* Leaf weights



Troy PN 12711

Leaf weights not pictured

# Pennyweight Cylindrical and Leaf, Grain and Lift Truck Weights

## PENNYWEIGHT CLASS F

Weight	Part #	Price	OPTIONAL Traceable Certificate
20 dwt	12698	\$65.00	\$35.00
10 dwt	12697	65.00	35.00
5 dwt	12696	65.00	35.00
2 dwt	12695	65.00	35.00
1 dwt	12694	65.00	35.00

## PENNYWEIGHT LEAF CLASS F

Weight	Part #	Price	OPTIONAL Traceable Certificate
0.5 dwt	12693	\$57.00	\$35.00
0.2 dwt	12692	57.00	35.00
0.1 dwt	12691	57.00	35.00

## GRAIN CLASS F

Weight	Part #	Price	OPTIONAL Traceable Certificate
1 GN	12726	\$20.00	\$35.00
2 GN	12727	23.00	35.00
10 GN	12733	23.00	35.00
20 GN	12736	30.00	35.00

## ADDITIONAL ACCESSORIES

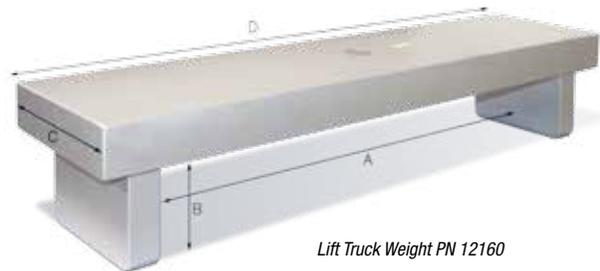
Part #	Description	Price
36092	Statement of Accuracy	\$45.00
25836	Serial number	15.00



Leaf PN 12693

## LIFT TRUCK - MEETS CLASS 6 TOLERANCE

Part #	Description	DIMENSIONS				Price
		A	B	C	D	
120160	1,000 lb	38.25	6.0	22.5	46.25	\$2,150.00
120162	2,000 lb	34.25	6.0	22.5	46.25	6,400.00



Lift Truck Weight PN 12160

# Specialty Weights/Cube Weights Sets

### CUBE WEIGHT SETS AVOIRDUPOIS CLASS F

Set Size	Part #	Price	OPTIONAL Traceable Certificate	REPLACEMENT CASES Part #	Price
8oz - 1/16oz	<b>12630</b>	\$275.00	\$220.00	<b>11510</b>	\$30.00
(3) 2lb - 1/16oz	<b>12652</b>	815.00	364.00	<b>11569</b>	180.00
(3) 2lb - .001lb	<b>12659</b>	915.00	437.00	<b>11569</b>	180.00
(14) 2lb - 1/16oz	<b>12585</b>	1,335.00	868.00	<b>12630</b>	275.00

### CUBE WEIGHT SETS METRIC

Set Size	Part #	Price	OPTIONAL Traceable Certificate	REPLACEMENT CASES Part #	Price
300g - 10g	<b>12545</b>	\$280.00	\$270.00	<b>11510</b>	\$30.00
(14) 1kg - 1mg	<b>12553*</b>	1,850.00	949.00	<b>12545</b>	280.00
(3) 1kg - 1mg	<b>12555*</b>	1,155.00	615.00	<b>11569</b>	180.00

\* Glass bead finish

### WEIGHT SET CONTENTS

300g - 10g	8oz - 1/16oz	2lb - 1/16oz	2lb - 0.001lb	2lb - 1/16oz	1kg - 1mg	1kg - 1mg
1 - 300g*	1 - 8oz*	3 - 2lb*	3 - 2lb*	14 - 2lb*	14 - 1kg*	3 - 1kg*
1 - 200g*	1 - 4oz*	1 - 1lb*	1 - 1lb*	2 - 1lb*	2 - 500g+	1 - 500g*
1 - 100g*	1 - 2oz*	1 - 8oz*	1 - 0.3lb	1 - 8oz*	1 - 300g*	1 - 300g*
1 - 50g	1 - 1oz	1 - 4oz*	1 - 0.2lb	1 - 4oz*	1 - 200g*	1 - 200g*
1 - 30g	1 - 1/2oz	1 - 2oz*	1 - 0.1lb	1 - 2oz*	1 - 100g*	1 - 100g*
1 - 20g	1 - 1/4oz	1 - 1oz	1 - 0.05lb	1 - 1oz	1 - 50g	1 - 50g
1 - 10g	1 - 1/8oz	1 - 1/2oz	1 - 0.03lb	1 - 1/2oz	1 - 30g	1 - 30g
-	2 - 1/16oz	1 - 1/4oz	1 - 0.02lb	1 - 1/4oz	1 - 20g	1 -- 20g
-	-	1 - 1/8oz	1 - 0.01lb	1 - 1/8oz	1 - 10g	1 - 10g
-	-	2 - 1/16oz	1 - 0.005lb	2 - 1/16oz	1 - 5g	1 - 5g
-	-	-	1 - 0.003lb	-	1 - 3g	1 - 3g
-	-	-	1 - 0.002lb	-	1 - 2g	1 - 2g
-	-	-	2 - 001lb	-	1 - 1g	1 - 1g
-	-	-	-	-	1 - 500mg	1 - 500mg
-	-	-	-	-	1 - 300mg	1 - 300mg
-	-	-	-	-	1 - 200mg	1 - 200mg
-	-	-	-	-	1 - 100mg	1 - 100mg
-	-	-	-	-	1 - 50mg	1 - 50mg
-	-	-	-	-	1 - 30mg	1 - 30mg
-	-	-	-	-	1 - 20mg	1 - 20mg
-	-	-	-	-	1 - 10mg	1 - 10mg
-	-	-	-	-	1 - 5mg	1 - 5mg
-	-	-	-	-	1 - 3mg	1 - 3mg
-	-	-	-	-	1 - 2mg	1 - 2mg
-	-	-	-	-	1 - 1mg	1 - 1mg
<b>Piece Count</b>						
7	9	13	16	25	39	27
<b>Total Weight</b>						
710g	1lb	8lb	7.72lb	31lb	15,722.221g	4,222.221g
<b>Part #</b>	<b>Part #</b>	<b>Part #</b>	<b>Part #</b>	<b>Part #</b>	<b>Part #</b>	<b>Part #</b>
<b>12545</b>	<b>12630</b>	<b>12652</b>	<b>12659</b>	<b>12585</b>	<b>12553</b>	<b>12555</b>

\*Cube Weight

### CASE INSERT

Size	Part #	Price
300g - 10g	<b>11526</b>	\$32.00
5g - 1mg	<b>11527</b>	30.00
(2) 50g - 1mg	<b>11528</b>	32.00
1kg - 1mg	<b>11526</b>	32.00
(3) 1kg - 1mg	<b>11526</b>	32.00

### ADDITIONAL ACCESSORIES

Part #	Description	Price
<b>36092</b>	Statement of Accuracy	\$45.00
<b>11758</b>	Leaf weight cover	35.00
<b>65640</b>	Tweezer	15.00
<b>25836</b>	Serial number	15.00
<b>152414</b>	Premium tweezer	35.00

# Avoirdupois and Metric Individual Hook Weights

## HOOK WEIGHTS METRIC CLASS 6

OPTIONAL

Weight	Part #	Diameter	Hanging Height	Opening Diameter	Price	Traceable Certificate
25 kg	12720	5 31/32 in (151.6 mm)	9 3/16 in (233.4 mm)	1/4 in (6.4 mm)	\$765.00	\$70.00
20 kg	12725	5 31/32 in (151.6 mm)	8 3/8 in (212.7 mm)	1/4 in (6.4 mm)	750.00	70.00
10 kg	12732	4 in (101.6 mm)	9 1/16 in (230.2 mm)	1/4 in (6.4 mm)	520.00	70.00
5 kg	12735	3 3/4 in (95.3 mm)	6 11/32 in (161.1 mm)	1/4 in (6.4 mm)	255.00	70.00
4 kg	161608	3 1/2 in (89 mm)	6.12 in (155 mm)	1/4 in (6.4 mm)	250.00	70.00
3 kg	96403	2 5/8 in (66.7 mm)	5 1/16 in (128.6 mm)	1/4 in (6.4 mm)	240.00	70.00
2 kg	12739	2 5/8 in (66.8 mm)	5 17/32 in (135.7 mm)	1/4 in (6.4 mm)	180.00	70.00
1 kg	12744	2 in (50.8 mm)	5 3/8 in (136.5 mm)	1/4 in (6.4 mm)	100.00	50.00
500 g	12747	1 5/8 in (41.3 mm)	4 1/2 in (114.3 mm)	5/32 in (4.0 mm)	85.00	50.00
300 g	96404	1 1/4 in (31.8 mm)	4 1/2 in (114.3 mm)	5/32 in (4.0 mm)	85.00	50.00
200 g	12748	1 1/8 in (28.6 mm)	3 in (76.2 mm)	3/32 in (2.4 mm)	85.00	50.00
100 g	12749	1 in (25.4 mm)	2 3/8 in (60.3 mm)	3/32 in (2.4 mm)	75.00	35.00
50 g	12750	3/4 in (19.1 mm)	2 1/4 in (57.2 mm)	3/32 in (2.4 mm)	75.00	35.00
30 g	96405	5/8 in (15.9 mm)	2 1/8 in (54.0 mm)	3/32 in (2.4 mm)	75.00	35.00
20 g	12751	5/8 in (15.9 mm)	2 1/8 in (54.0 mm)	3/32 in (2.4 mm)	75.00	35.00
10 g	12754	1/2 in (12.7 mm)	2 in (50.8 mm)	3/32 in (2.4 mm)	55.00	35.00
HOOK ONLY						
5 g	12757	1/8 in (3.2 mm)	2 5/32 in (54.8 mm)	3/16 in (4.7 mm)	50.00	35.00
3 g	96406	3/32 in (2.4 mm)	2.32 in (58.9 mm)	3/16 in (4.7 mm)	50.00	35.00
2 g	12762	3/32 in (2.4 mm)	1 7/32 in (31.0 mm)	3/16 in (4.7 mm)	45.00	35.00
1 g	12766	1/16 in (1.6 mm)	1 21/32 in (42.1 mm)	3/16 in (4.7 mm)	45.00	35.00

## HOOK WEIGHTS AVOIRDUPOIS CLASS 6

OPTIONAL

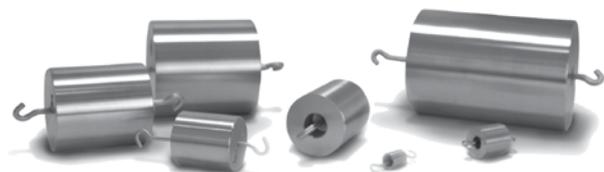
50 lb	12894	5 31/32 in (151.6 mm)	9 1/4 in (235.0 mm)	1/4 in (6.4 mm)	\$765.00	\$75.00
25 lb	96408	4 19/32 in (116.7 mm)	5 3/4 in (146.1 mm)	1/4 in (6.4 mm)	695.00	75.00
20 lb	12895	4 in (101.6 mm)	9 3/16 in (233.3 mm)	1/4 in (6.4 mm)	500.00	75.00
10 lb	12896	3 1/2 in (88.9 mm)	6 1/4 in (158.8 mm)	1/4 in (6.4 mm)	250.00	75.00
5 lb	12897	2 5/8 in (66.6 mm)	6 1/2 in (165.1 mm)	1/4 in (6.4 mm)	170.00	75.00
3 lb	96409	2 1/4 in (57.2 mm)	4 1/32 in (102.4 mm)	1/4 in (6.4 mm)	160.00	75.00
2 lb	12898	2 in (50.8 mm)	5 in (127.0 mm)	1/4 in (6.4 mm)	100.00	60.00
1 lb	12899	1 5/8 in (41.3 mm)	4 1/2 in (114.3 mm)	5/32 in (4.0 mm)	75.00	60.00
0.2 lb	96410	1 in (25.4 mm)	2 5/16 in (58.7 mm)	3/32 in (2.4 mm)	65.00	35.00
0.1 lb	96411	3/4 in (19.1 mm)	2 5/32 in (54.8 mm)	3/32 in (2.4 mm)	65.00	35.00
8 oz	12900	1 1/4 in (31.8 mm)	4 in (101.6 mm)	5/32 in (4.0 mm)	65.00	35.00
4 oz	12901	1 in (25.4 mm)	2 1/4 in (57.2 mm)	3/32 in (2.4 mm)	65.00	35.00
2 oz	12902	13/16 in (20.6 mm)	2 1/4 in (57.2 mm)	3/32 in (2.4 mm)	65.00	35.00
1 oz	12903	5/8 in (15.9 mm)	2 1/4 in (57.2 mm)	3/32 in (2.4 mm)	65.00	35.00
1/2 oz	12904	17/32 in (13.5 mm)	2 29/32 in (73.8 mm)	3/32 in (2.4 mm)	60.00	35.00
HOOK ONLY						
1/4 oz	12905	5/32 in (4.0 mm)	1 13/16 in (46.0 mm)	3/16 in (4.7 mm)	45.00	35.00
1/8 oz	12906	1/8 in (3.2 mm)	1 1/8 in (28.6 mm)	3/16 in (4.7 mm)	45.00	35.00
1/16 oz	12907	3/32 in (2.4 mm)	1 1/4 in (31.8 mm)	3/16 in (4.7 mm)	45.00	35.00
1/32 oz	12908	1/16 in (1.6 mm)	1 13/32 in (35.7 mm)	3/16 in (4.7 mm)	45.00	35.00

## ADDITIONAL ACCESSORIES

Part #	Description	Price
36092	Statement of Accuracy	\$45.00
25836	Serial number	15.00



Hook (only) Weight (5g - 1g) and (1/4-1/32 oz)



Hook Weight

# Avoirdupois and Metric Individual Hangers and Slotted Weights

## CLASS 7 STAINLESS STEEL WEIGHT HANGER

OPTIONAL

Weight	Part #	Diameter	Length	Total Cap	Price	Traceable Certificate
5 lb	<b>12846</b>	4 in (101.6 mm)	37 1/4 in	500 lb	\$260.00	\$75.00
3 kg	<b>156937</b>	4 in (101.6 mm)	38 3/16 in	250 kg	270.00	70.00

## AVOIRDUPOIS SLOTTED CLASS F

OPTIONAL

Weight	Part #	Diameter	Height	Slot Width	Price	Traceable Certificate
10 lb	<b>12589</b>	4 in (101.6 mm)	3 1/8 in (79.4 mm)	1/2 in (12.7 mm)	\$485.00	\$75.00
5 lb	<b>12586</b>	4 in (101.6 mm)	1 9/16 in (39.7 mm)	1/2 in (12.7 mm)	305.00	75.00
2 lb	<b>12577</b>	3 in (76.2 mm)	1 9/64 in (29.0 mm)	1/2 in (12.7 mm)	190.00	60.00
1 lb	<b>12574</b>	3 in (76.2 mm)	19/32 in (15.1 mm)	1/2 in (12.7 mm)	160.00	60.00
8 oz	<b>12583</b>	2 in (50.8 mm)	45/64 in (17.9 mm)	1/2 in (12.7 mm)	140.00	35.00
4 oz	<b>12580</b>	1 1/2 in (38.1 mm)	11/16 in (17.5 mm)	1/2 in (12.7 mm)	110.00	35.00

## METRIC SLOTTED CLASS F

OPTIONAL

Weight	Part #	Diameter	Height	Slot Width	Price	Traceable Certificate
5 kg	<b>156931</b>	4 in (101.6 mm)	3 1/8 in (79.4 mm)	1/2 in (12.7 mm)	\$485.00	\$70.00
2 kg	<b>156932</b>	4 in (101.6 mm)	1 9/16 in (39.7 mm)	1/2 in (12.7 mm)	340.00	70.00
1 kg	<b>156933</b>	3 in (76.2 mm)	1.27 in (32.3 mm)	1/2 in (12.7 mm)	195.00	50.00
500 g	<b>156934</b>	3 in (76.2 mm)	0.836 in (21.2 mm)	1/2 in (12.7 mm)	175.00	50.00
200 g	<b>156935</b>	1.5 in (38.1 mm)	0.801 in (20.4 mm)	1/2 in (12.7 mm)	145.00	50.00
100 g	<b>156936</b>	1.5 in (38.1 mm)	0.601 in (15.3 mm)	1/2 in (12.7 mm)	95.00	35.00

## ADDITIONAL ACCESSORIES

Part #	Description	Price
<b>36092</b>	Statement of Accuracy	\$45.00
<b>25836</b>	Serial number	15.00



Slotted

# ELECTRONIC CALIBRATION

## Classes Available:

**ASTM** Class 1 polished finish

**ASTM** Class 2 to 4 satin finish

**ASTM** Class 0 to 7 manufactured in accordance with ASTM E 617-13 specification and tolerances



## Applications:

- Calibrating Class I and II balances
- ASTM Class 4, 5 and 6 weights
- Tolerance checking or verification of balances

## Styles Available:

- Grip handle
- Cylindrical
- Leaf weight

## Product Configuration:

- Individual weight
- Individual weight kit: weight, case or vial, and glove or appropriate lifting device

## Features:

- Nominal value marked on weights
- Serial numbers may be stamped on weights (Class 2 to 4)
- Sealing cavity for adjusting material in 100 g or larger weights
- Density 7.84 g/cm<sup>3</sup>

Electronic Calibration - ASTM  
**Metric Kits**

CLASS 1*			CLASS 2		CLASS 3		OPTIONAL	OPTIONAL	REPLACEMENT CASES	
Weight	Kit Part #	Kit Price	Kit Part #	Kit Price	Kit Part #	Kit Price	Calibration Report	Mass Value Certificate	Part #	Price
5 kg	12958	\$610.00	13076	\$490.00	13179	\$465.00	\$140.00	\$75.00	11462	\$42.00
4 kg	12956	540.00	13074	485.00	13177	445.00	140.00	75.00	11463	42.00
3 kg	12954	325.00	13072	260.00	13175	250.00	140.00	75.00	11464	42.00
2 kg	12952	190.00	13070	170.00	13173	170.00	140.00	75.00	11465	42.00
1,500g	12985	170.00	13103	170.00	13206	165.00	140.00	75.00	11467	42.00
1,000g	12971	155.00	13089	140.00	13192	140.00	120.00	55.00	11468	42.00
600g	12983	165.00	13101	160.00	13204	155.00	120.00	55.00	11469	42.00
500g	12950	130.00	13068	130.00	13171	115.00	120.00	55.00	11470	42.00
400g	12968	130.00	13086	125.00	13189	120.00	120.00	55.00	11471	42.00
300g	12966	120.00	13084	120.00	13187	105.00	120.00	55.00	11472	42.00
200g	12948	105.00	13066	105.00	13169	105.00	120.00	55.00	11473	42.00
160g	12981	115.00	13099	110.00	13202	105.00	120.00	55.00	11474	42.00
150g	12979	100.00	13097	95.00	13200	90.00	120.00	55.00	11475	42.00
100g	12946	90.00	13064	85.00	13167	85.00	50.00	40.00	11476	42.00
50g	12964	80.00	13082	75.00	13185	75.00	50.00	40.00	11480	42.00
30g	12962	80.00	13080	75.00	13183	75.00	50.00	40.00	11481	42.00
20g	12960	80.00	13078	75.00	13181	75.00	50.00	40.00	11482	42.00
10g	12944	80.00	13062	75.00	13165	75.00	50.00	40.00	11483	42.00

\*Polished finish

CLASS 4			OPTIONAL	REPLACEMENT CASES	
Weight	Kit Part #	Kit Price	Traceable Certificate	Part #	Price
5 kg	13282	\$450.00	\$70.00	11462	\$42.00
4 kg	13280	425.00	70.00	11463	42.00
3 kg	13278	245.00	70.00	11464	42.00
2 kg	13276	160.00	70.00	11465	42.00
1,500g	13309	155.00	70.00	11467	42.00
1,000g	13295	140.00	70.00	11468	42.00
600g	13307	145.00	50.00	11469	42.00
500g	13274	115.00	50.00	11470	42.00
400g	13292	110.00	50.00	11471	42.00
300g	13290	100.00	50.00	11472	42.00
200g	13272	95.00	50.00	11473	42.00
160g	13305	100.00	50.00	11474	42.00
150g	13303	85.00	50.00	11475	42.00
100g	13270	75.00	35.00	11476	42.00
50g	13288	75.00	35.00	11480	42.00
30g	13286	70.00	35.00	11481	42.00
20g	13284	70.00	35.00	11482	42.00
10g	13268	70.00	35.00	11483	42.00

**ADDITIONAL ACCESSORIES**

Part #	Description	Price
36092	Statement of Accuracy	\$45.00
11714	Weight gloves, white cotton	5.00
11773	Vinyl glove	1.50
25836	Serial number	15.00



Kits

Electronic Calibration - ASTM  
**Metric Individual Weights**

		CLASS 1*			CLASS 2		CLASS 3		OPTIONAL		OPTIONAL		REPLACEMENT CASES	
		Weight	Part #	Price	Part #	Price	Part #	Price	Calibration Report	Mass Value Certificate	Part #	Price	Part #	Price
Grip Handle		30 kg	<b>12996</b>	\$1,760.00	<b>13114</b>	\$1,555.00	<b>13217</b>	\$1,395.00	\$375.00	\$80.00	-	-	-	-
		25 kg	<b>12995</b>	1,520.00	<b>13113</b>	1,300.00	<b>13216</b>	1,210.00	140.00	75.00	-	-	-	-
		24 kg	<b>12994</b>	1,470.00	<b>13112</b>	1,280.00	<b>13215</b>	1,175.00	140.00	75.00	-	-	-	-
		20 kg	<b>12993</b>	1,335.00	<b>13111</b>	1,140.00	<b>13214</b>	1,035.00	140.00	75.00	-	-	-	-
		16 kg	<b>12992</b>	1,175.00	<b>13110</b>	1,100.00	<b>13213</b>	885.00	140.00	75.00	-	-	-	-
		10 kg	<b>12991</b>	850.00	<b>13109</b>	770.00	<b>13212</b>	700.00	140.00	75.00	-	-	-	-
		8 kg	<b>12990</b>	830.00	<b>13108</b>	755.00	<b>13211</b>	650.00	140.00	75.00	-	-	-	-
		5 kg	<b>12989</b>	620.00	<b>13107</b>	500.00	<b>13210</b>	485.00	140.00	75.00	-	-	-	-
Cylindrical		5 kg	<b>12959</b>	585.00	<b>13077</b>	470.00	<b>13180</b>	445.00	140.00	75.00	<b>11462</b>	\$42.00		
		4 kg	<b>12957</b>	515.00	<b>13075</b>	460.00	<b>13178</b>	420.00	140.00	75.00	<b>11463</b>	42.00		
		3 kg	<b>12955</b>	305.00	<b>13073</b>	240.00	<b>13176</b>	230.00	140.00	75.00	<b>11464</b>	42.00		
		2 kg	<b>12953</b>	170.00	<b>13071</b>	155.00	<b>13174</b>	145.00	140.00	75.00	<b>11465</b>	42.00		
		1,500g	<b>12986</b>	150.00	<b>13104</b>	150.00	<b>13207</b>	145.00	140.00	75.00	<b>11467</b>	42.00		
		1,000g	<b>12972</b>	130.00	<b>13090</b>	125.00	<b>13193</b>	120.00	120.00	55.00	<b>11468</b>	42.00		
		600g	<b>12984</b>	140.00	<b>13102</b>	130.00	<b>13205</b>	125.00	120.00	55.00	<b>11469</b>	42.00		
		500g	<b>12951</b>	110.00	<b>13069</b>	105.00	<b>13172</b>	95.00	120.00	55.00	<b>11470</b>	42.00		
		400g	<b>12969</b>	105.00	<b>13087</b>	100.00	<b>13190</b>	95.00	120.00	55.00	<b>11471</b>	42.00		
		300g	<b>12967</b>	100.00	<b>13085</b>	90.00	<b>13188</b>	85.00	120.00	55.00	<b>11472</b>	42.00		
		200g	<b>12949</b>	100.00	<b>13067</b>	90.00	<b>13170</b>	80.00	120.00	55.00	<b>11473</b>	42.00		
		160g	<b>12982</b>	110.00	<b>13100</b>	100.00	<b>13203</b>	100.00	120.00	55.00	<b>11474</b>	42.00		
		150g	<b>12980</b>	75.00	<b>13098</b>	70.00	<b>13201</b>	65.00	120.00	55.00	<b>11475</b>	42.00		
		100g	<b>12947</b>	70.00	<b>13065</b>	65.00	<b>13168</b>	60.00	50.00	40.00	<b>11476</b>	42.00		
		50g	<b>12965</b>	65.00	<b>13083</b>	60.00	<b>13186</b>	55.00	50.00	40.00	<b>11480</b>	42.00		
		30g	<b>12963</b>	65.00	<b>13081</b>	60.00	<b>13184</b>	55.00	50.00	40.00	<b>11481</b>	42.00		
		20g	<b>12961</b>	65.00	<b>13079</b>	60.00	<b>13182</b>	55.00	50.00	40.00	<b>11482</b>	42.00		
		10g	<b>12945</b>	65.00	<b>13063</b>	60.00	<b>13166</b>	55.00	50.00	40.00	<b>11483</b>	42.00		

\*Polished finish

		CLASS 4			OPTIONAL		REPLACEMENT CASES	
		Weight	Part #	Price	Traceable Certificate	Part #	Price	
Grip Handle		30 kg	<b>13320</b>	\$1,295.00	\$75.00	-	-	
		25 kg	<b>13319</b>	1,090.00	70.00	-	-	
		24 kg	<b>13318</b>	1,040.00	70.00	-	-	
		20 kg	<b>13317</b>	890.00	70.00	-	-	
		16 kg	<b>13316</b>	790.00	70.00	-	-	
		10 kg	<b>13315</b>	615.00	70.00	-	-	
		8 kg	<b>13314</b>	610.00	70.00	-	-	
		5 kg	<b>13313</b>	385.00	70.00	-	-	
Cylindrical		5 kg	<b>13283</b>	430.00	70.00	<b>11462</b>	\$42.00	
		4 kg	<b>13281</b>	405.00	70.00	<b>11463</b>	42.00	
		3 kg	<b>13279</b>	225.00	70.00	<b>11464</b>	42.00	
		2 kg	<b>13277</b>	140.00	70.00	<b>11465</b>	42.00	
		1,500g	<b>13310</b>	135.00	70.00	<b>11467</b>	42.00	
		1,000g	<b>13296</b>	120.00	70.00	<b>11468</b>	42.00	
		600g	<b>13308</b>	120.00	50.00	<b>11469</b>	42.00	
		500g	<b>13275</b>	90.00	50.00	<b>11470</b>	42.00	
		400g	<b>13293</b>	90.00	50.00	<b>11471</b>	42.00	
		300g	<b>13291</b>	80.00	50.00	<b>11472</b>	42.00	
		200g	<b>13273</b>	75.00	50.00	<b>11473</b>	42.00	
		160g	<b>13306</b>	95.00	50.00	<b>11474</b>	42.00	
		150g	<b>13304</b>	60.00	50.00	<b>11475</b>	42.00	
		100g	<b>13271</b>	55.00	35.00	<b>11476</b>	42.00	
		50g	<b>13289</b>	55.00	35.00	<b>11480</b>	42.00	
		30g	<b>13287</b>	55.00	35.00	<b>11481</b>	42.00	
		20g	<b>13285</b>	55.00	35.00	<b>11482</b>	42.00	
		10g	<b>13269</b>	55.00	35.00	<b>11483</b>	42.00	



Individual

Electronic Calibration - ASTM  
**Avoirdupois Kits**

TEST WEIGHTS

CLASS 1*			CLASS 2		CLASS 3		OPTIONAL	OPTIONAL	REPLACEMENT CASES	
Weight	Kit Part #	Kit Price	Kit Part #	Kit Price	Kit Part #	Kit Price	Calibration Report	Mass Value Certificate	Part #	Price
10lb	13021	\$610.00	13138	\$490.00	13241	\$440.00	\$125.00	\$80.00	152299	\$42.00
5lb	13019	325.00	13136	260.00	13239	260.00	125.00	80.00	11496	42.00
4lb	13017	190.00	13134	185.00	13237	185.00	125.00	80.00	11465	42.00
3lb	13015	170.00	13132	170.00	13235	170.00	125.00	80.00	11495	42.00
2lb	13013	155.00	13130	140.00	13233	140.00	100.00	65.00	11468	42.00
1 lb	13011	130.00	13128	130.00	13231	120.00	100.00	65.00	82983	42.00
8 oz	13009	110.00	13126	105.00	13229	105.00	50.00	40.00	11491	42.00
4 oz	13007	105.00	13124	85.00	13227	85.00	50.00	40.00	11494	42.00
2 oz	13005	100.00	13122	85.00	13225	85.00	50.00	40.00	11479	42.00
1 oz	13003	100.00	13120	85.00	13223	85.00	50.00	40.00	11493	42.00
1/2 oz	13001	100.00	13118	85.00	13221	85.00	50.00	40.00	11492	42.00
0.5lb	13032	110.00	13149	105.00	13252	105.00	50.00	40.00	11491	42.00
0.2lb	13024	105.00	13141	85.00	13244	80.00	50.00	40.00	11479	42.00
0.1 lb	13026	100.00	13143	85.00	13246	80.00	50.00	40.00	11478	42.00
0.05lb	13028	100.00	13145	85.00	13248	80.00	50.00	40.00	82982	42.00

\* Polished finish

CLASS 4			OPTIONAL	REPLACEMENT CASES	
Weight	Kit Part #	Kit Price	Traceable Certificate	Part #	Price
10lb	13344	\$425.00	\$75.00	11462	\$42.00
5lb	13342	250.00	75.00	11496	42.00
4lb	13340	175.00	75.00	11465	42.00
3lb	13338	160.00	75.00	11495	42.00
2lb	13336	140.00	60.00	11468	42.00
1 lb	13334	115.00	60.00	82983	42.00
8 oz	13332	95.00	35.00	11491	42.00
4 oz	13330	85.00	35.00	11494	42.00
2 oz	13328	85.00	35.00	11479	42.00
1 oz	13326	80.00	35.00	11493	42.00
1/2 oz	13324	80.00	35.00	11492	42.00
0.5lb	13355	100.00	35.00	11491	42.00
0.2lb	13347	75.00	35.00	11479	42.00
0.1 lb	13349	75.00	35.00	11478	42.00
0.05lb	13351	75.00	35.00	82982	42.00

**ADDITIONAL ACCESSORIES**

Part #	Description	Price
36092	Statement of Accuracy	\$45.00
11714	Weight gloves, white cotton	5.00
11773	Vinyl glove	1.50
25836	Serial number	15.00



Kits

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**RICE LAKE**

# Avoirdupois Individual Weights

		CLASS 1*			CLASS 2		CLASS 3		OPTIONAL	OPTIONAL	REPLACEMENT CASES	
		Weight	Part #	Price	Part #	Price	Part #	Price	Calibration Report	Mass Value Certificate	Part #	Price
Grip Handle	50 lb	<b>13038</b>		\$1,520.00	<b>13155</b>	\$1,300.00	<b>13258</b>	\$1,215.00	\$275.00	\$80.00	-	-
	30 lb	<b>13037</b>		1,180.00	<b>13154</b>	960.00	<b>13257</b>	850.00	125.00	80.00	-	-
	25 lb	<b>13036</b>		850.00	<b>13153</b>	745.00	<b>13256</b>	645.00	125.00	80.00	-	-
	20 lb	<b>13035</b>		845.00	<b>13152</b>	720.00	<b>13255</b>	625.00	125.00	80.00	-	-
	10 lb	<b>13034</b>		620.00	<b>13151</b>	500.00	<b>13254</b>	490.00	125.00	80.00	-	-
Cylindrical	10 lb	<b>13022</b>		590.00	<b>13139</b>	465.00	<b>13242</b>	420.00	125.00	80.00	<b>11462</b>	\$42.00
	5 lb	<b>13020</b>		305.00	<b>13137</b>	250.00	<b>13240</b>	240.00	125.00	80.00	<b>11496</b>	42.00
	4 lb	<b>13018</b>		170.00	<b>13135</b>	160.00	<b>13238</b>	155.00	125.00	80.00	<b>11465</b>	42.00
	3 lb	<b>13016</b>		150.00	<b>13133</b>	145.00	<b>13236</b>	145.00	125.00	80.00	<b>11495</b>	42.00
	2 lb	<b>13014</b>		135.00	<b>13131</b>	125.00	<b>13234</b>	120.00	100.00	65.00	<b>11468</b>	42.00
	1 lb	<b>13012</b>		110.00	<b>13129</b>	105.00	<b>13232</b>	100.00	100.00	65.00	<b>82983</b>	42.00
	8 oz	<b>13010</b>		90.00	<b>13127</b>	85.00	<b>13230</b>	80.00	50.00	40.00	<b>11491</b>	42.00
	4 oz	<b>13008</b>		85.00	<b>13125</b>	70.00	<b>13228</b>	70.00	50.00	40.00	<b>11494</b>	42.00
	2 oz	<b>13006</b>		80.00	<b>13123</b>	65.00	<b>13226</b>	65.00	50.00	40.00	<b>11479</b>	42.00
	1 oz	<b>13004</b>		80.00	<b>13121</b>	65.00	<b>13224</b>	60.00	50.00	40.00	<b>11493</b>	42.00
	1/2 oz	<b>13002</b>		75.00	<b>13119</b>	65.00	<b>13222</b>	60.00	50.00	40.00	<b>11492</b>	42.00
	0.5 lb	<b>13033</b>		90.00	<b>13150</b>	80.00	<b>13253</b>	80.00	50.00	40.00	<b>11491</b>	42.00
	0.2 lb	<b>13025</b>		85.00	<b>13142</b>	65.00	<b>13245</b>	55.00	50.00	40.00	<b>11479</b>	42.00
	0.1 lb	<b>13027</b>		80.00	<b>13144</b>	65.00	<b>13247</b>	55.00	50.00	40.00	<b>11478</b>	42.00
	0.05 lb	<b>13029</b>		75.00	<b>13146</b>	65.00	<b>13249</b>	55.00	50.00	40.00	<b>82982</b>	42.00

\*Polished finish

		CLASS 4			OPTIONAL	REPLACEMENT CASES	
		Weight	Part #	Price	Traceable Certificate	Part #	Price
Grip Handle	50 lb	<b>13361</b>		\$1205.00	\$75.00	-	-
	30 lb	<b>13360</b>		800.00	75.00	-	-
	25 lb	<b>13359</b>		585.00	75.00	-	-
	20 lb	<b>13358</b>		525.00	75.00	-	-
	10 lb	<b>13357</b>		400.00	75.00	-	-
Cylindrical	10 lb	<b>13345</b>		400.00	75.00	<b>11462</b>	\$42.00
	5 lb	<b>13343</b>		230.00	75.00	<b>11496</b>	42.00
	4 lb	<b>13341</b>		150.00	75.00	<b>11465</b>	42.00
	3 lb	<b>13339</b>		140.00	75.00	<b>11495</b>	42.00
	2 lb	<b>13337</b>		120.00	60.00	<b>11468</b>	42.00
	1 lb	<b>13335</b>		95.00	60.00	<b>82983</b>	42.00
	8 oz	<b>13333</b>		75.00	35.00	<b>11491</b>	42.00
	4 oz	<b>13331</b>		65.00	35.00	<b>11494</b>	42.00
	2 oz	<b>13329</b>		60.00	35.00	<b>11479</b>	42.00
	1 oz	<b>13327</b>		55.00	35.00	<b>11493</b>	42.00
	1/2 oz	<b>13325</b>		55.00	35.00	<b>11492</b>	42.00
	0.5 lb	<b>13356</b>		75.00	35.00	<b>11491</b>	42.00
	0.2 lb	<b>13348</b>		55.00	35.00	<b>11479</b>	42.00
	0.1 lb	<b>13350</b>		55.00	35.00	<b>11478</b>	42.00
	0.05 lb	<b>13352</b>		55.00	35.00	<b>82982</b>	42.00



Individual

# PRECISION LABORATORY

## ASTM



### Applications:

- Calibrating Class I and II balances
- ASTM Class 4, 5 and 6 weights
- Student laboratory use
- Rough weighing operations; e.g., force
- Tolerance testing
- Verification checks

### Styles Available:

- Type I design (one piece) for Class 0
- Type II design (screw-knob) for Classes 1-4 with sealing cavity for adjusting material

### Product Configuration:

- Individual weight
- Individual weight kit: weight, case or vial, and glove
- Weight set: weights, case and handling equipment
- Weight set configurations: 5-2-2-1 and 5-3-2-1  
Example: (1) 50g, (2) 20g and (1) 10g or (1) 50g, (1) 30g, (1) 20g and (1) 10g

### Custom Configuration:

- Custom sets are available as build-to-order configurations to meet your specific requirements
- ASTM weight sets larger than 500g or 1 lb include a hardwood case with velvet-lined pockets
- Weight sets with the largest weight of 500g include a precision-machined, polyvinyl, crush-resistant case

### Features:

- Stainless steel polished finish
- Designed to meet ASTM E617-13 specifications. ASTM Class 0 weight sets and individual weights are not individually marked with their weight value or individually serialized per ASTM E 617-13
- Nominal value marked on weights
- Serial numbers applied to case (weights may be marked with symbol)
- Density 7.95g/cm<sup>3</sup>

Precision Laboratory - ASTM  
**Metric Kits**

**CLASS 0\* ONE PIECE DESIGN**

**REPLACEMENT CASES**

	Weight	Kit Part #	Kit Price	Part #	Price
<b>Cylindrical</b>	50 kg	Consult	Consult	Consult	Consult
	25 kg	Consult	Consult	Consult	Consult
	20 kg	<b>45856</b>	\$3,615.00	Consult	Consult
	10 kg	<b>45857</b>	2,370.00	Consult	Consult
	5 kg	<b>45858</b>	1,700.00	Consult	Consult
	3 kg	<b>45859</b>	1,500.00	Consult	Consult
	2 kg	<b>45860</b>	1,230.00	Consult	Consult
	1 kg	<b>45861</b>	910.00	Consult	Consult
	500 g	<b>45862</b>	555.00	Consult	Consult
	300 g	<b>45863</b>	525.00	Consult	Consult
	200 g	<b>45864</b>	485.00	Consult	Consult
	100 g	<b>45865</b>	405.00	Consult	Consult
	50 g	<b>45866</b>	380.00	Consult	Consult
	30 g	<b>45867</b>	370.00	Consult	Consult
	20 g	<b>45868</b>	370.00	Consult	Consult
10 g	<b>45869</b>	370.00	Consult	Consult	
5 g	<b>45870</b>	320.00	Consult	Consult	
3 g	<b>45871</b>	320.00	Consult	Consult	
2 g	<b>45872</b>	320.00	Consult	Consult	
1 g	<b>45873</b>	320.00	Consult	Consult	
<b>Milligram</b>	500 mg	<b>45874</b>	246.00	-	-
	300 mg	<b>45875</b>	246.00	-	-
	200 mg	<b>45876</b>	246.00	-	-
	100 mg	<b>45877</b>	246.00	-	-
	50 mg	<b>45878</b>	246.00	-	-
	30 mg	<b>45879</b>	246.00	-	-
	20 mg	<b>45880</b>	246.00	-	-
	10 mg	<b>45881</b>	246.00	-	-
	5 mg	<b>45882</b>	246.00	-	-
	3 mg	<b>45883</b>	246.00	-	-
2 mg	<b>45884</b>	246.00	-	-	
1 mg	<b>45885</b>	246.00	-	-	



One Piece and Milligram Kits

\*Calibration Report is included, Statement of Accuracy is not available for Class 0 and require case for shipping.

**ADDITIONAL ACCESSORIES**

Part #	Description	Price
<b>11711</b>	Weight tweezer (plastic) for polished weights 100g and below	\$3.00
<b>152414</b>	Premium tweezer	35.00
<b>11714</b>	Weight gloves, white, cotton	5.00
<b>11755</b>	Leaf weight cover	35.00
<b>11747</b>	Weight lifter bar, plexiglass, for weights 200g - 3kg and 8 oz - 5 lb (screw-knob weights only)	15.00
<b>11712</b>	Lifter with larger handle (Class 1-4/4 kg - 25 kg) (10 - 50 lb)	60.00
<b>50035</b>	Weight forceps, plastic, Class 0, 100g - 1 mg	35.00
<b>50000</b>	Tong assembly, Class 0, 1 kg - 200g	60.00



One Piece Kit

# Metric Individual Weights

**CLASS 0\* ONE PIECE DESIGN**

**REPLACEMENT CASES**

	Weight	Part #	Price	Part #	Price
<b>Cylindrical</b>	50 kg	Consult	Consult	Consult	Consult
	25 kg	Consult	Consult	Consult	Consult
	20 kg	<b>46097</b>	\$3,555.00	Consult	Consult
	10 kg	<b>46096</b>	2,320.00	Consult	Consult
	5 kg	<b>46095</b>	1,650.00	Consult	Consult
	3 kg	<b>46094</b>	1,480.00	Consult	Consult
	2 kg	<b>46093</b>	1,210.00	Consult	Consult
	1 kg	<b>46092</b>	890.00	Consult	Consult
	500 g	<b>46091</b>	540.00	Consult	Consult
	300 g	<b>46090</b>	510.00	Consult	Consult
	200 g	<b>46089</b>	470.00	Consult	Consult
	100 g	<b>46088</b>	390.00	Consult	Consult
	50 g	<b>46087</b>	365.00	Consult	Consult
	30 g	<b>46086</b>	355.00	Consult	Consult
	20 g	<b>46085</b>	355.00	Consult	Consult
	10 g	<b>46084</b>	355.00	Consult	Consult
	5 g	<b>46083</b>	305.00	Consult	Consult
	3 g	<b>46082</b>	305.00	Consult	Consult
	2 g	<b>46081</b>	305.00	Consult	Consult
1 g	<b>46080</b>	305.00	Consult	Consult	
<b>Milligram</b>	500 mg	<b>46079</b>	245.00	-	-
	300 mg	<b>46078</b>	245.00	-	-
	200 mg	<b>46077</b>	245.00	-	-
	100 mg	<b>46076</b>	245.00	-	-
	50 mg	<b>46075</b>	245.00	-	-
	30 mg	<b>46074</b>	245.00	-	-
	20 mg	<b>46073</b>	245.00	-	-
	10 mg	<b>46072</b>	245.00	-	-
	5 mg	<b>46071</b>	245.00	-	-
	3 mg	<b>46070</b>	245.00	-	-
	2 mg	<b>46069</b>	245.00	-	-
1 mg	<b>46068</b>	245.00	-	-	

\*Calibration Report is included, Statement of Accuracy is not available for Class 0 and requires case for shipping. For special kits, individual weights must ship in a case.



One Piece



Milligram

	CLASS 1			CLASS 2		CLASS 3		OPTIONAL	OPTIONAL	REPLACEMENT CASES	
	Weight	Kit Part #	Kit Price	Kit Part #	Kit Price	Kit Part #	Kit Price	Calibration Report	Mass Value Certificate	Part #	Price
<b>Screw Knob</b>	50 kg	Consult	Consult	Consult	Consult	Consult	Consult	Consult	Consult	Consult	Consult
	25 kg	Consult	Consult	Consult	Consult	Consult	Consult	Consult	Consult	Consult	Consult
	20 kg	<b>82590</b>	\$3,220.00	<b>82632</b>	\$2,165.00	<b>82674</b>	\$2,140.00	\$140.00	\$75.00	<b>80703</b>	\$200.00
	10 kg	<b>82591</b>	1,830.00	<b>82633</b>	1,755.00	<b>82675</b>	1,610.00	140.00	75.00	<b>80704</b>	200.00
	5 kg	<b>82592</b>	1,055.00	<b>82634</b>	1,020.00	<b>82676</b>	1,015.00	140.00	75.00	<b>80705</b>	145.00
	3 kg	<b>82593</b>	835.00	<b>82635</b>	800.00	<b>82677</b>	775.00	140.00	75.00	<b>80706</b>	42.00
	2 kg	<b>82594</b>	660.00	<b>82636</b>	620.00	<b>82678</b>	610.00	140.00	75.00	<b>80707</b>	42.00
	1 kg	<b>82595</b>	475.00	<b>82637</b>	410.00	<b>82679</b>	400.00	120.00	55.00	<b>80708</b>	42.00
	500 g	<b>82596</b>	200.00	<b>82638</b>	195.00	<b>82680</b>	190.00	120.00	55.00	<b>80709</b>	30.00
	300 g	<b>82597</b>	155.00	<b>82639</b>	145.00	<b>82681</b>	140.00	120.00	55.00	<b>80710</b>	30.00
	200 g	<b>82598</b>	145.00	<b>82640</b>	140.00	<b>82682</b>	135.00	120.00	55.00	<b>80711</b>	30.00
	100 g	<b>82599</b>	105.00	<b>82641</b>	105.00	<b>82683</b>	100.00	50.00	40.00	<b>80712</b>	30.00
	50 g	<b>82600</b>	100.00	<b>82642</b>	95.00	<b>82684</b>	90.00	50.00	40.00	<b>80713</b>	30.00
	30 g	<b>82601</b>	95.00	<b>82643</b>	85.00	<b>82685</b>	85.00	50.00	40.00	<b>80714</b>	30.00
	20 g	<b>82602</b>	90.00	<b>82644</b>	80.00	<b>82686</b>	80.00	50.00	40.00	<b>80715</b>	30.00
	10 g	<b>82603</b>	90.00	<b>82645</b>	80.00	<b>82687</b>	80.00	50.00	40.00	<b>80716</b>	30.00
	5 g	<b>82604</b>	90.00	<b>82646</b>	70.00	<b>82688</b>	60.00	50.00	40.00	<b>80717</b>	30.00
	3 g	<b>82605</b>	80.00	<b>82647</b>	70.00	<b>82689</b>	60.00	50.00	40.00	<b>80718</b>	30.00
	2 g	<b>82606</b>	80.00	<b>82648</b>	70.00	<b>82690</b>	60.00	50.00	40.00	<b>80719</b>	30.00
	1 g	<b>82607</b>	70.00	<b>82649</b>	70.00	<b>82691</b>	60.00	50.00	40.00	<b>80720</b>	30.00
<b>Milligram</b>	500 mg	<b>80458</b>	60.00	<b>80470</b>	40.00	<b>80482</b>	35.00	50.00	40.00	-	-
	300 mg	<b>80459</b>	60.00	<b>80471</b>	40.00	<b>80483</b>	35.00	50.00	40.00	-	-
	200 mg	<b>80460</b>	60.00	<b>80472</b>	40.00	<b>80484</b>	35.00	50.00	40.00	-	-
	100 mg	<b>80461</b>	60.00	<b>80473</b>	40.00	<b>80485</b>	35.00	50.00	40.00	-	-
	50 mg	<b>80462</b>	60.00	<b>80474</b>	40.00	<b>80486</b>	35.00	50.00	40.00	-	-
	30 mg	<b>80463</b>	60.00	<b>80475</b>	40.00	<b>80487</b>	35.00	50.00	40.00	-	-
	20 mg	<b>80464</b>	60.00	<b>80476</b>	40.00	<b>80488</b>	35.00	50.00	40.00	-	-
	10 mg	<b>80465</b>	60.00	<b>80477</b>	40.00	<b>80489</b>	35.00	50.00	40.00	-	-
	5 mg	<b>80466</b>	60.00	<b>80478</b>	40.00	<b>80490</b>	35.00	50.00	40.00	-	-
	3 mg	<b>80467</b>	60.00	<b>80479</b>	40.00	<b>80491</b>	35.00	50.00	40.00	-	-
	2 mg	<b>80468</b>	60.00	<b>80480</b>	40.00	<b>80492</b>	35.00	50.00	40.00	-	-
	1 mg	<b>80469</b>	60.00	<b>80481</b>	40.00	<b>80493</b>	35.00	50.00	40.00	-	-
	0.5 mg	<b>36076*</b>	60.00	<b>36077</b>	40.00	<b>36078</b>	35.00	50.00	40.00	-	-

\* Wire weight

**ADDITIONAL ACCESSORIES**

Part #	Description	Price
<b>11711</b>	Weight tweezer, plastic, for polished weights 100 g and below	\$3.00
<b>152414</b>	Premium tweezer	35.00
<b>11714</b>	Weight gloves, white, cotton	5.00
<b>11755</b>	Leaf weight cover	35.00
<b>11747</b>	Weight lifter bar, plexiglass, for weights 200 g - 3 kg and 8 oz - 5 lb (screw-knob weights only)	15.00
<b>11712</b>	Lifter with larger handle (Class 1-4/4 kg - 25 kg) (10 - 50 lb)	60.00
<b>50038</b>	Vials	3.00
<b>36092</b>	Statement of Accuracy	45.00
<b>25836</b>	Serial number	15.00



Screw-knob Kit

Precision Laboratory - ASTM  
**Metric Individual Weights**

TEST WEIGHTS

www.ricelake.com | Phone: 800-472-6703

RICELAKE

	CLASS 1			CLASS 2		CLASS 3		OPTIONAL	OPTIONAL	REPLACEMENT CASES	
	Weight	Part #	Price	Part #	Price	Part #	Price	Calibration Report	Mass Value Certificate	Part #	Price
<b>Screw Knob</b>	50 kg	Consult	Consult	Consult	Consult	12274	Consult	Consult	Consult	Consult	Consult
	25 kg	11876	\$3,800.00	12131	\$3,555.00	12272	\$3,495.00	Consult	Consult	Consult	Consult
	20 kg	11875	3,110.00	12130	2,055.00	12271	2,025.00	\$140.00	\$75.00	80703	\$200.00
	10 kg	11874	1,725.00	12129	1,610.00	12270	1,500.00	140.00	75.00	80704	200.00
	5 kg	11872	945.00	12127	940.00	12269	935.00	140.00	75.00	80705	145.00
	3 kg	11871	810.00	12126	780.00	12268	750.00	140.00	75.00	80706	40.00
	2 kg	11870	640.00	12125	600.00	12267	590.00	140.00	75.00	80707	42.00
	1 kg	11869	445.00	12124	400.00	12266	385.00	120.00	55.00	80708	42.00
	500 g	11867	185.00	12122	180.00	12265	175.00	120.00	55.00	80709	30.00
	300 g	11866	140.00	12121	130.00	12264	125.00	120.00	55.00	80710	30.00
	200 g	11865	130.00	12120	125.00	12263	120.00	120.00	55.00	80711	30.00
	100 g	11864	95.00	12119	90.00	12262	85.00	50.00	40.00	80712	30.00
	50 g	11862	90.00	12117	75.00	12261	75.00	50.00	40.00	80713	30.00
	30 g	11861	85.00	12116	70.00	12260	70.00	50.00	40.00	80714	30.00
	20 g	11860	85.00	12115	70.00	12259	70.00	50.00	40.00	80715	30.00
	10 g	11859	80.00	12114	70.00	12258	70.00	50.00	40.00	80716	30.00
	5 g	11857	75.00	12112	55.00	12257	52.00	50.00	40.00	80717	30.00
	3 g	11856	65.00	12111	55.00	12256	52.00	50.00	40.00	80718	30.00
	2 g	11855	65.00	12110	55.00	12255	52.00	50.00	40.00	80719	30.00
	1 g	11854	60.00	12109	55.00	12254	52.00	50.00	40.00	80720	30.00
<b>Milligram</b>	500 mg	11852	55.00	12107	35.00	12253	32.00	50.00	40.00	-	-
	300 mg	11851	55.00	12106	35.00	12252	32.00	50.00	40.00	-	-
	200 mg	11850	55.00	12105	35.00	12251	32.00	50.00	40.00	-	-
	100 mg	11849	55.00	12104	35.00	12250	32.00	50.00	40.00	-	-
	50 mg	11847	55.00	12102	35.00	12248	32.00	50.00	40.00	-	-
	30 mg	11846	55.00	12101	35.00	12247	32.00	50.00	40.00	-	-
	20 mg	11845	55.00	12100	35.00	12246	32.00	50.00	40.00	-	-
	10 mg	11844	55.00	12099	35.00	12245	32.00	50.00	40.00	-	-
	5 mg	11842	55.00	12097	35.00	12244	32.00	50.00	40.00	-	-
	3 mg	11841	55.00	12096	35.00	12243	32.00	50.00	40.00	-	-
	2 mg	11840	55.00	12095	35.00	12242	32.00	50.00	40.00	-	-
	1 mg	11839	55.00	12094	35.00	12241	32.00	50.00	40.00	-	-
0.5 mg*	N/A	N/A	-	-	-	-	50.00	40.00	-	-	

\*Wire Weight for special kits, individual weights must ship in a case



Screw-knob Design



Milligram

# Metric Kits

CLASS 4			OPTIONAL	REPLACEMENT CASES		
Weight	Kit Part #	Kit Price	Traceable Certificate	Part #	Price	
<b>Screw Knob</b>	50kg	<b>Consult</b>	Consult	<b>Consult</b>	Consult	
	25kg	<b>Consult</b>	Consult	<b>Consult</b>	Consult	
	20kg	<b>82716</b>	\$2,000.00	\$70.00	<b>80703</b>	\$200.00
	10kg	<b>82717</b>	1,445.00	70.00	<b>80704</b>	200.00
	5kg	<b>82718</b>	1,000.00	70.00	<b>80705</b>	145.00
	3kg	<b>82719</b>	725.00	70.00	<b>80706</b>	42.00
	2kg	<b>82720</b>	585.00	70.00	<b>80707</b>	42.00
	1kg	<b>82721</b>	385.00	50.00	<b>80708</b>	42.00
	500g	<b>82722</b>	185.00	50.00	<b>80709</b>	30.00
	300g	<b>82723</b>	135.00	50.00	<b>80710</b>	30.00
	200g	<b>82724</b>	115.00	50.00	<b>80711</b>	30.00
	100g	<b>82725</b>	80.00	35.00	<b>80712</b>	30.00
	50g	<b>82726</b>	80.00	35.00	<b>80713</b>	30.00
	30g	<b>82727</b>	70.00	35.00	<b>80714</b>	30.00
	20g	<b>82728</b>	70.00	35.00	<b>80715</b>	30.00
	10g	<b>82729</b>	65.00	35.00	<b>80716</b>	30.00
	5g	<b>82730</b>	50.00	35.00	<b>80717</b>	30.00
	3g	<b>82731</b>	50.00	35.00	<b>80718</b>	30.00
	2g	<b>82732</b>	50.00	35.00	<b>80719</b>	30.00
	1g	<b>82733</b>	50.00	35.00	<b>80720</b>	30.00
<b>Milligram</b>	500mg	<b>80494</b>	30.00	35.00	-	-
	300mg	<b>80495</b>	30.00	35.00	-	-
	200mg	<b>80496</b>	30.00	35.00	-	-
	100mg	<b>80497</b>	30.00	35.00	-	-
	50mg	<b>80498</b>	30.00	35.00	-	-
	30mg	<b>80499</b>	30.00	35.00	-	-
	20mg	<b>80500</b>	30.00	35.00	-	-
	10mg	<b>80501</b>	30.00	35.00	-	-
	5mg	<b>80502</b>	30.00	35.00	-	-
	3mg	<b>80503</b>	30.00	35.00	-	-
	2mg	<b>80504</b>	30.00	35.00	-	-
	1mg	<b>80505</b>	30.00	35.00	-	-
	0.5mg	<b>36079</b>	65.00	35.00	-	-

### ADDITIONAL ACCESSORIES

Part #	Description	Price
<b>11711</b>	Weight tweezer (plastic) for polished weights 100 g and below	\$3.00
<b>152414</b>	Premium tweezer	35.00
<b>11714</b>	Weight gloves, white, cotton	5.00
<b>11755</b>	Leaf weight cover	35.00
<b>11747</b>	Weight lifter bar, plexiglas, for weights 200 g - 3 kg and 8 oz - 5 lb (screw-knob weights only)	15.00
<b>11712</b>	Lifter with larger handle (Class 1-4/4 kg - 25 kg) (10 - 50lb)	60.00
<b>50038</b>	Vials	3.00
<b>36092</b>	Statement of Accuracy	45.00
<b>25836</b>	Serial number	15.00



Screw-knob Kit

Precision Laboratory - ASTM  
**Metric Individual Weights**

TEST WEIGHTS

www.ricelake.com | Phone: 800-472-6703

**RICE LAKE**

**CLASS 4**

**OPTIONAL**

**REPLACEMENT CASES**

	Weight	Part #	Price	Traceable Certificate	Part #	Price
<b>Screw Knob</b>	50 kg	Consult	Consult	Consult	Consult	Consult
	25 kg	12375	\$3,425.00	Consult	Consult	Consult
	20 kg	12374	1,890.00	\$70.00	80703	\$200.00
	10 kg	12373	1,335.00	70.00	80704	200.00
	5 kg	12372	890.00	70.00	80705	145.00
	3 kg	12371	700.00	70.00	80706	42.00
	2 kg	12370	565.00	70.00	80707	42.00
	1 kg	12369	370.00	50.00	80708	42.00
	500 g	12368	170.00	50.00	80709	30.00
	300 g	12367	120.00	50.00	80710	30.00
	200 g	12366	105.00	50.00	80711	30.00
	100 g	12365	75.00	35.00	80712	30.00
	50 g	12364	62.00	35.00	80713	30.00
	30 g	12363	55.00	35.00	80714	30.00
	20 g	12362	55.00	35.00	80715	30.00
	10 g	12361	55.00	35.00	80716	30.00
	5 g	12360	40.00	35.00	80717	30.00
	3 g	12359	40.00	35.00	80718	30.00
	2 g	12358	40.00	35.00	80719	30.00
	1 g	12357	40.00	35.00	80720	30.00
<b>Milligram</b>	500 mg	12356	30.00	35.00	-	-
	300 mg	12355	30.00	35.00	-	-
	200 mg	12354	30.00	35.00	-	-
	100 mg	12353	30.00	35.00	-	-
	50 mg	12352	30.00	35.00	-	-
	30 mg	12351	30.00	35.00	-	-
	20 mg	12350	30.00	35.00	-	-
	10 mg	22198	30.00	35.00	-	-
	5 mg	22197	30.00	35.00	-	-
	3 mg	22196	30.00	35.00	-	-
2 mg	22195	30.00	35.00	-	-	
1 mg	22194	30.00	35.00	-	-	

For special kits, individual weights must ship in a case



Screw-knob Design



Milligram

	CLASS 1			CLASS 2		CLASS 3		OPTIONAL	OPTIONAL	REPLACEMENT CASES	
	Weight	Kit Part #	Kit Price	Kit Part #	Kit Price	Kit Part #	Kit Price	Calibration Report	Mass Value Certificate	Part #	Price
<b>Screw Knob</b>	30 lb	<b>82581</b>	\$3,345.00	<b>82625</b>	\$3,260.00	<b>82667</b>	\$3,140.00	\$125.00	\$80.00	<b>80743</b>	\$200.00
	25 lb	<b>82580</b>	2,325.00	<b>82624</b>	2,770.00	<b>82666</b>	2,665.00	125.00	80.00	<b>80742</b>	200.00
	20 lb	<b>82579</b>	2,300.00	<b>82623</b>	2,240.00	<b>82665</b>	2,100.00	125.00	80.00	<b>80741</b>	200.00
	10 lb	<b>82578</b>	1,350.00	<b>82622</b>	1,320.00	<b>82664</b>	1,250.00	125.00	80.00	<b>80740</b>	200.00
	5 lb	<b>82589</b>	970.00	<b>82631</b>	930.00	<b>82673</b>	910.00	125.00	80.00	<b>80739</b>	55.00
	4 lb	<b>82588</b>	825.00	<b>82630</b>	785.00	<b>82672</b>	755.00	125.00	80.00	<b>80738</b>	55.00
	3 lb	<b>82587</b>	620.00	<b>82629</b>	565.00	<b>82671</b>	550.00	125.00	80.00	<b>80737</b>	55.00
	2 lb	<b>82586</b>	545.00	<b>82628</b>	515.00	<b>82670</b>	495.00	100.00	65.00	<b>80736</b>	55.00
	1 lb	<b>82585</b>	275.00	<b>82627</b>	260.00	<b>82669</b>	245.00	100.00	65.00	<b>80735</b>	55.00
	8 oz	<b>82584</b>	225.00	<b>82626</b>	215.00	<b>82668</b>	215.00	50.00	40.00	<b>80734</b>	30.00
	0.5 lb	<b>82570</b>	230.00	<b>82614</b>	215.00	<b>82656</b>	215.00	50.00	40.00	<b>80724</b>	30.00
	0.3 lb	<b>118518</b>	170.00	<b>118519</b>	165.00	<b>118520</b>	135.00	50.00	40.00	<b>118551</b>	30.00
	0.2 lb	<b>82569</b>	145.00	<b>82613</b>	145.00	<b>82655</b>	115.00	50.00	40.00	<b>80726</b>	30.00
	0.1 lb	<b>82568</b>	110.00	<b>82612</b>	100.00	<b>82654</b>	100.00	50.00	40.00	<b>80725</b>	30.00
	0.05 lb	<b>82567</b>	100.00	<b>82611</b>	95.00	<b>82653</b>	90.00	50.00	40.00	<b>80724</b>	30.00
	0.03 lb	<b>118805</b>	95.00	<b>118806</b>	85.00	<b>118807</b>	85.00	50.00	40.00	<b>80730</b>	30.00
	0.02 lb	<b>82566</b>	95.00	<b>82610</b>	90.00	<b>82652</b>	88.00	50.00	40.00	<b>80723</b>	30.00
	0.01 lb	<b>82565</b>	95.00	<b>82609</b>	85.00	<b>82651</b>	85.00	50.00	40.00	<b>80722</b>	30.00
	0.005 lb	<b>82564</b>	95.00	<b>82608</b>	85.00	<b>82650</b>	85.00	50.00	40.00	<b>80721</b>	30.00
	0.003 lb	<b>118801</b>	95.00	<b>118802</b>	85.00	<b>118803</b>	85.00	50.00	40.00	<b>118550</b>	30.00
4 oz	<b>82577</b>	125.00	<b>82621</b>	120.00	<b>82663</b>	120.00	50.00	40.00	<b>80733</b>	30.00	
2 oz	<b>82576</b>	110.00	<b>82620</b>	100.00	<b>82662</b>	100.00	50.00	40.00	<b>80732</b>	30.00	
1 oz	<b>82575</b>	90.00	<b>82619</b>	90.00	<b>82661</b>	85.00	50.00	40.00	<b>80731</b>	30.00	
1/2 oz	<b>82574</b>	85.00	<b>82618</b>	85.00	<b>82660</b>	85.00	50.00	40.00	<b>80730</b>	30.00	
1/4 oz	<b>82573</b>	85.00	<b>82617</b>	85.00	<b>82659</b>	85.00	50.00	40.00	<b>80729</b>	30.00	
1/8 oz	<b>82572</b>	85.00	<b>82616</b>	85.00	<b>82658</b>	85.00	50.00	40.00	<b>80728</b>	30.00	
1/16 oz	<b>82571</b>	85.00	<b>82615</b>	85.00	<b>82657</b>	85.00	50.00	40.00	<b>80719</b>	30.00	
<b>Milligram</b>	0.001 lb	<b>80428</b>	85.00	<b>80443</b>	85.00	<b>80448</b>	85.00	50.00	40.00	-	-
	0.002 lb	<b>80439</b>	85.00	<b>80445</b>	85.00	<b>80449</b>	85.00	50.00	40.00	-	-
	1/32 oz	<b>80442</b>	85.00	<b>80446</b>	85.00	<b>80451</b>	85.00	50.00	40.00	-	-

**ADDITIONAL ACCESSORIES**

Part #	Description	Price
<b>11714</b>	Weight gloves, white, cotton	\$5.00
<b>11747</b>	Lifting bar	15.00
<b>11711</b>	Weight tweezers	3.00
<b>152414</b>	Premium tweezers	35.00
<b>36092</b>	Statement of Accuracy	45.00
<b>50038</b>	Vial	3.00
<b>25836</b>	Serial number	15.00



# Avoirdupois Individual Weights

	CLASS 1			CLASS 2		CLASS 3		OPTIONAL	OPTIONAL	REPLACEMENT CASES	
	Weight	Part #	Price	Part #	Price	Part #	Price	Calibration Report	Mass Value Certificate	Part #	Price
Screw Knob	50 lb	12056	\$4,390.00	12202	\$4,325.00	12335	\$4,260.00	-	-	-	-
	30 lb	12055	3,235.00	12201	3,150.00	12334	3,025.00	\$125.00	\$80.00	80743	\$200.00
	25 lb	12054	2,710.00	12200	2,655.00	12333	2,555.00	125.00	80.00	80742	200.00
	20 lb	12053	2,190.00	12199	2,125.00	12332	1,990.00	125.00	80.00	80741	200.00
	10 lb	12052	1,240.00	12198	1,205.00	12331	1,145.00	125.00	80.00	80740	200.00
	5 lb	12050	925.00	12196	885.00	12330	865.00	125.00	80.00	80739	55.00
	4 lb	12049	780.00	12195	725.00	12329	715.00	125.00	80.00	80738	55.00
	3 lb	12048	590.00	12194	540.00	12328	520.00	125.00	80.00	80737	55.00
	2 lb	12047	520.00	12193	490.00	12327	470.00	100.00	65.00	80736	55.00
	1 lb	12046	245.00	12192	245.00	12326	235.00	100.00	65.00	80735	55.00
	8 oz	12044	215.00	12190	210.00	12325	200.00	50.00	40.00	80734	30.00
	0.5 lb	12034	220.00	12180	210.00	12316	205.00	50.00	40.00	80734	30.00
	0.3 lb	118518	170.00	118519	165.00	118520	135.00	50.00	40.00	118551	30.00
	0.2 lb	12033	135.00	12179	135.00	12315	105.00	50.00	40.00	80726	30.00
	0.1 lb	12032	100.00	12178	95.00	12314	90.00	50.00	40.00	80725	30.00
	0.05 lb	12027	90.00	12173	90.00	12310	85.00	50.00	40.00	80724	30.00
	0.03 lb	118514	85.00	118515	85.00	118516	85.00	50.00	40.00	80730	30.00
	0.02 lb	12022	85.00	12168	85.00	22185	85.00	50.00	40.00	80723	30.00
	0.01 lb	12020	85.00	12166	85.00	22183	85.00	50.00	40.00	80722	30.00
	0.005 lb	12013	85.00	12159	85.00	12297	85.00	50.00	40.00	80721	30.00
	0.003 lb	118510	85.00	118511	85.00	118512	85.00	50.00	40.00	118550	30.00
	4 oz	12043	115.00	12189	115.00	12324	115.00	50.00	40.00	80733	30.00
	2 oz	12042	100.00	12188	95.00	12323	95.00	50.00	40.00	80732	30.00
	1 oz	12041	80.00	12187	80.00	12322	75.00	50.00	40.00	80731	30.00
	1/2 oz	12040	85.00	12186	85.00	12321	85.00	50.00	40.00	80730	30.00
	1/4 oz	12039	85.00	12185	85.00	12320	85.00	50.00	40.00	80729	30.00
1/8 oz	12038	85.00	12184	85.00	12319	85.00	50.00	40.00	80728	30.00	
1/16 oz	12037	85.00	12183	85.00	12318	85.00	50.00	40.00	80719	30.00	
Milligram	0.001 lb	12007	85.00	12153	85.00	12291	85.00	50.00	40.00	-	-
	0.002 lb	12009	85.00	12155	85.00	12293	85.00	50.00	40.00	-	-
	1/32 oz	12036	85.00	12182	85.00	12317	85.00	50.00	40.00	-	-

For special kits, individual weights must ship in a case.



Screw-knob Design



Milligram

CLASS 4			OPTIONAL	REPLACEMENT CASES	
Weight	Kit Part #	Kit Price	Traceable Certificate	Part #	Price
50 lb	-	-	-	-	-
30 lb	<b>82709</b>	\$3,110.00	\$75.00	<b>80743</b>	\$200.00
25 lb	<b>82708</b>	2,625.00	75.00	<b>80742</b>	200.00
20 lb	<b>82707</b>	2,065.00	75.00	<b>80741</b>	200.00
10 lb	<b>82706</b>	1,215.00	75.00	<b>80740</b>	200.00
5 lb	<b>82715</b>	895.00	75.00	<b>80739</b>	55.00
4 lb	<b>82714</b>	690.00	75.00	<b>80738</b>	55.00
3 lb	<b>82713</b>	530.00	75.00	<b>80737</b>	55.00
2 lb	<b>82712</b>	480.00	60.00	<b>80736</b>	55.00
1 lb	<b>82711</b>	225.00	60.00	<b>80735</b>	55.00
8 oz	<b>82710</b>	205.00	35.00	<b>80734</b>	30.00
0.5 lb	<b>82698</b>	215.00	35.00	<b>80734</b>	30.00
0.3 lb	<b>118812</b>	145.00	35.00	<b>118551</b>	30.00
0.2 lb	<b>82697</b>	110.00	35.00	<b>80723</b>	30.00
0.1 lb	<b>82696</b>	90.00	35.00	<b>80725</b>	30.00
0.05 lb	<b>82695</b>	85.00	35.00	<b>80724</b>	30.00
0.03 lb	<b>118808</b>	75.00	35.00	<b>80730</b>	30.00
0.02 lb	<b>82694</b>	85.00	35.00	<b>80723</b>	30.00
0.01 lb	<b>82693</b>	85.00	35.00	<b>80722</b>	30.00
0.005 lb	<b>82692</b>	85.00	35.00	<b>80721</b>	30.00
0.003 lb	<b>118804</b>	85.00	35.00	<b>118550</b>	30.00
4 oz	<b>82705</b>	110.00	35.00	<b>80733</b>	30.00
2 oz	<b>82704</b>	100.00	35.00	<b>80732</b>	30.00
1 oz	<b>82703</b>	90.00	35.00	<b>80731</b>	30.00
1/2 oz	<b>82702</b>	85.00	35.00	<b>80730</b>	30.00
1/4 oz	<b>82701</b>	85.00	35.00	<b>80729</b>	30.00
1/8 oz	<b>82700</b>	85.00	35.00	<b>80728</b>	30.00
1/16 oz	<b>82699</b>	85.00	35.00	<b>80719</b>	30.00
<b>Milligram</b>					
0.001 lb	<b>80452</b>	80.00	35.00	-	-
0.002 lb	<b>80453</b>	80.00	35.00	-	-
1/32 oz	<b>80454</b>	80.00	35.00	-	-

**ADDITIONAL ACCESSORIES**

Part #	Description	Price
<b>11714</b>	Weight gloves, white, cotton	\$5.00
<b>11747</b>	Lifting bar	15.00
<b>11711</b>	Weight tweezers	3.00
<b>152414</b>	Premium tweezers	35.00
<b>36092</b>	Statement of Accuracy	45.00
<b>50038</b>	Vial	3.00
<b>80420</b>	Capsule	3.00
<b>25836</b>	Serial number	15.00



Screw-knob Kit

# Avoirdupois Individual Weights

**CLASS 4**

**OPTIONAL**

**REPLACEMENT CASES**

	Weight	Part #	Price	Traceable Certificate	Part #	Price
<b>Screw Knob</b>	50 lb	<b>12438</b>	\$4,210.00	-	-	-
	30 lb	<b>12437</b>	3,000.00	\$75.00	<b>80743</b>	\$200.00
	25 lb	<b>12436</b>	2,520.00	75.00	<b>80742</b>	200.00
	20 lb	<b>12435</b>	1,955.00	75.00	<b>80741</b>	200.00
	10 lb	<b>12434</b>	1,105.00	75.00	<b>80740</b>	200.00
	5 lb	<b>12433</b>	850.00	75.00	<b>80739</b>	55.00
	4 lb	<b>12432</b>	655.00	75.00	<b>80738</b>	55.00
	3 lb	<b>12431</b>	500.00	75.00	<b>80737</b>	55.00
	2 lb	<b>12430</b>	460.00	60.00	<b>80736</b>	55.00
	1 lb	<b>12429</b>	215.00	60.00	<b>80735</b>	55.00
	8 oz	<b>12428</b>	195.00	35.00	<b>80734</b>	30.00
	0.5 lb	<b>12419</b>	205.00	35.00	<b>80734</b>	30.00
	0.3 lb	<b>118521</b>	130.00	35.00	<b>118551</b>	30.00
	0.2 lb	<b>12418</b>	100.00	35.00	<b>80723</b>	30.00
	0.1 lb	<b>12417</b>	80.00	35.00	<b>80725</b>	30.00
	0.05 lb	<b>12413</b>	85.00	35.00	<b>80724</b>	30.00
	0.03 lb	<b>118517</b>	85.00	35.00	<b>80730</b>	30.00
	0.02 lb	<b>12408</b>	85.00	35.00	<b>80723</b>	30.00
	0.01 lb	<b>12406</b>	80.00	35.00	<b>80722</b>	30.00
	0.005 lb	<b>12400</b>	80.00	35.00	<b>80721</b>	30.00
	0.003 lb	<b>118513</b>	80.00	35.00	<b>118550</b>	30.00
	4 oz	<b>12427</b>	95.00	35.00	<b>80733</b>	30.00
	2 oz	<b>12426</b>	90.00	35.00	<b>80732</b>	30.00
	1 oz	<b>12425</b>	80.00	35.00	<b>80731</b>	30.00
1/2 oz	<b>12424</b>	85.00	35.00	<b>80730</b>	30.00	
1/4 oz	<b>12423</b>	85.00	35.00	<b>80729</b>	30.00	
1/8 oz	<b>12422</b>	85.00	35.00	<b>80728</b>	30.00	
1/16 oz	<b>12421</b>	85.00	35.00	<b>80719</b>	30.00	
<b>Milligram</b>	0.001 lb	<b>12394</b>	75.00	35.00	-	-
	0.002 lb	<b>12396</b>	75.00	35.00	-	-
	1/32 oz	<b>12420</b>	75.00	35.00	-	-

For special kits-individual weights must ship in a case.



Screw-knob Design



Milligram

### Standard Features

- ASTM Class 1 weights
- Polished stainless steel Type II design
- Sealing cavity
- Density is approximately 7.95 g/cm<sup>3</sup>
- Special PVC weight case or ABS case
- Precision tweezers included
- Configurations available ideal for calibration, shift tests and sensitivity tests
- Other configurations available by special order



200 g PVC set shown,  
 other sets will vary

### CLASS 1

Weight	Part #	Kit Price
5 kg, 2 kg, 500 g, 2 g	<b>161713*</b>	\$1,200.00
2 kg, 1 kg, 500 mg	<b>161712</b>	935.00
500 g, 200 g, 50 g, 100 mg	<b>161711</b>	560.00
200 g, 100 g, 20 mg	<b>161710</b>	490.00
100 g, 50 g, 10 mg	<b>161709</b>	385.00

### REPLACEMENT CASES

Calibration Certificate	Mass Value Certificate	Part #	Price
\$450.00	\$245.00	<b>162364*</b>	\$200.00
310.00	170.00	<b>161717</b>	435.00
340.00	190.00	<b>161716</b>	210.00
220.00	135.00	<b>161715</b>	210.00
150.00	120.00	<b>161714</b>	165.00

\*ABS plastic case

### ADDITIONAL ACCESSORIES

PART #	DESCRIPTION	PRICE
<b>36092</b>	Statement of Accuracy	\$45.00
<b>11714</b>	Weight gloves, white cotton	5.00
<b>25836</b>	Serial number	15.00

# Metric Sets

Range: 500 mg

TEST WEIGHTS

### CLASS 0\*\*

Set Size	Part #	Price	Part #	Price
500 mg - 1 mg	<b>45933</b>	\$1,735.00	<b>34699</b>	\$100.00
500 mg - 1 mg*	<b>96359*</b>	1,735.00	<b>34699</b>	100.00
500 mg - 10 mg	<b>84141</b>	1,285.00	<b>34699</b>	100.00
500 mg - 10 mg*	<b>98191*</b>	1,285.00	<b>34699</b>	100.00
500 mg - 100 mg	<b>45934</b>	885.00	<b>34699</b>	100.00
500 mg - 100 mg*	<b>96360*</b>	885.00	<b>34699</b>	100.00

### REPLACEMENT CASES

\*\* Calibration Report included, Statement of Accuracy not available for Class 0

### CLASS 1

Set Size	Part #	Price
500 mg - 1 mg	<b>12445</b>	\$535.00
500 mg - 1 mg*	<b>11910*</b>	535.00
500 mg - 10 mg	<b>12447</b>	395.00
500 mg - 10 mg*	<b>11909*</b>	395.00
500 mg - 100 mg	<b>45952</b>	375.00
500 mg - 100 mg*	<b>45944*</b>	375.00

### CLASS 2

Part #	Price
<b>11838</b>	\$460.00
<b>12176*</b>	460.00
<b>11848</b>	370.00
<b>12175*</b>	370.00
<b>45953</b>	325.00
<b>45945*</b>	325.00

### CLASS 3

Part #	Price
<b>11946</b>	\$445.00
<b>12313*</b>	445.00
<b>11956</b>	325.00
<b>12312*</b>	325.00
<b>45954</b>	260.00
<b>45946*</b>	260.00

### OPTIONAL

Calibration Report	Mass Value Certificate
\$450.00	\$360.00
450.00	360.00
300.00	240.00
300.00	240.00
150.00	120.00
150.00	120.00

### REPLACEMENT CASES\*\*\*

Part #	Price
<b>11763</b>	\$70.00
<b>11763</b>	70.00

\*\*\* Includes milligram lid and tweezer

### CLASS 4

Set Size	Part #	Price
500 mg - 1 mg	<b>12093</b>	\$280.00
500 mg - 1 mg*	<b>12416*</b>	280.00
500 mg - 10 mg	<b>12103</b>	210.00
500 mg -10 mg*	<b>12415*</b>	210.00
500 mg - 100 mg	<b>45955</b>	165.00
500 mg - 100 mg*	<b>45947*</b>	165.00

### OPTIONAL

Traceable Certificate
\$270.00
270.00
180.00
180.00
90.00
90.00

### REPLACEMENT CASES

Part #	Price
<b>11763</b>	\$70.00
<b>11763</b>	70.00

\* 5-2-2-1 configuration

www.ricelake.com | Phone: 800-472-6703

RICELAKE



Set includes lifting device and glove

## Metric Sets

Range: 500mg

### WEIGHT SET CONTENTS

500 mg - 1 mg	500 mg - 1 mg*	500 mg - 10 mg	500 mg - 10 mg*	500 mg - 100 mg	500 mg - 100 mg*
1 - 500 mg	1 - 500 mg	1 - 500 mg	1 - 500 mg	1 - 500 mg	1 - 500 mg
1 - 300 mg	2 - 200 mg	1 - 300 mg	2 - 200 mg	1 - 300 mg	2 - 200 mg
1 - 200 mg	1 - 100 mg	1 - 200 mg	1 - 100 mg	1 - 200 mg	1 - 100 mg
1 - 100 mg	1 - 50 mg	1 - 100 mg	1 - 50 mg	1 - 100 mg	-
1 - 50 mg	2 - 20 mg	1 - 50 mg	2 - 20 mg	-	-
1 - 30 mg	1 - 10 mg	1 - 30 mg	1 - 10 mg	-	-
1 - 20 mg	1 - 5 mg	1 - 20 mg	-	-	-
1 - 10 mg	2 - 2 mg	1 - 10 mg	-	-	-
1 - 5 mg	1 - 1 mg	-	-	-	-
1 - 3 mg	-	-	-	-	-
1 - 2 mg	-	-	-	-	-
1 - 1 mg	-	-	-	-	-
<b>Piece Count</b>					
12	12	8	8	4	4
<b>Total Weight</b>					
1.221 g	1.11 g	1.21 g	1.11 g	1.1 g	.8g
Part #	Part #	Part #	Part #	Part #	Part #
45933-Class 0	96359-Class 0	84141-Class 0	98191-Class 0	45934-Class 0	96360-Class 0
12445-Class 1	11910-Class 1	12447-Class 1	11909-Class 1	45952-Class 1	45944-Class 1
11838-Class 2	12176-Class 2	11848-Class 2	12175-Class 2	45953-Class 2	45945-Class 2
11946-Class 3	12313-Class 3	11956-Class 3	12312-Class 3	45954-Class 3	45946-Class 3
12093-Class 4	12416-Class 4	12103-Class 4	12415-Class 4	45955-Class 4	45947-Class 4

\* 5-2-2-1 configuration

### ADDITIONAL ACCESSORIES

Part #	Description	Price
36092	Statement of Accuracy	\$45.00
11714	Weight gloves, white cotton	5.00
11711	Tweezer	3.00
152414	Premium tweezer	35.00
25836	Serial number	15.00

# Metric Sets

Range: 20g

### CLASS 0\*\*

Set Size	Part #	Price	Part #	Price
20g - 1mg	<b>84154</b>	\$2,370.00	<b>49503</b>	\$200.00
20g - 5mg	<b>84149</b>	2,535.00	<b>49503</b>	200.00
20g - 10mg	<b>84148</b>	2,360.00	<b>49503</b>	200.00
20g - 100mg	<b>84146</b>	1,775.00	<b>49503</b>	200.00
20g - 1g	<b>84155</b>	1,280.00	<b>49503</b>	200.00

### REPLACEMENT CASES

\*\* Calibration Report included, Statement of Accuracy not available for Class 0

### CLASS 1

Set Size	Part #	Price
20g - 1mg	<b>12448</b>	\$925.00
20g - 1mg	<b>11908*</b>	925.00
20g - 5mg	<b>12450</b>	795.00
20g - 5mg	<b>11907*</b>	795.00
20g - 10mg	<b>12451</b>	760.00
20g - 10mg	<b>11906*</b>	760.00
20g - 100mg	<b>84145</b>	645.00
20g - 100mg	<b>11905*</b>	645.00
20g - 1g	<b>12452</b>	535.00
20g - 1g	<b>11904*</b>	535.00

### CLASS 2

Part #	Price
<b>11853</b>	\$770.00
<b>12174*</b>	770.00
<b>11858</b>	685.00
<b>12172*</b>	685.00
<b>11863</b>	620.00
<b>12171*</b>	620.00
<b>84144</b>	545.00
<b>12170*</b>	545.00
<b>11868</b>	460.00
<b>12169*</b>	460.00

### CLASS 3

Part #	Price
<b>11961</b>	\$700.00
<b>12311*</b>	700.00
<b>11966</b>	625.00
<b>12309*</b>	625.00
<b>11971</b>	565.00
<b>22188*</b>	565.00
<b>84143</b>	510.00
<b>22187*</b>	510.00
<b>11976</b>	400.00
<b>22186*</b>	400.00

### OPTIONAL

Calibration Report	Mass Value Certificate
\$675.00	\$540.00
675.00	540.00
565.00	450.00
565.00	450.00
525.00	420.00
525.00	420.00
375.00	300.00
375.00	300.00
225.00	180.00
225.00	180.00

### OPTIONAL

Calibration Report	Mass Value Certificate
\$675.00	\$540.00
675.00	540.00
565.00	450.00
565.00	450.00
525.00	420.00
525.00	420.00
375.00	300.00
375.00	300.00
225.00	180.00
225.00	180.00

### REPLACEMENT CASES

Part #	Price
<b>11596</b>	\$145.00
<b>11588</b>	145.00
<b>11596</b>	145.00
<b>11588</b>	145.00
<b>11596</b>	145.00
<b>11588</b>	145.00
<b>11596</b>	145.00
<b>11588</b>	145.00
<b>11596</b>	145.00
<b>11588</b>	145.00

### CLASS 4

Set Size	Part #	Price
20g - 1mg	<b>12108</b>	\$540.00
20g - 1mg	<b>12414*</b>	540.00
20g - 5mg	<b>12113</b>	500.00
20g - 5mg	<b>12412*</b>	500.00
20g - 10mg	<b>12118</b>	480.00
20g - 10mg	<b>12411*</b>	480.00
20g - 100mg	<b>84142</b>	400.00
20g - 100mg	<b>12410*</b>	400.00
20g - 1g	<b>12123</b>	325.00
20g - 1g	<b>12409*</b>	325.00

### OPTIONAL

Traceable Certificate
\$410.00
410.00
340.00
340.00
310.00
310.00
225.00
225.00
135.00
135.00

### REPLACEMENT CASES

Part #	Price
<b>11596</b>	\$145.00
<b>11588</b>	145.00
<b>11596</b>	145.00
<b>11588</b>	145.00
<b>11596</b>	145.00
<b>11588</b>	145.00
<b>11596</b>	145.00
<b>11588</b>	145.00
<b>11596</b>	145.00
<b>11588</b>	145.00

\* 5-2-2-1 configuration



Set includes lifting device and gloves

# Metric Sets

Range: 20g

## WEIGHT SET CONTENTS

20g - 1 mg	20g - 1 mg*	20g - 5 mg	20g - 5 mg*	20g - 10 mg	20g - 10 mg*	20g - 100 mg	20g - 100 mg*	20g - 1 g	20g - 1 g*
1 - 20g	1 - 20g	1 - 20g	1 - 20g	1 - 20g	1 - 20g	1 - 20g	1 - 20g	1 - 20g	1 - 20g
1 - 10g	1 - 10g	1 - 10g	1 - 10g	1 - 10g	1 - 10g	1 - 10g	1 - 10g	1 - 10g	1 - 10g
1 - 5g	1 - 5g	1 - 5g	1 - 5g	1 - 5g	1 - 5g	1 - 5g	1 - 5g	1 - 5g	1 - 5g
1 - 3g	2 - 2g	1 - 3g	2 - 2g	1 - 3g	2 - 2g	1 - 3g	2 - 2g	1 - 3g	2 - 2g
1 - 2g	1 - 1g	1 - 2g	1 - 1g	1 - 2g	1 - 1g	1 - 2g	1 - 1g	1 - 2g	1 - 1g
1 - 1g	1 - 500mg	1 - 1g	1 - 500mg	1 - 1g	1 - 500mg	1 - 1g	1 - 500mg	1 - 1g	1 - 1g
1 - 500mg	2 - 200mg	1 - 500mg	2 - 200mg	1 - 500mg	2 - 200mg	1 - 500mg	2 - 200mg	-	-
1 - 300mg	1 - 100mg	1 - 300mg	1 - 100mg	1 - 300mg	1 - 100mg	1 - 300mg	1 - 100mg	-	-
1 - 200mg	1 - 50mg	1 - 200mg	1 - 50mg	1 - 200mg	1 - 50mg	1 - 200mg	-	-	-
1 - 100mg	2 - 20mg	1 - 100mg	2 - 20mg	1 - 100mg	2 - 20mg	1 - 100mg	-	-	-
1 - 50mg	1 - 10mg	1 - 50mg	1 - 10mg	1 - 50mg	1 - 10mg	-	-	-	-
1 - 30mg	1 - 5mg	1 - 30mg	1 - 5mg	1 - 30mg	-	-	-	-	-
1 - 20mg	2 - 2mg	1 - 20mg	-	1 - 20mg	-	-	-	-	-
1 - 10mg	1 - 1mg	1 - 10mg	-	1 - 10mg	-	-	-	-	-
1 - 5mg	-	1 - 5mg	-	-	-	-	-	-	-
1 - 3mg	-	-	-	-	-	-	-	-	-
1 - 2mg	-	-	-	-	-	-	-	-	-
1 - 1mg	-	-	-	-	-	-	-	-	-

**Piece Count**

18	18	15	15	14	14	10	10	6	6
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**Total Weight**

42.221g	42.221g	42.215g	42.215g	42.421g	41.1g	41g	41g	42.105g	40g
Part #									
84154-Class 0	-	84149-Class 0	-	84148-Class 0	-	84146-Class 0	-	84155-Class 0	-
12448-Class 1	11908-Class 1	12450-Class 1	11907-Class 1	12451-Class 1	11906-Class 1	84145-Class 1	11905-Class 1	12452-Class 1	11904-Class 1
11853-Class 2	12174-Class 2	11858-Class 2	12172-Class 2	11863-Class 2	12171-Class 2	84144-Class 2	12170-Class 2	11868-Class 2	12169-Class 2
11961-Class 3	12311-Class 3	11966-Class 3	12309-Class 3	11971-Class 3	22188-Class 3	84143-Class 3	22187-Class 3	11976-Class 3	22186-Class 3
12108-Class 4	12414-Class 4	12113-Class 4	12412-Class 4	12118-Class 4	12411-Class 4	84142-Class 4	12410-Class 4	12123-Class 4	12409-Class 4

\* 5-2-2-1 configuration

## ADDITIONAL ACCESSORIES

Part #	Description	Price
36092	Statement of Accuracy	\$45.00
11714	Weight gloves, white cotton	5.00
11711	Tweezer	3.00
152414	Premium tweezer	35.00
25836	Serial number	15.00
11755	Leaf weight cover	35.00

# Metric Sets

Range: 50 g

### CLASS 0\*\*

Set Size	Part #	Price
50 g - 1 mg	<b>84177</b>	\$3,065.00
50 g - 5 mg	<b>84176</b>	2,850.00
50 g - 10 mg	<b>84164</b>	2,580.00
50 g - 100 mg	<b>84163</b>	1,965.00
50 g - 1 g	<b>84178</b>	1,540.00

### REPLACEMENT CASES

Part #	Price
<b>49503</b>	\$200.00
<b>49503</b>	200.00

\*\* Calibration Report included, Statement of Accuracy not available for Class 0

### CLASS 1

Set Size	Part #	Price
50 g - 1 mg	<b>12453</b>	\$910.00
50 g - 1 mg*	<b>11903</b>	910.00
50 g - 5 mg	<b>12454</b>	850.00
50 g - 5 mg*	<b>11902</b>	850.00
50 g - 10 mg	<b>12455</b>	800.00
50 g - 10 mg *	<b>11900</b>	800.00
50 g - 100 mg	<b>84159</b>	695.00
50 g - 100 mg *	<b>11899</b>	695.00
50 g - 1 g	<b>12456</b>	575.00
50 g - 1 g*	<b>11898</b>	575.00

### CLASS 2

Part #	Price
<b>11873</b>	\$800.00
<b>12167*</b>	800.00
<b>11879</b>	730.00
<b>12165*</b>	730.00
<b>11880</b>	695.00
<b>12163*</b>	695.00
<b>84160</b>	555.00
<b>12162*</b>	555.00
<b>11890</b>	500.00
<b>12161*</b>	500.00

### CLASS 3

Part #	Price
<b>11982</b>	\$750.00
<b>22288*</b>	750.00
<b>11988</b>	660.00
<b>22182*</b>	660.00
<b>11989</b>	635.00
<b>22181*</b>	635.00
<b>84161</b>	530.00
<b>12300*</b>	530.00
<b>12004</b>	455.00
<b>12299*</b>	455.00

### OPTIONAL

Calibration Report	Price
	\$750.00
	750.00
	640.00
	640.00
	600.00
	600.00
	450.00
	450.00
	300.00
	300.00

### OPTIONAL

Mass Value Certificate	Price
	\$600.00
	600.00
	510.00
	510.00
	480.00
	480.00
	360.00
	360.00
	240.00
	240.00

### REPLACEMENT CASES

Part #	Price
<b>11596</b>	\$145.00
<b>11588</b>	145.00
<b>11596</b>	145.00
<b>11588</b>	145.00
<b>11596</b>	145.00
<b>11588</b>	145.00
<b>11596</b>	145.00
<b>11588</b>	145.00
<b>11596</b>	145.00
<b>11588</b>	145.00

### CLASS 4

Set Size	Part #	Price
50 g - 1 mg	<b>12128</b>	\$635.00
50 g - 1 mg*	<b>12407</b>	635.00
50 g - 5 mg	<b>12134</b>	580.00
50 g - 5 mg*	<b>12405</b>	580.00
50 g - 10 mg	<b>12135</b>	560.00
50 g - 10 mg *	<b>12404</b>	560.00
50 g - 100 mg	<b>84162</b>	480.00
50 g - 100 mg *	<b>12403</b>	480.00
50 g - 1 g	<b>12150</b>	400.00
50 g - 1 g*	<b>12402</b>	400.00

### OPTIONAL

Traceable Certificate	Price
	\$455.00
	455.00
	385.00
	385.00
	365.00
	365.00
	270.00
	270.00
	180.00
	180.00

### REPLACEMENT CASES

Part #	Price
<b>11596</b>	\$145.00
<b>11588</b>	145.00
<b>11596</b>	145.00
<b>11588</b>	145.00
<b>11596</b>	145.00
<b>11588</b>	145.00
<b>11596</b>	145.00
<b>11588</b>	145.00
<b>11596</b>	145.00
<b>11588</b>	145.00

\* 5-2-2-1 configuration



Set includes lifting device and gloves

# Metric Sets

Range: 50g

## WEIGHT SET CONTENTS

50g - 1 mg	50g - 1 mg*	50g - 5 mg	50g - 5 mg*	50g - 10 mg	50g - 10 mg*	50g - 100 mg	50g - 100 mg*	50g - 1 g	50g - 1 g*
1 - 50g	1 - 50g	1 - 50g	1 - 50g	1 - 50g	1 - 50g	1 - 50g	1 - 50g	1 - 50g	1 - 50g
1 - 30g	2 - 20g	1 - 30g	2 - 20g	1 - 30g	2 - 20g	1 - 30g	2 - 20g	1 - 30g	2 - 20g
1 - 20g	1 - 10g	1 - 20g	1 - 10g	1 - 20g	1 - 10g	1 - 20g	1 - 10g	1 - 20g	1 - 10g
1 - 10g	1 - 5g	1 - 10g	1 - 5g	1 - 10g	1 - 5g	1 - 10g	1 - 5g	1 - 10g	1 - 5g
1 - 5g	2 - 2g	1 - 5g	2 - 2g	1 - 5g	2 - 2g	1 - 5g	2 - 2g	1 - 5g	2 - 2g
1 - 3g	1 - 1g	1 - 3g	1 - 1g	1 - 3g	1 - 1g	1 - 3g	1 - 1g	1 - 3g	1 - 1g
1 - 2g	1 - 500mg	1 - 2g	1 - 500mg	1 - 2g	1 - 500mg	1 - 2g	1 - 500mg	1 - 2g	-
1 - 1g	2 - 200mg	1 - 1g	2 - 200mg	1 - 1g	2 - 200mg	1 - 1g	2 - 200mg	1 - 1g	-
1 - 500mg	1 - 100mg	1 - 500mg	1 - 100mg	1 - 500mg	1 - 100mg	1 - 500mg	1 - 100mg	-	-
1 - 300mg	1 - 50mg	1 - 300mg	1 - 50mg	1 - 300mg	1 - 50mg	1 - 300mg	-	-	-
1 - 200mg	2 - 20mg	1 - 200mg	2 - 20mg	1 - 200mg	2 - 20mg	1 - 200mg	-	-	-
1 - 100mg	1 - 10mg	1 - 100mg	1 - 10mg	1 - 100mg	1 - 10mg	1 - 100mg	-	-	-
1 - 50mg	1 - 5mg	1 - 50mg	1 - 5mg	1 - 50mg	-	-	-	-	-
1 - 30mg	2 - 2mg	1 - 30mg	-	1 - 30mg	-	-	-	-	-
1 - 20mg	1 - 1mg	1 - 20mg	-	1 - 20mg	-	-	-	-	-
1 - 10mg	-	1 - 10mg	-	1 - 10mg	-	-	-	-	-
1 - 5mg	-	1 - 5mg	-	-	-	-	-	-	-
1 - 3mg	-	-	-	-	-	-	-	-	-
1 - 2mg	-	-	-	-	-	-	-	-	-
1 - 1mg	-	-	-	-	-	-	-	-	-

### Piece Count

20	20	17	17	16	16	12	12	8	8
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### Total Weight

122.221g	111.11g	122.215g	111.105g	122.21g	111.1g	122.1g	111g	121g	110g
Part #									
84177-Class 0	-	84176-Class 0	-	84164-Class 0	-	84163-Class 0	-	84178-Class 0	-
12453-Class 1	11903-Class 1	12454-Class 1	11902-Class 1	12455-Class 1	11900-Class 1	84159-Class 1	11899-Class 1	12456-Class 1	11898-Class 1
11873-Class 2	12167-Class 2	11879-Class 2	12165-Class 2	11880-Class 2	12163-Class 2	84160-Class 2	12162-Class 2	11890-Class 2	12161-Class 2
11982-Class 3	22288-Class 3	11988-Class 3	22182-Class 3	11989-Class 3	22181-Class 3	84161-Class 3	12300-Class 3	12004-Class 3	12299-Class 3
12128-Class 4	12407-Class 4	12134-Class 4	12405-Class 4	12135-Class 4	12404-Class 4	84162-Class 4	12403-Class 4	12150-Class 4	12402-Class 4

\* 5-2-2-1 configuration

## ADDITIONAL ACCESSORIES

Part #	Description	Price
36092	Statement of Accuracy	\$45.00
11714	Weight gloves, white cotton	5.00
11711	Tweezer	3.00
152414	Premium tweezer	35.00
25836	Serial number	15.00
11755	Leaf weight cover	35.00

# Metric Sets

Range: 100g

### CLASS 0\*\*

Set Size	Part #	Price	Part #	Price
100 g - 1 mg	45930	\$3,365.00	49503	\$200.00
100 g - 5 mg	84211	2,935.00	49503	200.00
100 g - 10 mg	84212	2,720.00	49503	200.00
100 g - 100 mg	45931	2,255.00	49503	200.00
100 g - 1 g	45932	1,635.00	49503	200.00

### REPLACEMENT CASES

\*\* Calibration Report included, Statement of Accuracy not available for Class 0

### CLASS 1

Set Size	Part #	Price
100 g - 1 mg	12457	\$985.00
100 g - 1 mg *	11897	985.00
100 g - 5 mg	11911	875.00
100 g - 5 mg*	11896	875.00
100 g - 10 mg	12460	860.00
100 g - 10 mg*	11895	860.00
100 g - 100 mg	45956	700.00
100 g - 100 mg*	45948	700.00
100 g - 1 g	12461	625.00
100 g - 1 g*	11894	625.00

### CLASS 2

Part #	Price
11901	\$860.00
12160	860.00
12158	765.00
-	-
11912	750.00
12157	750.00
45957	730.00
45949	730.00
11913	615.00
12156	615.00

### CLASS 3

Part #	Price
12018	\$815.00
12298	815.00
12031	720.00
12296	720.00
12035	715.00
12295	715.00
45958	680.00
45950	680.00
12045	600.00
12294	600.00

### OPTIONAL

Calibration Report	Price
\$790.00	
790.00	
675.00	
675.00	
640.00	
640.00	
490.00	
490.00	
340.00	
340.00	

### OPTIONAL

Mass Value Certificate	Price
\$590.00	
590.00	
520.00	
520.00	
510.00	
510.00	
390.00	
390.00	
270.00	
270.00	

### REPLACEMENT CASES

Part #	Price
11596	\$145.00
11588	145.00
11596	145.00
11588	145.00
11596	145.00
11588	145.00
11596	145.00
11588	145.00
11596	145.00
11588	145.00

### CLASS 4

Set Size	Part #	Price
100 g - 1 mg	12164	\$735.00
100 g - 1 mg *	12401	735.00
100 g - 5 mg	12177	720.00
100 g - 5 mg*	12399	720.00
100 g - 10 mg	12181	715.00
100 g - 10 mg*	12398	715.00
100 g - 100 mg	45959	595.00
100 g - 100 mg*	45951	595.00
100 g - 1 g	12191	525.00
100 g - 1 g*	12397	525.00

### OPTIONAL

Traceable Certificate	Price
\$485.00	
485.00	
410.00	
410.00	
380.00	
380.00	
295.00	
295.00	
205.00	
205.00	

### REPLACEMENT CASES

Part #	Price
11596	\$145.00
11588	145.00
11596	145.00
11588	145.00
11596	145.00
11588	145.00
11596	145.00
11588	145.00
11596	145.00
11588	145.00

\* 5-2-2-1 configuration



Set includes lifting device and gloves

# Metric Sets

Range: 100g

## WEIGHT SET CONTENTS

100g - 1 mg	100g - 1 mg*	100g - 5 mg	100g - 5 mg*	100g - 10mg	100g - 10mg*	100g - 100mg	100g - 100mg*	100g - 1 g	100g - 1 g*
1 - 100g	1 - 100g	1 - 100 g	1 - 100g	1 - 100g	1 - 100g	1 - 100g	1 - 100g	1 - 100g	1 - 100g
1 - 50g	1 - 50g	1 - 50 g	1 - 50 g	1 - 50g	1 - 50g	1 - 50g	1 - 50g	1 - 50g	1 - 50g
1 - 30g	2 - 20g	1 - 30g	2 - 20g	1 - 30g	2 - 20g	1 - 30g	2 - 20g	1 - 30g	2 - 20g
1 - 20g	1 - 10g	1 - 20g	1 - 10g	1 - 20g	1 - 10g	1 - 20g	1 - 10g	1 - 20g	1 - 10g
1 - 10g	1 - 5g	1 - 10g	1 - 5g	1 - 10g	1 - 5g	1 - 10g	1 - 5g	1 - 10g	1 - 5g
1 - 5g	2 - 2g	1 - 5g	2 - 2g	1 - 5g	2 - 2g	1 - 5g	2 - 2g	1 - 5g	2 - 2g
1 - 3g	1 - 1g	1 - 3g	1 - 1g	1 - 3g	1 - 1g	1 - 3g	1 - 1g	1 - 3g	1 - 1g
1 - 2g	1 - 500mg	1 - 2g	1 - 500mg	1 - 2g	1 - 500mg	1 - 2g	1 - 500mg	1 - 2g	-
1 - 1g	2 - 200mg	1 - 1g	2 - 200mg	1 - 1g	2 - 200mg	1 - 1g	2 - 200mg	1 - 1g	-
1 - 500mg	1 - 100mg	1 - 500mg	1 - 100mg	1 - 500mg	1 - 100mg	1 - 500mg	1 - 100mg	-	-
1 - 300mg	1 - 50mg	1 - 300mg	1 - 50mg	1 - 300mg	1 - 50mg	1 - 300mg	-	-	-
1 - 200mg	2 - 20mg	1 - 200mg	2 - 20mg	1 - 200mg	2 - 20mg	1 - 200mg	-	-	-
1 - 100mg	1 - 10mg	1 - 100mg	1 - 10mg	1 - 100mg	1 - 10mg	1 - 100mg	-	-	-
1 - 50mg	1 - 5mg	1 - 50mg	1 - 5mg	1 - 50mg	-	-	-	-	-
1 - 30mg	2 - 2mg	1 - 30mg	-	1 - 30mg	-	-	-	-	-
1 - 20mg	1 - 1mg	1 - 20mg	-	1 - 20mg	-	-	-	-	-
1 - 10mg	-	1 - 10mg	-	1 - 10mg	-	-	-	-	-
1 - 5mg	-	1 - 5mg	-	-	-	-	-	-	-
1 - 3mg	-	-	-	-	-	-	-	-	-
1 - 2mg	-	-	-	-	-	-	-	-	-
1 - 1mg	-	-	-	-	-	-	-	-	-

**Piece Count**

21	21	18	18	17	17	13	13	9	9
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**Total Weight**

222.221 g	211.11 g	222.215 g	211.085 g	222.21 g	211.1 g	222.1 g	211 g	221 g	210 g
Part #									
45930-Class 0	-	84211-Class 0	-	84212-Class 0	-	45931-Class 0	-	45932-Class 0	-
12457-Class 1	11897-Class 1	11911-Class 1	11896-Class 1	12460-Class 1	11895-Class 1	45956-Class 1	45948-Class 1	12461-Class 1	11894-Class 1
11901-Class 2	12160-Class 2	12158-Class 2	-	11912-Class 2	12157-Class 2	45957-Class 2	45949-Class 2	11913-Class 2	12156-Class 2
12018-Class 3	12298-Class 3	12031-Class 3	12296-Class 3	12035-Class 3	12295-Class 3	45958-Class 3	45950-Class 3	12045-Class 3	12294-Class 3
12164-Class 4	12401-Class 4	12177-Class 4	12399-Class 4	12181-Class 4	12398-Class 4	45959-Class 4	45951-Class 4	12191-Class 4	12397-Class 4

## ADDITIONAL ACCESSORIES

Part #	Description	Price
36092	Statement of Accuracy	\$45.00
11714	Weight gloves, white cotton	5.00
11711	Tweezer	3.00
152414	Premium tweezer	35.00
25836	Serial number	15.00
11755	Leaf weight cover	35.00

# Metric Sets

Range: 200 g

### CLASS 0\*\*

Set Size	Part #	Price
200g - 1 mg	<b>45927</b>	\$3,720.00
200g - 1 mg*	<b>156298</b>	3,720.00
(2) 200g - 1 mg*	<b>87039</b>	4,145.00
200g - 10 mg	<b>84213</b>	3,345.00
(2) 200g - 10 mg*	<b>87038</b>	3,600.00
200g - 100 mg	<b>45928</b>	2,905.00
(2) 200g - 100 mg*	<b>87037</b>	3,110.00
200g - 1 g	<b>45929</b>	1,945.00
(2) 200g - 1 g*	<b>87040</b>	2,310.00

### REPLACEMENT CASES

Part #	Price
<b>34645</b>	\$270.00
<b>34645</b>	270.00

\*\* Calibration Report included, Statement of Accuracy not available for Class 0

### CLASS 1

Set Size	Part #	Price
200g - 1 mg	<b>12462</b>	\$1,050.00
200g - 1 mg*	<b>156299</b>	1,050.00
(2) 200g - 1 mg*	<b>87053</b>	1,110.00
200g - 10 mg	<b>12467</b>	960.00
(2) 200g - 10 mg*	<b>87049</b>	1,100.00
200g - 100 mg	<b>45960</b>	920.00
(2) 200g - 100 mg*	<b>87045</b>	1,070.00
200g - 1 g	<b>12468</b>	780.00
200g - 1 g*	<b>11893</b>	780.00
(2) 200g - 1 g*	<b>87057</b>	885.00

### CLASS 2

Part #	Price
<b>11914</b>	\$1,005.00
<b>156300</b>	1,005.00
<b>87054</b>	1,055.00
<b>11916</b>	825.00
<b>87050</b>	1,025.00
<b>45961</b>	790.00
<b>87046</b>	1,000.00
<b>11917</b>	730.00
<b>12154</b>	730.00
<b>87058</b>	755.00

### CLASS 3

Part #	Price
<b>12051</b>	\$995.00
<b>156301</b>	995.00
<b>87055</b>	1,050.00
<b>12064</b>	800.00
<b>87051</b>	1,000.00
<b>45962</b>	730.00
<b>87047</b>	995.00
<b>12065</b>	725.00
<b>12292</b>	725.00
<b>87059</b>	750.00

### OPTIONAL

Calibration Report	Price
	\$880.00
	880.00
	970.00
	730.00
	820.00
	580.00
	670.00
	430.00
	430.00
	520.00

### OPTIONAL

Mass Value Certificate	Price
	\$630.00
	630.00
	645.00
	515.00
	595.00
	430.00
	475.00
	310.00
	310.00
	355.00

### REPLACEMENT CASES

Part #	Price
<b>34645</b>	\$270.00
<b>34645</b>	270.00

### CLASS 4

Set Size	Part #	Price
200g - 1 mg	<b>12197</b>	\$780.00
200g - 1 mg*	<b>156302</b>	780.00
(2) 200g - 1 mg*	<b>87056</b>	850.00
200g - 10 mg	<b>12210</b>	740.00
(2) 200g - 10 mg*	<b>87052</b>	815.00
200g - 100 mg	<b>45963</b>	665.00
(2) 200g - 100 mg*	<b>87048</b>	780.00
200g - 1 g	<b>12211</b>	560.00
200g - 1 g*	<b>12395</b>	560.00
(2) 200g - 1 g*	<b>87060</b>	660.00

### OPTIONAL

Traceable Certificate	Price
	\$510.00
	510.00
	540.00
	420.00
	450.00
	325.00
	360.00
	235.00
	235.00
	270.00

### REPLACEMENT CASES

Part #	Price
<b>34645</b>	\$270.00
<b>34645</b>	270.00

\*5-2-2-1 configuration



Set includes lifting device and gloves

# Metric Sets

Range: 200g

## WEIGHT SET CONTENTS

200g - 1 mg	200g - 1 mg*	(2) 200g - 1 mg*	200g - 10mg	(2) 200g - 10mg*	200g - 100mg	(2) 200g - 100mg*	200g - 1g	200g - 1g*	(2) 200g - 1g*
1 - 200g	1 - 200g	2 - 200g	1 - 200g	2 - 200g	1 - 200g	2 - 200g	1 - 200g	1 - 200g	2 - 200g
1 - 100g	1 - 100g	1 - 100g	1 - 100g	1 - 100g	1 - 100g	1 - 100g	1 - 100g	1 - 100g	1 - 100g
1 - 50g	1 - 50g	1 - 50g	1 - 50g	1 - 50g	1 - 50g	1 - 50g	1 - 50g	1 - 50g	1 - 50g
1 - 30g	2 - 20g	2 - 20g	1 - 30g	2 - 20g	1 - 30g	2 - 20g	1 - 30g	2 - 20g	2 - 20g
1 - 20g	1 - 10g	1 - 10g	1 - 20g	1 - 10g	1 - 20g	1 - 10g	1 - 20g	1 - 10g	1 - 10g
1 - 10g	1 - 5g	1 - 5g	1 - 10g	1 - 5g	1 - 10g	1 - 5g	1 - 10g	1 - 5g	1 - 5g
1 - 5g	2 - 2g	2 - 2g	1 - 5g	2 - 2g	1 - 5g	2 - 2g	1 - 5g	2 - 2g	2 - 2g
1 - 3g	1 - 1g	1 - 1g	1 - 3g	1 - 1g	1 - 3g	1 - 1g	1 - 3g	1 - 1g	1 - 1g
1 - 2g	1 - 500mg	1 - 500mg	1 - 2g	1 - 500mg	1 - 2g	1 - 500mg	1 - 2g	-	-
1 - 1g	2 - 200mg	2 - 200mg	1 - 1g	2 - 200mg	1 - 1g	2 - 200mg	1 - 1g	-	-
1 - 500mg	1 - 100mg	1 - 100mg	1 - 500mg	1 - 100mg	1 - 500mg	1 - 100mg	-	-	-
1 - 300mg	1 - 50mg	1 - 50mg	1 - 300mg	1 - 50mg	1 - 300mg	-	-	-	-
1 - 200mg	2 - 20mg	2 - 20mg	1 - 200mg	2 - 20mg	1 - 200mg	-	-	-	-
1 - 100mg	1 - 10mg	1 - 10mg	1 - 100mg	1 - 10mg	1 - 100mg	-	-	-	-
1 - 50mg	1 - 5mg	1 - 5mg	1 - 50mg	-	-	-	-	-	-
1 - 30mg	2 - 2mg	2 - 2mg	1 - 30mg	-	-	-	-	-	-
1 - 20mg	1 - 1mg	1 - 1mg	1 - 20mg	-	-	-	-	-	-
1 - 10mg	-	-	1 - 10mg	-	-	-	-	-	-
1 - 5mg	-	-	-	-	-	-	-	-	-
1 - 3mg	-	-	-	-	-	-	-	-	-
1 - 2mg	-	-	-	-	-	-	-	-	-
1 - 1mg	-	-	-	-	-	-	-	-	-

### Piece Count

22	22	23	18	19	14	15	10	10	11
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### Total Weight

422.221g	422.221g	622.221g	422.210g	611.1g	422.19g	611g	421g	410g	610g
Part #	Part #	Part #	Part #	Part #	Part #	Part #	Part #	Part #	Part #
45927-Class 0	156298-Class 0	87039-Class 0	84213-Class 0	87038-Class 0	45928-Class 0	87037-Class 0	45929-Class 0	-	87040-Class 0
12462-Class 1	156299-Class 1	87053-Class 1	12467-Class 1	87049-Class 1	45960-Class 1	87045-Class 1	12468-Class 1	11893-Class 1	87057-Class 1
11914-Class 2	156300-Class 2	87054-Class 2	11916-Class 2	87050-Class 2	45961-Class 2	87046-Class 2	11917-Class 2	12154-Class 2	87058-Class 2
12051-class 3	156301-Class 3	87055-Class 3	12064-Class 3	87051-Class 3	45962-Class 3	87047-Class 3	12065-Class 3	12292-Class 3	87059-Class 3
12197-Class 4	156302-Class 4	87056-Class 4	12210-Class 4	87052-Class 4	45963-Class 4	87048-Class 4	12211-Class 4	12395-Class 4	87060-Class 4

## CASE INSERT CLASS 0

Size	Part #	Price
200g - 1 mg	50431	\$100.00
(2) 200g - 1 mg*	84473	325.00
(2) 200g - 10mg*	84473	325.00
(2) 200g - 100mg*	84473	325.00
20g - 1g	50430	100.00
(2) 200 - 1g*	84472	325.00

## CASE INSERT CLASS 1 - 4

Size	Part #	Price
200g - 1 mg	11601	\$160.00
(2) 200g - 1g*	84465	160.00
(2) 200g - 1 mg*	84464	160.00
200g - 1g	11587	160.00

\* 5-2-2-1 configuration

## ADDITIONAL ACCESSORIES

Part #	Description	Price
36092	Statement of Accuracy	\$45.00
11714	Weight gloves, white cotton	5.00
11711	Tweezer	3.00
152414	Premium tweezer	35.00
25836	Serial number	15.00
11755	Leaf weight cover	35.00
50035	Weight forceps, plastic	35.00
11747	Lifter bar	15.00

# Metric Sets

Range: 300g and 500g

### CLASS 0\*\*

Set Size	Part #	Price	REPLACEMENT CASES	
			Part #	Price
500g - 1mg	<b>45923</b>	\$4,660.00	<b>34645</b>	\$270.00
500g - 100mg	<b>45924</b>	3,670.00	<b>34645</b>	270.00
500g - 1g	<b>45925</b>	3,040.00	<b>34645</b>	270.00
500g - 100g	<b>45926</b>	1,905.00	<b>34645</b>	270.00

\*\* Calibration Report included, Statement of Accuracy not available Class 0

### CLASS 1

Set Size	Part #	Price
300g - 1g	<b>11892</b>	\$1,310.00
500g - 1mg	<b>12469</b>	2,110.00
500g - 100mg	<b>45964</b>	2,170.00
500g - 1g	<b>12472</b>	1,425.00
500g - 1g*	<b>11891</b>	1,425.00
500g - 100g	<b>45968</b>	1,010.00

### CLASS 2

Part #	Price
<b>12152</b>	\$1,205.00
<b>11918</b>	1,675.00
<b>45965</b>	1,575.00
<b>11921</b>	1,310.00
<b>12151</b>	1,310.00
<b>45969</b>	925.00

### CLASS 3

Part #	Price
<b>12290</b>	\$1,175.00
<b>12066</b>	1,635.00
<b>45966</b>	1,495.00
<b>12069</b>	1,275.00
<b>12289</b>	1,275.00
<b>45970</b>	905.00

### OPTIONAL

Calibration Report
\$520.00
1,060.00
760.00
610.00
610.00
310.00

### OPTIONAL

Mass Value Certificate
\$355.00
685.00
515.00
395.00
395.00
155.00

### REPLACEMENT CASES

Part #	Price
<b>34645</b>	\$270.00
<b>34645</b>	270.00

### CLASS 4

Set Size	Part #	Price
300g - 1g	<b>12393</b>	\$1,075.00
500g - 1mg	<b>12212</b>	1,500.00
500g - 100mg	<b>45967</b>	1,335.00
500g - 1g	<b>12215</b>	1,175.00
500g - 1g*	<b>12392</b>	1,175.00
500g - 100g	<b>45971</b>	775.00

### OPTIONAL

Traceable Certificate
\$270.00
575.00
360.00
300.00
300.00
120.00

### REPLACEMENT CASES

Part #	Price
<b>34645</b>	\$270.00
<b>34645</b>	270.00

\* 5-2-2-1 configuration



Set includes lifting device and gloves PN 12151 500g to 1g

# Metric Sets

Range: 300g and 500g

## WEIGHT SET CONTENTS

300g - 1g	500g - 1mg	500g - 100mg	500g - 1g	500g - 1g*	500g - 100g
1 - 300g	1 - 500g	1 - 500g	1 - 500g	1 - 500g	1 - 500g
1 - 200g	1 - 300g	1 - 300g	1 - 300g	2 - 200g	1 - 300g
1 - 100g	1 - 200g	1 - 200g	1 - 200g	1 - 100g	1 - 200g
1 - 50g	1 - 100g	1 - 100g	1 - 100g	1 - 50g	1 - 100g
1 - 30g	1 - 50g	1 - 50g	1 - 50g	2 - 20g	-
1 - 20g	1 - 30g	1 - 30g	1 - 30g	1 - 10g	-
1 - 10g	1 - 20g	1 - 20g	1 - 20g	1 - 5g	-
1 - 5g	1 - 10g	1 - 10g	1 - 10g	2 - 2g	-
1 - 3g	1 - 5g	1 - 5g	1 - 5g	1 - 1g	-
1 - 2g	1 - 3g	1 - 3g	1 - 3g	-	-
1 - 1g	1 - 2g	1 - 2g	1 - 2g	-	-
-	1 - 1g	1 - 1g	1 - 1g	-	-
-	1 - 500mg	1 - 500mg	-	-	-
-	1 - 300mg	1 - 300mg	-	-	-
-	1 - 200mg	1 - 200mg	-	-	-
-	1 - 100mg	1 - 100mg	-	-	-
-	1 - 50mg	-	-	-	-
-	1 - 30mg	-	-	-	-
-	1 - 20mg	-	-	-	-
-	1 - 10mg	-	-	-	-
-	1 - 5mg	-	-	-	-
-	1 - 3mg	-	-	-	-
-	1 - 2mg	-	-	-	-
-	1 - 1mg	-	-	-	-

**Piece Count**

11	24	16	12	12	4
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**Total Weight**

721g	1.222221kg	1.2221kg	1.221kg	1.10kg	1.1kg
Part #					
-	<b>45923-Class 0</b>	<b>45924-class 0</b>	<b>45925-Class 0</b>	-	<b>45926-Class 0</b>
<b>11892-Class 1</b>	<b>12469-Class 1</b>	<b>45964-Class 1</b>	<b>12472-Class 1</b>	<b>11891-Class 1</b>	<b>45968-Class 1</b>
<b>12152-Class 2</b>	<b>11918-Class 2</b>	<b>45965-Class 2</b>	<b>11921-Class 2</b>	<b>12151-Class 2</b>	<b>45969-Class 2</b>
<b>12290-Class 3</b>	<b>12066-Class 3</b>	<b>45966-Class 3</b>	<b>12069-Class 3</b>	<b>12289-Class 3</b>	<b>45970-Class 3</b>
<b>12393-Class 4</b>	<b>12212-Class 4</b>	<b>45967-Class 4</b>	<b>12215-Class 4</b>	<b>12392-Class 4</b>	<b>45971-Class 4</b>

\*5-2-2-1 configuration

### CASE INSERT CLASS 0

Size	Part #	Price
500g - 1mg	<b>49500</b>	\$210.00
500g - 100g	<b>49501</b>	165.00

### CASE INSERT CLASS 1 - 4

Size	Part #	Price
300g - 1g	<b>11586</b>	\$160.00
500g - 1mg	<b>11602</b>	160.00
500g - 1g*	<b>11585</b>	160.00

### ADDITIONAL ACCESSORIES

Part #	Description	Price
<b>36092</b>	Statement of Accuracy	\$45.00
<b>11714</b>	Weight gloves, white cotton	5.00
<b>11711</b>	Tweezer	3.00
<b>152414</b>	Premium tweezer	35.00
<b>25836</b>	Serial number	15.00
<b>11755</b>	Leaf weight cover	35.00
<b>50035</b>	Weight forceps, plastic	35.00
<b>11747</b>	Lifter bar	15.00

# Metric Sets

Range: 1 kg

### CLASS 0\*\*

Set Size	Part #	Price	Part #	Price
1 kg - 1 mg	<b>45919</b>	\$5,385.00	<b>50437</b>	\$1,480.00
1 kg - 100 mg	<b>45920</b>	4,445.00	<b>50437</b>	1,480.00
1 kg - 1 g	<b>45921</b>	3,740.00	<b>50437</b>	1,480.00
1 kg - 100 g	<b>45922</b>	2,725.00	<b>50437</b>	1,480.00

### REPLACEMENT CASES

\*\* Calibration Report included, Statement of Accuracy not available Class 0

### CLASS 1

Set Size	Part #	Price
1 kg - 1 mg	<b>12473</b>	\$2,570.00
1 kg - 100 mg	<b>45972</b>	2,525.00
1 kg - 1 g	<b>12476</b>	2,300.00
1 kg - 1 g*	<b>11889*</b>	2,300.00
1 kg - 100 g	<b>45976</b>	2,070.00

### CLASS 2

Part #	Price	Part #	Price
<b>11922</b>	\$2,360.00	<b>12070</b>	\$2,345.00
<b>45973</b>	2,345.00	<b>45974</b>	2,300.00
<b>11925</b>	2,200.00	<b>12073</b>	2,100.00
<b>12149*</b>	2,200.00	<b>12288*</b>	2,100.00
<b>45977</b>	2,030.00	<b>45978</b>	1,990.00

### CLASS 3

### OPTIONAL

Calibration Report	Mass Value Certificate
\$1,150.00	\$725.00
850.00	505.00
700.00	435.00
700.00	435.00
400.00	195.00

### OPTIONAL

### REPLACEMENT CASES

Part #	Price
<b>11603</b>	\$1,480.00
<b>11603</b>	1,480.00
<b>11603</b>	1,480.00
<b>11584</b>	1,285.00
<b>11603</b>	1,480.00

### CLASS 4

Set Size	Part #	Price
1 kg - 1 mg	<b>12216</b>	\$2,135.00
1 kg - 100 mg	<b>45975</b>	2,100.00
1 kg - 1 g	<b>12219</b>	2,055.00
1 kg - 1 g*	<b>12391*</b>	1,990.00
1 kg - 100 g	<b>45979</b>	1,765.00

### OPTIONAL

Traceable Certificate
\$600.00
425.00
335.00
335.00
150.00

### REPLACEMENT CASES

Part #	Price
<b>11603</b>	\$1,480.00
<b>11603</b>	1,480.00
<b>11603</b>	1,480.00
<b>11605</b>	1,285.00
<b>11603</b>	1,480.00

\* 5-2-2-1 configuration



Set includes lifting device and gloves PN 12473 1 kg to 1 mg

# Metric Sets

Range: 1 kg

## WEIGHT SET CONTENTS

1 kg - 1 mg	1 kg - 100mg	1 kg - 1 g	1 kg - 1 g*	1 kg - 100g
1 - 1 kg				
1 - 500g				
1 - 300g	1 - 300g	1 - 300g	2 - 200g	1 - 300g
1 - 200g	1 - 200g	1 - 200g	1 - 100g	1 - 200g
1 - 100g	1 - 100g	1 - 100g	1 - 50g	1 - 100g
1 - 50g	1 - 50g	1 - 50g	2 - 20g	-
1 - 30g	1 - 30g	1 - 30g	1 - 10g	-
1 - 20g	1 - 20g	1 - 20g	1 - 5g	-
1 - 10g	1 - 10g	1 - 10g	2 - 2g	-
1 - 5g	1 - 5g	1 - 5g	1 - 1g	-
1 - 3g	1 - 3g	1 - 3g	-	-
1 - 2g	1 - 2g	1 - 2g	-	-
1 - 1g	1 - 1g	1 - 1g	-	-
1 - 500mg	1 - 500mg	-	-	-
1 - 300mg	1 - 300mg	-	-	-
1 - 200mg	1 - 200mg	-	-	-
1 - 100mg	1 - 100mg	-	-	-
1 - 50mg	-	-	-	-
1 - 30mg	-	-	-	-
1 - 20mg	-	-	-	-
1 - 10mg	-	-	-	-
1 - 5mg	-	-	-	-
1 - 3mg	-	-	-	-
1 - 2mg	-	-	-	-
1 - 1mg	-	-	-	-
<b>Piece Count</b>				
25	17	13	13	5
<b>Total Weight</b>				
2.222221 kg	2.2221 kg	2.221 kg	2.11 kg	2.1 kg
Part #				
<b>45919-Class 0</b>	<b>45920-Class 0</b>	<b>45921-Class 0</b>	-	<b>45922-Class 0</b>
<b>12473-Class 1</b>	<b>45972-Class 1</b>	<b>12476-Class 1</b>	<b>11889-Class 1</b>	<b>45976-Class 1</b>
<b>11922-Class 2</b>	<b>45973-Class 2</b>	<b>11925-Class 2</b>	<b>12149-Class 2</b>	<b>45977-Class 2</b>
<b>12070-Class 3</b>	<b>45974-Class 3</b>	<b>12073-Class 3</b>	<b>12288-Class 3</b>	<b>45978-Class 3</b>
<b>12216-Class 4</b>	<b>45975-Class 4</b>	<b>12219-Class 4</b>	<b>12391-Class 4</b>	<b>45979-Class 4</b>

\* 5-2-2-1 configuration

### SECONDARY CASE CLASS 1, 2, 3 AND 4

Size	Part #	Price
100g - 1 mg	<b>11596</b>	\$145.00
100g - 1 mg*	<b>11588</b>	145.00

### SECONDARY CASE CLASS 0

Size	Part #	Price
100g - 1 mg	<b>49503</b>	\$200.00

### CASE INSERT CLASSES 1-4

Size	Part #	Price
100g	<b>46380</b>	\$95.00

### ADDITIONAL ACCESSORIES

Part #	Description	Price
<b>36092</b>	Statement of Accuracy	\$45.00
<b>11714</b>	Weight gloves, white cotton	5.00
<b>11711</b>	Tweezer	3.00
<b>152414</b>	Premium tweezer	35.00
<b>25836</b>	Serial number	15.00
<b>11755</b>	Leaf weight cover	35.00
<b>50035</b>	Weight forceps, plastic	35.00
<b>11747</b>	Lifter bar	15.00
<b>50000</b>	Tong assembly, Class 0	60.00

# Metric Sets

Range: 2 kg

### CLASS 0\*\*

Set Size	Part #	Price
2 kg - 1 mg	<b>45915</b>	\$6,890.00
(2) 2 kg - 1 mg*	<b>87043</b>	8,255.00
(2) 2 kg - 10 mg*	<b>87042</b>	7,820.00
2 kg - 100 mg	<b>45916</b>	6,615.00
(2) 2 kg - 100 mg	<b>87041</b>	7,300.00
2 kg - 1 g	<b>45917</b>	4,960.00
(2) 2 kg x 1 g	<b>87044</b>	6,400.00
2 kg - 100 g	<b>45918</b>	4,000.00

### REPLACEMENT CASES

Part #	Price
<b>50439</b>	\$1,505.00
<b>84474</b>	1,595.00
<b>84474</b>	1,595.00
<b>50439</b>	1,505.00
<b>84474</b>	1,595.00
<b>50439</b>	1,505.00
<b>84474</b>	1,595.00
<b>50438</b>	1,505.00

\*\* Calibration Report included, Statement of Accuracy not available for Class 0

### CLASS 1

Set Size	Part #	Price
2 kg - 1 mg	<b>12477</b>	\$3,305.00
(2) 2 kg x 1 mg*	<b>87069</b>	3,685.00
(2) 2 kg x 10 mg*	<b>87065</b>	3,625.00
2 kg - 100 mg	<b>45980</b>	3,520.00
(2) 2 kg - 100 mg*	<b>87061</b>	3,595.00
2 kg - 1 g	<b>12480</b>	2,795.00
2 kg - 1 g*	<b>11888</b>	2,795.00
(2) 2 kg - 1 g*	<b>87073</b>	3,435.00
2 kg - 100 g	<b>45984</b>	2,700.00

### CLASS 2

Part #	Price
<b>11926</b>	\$2,945.00
<b>87070</b>	3,550.00
<b>87066</b>	3,300.00
<b>45981</b>	3,090.00
<b>87062</b>	3,220.00
<b>11929</b>	2,630.00
<b>12148</b>	2,630.00
<b>87074</b>	3,145.00
<b>45985</b>	2,580.00

### CLASS 3

Part #	Price
<b>12074</b>	\$2,895.00
<b>87071</b>	3,425.00
<b>87067</b>	3,160.00
<b>45982</b>	3,020.00
<b>87063</b>	3,085.00
<b>12077</b>	2,575.00
<b>12287</b>	2,575.00
<b>87075</b>	3,075.00
<b>45986</b>	2,420.00

### OPTIONAL

Calibration Report	Mass Value Certificate
\$1,250.00	\$850.00
1,360.00	910.00
1,210.00	790.00
950.00	610.00
1,060.00	670.00
800.00	490.00
800.00	490.00
910.00	550.00
500.00	250.00

### OPTIONAL

Part #	Price
<b>11604</b>	\$1,285.00
<b>84463</b>	1,295.00
<b>84463</b>	1,295.00
<b>11604</b>	1,285.00
<b>84463</b>	1,295.00
<b>11604</b>	1,285.00
<b>11583</b>	1,480.00
<b>84463</b>	1,295.00
<b>11604</b>	1,285.00

### REPLACEMENT CASES

### CLASS 4

Set Size	Part #	Price
2 kg - 1 mg	<b>12220</b>	\$2,580.00
(2) 2 kg x 1 mg*	<b>87072</b>	3,160.00
(2) 2 kg x 10 mg*	<b>87068</b>	2,885.00
2 kg - 100 mg	<b>45983</b>	3,000.00
(2) 2 kg - 100 mg*	<b>87064</b>	2,855.00
2 kg - 1 g	<b>12223</b>	2,475.00
2 kg - 1 g*	<b>12390</b>	2,475.00
(2) 2 kg - 1 g*	<b>87076</b>	2,680.00
2 kg - 100 g	<b>45987</b>	2,310.00

### OPTIONAL

Traceable Certificate
\$610.00
700.00
610.00
470.00
520.00
380.00
380.00
430.00
200.00

### REPLACEMENT CASES

Part #	Price
<b>11604</b>	\$1,285.00
<b>84463</b>	1,295.00
<b>84463</b>	1,295.00
<b>11604</b>	1,285.00
<b>84463</b>	1,295.00
<b>11604</b>	1,285.00
<b>11583</b>	1,480.00
<b>84463</b>	1,295.00
<b>11604</b>	1,285.00

\* 5-2-2-1 configuration



Set includes lifting device and gloves

# Metric Sets

Range: 2kg

## WEIGHT SET CONTENTS

2kg - 1mg	(2) 2kg - 1mg*	(2) 2kg - 10mg*	2kg - 100mg	(2) 2kg - 100mg*	2kg - 1g	2kg - 1g*	(2) 2kg - 1g*	2kg - 100g
1 - 2kg	2 - 2kg	2 - 2kg	1 - 2kg	2 - 2kg	1 - 2kg	1 - 2kg	2 - 2kg	1 - 2kg
1 - 1kg	1 - 1kg	1 - 1kg	1 - 1kg	1 - 1kg	1 - 1kg	1 - 1kg	1 - 1kg	1 - 1kg
1 - 500g	1 - 500g	1 - 500g	1 - 500g	1 - 500g	1 - 500g	1 - 500g	1 - 500g	1 - 500g
1 - 300g	2 - 200g	2 - 200g	1 - 300g	2 - 200g	1 - 300g	2 - 200g	2 - 200g	1 - 300g
1 - 200g	1 - 100g	1 - 100g	1 - 200g	1 - 100g	1 - 200g	1 - 100g	1 - 100g	1 - 200g
1 - 100g	1 - 50g	1 - 50g	1 - 100g	1 - 50g	1 - 100g	1 - 50g	1 - 50g	1 - 100g
1 - 50g	2 - 20g	2 - 20g	1 - 50g	2 - 20g	1 - 50g	2 - 20g	2 - 20g	-
1 - 30g	1 - 10g	1 - 10g	1 - 30g	1 - 10g	1 - 30g	1 - 10g	1 - 10g	-
1 - 20g	1 - 5g	1 - 5g	1 - 20g	1 - 5g	1 - 20g	1 - 5g	1 - 5g	-
1 - 10g	2 - 2g	2 - 2g	1 - 10g	2 - 2g	1 - 10g	2 - 2g	2 - 2g	-
1 - 5g	1 - 1g	1 - 1g	1 - 5g	1 - 1g	1 - 5g	1 - 1g	1 - 1g	-
1 - 3g	1 - 500mg	1 - 500mg	1 - 3g	1 - 500mg	1 - 3g	-	-	-
1 - 2g	2 - 200mg	2 - 200mg	1 - 2g	2 - 200mg	1 - 2g	-	-	-
1 - 1g	1 - 100mg	1 - 100mg	1 - 1g	1 - 100mg	1 - 1g	-	-	-
1 - 500mg	1 - 50mg	1 - 50mg	1 - 500mg	-	-	-	-	-
1 - 300mg	2 - 20mg	2 - 20mg	1 - 300mg	-	-	-	-	-
1 - 200mg	1 - 10mg	1 - 10mg	1 - 200mg	-	-	-	-	-
1 - 100mg	1 - 5mg	-	1 - 100mg	-	-	-	-	-
1 - 50mg	2 - 2mg	-	-	-	-	-	-	-
1 - 30mg	1 - 1mg	-	-	-	-	-	-	-
1 - 20mg	-	-	-	-	-	-	-	-
1 - 10mg	-	-	-	-	-	-	-	-
1 - 5mg	-	-	-	-	-	-	-	-
1 - 3mg	-	-	-	-	-	-	-	-
1 - 2mg	-	-	-	-	-	-	-	-
1 - 1mg	-	-	-	-	-	-	-	-

### Piece Count

26	27	23	18	19	14	14	15	6
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### Total Weight

4.222221 kg	6.222221 kg	6.22kg	4.2221 kg	6.2221 kg	4.11 kg	4.11 kg	6.221 kg	4.1 kg
Part #								
45915-Class 0	87043-Class 0	87042-Class 0	45916-Class 0	87041-Class 0	45917-Class 0	-	87044-Class 0	45918-Class 0
12477-Class 1	87069-Class 1	87065-Class 1	45980-Class 1	87061-Class 1	12480-Class 1	11888-Class 1	87073-Class 1	45984-Class 1
11926-Class 2	87070-Class 2	87066-Class 2	45981-Class 2	87062-Class 2	11929-Class 2	12148-Class 2	87074-Class 2	45985-Class 2
12074-Class 3	87071-Class 3	87067-Class 3	45982-Class 3	87063-Class 3	12077-Class 3	12287-Class 3	87075-Class 3	45986-Class 3
12220-Class 4	87072-Class 4	87068-Class 4	45983-Class 4	87064-Class 4	12223-Class 4	12390-Class 4	87076-Class 4	45987-Class 4

\* 5-2-2-1 configuration

## SECONDARY CASE CLASS 0

Size	Part #	Price
100g - 1mg*	34697	\$180.00
100g - 1mg	49503	200.00

## SECONDARY CASE CLASSES 1 - 4

Size	Part #	Price
100g - 1mg*	11588	\$145.00
100g - 1mg	11596	145.00

## CASE INSERT (WOODEN)

Size	Part #	Price
100g	46380	\$95.00

## ADDITIONAL ACCESSORIES

Part #	Description	Price
36092	Statement of Accuracy	\$45.00
11714	Weight gloves, white cotton	5.00
11711	Tweezer	3.00
152414	Premium tweezer	35.00
25836	Serial number	15.00
11755	Leaf weight cover	35.00
50035	Weight forceps, plastic	35.00
11747	Lifter bar	15.00
11712	Lifter bar, large handle	60.00
50000	Tong assembly, Class 0	60.00
50037	Lifter (Class 0 and OIML 2 and 5kg)	45.00

# Metric Sets

Range: 3 kg and 5 kg

### CLASS 0\*\*

Set Size	Part #	Price	Part #	Price
5kg - 1 mg	<b>45910</b>	\$9,345.00	<b>49495</b>	\$1,505.00
5kg - 100mg	<b>45911</b>	8,745.00	<b>49495</b>	1,505.00
5kg - 1 g	<b>45912</b>	7,655.00	<b>49495</b>	1,505.00
5kg - 100g	<b>45913</b>	6,435.00	<b>50440</b>	1,445.00

### REPLACEMENT CASES

\*\* Calibration Report included, Statement of Accuracy not available for Class 0

### CLASS 1

Set Size	Part #	Price
3kg - 1 g	<b>11887</b>	\$3,660.00
5kg - 1 mg	<b>12481</b>	4,880.00
5kg - 1 mg*	<b>114050</b>	4,880.00
5kg - 100mg	<b>45988</b>	4,610.00
5kg - 1 g	<b>12484</b>	4,330.00
5kg - 1 g *	<b>11886</b>	4,330.00
5kg - 100g	<b>45992</b>	4,000.00

### CLASS 2

Part #	Price
<b>12147</b>	\$3,120.00
<b>11930</b>	4,315.00
<b>114051</b>	4,315.00
<b>45989</b>	4,290.00
<b>11933</b>	3,965.00
<b>12146</b>	3,965.00
<b>45993</b>	3,630.00

### CLASS 3

Part #	Price
<b>12286</b>	\$3,110.00
<b>12078</b>	4,250.00
<b>114052</b>	4,250.00
<b>45990</b>	4,120.00
<b>12081</b>	3,935.00
<b>12285</b>	3,935.00
<b>45994</b>	3,605.00

### OPTIONAL

Calibration Report	Price
	\$910.00
	1,330.00
	1,330.00
	1,165.00
	1,015.00
	1,015.00
	715.00

### OPTIONAL

Mass Value Certificate	Price
	\$550.00
	800.00
	800.00
	725.00
	605.00
	605.00
	365.00

### REPLACEMENT CASES

Part #	Price
<b>11582</b>	\$1,285.00
<b>11605</b>	1,285.00
<b>11581</b>	1,285.00
<b>11605</b>	1,285.00
<b>11605</b>	1,285.00
<b>11581</b>	1,285.00
<b>11605</b>	1,285.00

### CLASS 4

Set Size	Part #	Price
3kg - 1 g	<b>12389</b>	\$2,785.00
5kg - 1 mg	<b>12224</b>	3,840.00
5kg - 1 mg*	<b>114053</b>	3,840.00
5kg - 100mg	<b>45991</b>	3,735.00
5kg - 1 g	<b>12227</b>	3,405.00
5kg - 1 g*	<b>12388</b>	3,405.00
5kg - 100g	<b>45995</b>	3,115.00

### OPTIONAL

Traceable Certificate	Price
	\$425.00
	740.00
	740.00
	560.00
	470.00
	470.00
	290.00

### REPLACEMENT CASES

Part #	Price
<b>11582</b>	\$1,285.00
<b>11605</b>	1,285.00
<b>11581</b>	1,285.00
<b>11605</b>	1,285.00
<b>11605</b>	1,285.00
<b>11581</b>	1,285.00
<b>11605</b>	1,285.00

\* 5-2-2-1 configuration



Set includes lifting device and gloves

# Metric Sets

Range: 3kg and 5kg

## WEIGHT SET CONTENTS

3kg - 1g	5kg - 1mg	5kg - 1mg*	5kg - 100mg	5kg - 1g	5kg - 1g*	5kg - 100g
1 - 3kg	1 - 5kg	1 - 5kg	1 - 5kg	1 - 5kg	1 - 5kg	1 - 5kg
1 - 2kg	1 - 3kg	2 - 2kg	1 - 3kg	1 - 3kg	2 - 2kg	1 - 3kg
1 - 1kg	1 - 2kg	1 - 1kg	1 - 2kg	1 - 2kg	1 - 1kg	1 - 2kg
1 - 500g	1 - 1kg	1 - 500g	1 - 1kg	1 - 1kg	1 - 500g	1 - 1kg
1 - 300g	1 - 500g	2 - 200g	1 - 500g	1 - 500g	2 - 200g	1 - 500g
1 - 200g	1 - 300g	1 - 100g	1 - 300g	1 - 300g	1 - 100g	1 - 300g
1 - 100g	1 - 200g	1 - 50g	1 - 200g	1 - 200g	1 - 50g	1 - 200g
1 - 50g	1 - 100g	2 - 20g	1 - 100g	1 - 100g	2 - 20g	1 - 100g
1 - 30g	1 - 50g	1 - 10g	1 - 50g	1 - 50g	1 - 10g	-
1 - 20g	1 - 30g	1 - 5g	1 - 30g	1 - 30g	1 - 5g	-
1 - 10g	1 - 20g	2 - 2g	1 - 20g	1 - 20g	2 - 2g	-
1 - 5g	1 - 10g	1 - 1g	1 - 10g	1 - 10g	1 - 1g	-
1 - 3g	1 - 5g	1 - 500mg	1 - 5g	1 - 5g	-	-
1 - 2g	1 - 3g	2 - 200mg	1 - 3g	1 - 3g	-	-
1 - 1g	1 - 2g	1 - 100mg	1 - 2g	1 - 2g	-	-
-	1 - 1g	1 - 50mg	1 - 1g	1 - 1g	-	-
-	1 - 500mg	2 - 20mg	1 - 500mg	-	-	-
-	1 - 300mg	1 - 10mg	1 - 300mg	-	-	-
-	1 - 200mg	1 - 5mg	1 - 200mg	-	-	-
-	1 - 100mg	2 - 2mg	1 - 100mg	-	-	-
-	1 - 50mg	1 - 1mg	-	-	-	-
-	1 - 30mg	-	-	-	-	-
-	1 - 20mg	-	-	-	-	-
-	1 - 10mg	-	-	-	-	-
-	1 - 5mg	-	-	-	-	-
-	1 - 3mg	-	-	-	-	-
-	1 - 2mg	-	-	-	-	-
-	1 - 1mg	-	-	-	-	-
<b>Piece Count</b>						
15	28	28	20	16	16	8
<b>Total Weight</b>						
7.221 kg	12.222221 kg	12.23 kg	12.22 kg	12.221 kg	11.110kg	12.1 kg
Part #	Part #	Part #	Part #	Part #	Part #	Part #
-	45910-Class 0	-	45911-Class 0	45912-Class 0	-	45913-Class 0
11887-Class 1	12481-Class 1	114050-Class 1	45988-Class 1	12484-Class 1	11886-Class 1	45992-Class 1
12147-Class 2	11930-Class 2	114051-Class 2	45989-Class 2	11933-Class 2	12146-Class 2	45993-Class 2
12286-Class 3	12078-Class 3	114052-Class 3	45990-Class 3	12081-Class 3	12285-Class 3	45994-Class 3
12389-Class 4	12224-Class 4	114053-Class 4	45991-Class 4	12227-Class 4	12388-Class 4	45995-Class 4

\* 5-2-2-1 configuration

### SECONDARY CASE CLASS 0

Size	Part #	Price
100g - 1mg	49503	\$200.00

### SECONDARY CASE CLASSES 1 - 4

Size	Part #	Price
100g - 1mg*	11588	\$145.00
100g - 1mg	11596	145.00

### CASE INSERT (WOODEN)

Size	Part #	Price
100g	46380	\$95.00

### ADDITIONAL ACCESSORIES

Part #	Description	Price
36092	Statement of Accuracy	\$45.00
11714	Weight gloves, white cotton	5.00
11711	Tweezer	3.00
152414	Premium tweezer	35.00
25836	Serial number	15.00
11755	Leaf weight cover	35.00
50035	Weight forceps, plastic	35.00
11747	Lifter bar	15.00
11712	Lifter bar, large handle	60.00
50000	Tong assembly, Class 0	60.00
50037	Lifter (Class 0 and OIML 2 and 5 kg)	45.00

# Metric Sets

Range: 10kg

### CLASS 0\*\*

Set Size	Part #	Price	Part #	Price
10kg - 1 mg	<b>45905</b>	\$12,165.00	<b>50442</b>	\$1,755.00
10kg - 100mg	<b>45906</b>	11,545.00	<b>50442</b>	1,755.00
10kg - 1 g	<b>45907</b>	9,855.00	<b>50442</b>	1,755.00
10kg - 100g	<b>45908</b>	9,765.00	<b>50442</b>	1,755.00
10kg - 1 kg	<b>45909</b>	7,695.00	<b>50441</b>	1,480.00

### REPLACEMENT CASES

\*\* Calibration Report included, Statement of Accuracy not available for Class 0

### CLASS 1

Set Size	Part #	Price
10kg - 1 mg	<b>12485</b>	\$6,920.00
10kg - 100mg	<b>45996</b>	6,815.00
10kg - 1 g	<b>12488</b>	6,470.00
10kg - 1 g*	<b>11885</b>	6,470.00
10kg - 100g	<b>46000</b>	6,400.00
10kg - 1 kg	<b>46004</b>	5,955.00

### CLASS 2

Part #	Price
<b>11934</b>	\$6,625.00
<b>45997</b>	6,510.00
<b>11937</b>	6,405.00
<b>12144</b>	6,405.00
<b>46001</b>	6,005.00
<b>46005</b>	5,370.00

### CLASS 3

Part #	Price
<b>12082</b>	\$6,570.00
<b>45998</b>	6,415.00
<b>12085</b>	6,325.00
<b>12283</b>	6,325.00
<b>46002</b>	5,930.00
<b>46006</b>	5,310.00

### OPTIONAL

Calibration Report	Price
	\$1,420.00
	1,265.00
	1,120.00
	1,120.00
	820.00
	510.00

### OPTIONAL

Mass Value Certificate	Price
	\$850.00
	780.00
	660.00
	660.00
	420.00
	270.00

### REPLACEMENT CASES

Part #	Price
<b>11606</b>	\$1,725.00
<b>11606</b>	1,725.00
<b>11606</b>	1,725.00
<b>11580</b>	1,725.00
<b>11606</b>	1,725.00
<b>11606</b>	1,725.00

### CLASS 4

Set Size	Part #	Price
10kg - 1 mg	<b>12228</b>	\$5,890.00
10kg - 100mg	<b>45999</b>	5,785.00
10kg - 1 g	<b>12231</b>	5,705.00
10kg - 1 g*	<b>12386</b>	5,705.00
10kg - 100g	<b>46003</b>	5,345.00
10kg - 1 kg	<b>46007</b>	4,780.00

### OPTIONAL

Traceable Certificate	Price
	\$790.00
	610.00
	515.00
	515.00
	335.00
	240.00

### REPLACEMENT CASES

Part #	Price
<b>11606</b>	\$1,725.00
<b>11606</b>	1,725.00
<b>11606</b>	1,725.00
<b>11580</b>	1,725.00
<b>11606</b>	1,725.00
<b>11606</b>	1,725.00

\* 5-2-2-1 configuration



Set includes lifting device and gloves PN 12485 10kg to 1 mg

# Metric Sets

Range: 10kg

## WEIGHT SET CONTENTS

10kg - 1 mg	10kg - 100 mg	10kg - 1 g	10kg - 1 g*	10kg - 100g	10kg - 1 kg
1 - 10kg	1 - 10kg	1 - 10kg	1 - 10kg	1 - 10kg	1 - 10kg
1 - 5kg	1 - 5kg	1 - 5kg	1 - 5kg	1 - 5kg	1 - 5kg
1 - 3kg	1 - 3kg	1 - 3kg	2 - 2kg	1 - 3kg	1 - 3kg
1 - 2kg	1 - 2kg	1 - 2kg	1 - 1kg	1 - 2kg	1 - 2kg
1 - 1kg	1 - 1kg	1 - 1kg	1 - 500g	1 - 1kg	1 - 1kg
1 - 500g	1 - 500g	1 - 500g	2 - 200g	1 - 500g	-
1 - 300g	1 - 300g	1 - 300g	1 - 100g	1 - 300g	-
1 - 200g	1 - 200g	1 - 200g	1 - 50g	1 - 200g	-
1 - 100g	1 - 100g	1 - 100g	2 - 20g	1 - 100g	-
1 - 50g	1 - 50g	1 - 50g	1 - 10g	-	-
1 - 30g	1 - 30g	1 - 30g	1 - 5g	-	-
1 - 20g	1 - 20g	1 - 20g	2 - 2g	-	-
1 - 10g	1 - 10g	1 - 10g	1 - 1g	-	-
1 - 5g	1 - 5g	1 - 5g	-	-	-
1 - 3g	1 - 3g	1 - 3g	-	-	-
1 - 2g	1 - 2g	1 - 2g	-	-	-
1 - 1g	1 - 1g	1 - 1g	-	-	-
1 - 500mg	1 - 500mg	-	-	-	-
1 - 300mg	1 - 300mg	-	-	-	-
1 - 200mg	1 - 200mg	-	-	-	-
1 - 100mg	1 - 100mg	-	-	-	-
1 - 50mg	-	-	-	-	-
1 - 30mg	-	-	-	-	-
1 - 20mg	-	-	-	-	-
1 - 10mg	-	-	-	-	-
1 - 5mg	-	-	-	-	-
1 - 3mg	-	-	-	-	-
1 - 2mg	-	-	-	-	-
1 - 1mg	-	-	-	-	-

**Piece Count**

29	21	17	17	9	5
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**Total Weight**

22.22221 kg	22.2221 kg	22.221 kg	21.11 kg	22.1 kg	21 kg
Part #					
45905-Class 0	45906-Class 0	45907-Class 0	-	45908-Class 0	45909-Class 0
12485-Class 1	45996-Class 1	12488-Class 1	11885-Class 1	46000-Class 1	46004-Class 1
11934-Class 2	45997-Class 2	11937-Class 2	12144-Class 2	46001-Class 2	46005-Class 2
12082-Class 3	45998-Class 3	12085-Class 3	12283-Class 3	46002-Class 3	46006-Class 3
12278-Class 4	45999-Class 4	12231-Class 4	12386-Class 4	46003-Class 4	46007-Class 4

\* 5-2-2-1 configuration

### SECONDARY CASE CLASS 0

Size	Part #	Price
100g - 1 mg*	11588	\$145.00
100g - 1 mg	49503	200.00
Insert, 100g	49489	130.00

### SECONDARY CASE CLASSES 1 - 4

Size	Part #	Price
100g - 1 mg*	11588	\$145.00
100g - 1 mg	11596	145.00
Insert, 100g	46380	95.00

### ADDITIONAL ACCESSORIES

Part #	Description	Price
36092	Statement of Accuracy	\$45.00
11714	Weight gloves, white cotton	5.00
11711	Tweezer	3.00
152414	Premium tweezer	35.00
25836	Serial number	15.00
11755	Leaf weight cover	35.00
50035	Weight forceps, plastic	35.00
11747	Lifter bar	15.00
11712	Lifter bar, large handle	60.00
50000	Tong assembly, Class 0	60.00
50037	Lifter (Class 0 and OIML 2kg and 5kg)	45.00

# Metric Sets

Range: 20kg and 25 kg

### CLASS 0\*\*

Set Size	Part #	Price
20kg - 1 mg	<b>45900</b>	\$15,420.00
20kg - 100 mg	<b>45901</b>	14,810.00
20kg - 1 g	<b>45902</b>	13,115.00
20kg - 100 g	<b>45903</b>	13,020.00
20kg - 1 kg	<b>45904</b>	11,325.00

### REPLACEMENT CASES

Part #	Price
<b>50670</b>	\$1,755.00
<b>50670</b>	1,755.00

\*\* Calibration Report included, Statement of Accuracy not available for Class 0

### CLASS 1

Set Size	Part #	Price
25 kg - 1 g*	<b>11883</b>	\$12,960.00
20kg - 1 mg	<b>12489</b>	9,520.00
20kg - 100 mg	<b>46008</b>	9,410.00
20kg - 1 g	<b>12492</b>	8,830.00
20kg - 1 g*	<b>11884</b>	8,830.00
20kg - 100g	<b>46012</b>	8,415.00
20kg - 1 kg	<b>46016</b>	8,180.00

### CLASS 2

Part #	Price
<b>12140</b>	\$11,680.00
<b>11938</b>	8,630.00
<b>46009</b>	8,505.00
<b>11941</b>	8,410.00
<b>12142</b>	8,410.00
<b>46013</b>	8,010.00
<b>46017</b>	7,380.00

### CLASS 3

Part #	Price
<b>12279</b>	\$11,235.00
<b>12086</b>	8,550.00
<b>46010</b>	8,405.00
<b>12089</b>	8,310.00
<b>12281</b>	8,310.00
<b>46014</b>	7,910.00
<b>46018</b>	7,285.00

### OPTIONAL

Calibration Report	Price
	\$1,325.00
	1,600.00
	1,375.00
	1,225.00
	1,225.00
	925.00
	615.00

### OPTIONAL

Mass Value Certificate	Price
	\$775.00
	975.00
	835.00
	720.00
	720.00
	480.00
	325.00

### REPLACEMENT CASES

Part #	Price
<b>11578</b>	\$1,725.00
<b>11608</b>	1,725.00
<b>11608</b>	1,725.00
<b>11608</b>	1,725.00
<b>11579</b>	1,725.00
<b>11608</b>	1,725.00
<b>11608</b>	1,725.00

### CLASS 4

Set Size	Part #	Price
25 kg - 1 g*	<b>12382</b>	\$10,510.00
20kg - 1 mg	<b>12232</b>	7,700.00
20kg - 100 mg	<b>46011</b>	7,570.00
20kg - 1 g	<b>12235</b>	7,485.00
20kg - 1 g*	<b>12384</b>	7,485.00
20kg - 100g	<b>46015</b>	7,135.00
20kg - 1 kg	<b>46019</b>	6,560.00

### OPTIONAL

Traceable Certificate	Price
	\$560.00
	850.00
	650.00
	580.00
	580.00
	380.00
	260.00

### REPLACEMENT CASES

Part #	Price
<b>11578</b>	\$1,725.00
<b>11608</b>	1,725.00
<b>11608</b>	1,725.00
<b>11579</b>	1,725.00
<b>11608</b>	1,725.00
<b>11608</b>	1,725.00
<b>11608</b>	1,725.00

\* 5-2-2-1 configuration

# Metric Sets

Range: 20 kg and 25 kg

## WEIGHT SET CONTENTS

25 kg - 1 g*	20 kg - 1 mg	20 kg - 100 mg	20 kg - 1 g	20 kg - 1 g*	20 kg - 100 g	20 - 1 kg
1 - 25 kg	1 - 20 kg	1 - 20 kg	1 - 20 kg	1 - 20 kg	1 - 20 kg	1 - 20 kg
1 - 10 kg	1 - 10 kg	1 - 10 kg	1 - 10 kg	1 - 10 kg	1 - 10 kg	1 - 10 kg
1 - 5 kg	1 - 5 kg	1 - 5 kg	1 - 5 kg	1 - 5 kg	1 - 5 kg	1 - 5 kg
2 - 2 kg	1 - 3 kg	1 - 3 kg	1 - 3 kg	2 - 2 kg	1 - 3 kg	1 - 3 kg
1 - 1 kg	1 - 2 kg	1 - 2 kg	1 - 2 kg	1 - 1 kg	1 - 2 kg	1 - 2 kg
1 - 500 g	1 - 1 kg	1 - 1 kg	1 - 1 kg	1 - 500 g	1 - 1 kg	1 - 1 kg
2 - 200 g	1 - 500 g	1 - 500 g	1 - 500 g	2 - 200 g	1 - 500 g	-
1 - 100 g	1 - 300 g	1 - 300 g	1 - 300 g	1 - 100 g	1 - 300 g	-
1 - 50 g	1 - 200 g	1 - 200 g	1 - 200 g	1 - 50 g	1 - 200 g	-
2 - 20 g	1 - 100 g	1 - 100 g	1 - 100 g	2 - 20 g	1 - 100 g	-
1 - 10 g	1 - 50 g	1 - 50 g	1 - 50 g	1 - 10 g	-	-
1 - 5 g	1 - 30 g	1 - 30 g	1 - 30 g	1 - 5 g	-	-
2 - 2 g	1 - 20 g	1 - 20 g	1 - 20 g	2 - 2 g	-	-
1 - 1 g	1 - 10 g	1 - 10 g	1 - 10 g	1 - 1 g	-	-
-	1 - 5 g	1 - 5 g	1 - 5 g	--	-	-
-	1 - 3 g	1 - 3 g	1 - 3 g	-	-	-
-	1 - 2 g	1 - 2 g	1 - 2 g	-	-	-
-	1 - 1 g	1 - 1 g	1 - 1 g	-	-	-
-	1 - 500 mg	1 - 500 mg	-	-	-	-
-	1 - 300 mg	1 - 300 mg	-	-	-	-
-	1 - 200 mg	1 - 200 mg	-	-	-	-
-	1 - 100 mg	1 - 100 mg	-	-	-	-
-	1 - 50 mg	-	-	-	-	-
-	1 - 30 mg	-	-	-	-	-
-	1 - 20 mg	-	-	-	-	-
-	1 - 10 mg	-	-	-	-	-
-	1 - 5 mg	-	-	-	-	-
-	1 - 3 mg	-	-	-	-	-
-	1 - 2 mg	-	-	-	-	-
-	1 - 1 mg	-	-	-	-	-

### Piece Count

18	30	22	18	18	10	6
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### Total Weight

46.11 kg	42.222221 kg	42.22 kg	42.22 kg	41.11 kg	42.1 kg	41 kg
Part #						
-	<b>45900-Class 0</b>	<b>45901-Class 0</b>	<b>45902-Class 0</b>	-	<b>45903-Class 0</b>	<b>45904-Class 0</b>
<b>11883-Class 1</b>	<b>12489-Class 1</b>	<b>46008-Class 1</b>	<b>12492-Class 1</b>	<b>11884-Class 1</b>	<b>46012-Class 1</b>	<b>46016-Class 1</b>
<b>12140-Class 2</b>	<b>11938-Class 2</b>	<b>46009-Class 2</b>	<b>11941-Class 2</b>	<b>12142-Class 2</b>	<b>46013-Class 2</b>	<b>46017-Class 2</b>
<b>12279-Class 3</b>	<b>12086-Class 3</b>	<b>46010-Class 3</b>	<b>12089-Class 3</b>	<b>12281-Class 3</b>	<b>46014-Class 3</b>	<b>46018-Class 3</b>
<b>12382-Class 4</b>	<b>12232-Class 4</b>	<b>46011-Class 4</b>	<b>12235-Class 4</b>	<b>12384-Class 4</b>	<b>46015-Class 4</b>	<b>46019-Class 4</b>

\* 5-2-2-1 configuration

## SECONDARY CASE CLASS 0

Size	Part #	Price
100 g - 1 mg*	<b>11588</b>	\$145.00
100 g - 1 mg	<b>49503</b>	200.00
Insert, 100 g	<b>49489</b>	130.00

## SECONDARY CASE CLASSES 1 - 4

Size	Part #	Price
100 g - 1 mg*	<b>11588</b>	\$145.00
100 g - 1 mg	<b>11596</b>	145.00
Insert, 100 g	<b>46380</b>	95.00

## ADDITIONAL ACCESSORIES

Part #	Description	Price
<b>36092</b>	Statement of Accuracy	\$45.00
<b>11714</b>	Weight gloves, white cotton	5.00
<b>11711</b>	Tweezer	3.00
<b>152414</b>	Premium tweezer	35.00
<b>25836</b>	Serial number	15.00
<b>11755</b>	Leaf weight cover	35.00
<b>50035</b>	Weight forceps, plastic	35.00
<b>11747</b>	Lifter bar	15.00
<b>11712</b>	Lifter bar, large handle	60.00
<b>50000</b>	Tong assembly, Class 0	60.00
<b>50037</b>	Lifter (Class 0 and OIML 2 and 5 kg)	45.00

# Avoirdupois Sets

Range: 50lb through 2lb

CLASS 1			CLASS 2		CLASS 3		OPTIONAL	OPTIONAL	REPLACEMENT CASES	
Set Size	Part #	Price	Part #	Price	Part #	Price	Calibration Report	Mass Value Certificate	Part #	Price
50lb - 1/32oz	<b>11999</b>	\$16,940.00	<b>12145</b>	\$16,760.00	<b>12284</b>	\$16,535.00	\$1,200.00	\$760.00	<b>11589</b>	\$1,725.00
50lb - 0.001lb	<b>119043</b>	16,940.00	<b>119044</b>	16,760.00	<b>119045</b>	16,535.00	1,200.00	760.00	<b>11589</b>	1,725.00
20lb - 1/32oz	<b>11997</b>	8,105.00	<b>12143</b>	8,100.00	<b>12282</b>	8,090.00	900.00	640.00	<b>11590</b>	1,850.00
20lb - 0.001lb	<b>119047</b>	8,105.00	<b>119048</b>	8,100.00	<b>119049</b>	8,090.00	900.00	640.00	<b>11590</b>	1,850.00
10lb - 1/32oz	<b>11995</b>	5,665.00	<b>12141</b>	5,500.00	<b>12280</b>	5,430.00	790.00	570.00	<b>11591</b>	1,480.00
10lb - 0.001lb	<b>119051</b>	5,665.00	<b>119052</b>	5,500.00	<b>119053</b>	5,430.00	790.00	570.00	<b>11591</b>	1,480.00
5lb - 1/32oz	<b>11993</b>	4,315.00	<b>12139</b>	4,165.00	<b>12278</b>	4,110.00	695.00	510.00	<b>11592</b>	1,145.00
5lb - 0.001lb	<b>119055</b>	4,315.00	<b>119056</b>	4,165.00	<b>119057</b>	4,110.00	695.00	510.00	<b>11592</b>	1,145.00
2lb - 1/32oz	<b>11991</b>	2,885.00	<b>12137</b>	2,760.00	<b>12276</b>	2,610.00	525.00	400.00	<b>11593</b>	1,495.00
2lb - 0.001lb	<b>119059</b>	2,885.00	<b>119060</b>	2,760.00	<b>119061</b>	2,610.00	525.00	400.00	<b>11593</b>	1,495.00

CLASS 4			OPTIONAL	REPLACEMENT CASES	
Set Size	Part #	Price	Traceable Certificate	Part #	Price
50lb - 1/32oz	<b>12387</b>	\$16,125.00	\$575.00	<b>11589</b>	\$1,725.00
50lb - 0.001lb	<b>119046</b>	16,125.00	575.00	<b>11589</b>	1,725.00
20lb - 1/32oz	<b>12385</b>	7,440.00	480.00	<b>11590</b>	1,850.00
20lb - 0.001lb	<b>119050</b>	7,440.00	480.00	<b>11590</b>	1,850.00
10lb - 1/32oz	<b>12383</b>	5,330.00	445.00	<b>11591</b>	1,480.00
10lb - 0.001lb	<b>119054</b>	5,330.00	445.00	<b>11591</b>	1,480.00
5lb - 1/32oz	<b>12381</b>	3,720.00	395.00	<b>11592</b>	1,145.00
5lb - 0.001lb	<b>119058</b>	3,720.00	395.00	<b>11592</b>	1,145.00
2lb - 1/32oz	<b>12379</b>	2,415.00	310.00	<b>11593</b>	1,495.00
2lb - 0.001lb	<b>119062</b>	2,415.00	310.00	<b>11593</b>	1,495.00

### SECONDARY CASE

Size	Part #	Price
4oz - 1/32oz	<b>11610</b>	\$250.00

### ADDITIONAL ACCESSORIES

Part #	Description	Price
<b>36092</b>	Statement of Accuracy	\$45.00
<b>11714</b>	Weight gloves, white cotton	5.00
<b>11711</b>	Tweezer	3.00
<b>152414</b>	Premium tweezer	35.00
<b>25836</b>	Serial number	15.00
<b>11758</b>	Leaf weight cover	35.00
<b>50035</b>	Weight forceps, plastic	35.00
<b>11747</b>	Lifter bar	15.00
<b>11712</b>	Lifter bar, large handle	60.00
<b>50000</b>	Tong assembly, Class 0	60.00
<b>50037</b>	Lifter (Class 0 and OIML 2kg and 5kg)	45.00



Set includes lifting device and gloves

# Avoirdupois Sets

Range: 50lb through 2lb

## WEIGHT SET CONTENTS

50 lb - 1/32 oz	50 lb - 0.001 lb	20 lb - 1/32 oz	20 lb - 0.001 lb	10 lb - 1/32 oz	10 lb - 0.001 lb	5 lb - 1/32 oz	5 lb - 0.001 lb	2 lb - 1/32 oz	2 lb - 0.001 lb
1 - 50 lb	1 - 50 lb	1 - 20 lb	1 - 20 lb	1 - 10 lb	1 - 10 lb	1 - 5 lb	1 - 5 lb	1 - 2 lb	1 - 2 lb
1 - 30 lb	1 - 30 lb	1 - 10 lb	1 - 10 lb	1 - 5 lb	1 - 5 lb	1 - 3 lb	1 - 3 lb	1 - 1 lb	1 - 1 lb
1 - 20 lb	1 - 20 lb	1 - 5 lb	1 - 5 lb	1 - 3 lb	1 - 3 lb	1 - 2 lb	1 - 2 lb	1 - 8 oz	1 - .5 lb
1 - 10 lb	1 - 10 lb	1 - 3 lb	1 - 3 lb	1 - 2 lb	1 - 2 lb	1 - 1 lb	1 - 1 lb	1 - 4 oz	1 - 0.3 lb
1 - 5 lb	1 - 5 lb	1 - 2 lb	1 - 2 lb	1 - 1 lb	1 - 1 lb	1 - 8 oz	1 - .5 lb	1 - 2 oz	1 - 0.2 lb
1 - 3 lb	1 - 3 lb	1 - 1 lb	1 - 1 lb	1 - 8 oz	1 - .5 lb	1 - 4 oz	1 - 0.3 lb	1 - 1 oz	1 - 0.1 lb
1 - 2 lb	1 - 2 lb	1 - 8 oz	1 - .5 lb	1 - 4 oz	1 - 0.3 lb	1 - 2 oz	1 - 0.2 lb	1 - 1/2 oz	1 - 0.05 lb
1 - 1 lb	1 - 1 lb	1 - 4 oz	1 - 0.3 lb	1 - 2 oz	1 - 0.2 lb	1 - 1 oz	1 - 0.1 lb	1 - 1/4 oz	1 - 0.03 lb
1 - 8 oz	1 - .5 lb	1 - 2 oz	1 - 0.2 lb	1 - 1 oz	1 - 0.1 lb	1 - 1/2 oz	1 - 0.05 lb	1 - 1/8 oz	1 - 0.02 lb
1 - 4 oz	1 - 0.3 lb	1 - 1 oz	1 - 0.1 lb	1 - 1/2 oz	1 - 0.05 lb	1 - 1/4 oz	1 - 0.03 lb	1 - 1/16 oz	1 - 0.01 lb
1 - 2 oz	1 - 0.2 lb	1 - 1/2 oz	1 - 0.05 lb	1 - 1/4 oz	1 - 0.03 lb	1 - 1/8 oz	1 - 0.02 lb	2 - 1/32 oz	1 - 0.005 lb
1 - 1 oz	1 - 0.1 lb	1 - 1/4 oz	1 - 0.03 lb	1 - 1/8 oz	1 - 0.02 lb	1 - 1/16 oz	1 - 0.01 lb	-	1 - 0.003 lb
1 - 1/2 oz	1 - 0.05 lb	1 - 1/8 oz	1 - 0.02 lb	1 - 1/16 oz	1 - 0.01 lb	2 - 1/32 oz	1 - 0.005 lb	-	1 - 0.002 lb
1 - 1/4 oz	1 - 0.03 lb	1 - 1/16 oz	1 - 0.01 lb	2 - 1/32 oz	1 - 0.005 lb	-	1 - 0.003 lb	-	1 - 0.001 lb
1 - 1/8 oz	1 - 0.02 lb	2 - 1/32 oz	1 - 0.005 lb	-	1 - 0.003 lb	-	1 - 0.002 lb	-	-
1 - 1/16 oz	1 - 0.01 lb	-	1 - 0.003 lb	-	1 - 0.002 lb	-	1 - 0.001 lb	-	-
2 - 1/32 oz	1 - 0.005 lb	-	1 - 0.002 lb	-	1 - 0.001 lb	-	-	-	-
-	1 - 0.003 lb	-	1 - 0.001 lb	-	-	-	-	-	-
-	1 - 0.002 lb	-	-	-	-	-	-	-	-
-	1 - 0.001 lb	-	-	-	-	-	-	-	-

**Piece Count**

18	20	16	18	15	17	14	16	12	14
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**Total Weight**

122 lb	122 lb	42 lb	42 lb	22 lb	22 lb	12 lb	12 lb	4 lb	4 lb
Part #	Part #								
11999-Class 1	119043-Class 1	11997-Class 1	119047-Class 1	11995-Class 1	119051-Class 1	11993-Class 1	119055-Class 1	11991-Class 1	119059-Class 1
12145-Class 2	119044-Class 2	12143-Class 2	119048-Class 2	12141-Class 2	119052-Class 2	12139-Class 2	119056-Class 2	12137-Class 2	119060-Class 2
12284-Class 3	119045-Class 3	12282-Class 3	119049-Class 3	12280-Class 3	119053-Class 3	12278-Class 3	119057-Class 3	12276-Class 3	119061-Class 3
12387-Class 4	119046-Class 4	12385-Class 4	119050-Class 4	12383-Class 4	119054-Class 4	12381-Class 4	119058-Class 4	12379-Class 4	119062-Class 4

# PRECISION LABORATORY

## OIML



### Applications:

- Density measurement
- Tolerance checking
- Mass standards
- OIML guidelines for balance and scale verification

### Styles Available:

- Type 1, one-piece construction, no added adjusting material

### Product Configuration:

- Individual weight
- Individual weight kit: weight, case or vial, and glove
- Weight set: weights, case (additional small case or vial if required) and handling equipment
- Weight set configuration: 5-2-2-1  
Example: (1) 50g, (2) 20g and (1) 10g
- OIML weight sets larger than 500g include a hardwood case with velvet-lined pockets
- Weight sets with the largest weight of 500g include a precision-machined, polyvinyl, crush-resistant case

### Features:

- Nominal value marked on weights
- Serial numbers applied to case (weights may be marked with symbol)
- Density is approximately 7.95g/cm<sup>3</sup>
- OIML E1, E2, F1 and F2 polish finish
- OIML M1 and M2 satin finish
- E1, E2, F1, F2 and M1 weights include protective case
- Weights manufactured to international recommendation, OIML R111 specifications
- E1 and E2 supplied with calibration report per OIML R111

Precision Laboratory - OIML  
**Metric Kits**

CLASS E1*				CLASS E2*			
	Weight	Kit Part #	Kit Price	Weight	Kit Part #	Kit Price	
<b>Cylindrical</b>	-	-	-	20kg	<b>53850</b>	\$2,640.00	
	10kg	<b>36872</b>	\$2,950.00	10kg	<b>36871</b>	2,160.00	
	5kg	<b>29785</b>	1,900.00	5kg	<b>29775</b>	1,215.00	
	2kg	<b>29784</b>	1,395.00	2kg	<b>29774</b>	765.00	
	1kg	<b>29783</b>	940.00	1kg	<b>29773</b>	570.00	
	500g	<b>29782</b>	700.00	500g	<b>29772</b>	395.00	
	200g	<b>29781</b>	600.00	200g	<b>29771</b>	312.00	
	100g	<b>29780</b>	560.00	100g	<b>29770</b>	155.00	
	50g	<b>29779</b>	500.00	50g	<b>29769</b>	150.00	
	20g	<b>29778</b>	495.00	20g	<b>29768</b>	147.00	
	10g	<b>29777</b>	490.00	10g	<b>29767</b>	140.00	
	5g	<b>29776</b>	440.00	5g	<b>29766</b>	123.00	
	2g	<b>29745</b>	440.00	2g	<b>29743</b>	123.00	
	1g	<b>29744</b>	420.00	1g	<b>29742</b>	123.00	
	<b>Milligram</b>	500mg	<b>29737</b>	240.00	500mg	<b>29731</b>	120.00
200mg		<b>29736</b>	240.00	200mg	<b>29730</b>	120.00	
100mg		<b>29735</b>	240.00	100mg	<b>29729</b>	120.00	
50mg		<b>29734</b>	240.00	50mg	<b>29728</b>	120.00	
20mg		<b>29733</b>	240.00	20mg	<b>29727</b>	120.00	
10mg		<b>29732</b>	240.00	10mg	<b>29726</b>	120.00	
5mg		<b>29713</b>	240.00	5mg	<b>29710</b>	120.00	
2mg		<b>29712</b>	240.00	2mg	<b>29709</b>	120.00	
1mg		<b>29711</b>	240.00	1mg	<b>29708</b>	120.00	



One-piece and Milligram Kits

\*Calibration Report included, Statement of Accuracy not available Class E1 and E2

CLASS F1				CLASS F2		OPTIONAL	
	Weight	Kit Part #	Kit Price	Kit Part #	Kit Price	Calibration Report	Mass Value Certificate
<b>Cylindrical</b>	20kg	<b>53654</b>	\$1,950.00	<b>53655</b>	\$1,860.00	\$140.00	\$75.00
	10kg	<b>36870</b>	1,580.00	<b>36869</b>	1,215.00	140.00	75.00
	5kg	<b>29765</b>	945.00	<b>29755</b>	660.00	140.00	75.00
	2kg	<b>29764</b>	555.00	<b>29754</b>	525.00	140.00	75.00
	1kg	<b>29763</b>	390.00	<b>29753</b>	340.00	120.00	55.00
	500g	<b>29762</b>	225.00	<b>29752</b>	225.00	120.00	55.00
	200g	<b>29761</b>	175.00	<b>29751</b>	170.00	120.00	55.00
	100g	<b>29760</b>	125.00	<b>29750</b>	105.00	50.00	40.00
	50g	<b>29759</b>	110.00	<b>29749</b>	105.00	50.00	40.00
	20g	<b>29758</b>	110.00	<b>29748</b>	105.00	50.00	40.00
	10g	<b>29757</b>	110.00	<b>29747</b>	105.00	50.00	40.00
	5g	<b>29756</b>	110.00	<b>29746</b>	105.00	50.00	40.00
	2g	<b>29741</b>	110.00	<b>29739</b>	105.00	50.00	40.00
	1g	<b>29740</b>	110.00	<b>29738</b>	105.00	50.00	40.00
	<b>Milligram</b>	500mg	<b>29725</b>	45.00	<b>29719</b>	40.00	50.00
200mg		<b>29724</b>	45.00	<b>29718</b>	40.00	50.00	40.00
100mg		<b>29723</b>	45.00	<b>29717</b>	40.00	50.00	40.00
50mg		<b>29722</b>	45.00	<b>29716</b>	40.00	50.00	40.00
20mg		<b>29721</b>	45.00	<b>29715</b>	40.00	50.00	40.00
10mg		<b>29720</b>	45.00	<b>29714</b>	40.00	50.00	40.00
5mg		<b>29707</b>	45.00	<b>29704</b>	40.00	50.00	40.00
2mg		<b>29706</b>	45.00	<b>29703</b>	40.00	50.00	40.00
1mg		<b>29705</b>	45.00	<b>29702</b>	40.00	50.00	40.00

# Metric Kits and Weights

## M1

Weight	Kit Part #	Kit Price
20kg	<b>156292</b>	\$1,175.00
10kg	<b>156291</b>	1,010.00
5kg	<b>116207</b>	455.00
2kg	<b>116206</b>	260.00
1kg	<b>116205</b>	180.00
500g	<b>116204</b>	125.00
200g	<b>116203</b>	95.00
100g	<b>111927</b>	80.00
50g	<b>111928</b>	78.00
20g	<b>111929</b>	75.00
10g	<b>111930</b>	75.00
5g	<b>111931</b>	75.00
2g	<b>111932</b>	75.00
1g	<b>111933</b>	75.00

## OPTIONAL

Traceable Certificate
\$70.00
70.00
70.00
70.00
50.00
50.00
50.00
35.00
35.00
35.00
35.00
35.00
35.00
35.00
35.00

## REPLACEMENT CASES

Part #	Price
<b>156290</b>	\$450.00
<b>156289</b>	450.00
<b>116202</b>	200.00
<b>116201</b>	60.00
<b>116200</b>	60.00
<b>116199</b>	40.00
<b>116198</b>	40.00
<b>112850</b>	30.00
<b>112849</b>	30.00
<b>112848</b>	30.00
<b>112847</b>	30.00
<b>112846</b>	30.00
<b>112845</b>	30.00
<b>112844</b>	30.00



PN 156284

## M2\*

Weight	Part #	Price
5kg	<b>115926</b>	\$220.00
2kg	<b>115925</b>	195.00
1kg	<b>115924</b>	130.00
500g	<b>115923</b>	85.00
200g	<b>115922</b>	75.00
100g	<b>111934</b>	60.00
50g	<b>111935</b>	60.00
20g	<b>111936</b>	60.00
10g	<b>111937</b>	60.00
5g	<b>111938</b>	60.00
2g	<b>111939</b>	60.00
1g	<b>111940</b>	60.00

## OPTIONAL

Traceable Certificate
\$70.00
70.00
50.00
50.00
50.00
50.00
35.00
35.00
35.00
35.00
35.00
35.00
35.00
35.00
35.00

## REPLACEMENT CASES

Part #	Price
<b>116202</b>	\$200.00
<b>116201</b>	60.00
<b>116200</b>	60.00
<b>116199</b>	40.00
<b>116198</b>	40.00
<b>112850</b>	30.00
<b>112849</b>	30.00
<b>112848</b>	30.00
<b>112847</b>	30.00
<b>112846</b>	30.00
<b>112845</b>	30.00
<b>112844</b>	30.00



PN 69229

\*M2 is sold as individual weight, accessory cases are available.

## ADDITIONAL ACCESSORIES

Part #	Description	Price
<b>36092</b>	Statement of Accuracy	\$45.00
<b>11714</b>	Weight gloves, white cotton	5.00
<b>152414</b>	Premium tweezer	35.00



PN 152414



M1 and M2 One-piece Design

# Metric Sets

Range: 500mg-50g

## CLASS E1\*

Set Size	Part #	Price
500mg - 1mg	<b>30850</b>	\$1,760.00
500mg - 100mg	<b>30854</b>	885.00

\*Calibration Report included, Statement of Accuracy not available, Class E1 or E2

## CLASS E2\*

Set Size	Part #	Price
500mg - 1mg	<b>30851</b>	\$1,200.00
500mg - 100mg	<b>30855</b>	760.00
50g - 1mg	<b>96477</b>	1,800.00
50g - 1g	<b>96478</b>	980.00

## REPLACEMENT CASES

Part #	Price
<b>34699</b>	\$100.00
<b>34699</b>	100.00
<b>34697</b>	180.00
<b>34697</b>	180.00

## CLASS F1

Set Size	Part #	Price
500mg - 1mg	<b>30852</b>	\$500.00
500mg - 100mg	<b>30856</b>	365.00
50g - 1mg	<b>96479</b>	970.00
50g - 1g	<b>96480</b>	590.00

## CLASS F2

Part #	Price
<b>30853</b>	\$495.00
<b>30857</b>	285.00
<b>96481</b>	795.00
<b>96482</b>	580.00

## OPTIONAL

Calibration Report	Price
	\$450.00
	150.00
	750.00
	300.00

## OPTIONAL

Mass Value Certificate	Price
	\$360.00
	120.00
	600.00
	240.00

## REPLACEMENT CASES

Part #	Price
<b>34699</b>	\$100.00
<b>34699</b>	100.00
<b>34697</b>	180.00
<b>34697</b>	180.00

## CLASS M1\*

Set Size	Part #	Price
500mg - 1mg	<b>161537</b>	\$365.00

## TRACEABLE REPORT

Price
\$270.00

## WEIGHT SET CONTENTS

500mg - 1mg	500mg - 100mg	50g - 1mg	50g - 1g
1 - 500mg	1 - 500mg	1 - 50g	1 - 50g
2 - 200mg	2 - 200mg	2 - 20g	2 - 20g
1 - 100mg	1 - 100mg	1 - 10g	1 - 10g
1 - 50mg	-	1 - 5g	1 - 5g
2 - 20mg	-	2 - 2g	2 - 2g
1 - 10mg	-	1 - 1g	1 - 1g
1 - 5mg	-	1 - 500mg	-
2 - 2mg	-	2 - 200mg	-
1 - 1mg	-	1 - 100mg	-
-	-	1 - 50mg	-
-	-	2 - 20mg	-
-	-	1 - 10mg	-
-	-	1 - 5mg	-
-	-	2 - 2mg	-
-	-	1 - 1mg	-

### Piece Count

12	4	20	8
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### Total Weight

1.11g	1g	111.11g	108g
Part #	Part #	Part #	Part #
<b>30850-Class E1</b>	<b>30854-Class E1</b>	-	-
<b>30851-Class E2</b>	<b>30855-Class E2</b>	<b>96477-Class E2</b>	<b>96478-Class E2</b>
<b>30852-Class F1</b>	<b>30856-Class F1</b>	<b>96479-Class F1</b>	<b>96480-Class F1</b>
<b>30853-Class F2</b>	<b>30857-Class F2</b>	<b>96481-Class F2</b>	<b>96482-Class F2</b>
<b>161537-Class M1</b>	-	-	-

## ADDITIONAL ACCESSORIES

Part #	Description	Price
<b>36092</b>	Statement of Accuracy*	\$45.00
<b>11714</b>	Weight gloves, white cotton	5.00
<b>11711</b>	Tweezer	3.00
<b>152414</b>	Premium tweezer	35.00
<b>25836</b>	Serial number	15.00
<b>11755</b>	Leaf weight cover	35.00
<b>50035</b>	Weight forceps, plastic, 200g - 500g	35.00
<b>50000</b>	Tong assembly, Class 0	60.00
<b>50037</b>	Lifter (Class 0 and OIML 2kg and 5kg)	45.00

# Metric Sets

Range: 100g

### CLASS E1\*

Set Size	Part #	Price
100g - 1 mg	<b>30838</b>	\$4,320.00
100g - 100mg	<b>30842</b>	3,380.00
100g - 1g	<b>30846</b>	2,810.00

### CLASS E2\*

Set Size	Part #	Price
100g - 1 mg	<b>30839</b>	\$1,985.00
100g - 100mg	<b>30843</b>	1,420.00
100g - 1g	<b>30847</b>	1,065.00

### REPLACEMENT CASES

Part #	Price
<b>34697</b>	\$180.00
<b>34697</b>	180.00
<b>34697</b>	180.00

\*Calibration Report included, Statement of Accuracy not available Class E1 or E2

### CLASS F1

Set Size	Part #	Price
100g - 1 mg	<b>30840</b>	\$1,035.00
100g - 100mg	<b>30844</b>	865.00
100g - 1g	<b>30848</b>	680.00

### CLASS F2

Part #	Price
<b>30841</b>	\$815.00
<b>30845</b>	800.00
<b>30849</b>	650.00

### OPTIONAL

Calibration Report	Mass Value Certificate
\$790.00	\$560.00
490.00	390.00
340.00	270.00

### OPTIONAL

Part #	Price
<b>34697</b>	\$180.00
<b>34697</b>	180.00
<b>34697</b>	180.00

### REPLACEMENT CASES

Part #	Price
<b>34697</b>	\$180.00
<b>34697</b>	180.00
<b>34697</b>	180.00

### M1

Set Size	Part #	Price
100g - 1 mg	<b>119561</b>	\$770.00
100g - 1g	<b>119560</b>	550.00

### OPTIONAL

Traceable Certificate	Price
	\$485.00
	205.00

### REPLACEMENT CASES

Part #	Price
<b>34697</b>	\$180.00
<b>34697</b>	180.00

### WEIGHT SET CONTENTS

100g - 1 mg	100g - 100 mg	100g - 1g
1 - 100g	1 - 100g	1 - 100g
1 - 50g	1 - 50g	1 - 50g
2 - 20g	2 - 20g	2 - 20g
1 - 10g	1 - 10g	1 - 10g
1 - 5g	1 - 5g	1 - 5g
2 - 2g	2 - 2g	2 - 2g
1 - 1g	1 - 1g	1 - 1g
1 - 500mg	1 - 500mg	-
2 - 200mg	2 - 200mg	-
1 - 100mg	1 - 100mg	-
1 - 50mg	-	-
2 - 20mg	-	-
1 - 10mg	-	-
1 - 5mg	-	-
2 - 2mg	-	-
1 - 1mg	-	-
<b>Piece Count</b>		
21	13	9
<b>Total Weight</b>		
211.11g	211g	210g
Part #	Part #	Part #
<b>30838-Class E1</b>	<b>30842-Class E1</b>	<b>30846-Class E1</b>
<b>30839-Class E2</b>	<b>30843-Class E2</b>	<b>30847-Class E2</b>
<b>30840-Class F1</b>	<b>30844-Class F1</b>	<b>30848-Class F1</b>
<b>30841-Class F2</b>	<b>30845-Class F2</b>	<b>30849-Class F2</b>
<b>119561-Class M1</b>	-	<b>119560-Class M1</b>

### ADDITIONAL ACCESSORIES

Part #	Description	Price
<b>36092</b>	Statement of Accuracy*	\$45.00
<b>11714</b>	Weight gloves, white cotton	5.00
<b>11711</b>	Tweezer	3.00
<b>152414</b>	Premium tweezer	35.00
<b>25836</b>	Serial number	15.00
<b>50035</b>	Weight forceps, plastic, 200g - 500g	35.00
<b>11755</b>	Leaf weight cover	35.00



Set includes lifting device and gloves PN 30838 100g to 1 mg

# Metric Sets

Range: 200g

### CLASS E1\*

Set Size	Part #	Price
200g - 1 mg	<b>40546</b>	\$4,630.00
200g - 100mg	<b>40547</b>	3,940.00
200g - 1 g	<b>40548</b>	3,370.00
200g - 100g	<b>40549</b>	2,000.00

*\*Calibration Report included, Statement of Accuracy not available, Class E1 or E2*

### CLASS E2\*

Set Size	Part #	Price
200g - 1 mg	<b>40550</b>	\$2,255.00
(2) 200g - 1 mg	<b>96468</b>	2,545.00
200g - 100mg	<b>40551</b>	1,775.00
200g - 1 g	<b>40552</b>	1,395.00
(2) 200g - 1 g	<b>96469</b>	1,685.00
(2) 200g - 100g	<b>40553</b>	1,085.00

### REPLACEMENT CASES

Part #	Price
<b>34645</b>	\$270.00
<b>34645</b>	270.00

### CLASS F1

Set Size	Part #	Price
200g - 1 mg	<b>40554</b>	1450.00
(2) 200g - 1 mg	<b>96470</b>	1490.00
200g - 100mg	<b>40555</b>	1110.00
(2) 200g - 1 g	<b>96471</b>	1000.00
200g - 1 g	<b>40556</b>	920.00
(2) 200g - 100g	<b>40557</b>	630.00

### CLASS F2

Part #	Price
<b>40558</b>	1425.00
<b>96472</b>	1450.00
<b>40559</b>	1000.00
<b>96473</b>	950.00
<b>40560</b>	900.00
<b>40561</b>	625.00

### OPTIONAL

Calibration Report
\$880.00
970.00
580.00
430.00
520.00
290.00

### OPTIONAL

Mass Value Certificate
\$630.00
645.00
430.00
310.00
355.00
150.00

### REPLACEMENT CASES

Part #	Price
<b>34645</b>	\$270.00
<b>34645</b>	270.00

# Metric Sets

Range: 200g

## WEIGHT SET CONTENTS

200g - 1 mg	(2) 200g - 1 mg	200g - 100 mg	200g - 1 g	(2) 200g - 1 g	(2) 200g - 100 g
1 - 200g	2 - 200g	1 - 200g	1 - 200g	2 - 200g	2 - 200g
1 - 100g	1 - 100g	1 - 100g	1 - 100g	1 - 100g	1 - 100g
1 - 50g	1 - 50g	1 - 50g	1 - 50g	1 - 50g	-
2 - 20g	2 - 20g	2 - 20g	2 - 20g	2 - 20g	-
1 - 10g	1 - 10g	1 - 10g	1 - 10g	1 - 10g	-
1 - 5g	1 - 5g	1 - 5g	1 - 5g	1 - 5g	-
2 - 2g	2 - 2g	2 - 2g	2 - 2g	2 - 2g	-
1 - 1g	1 - 1g	1 - 1g	1 - 1g	1 - 1g	-
1 - 500mg	1 - 500mg	1 - 500mg	-	-	-
2 - 200mg	2 - 200mg	2 - 200mg	-	-	-
1 - 100mg	1 - 100mg	1 - 100mg	-	-	-
1 - 50mg	1 - 50mg	-	-	-	-
2 - 20mg	2 - 20mg	-	-	-	-
1 - 10mg	1 - 10mg	-	-	-	-
1 - 5mg	1 - 5mg	-	-	-	-
2 - 2mg	2 - 2mg	-	-	-	-
1 - 1mg	1 - 1mg	-	-	-	-

### Piece Count

22	23	14	10	11	3
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### Total Weight

411.11 g	611.11 g	611 g	410 g	610 g	500 g
Part #					
40546-Class E1	-	40547-Class E1	40548-Class E1	-	40549-Class E1
40550-Class E2	96468-Class E2	40551-Class E2	40552-Class E2	96469-Class E2	40553-Class E2
40554-Class F1	96470-Class F1	40555-Class F1	40556-Class F1	96471-Class F1	40557-Class F1
40558-Class F2	96472-Class F2	40559-Class F2	40560-Class F2	96473-Class F2	40561-Class F2

## ADDITIONAL ACCESSORIES

Part #	Description	Price
36092	Statement of Accuracy*	\$45.00
11714	Weight gloves, white cotton	5.00
11711	Tweezer	3.00
152414	Premium tweezer	35.00
25836	Serial number	15.00
50035	Weight forceps, plastic, 200 g - 500 g	35.00
11755	Leaf weight cover	35.00

\*Not available for Class E1 or E2

## CASE INSERTS

Part #	Size	Price
30607	200g - 1 mg	\$170.00
84473	(2) 200g - 1 mg	325.00
84472	(2) 200g - 1 g	325.00
30608	(2) 200g - 100 g	325.00

# Metric Sets

Range: 500g

### CLASS E1\*

Set Size	Part #	Price
500 g - 1 mg	<b>30822</b>	\$5,560.00
500 g - 100 mg	<b>30826</b>	4,920.00
500 g - 1 g	<b>30830</b>	4,450.00
500 g - 100 g	<b>30834</b>	2,745.00

### CLASS E2\*

Set Size	Part #	Price
500 g - 1 mg	<b>30823</b>	\$2,960.00
500 g - 100 mg	<b>30827</b>	2,555.00
500 g - 1 g	<b>30831</b>	2,055.00
500 g - 100 g	<b>30835</b>	1,500.00

### REPLACEMENT CASES

Part #	Price
<b>34645</b>	\$270.00
<b>34645</b>	270.00
<b>34645</b>	270.00
<b>34645</b>	270.00

\*Calibration Report is included with Class E1 and Class E2 kits, Statement of Accuracy not available

### CLASS F1

Set Size	Part #	Price
500 g - 1 mg	<b>30824</b>	\$1,760.00
500 g - 100 mg	<b>30828</b>	1,575.00
500 g - 1 g	<b>30832</b>	1,310.00
500 g - 100 g	<b>30836</b>	1,140.00

### CLASS F2

Part #	Price
<b>30825</b>	\$1,500.00
<b>30829</b>	1,385.00
<b>30833</b>	1,160.00
<b>30837</b>	850.00

### OPTIONAL

Calibration Report
\$1,060.00
760.00
610.00
310.00

### OPTIONAL

Mass Value Certificate
\$685.00
515.00
395.00
155.00

### REPLACEMENT CASES

Part #	Price
<b>34645</b>	\$270.00
<b>34645</b>	270.00
<b>34645</b>	270.00
<b>34645</b>	270.00

**Metric Sets**

Range: 500g

**WEIGHT SET CONTENTS**

500 g - 1 mg	500 g - 100 mg	500 g - 1 g	500 g - 100 g
1 - 500g	1 - 500g	1 - 500g	1 - 500g
2 - 200g	2 - 200g	2 - 200g	2 - 200g
1 - 100g	1 - 100g	1 - 100g	1 - 100g
1 - 50g	1 - 50g	1 - 50g	-
2 - 20g	2 - 20g	2 - 20g	-
1 - 10g	1 - 10g	1 - 10g	-
1 - 5g	1 - 5g	1 - 5g	-
2 - 2g	2 - 2g	2 - 2g	-
1 - 1g	1 - 1g	1 - 1g	-
1 - 500 mg	1 - 500 mg	-	-
2 - 200 mg	2 - 200 mg	-	-
1 - 100 mg	1 - 100 mg	-	-
1 - 50 mg	-	-	-
2 - 20 mg	-	-	-
1 - 10 mg	-	-	-
1 - 5 mg	-	-	-
2 - 2 mg	-	-	-
1 - 1 mg	-	-	-

**Piece Count**

24	16	12	4
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**Total Weight**

1.11111 kg	1.111 kg	1.11 kg	1 kg
Part #	Part #	Part #	Part #
30822-Class E1	30826-Class E1	30830-Class E1	30834-Class E1
30823-Class E2	30827-Class E2	30831-Class E2	30835-Class E2
30824-Class F1	30828-Class F1	30832-Class F1	30836-Class F1
30825-Class F2	30829-Class F2	30833-Class F2	30837-Class F2

**ADDITIONAL ACCESSORIES**

Part #	Description	Price
36092	Statement of Accuracy*	\$45.00
11714	Weight gloves, white cotton	5.00
11711	Tweezer	3.00
152414	Premium tweezer	35.00
25836	Serial number	15.00
50035	Weight forceps, plastic, 200g - 500g	35.00
11755	Leaf weight cover	35.00
50000	Tong assembly 1 kg - 200g	60.00

\*Not available for Class E1 or E2

**CASE INSERTS**

Part #	Size	Price
30607	500g - 1 mg	\$170.00
30608	500g - 100g	270.00

## Metric Sets

Range: 1 kg

### CLASS E1\*

Set Size	Part #	Price
1 kg - 1 mg	<b>30806</b>	\$6,355.00
1 kg - 100 mg	<b>30810</b>	5,370.00
1 kg - 1 g	<b>30814</b>	4,840.00
1 kg - 100 g	<b>30818</b>	3,280.00

### CLASS E2\*

Set Size	Part #	Price
1 kg - 1 mg	<b>30807</b>	\$3,465.00
1 kg - 100 mg	<b>30811</b>	3,165.00
1 kg - 1 g	<b>30815</b>	3,005.00
1 kg - 100 g	<b>30819</b>	2,400.00

### REPLACEMENT CASES

Part #	Price
<b>30605</b>	\$1,595.00
<b>30605</b>	1,595.00
<b>30605</b>	1,595.00
<b>30606</b>	1,435.00

\*Calibration Report included, Statement of Accuracy not available Class E1 or E2

### CLASS F1

Set Size	Part #	Price
1 kg - 1 mg	<b>30808</b>	\$2,500.00
1 kg - 100 mg	<b>30812</b>	2,450.00
1 kg - 1 g	<b>30816</b>	2,315.00
1 kg - 100 g	<b>30820</b>	2,030.00

### CLASS F2

Part #	Price
<b>30809</b>	\$2,450.00
<b>30813</b>	2,400.00
<b>30817</b>	2,300.00
<b>30821</b>	1,775.00

### OPTIONAL

Calibration Report
\$1,150.00
850.00
700.00
400.00

### OPTIONAL

Mass Value Certificate
\$725.00
505.00
435.00
195.00

### REPLACEMENT CASES

Part #	Price
<b>30605</b>	\$1,595.00
<b>30605</b>	1,595.00
<b>30605</b>	1,595.00
<b>30606</b>	1,435.00



Set includes lifting device and gloves PN 30806 1 kg to 1 mg

**Metric Sets**

Range: 1 kg

**WEIGHT SET CONTENTS**

1 kg - 1 mg	1 kg - 100 mg	1 kg - 1 g	1 kg - 100 g
1 - 1 kg	1 - 1 kg	1 - 1 kg	1 - 1 kg
1 - 500 g	1 - 500 g	1 - 500 g	1 - 500 g
2 - 200 g	2 - 200 g	2 - 200 g	2 - 200 g
1 - 100 g	1 - 100 g	1 - 100 g	1 - 100 g
1 - 50 g	1 - 50 g	1 - 50 g	-
2 - 20 g	2 - 20 g	2 - 20 g	-
1 - 10 g	1 - 10 g	1 - 10 g	-
1 - 5 g	1 - 5 g	1 - 5 g	-
2 - 2 g	2 - 2 g	2 - 2 g	-
1 - 1 g	1 - 1 g	1 - 1 g	-
1 - 500 mg	1 - 500 mg	-	-
2 - 200 mg	2 - 200 mg	-	-
1 - 100 mg	1 - 100 mg	-	-
1 - 50 mg	-	-	-
2 - 20 mg	-	-	-
1 - 10 mg	-	-	-
1 - 5 mg	-	-	-
2 - 2 mg	-	-	-
1 - 1 mg	-	-	-

**Piece Count**

25	17	13	5
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**Total Weight**

2.11111 kg	2.111 kg	2.11 kg	2 kg
Part #	Part #	Part #	Part #
<b>30806-Class E1</b>	<b>30810-Class E1</b>	<b>30814-Class E1</b>	<b>30818-Class E1</b>
<b>30807-Class E2</b>	<b>30811-Class E2</b>	<b>30815-Class E2</b>	<b>30819-Class E2</b>
<b>30808-Class F1</b>	<b>30812-Class F1</b>	<b>30816-Class F1</b>	<b>30820-Class F1</b>
<b>30809-Class F2</b>	<b>30813-Class F2</b>	<b>30817-Class F2</b>	<b>30821-Class F2</b>

**ADDITIONAL ACCESSORIES**

Part #	Description	Price
<b>36092</b>	Statement of Accuracy	\$45.00
<b>11714</b>	Weight gloves, white cotton	5.00
<b>11711</b>	Tweezer	3.00
<b>152414</b>	Premium tweezer	35.00
<b>25836</b>	Serial number	15.00
<b>50035</b>	Weight forceps, plastic, 200 g - 500 g	35.00
<b>11755</b>	Leaf weight cover	35.00
<b>50000</b>	Tong assembly 1 kg - 200 g	60.00

**SECONDARY CASE**

Part #	Size	Price
<b>34697</b>	100 g - 1 mg	\$180.00

# Metric Sets

Range: 2 kg

CLASS E1*			CLASS E2*			REPLACEMENT CASES	
Set Size	Part #	Price	Set Size	Part #	Price	Part #	Price
2 kg - 1 mg	<b>40518</b>	\$8,380.00	2 kg - 1 mg	<b>40523</b>	\$4,325.00	<b>84474</b>	\$1,595.00
2 kg - 100 mg	<b>40519</b>	7,140.00	(2) 2 kg - 1 mg	<b>96455</b>	4,760.00	<b>96308</b>	1,595.00
2 kg - 1 g	<b>40520</b>	6,105.00	2 kg - 1 g	<b>40525</b>	3,415.00	<b>84474</b>	1,595.00
2 kg - 100 g	<b>40521</b>	4,475.00	(2) 2 kg - 1 g	<b>96457</b>	4,300.00	<b>96308</b>	1,595.00

\*Calibration Report included Statement of Accuracy not available, Class E1 or E2

CLASS F1			CLASS F2		OPTIONAL		OPTIONAL		REPLACEMENT CASES	
Set Size	Part #	Price	Part #	Price	Calibration Report	Mass Value Certificate	Part #	Price	Part #	Price
2 kg - 1 mg	<b>40528</b>	\$3,400.00	<b>40533</b>	\$2,950.00	\$1,250.00	\$850.00	<b>96308</b>	\$1,595.00	<b>96308</b>	\$1,595.00
(2) 2 kg - 1 mg	<b>96459</b>	3,555.00	<b>96463</b>	2,800.00	1,360.00	910.00	<b>84474</b>	1,595.00	<b>84474</b>	1,595.00
2 kg - 1 g	<b>40530</b>	2,630.00	<b>40535</b>	2,600.00	800.00	490.00	<b>96308</b>	1,595.00	<b>96308</b>	1,595.00
(2) 2 kg - 1 g	<b>96461</b>	3,110.00	<b>96465</b>	3,000.00	910.00	550.00	<b>84474</b>	1,595.00	<b>84474</b>	1,595.00

**Metric Sets**

Range: 2 kg

**WEIGHT SET CONTENTS**

2 kg - 1 mg	2 kg - 100 mg	(2) 2 kg - 1 mg	2 kg - 1 g	(2) 2 kg - 1 g	2 kg - 100 g
1 - 2 kg	1 - 2 kg	2 - 2 kg	1 - 2 kg	2 - 2 kg	1 - 2 kg
1 - 1 kg	1 - 1 kg	1 - 1 kg	1 - 1 kg	1 - 1 kg	1 - 1 kg
1 - 500 g	1 - 500 g	1 - 500 g	1 - 500 g	1 - 500 g	1 - 500 g
2 - 200 g	2 - 200 g	2 - 200 g	2 - 200 g	2 - 200 g	2 - 200 g
1 - 100 g	1 - 100 g	1 - 100 g	1 - 100 g	1 - 100 g	1 - 100 g
1 - 50 g	1 - 50 g	1 - 50 g	1 - 50 g	1 - 50 g	-
2 - 20 g	2 - 20 g	2 - 20 g	2 - 20 g	2 - 20 g	-
1 - 10 g	1 - 10 g	1 - 10 g	1 - 10 g	1 - 10 g	-
1 - 5 g	1 - 5 g	1 - 5 g	1 - 5 g	1 - 5 g	-
2 - 2 g	2 - 2 g	2 - 2 g	2 - 2 g	2 - 2 g	-
1 - 1 g	1 - 1 g	1 - 1 g	1 - 1 g	1 - 1 g	-
1 - 500 mg	1 - 500 mg	1 - 500 mg	-	-	-
2 - 200 mg	2 - 200 mg	2 - 200 mg	-	-	-
1 - 100 mg	1 - 100 mg	1 - 100 mg	-	-	-
1 - 50 mg	-	1 - 50 mg	-	-	-
2 - 20 mg	-	2 - 20 mg	-	-	-
1 - 10 mg	-	1 - 10 mg	-	-	-
1 - 5 mg	-	1 - 5 mg	-	-	-
2 - 2 mg	-	2 - 2 mg	-	-	-
1 - 1 mg	-	1 - 1 mg	-	-	-

**Piece Count**

26	18	27	14	15	6
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**Total Weight**

4.11111 kg	4.111 kg	6.11111 kg	4.11 kg	6.11 kg	4.0 kg
Part #					
<b>40518-Class E1</b>	<b>40519-Class E1</b>	<b>96455-Class E2</b>	<b>40520-Class E1</b>	<b>96457-Class E2</b>	<b>40521- Class E1</b>
<b>40523-Class E2</b>	-	<b>96459-Class F1</b>	<b>40525-Class E2</b>	<b>96461-Class F1</b>	-
<b>40528-Class F1</b>	-	<b>96463-Class F2</b>	<b>40530-Class F1</b>	<b>96465-Class F2</b>	-
<b>40533-Class F2</b>	-	-	<b>40535-Class F2</b>	-	-

**ADDITIONAL ACCESSORIES**

Part #	Description	Price
<b>36092</b>	Statement of Accuracy*	\$45.00
<b>11714</b>	Weight gloves, white cotton	5.00
<b>11711</b>	Tweezer	3.00
<b>152414</b>	Premium tweezer	35.00
<b>25836</b>	Serial number	15.00
<b>50035</b>	Weight forceps, plastic, 200 g - 500 g	35.00
<b>11755</b>	Leaf weight cover	35.00
<b>50000</b>	Tong assembly 1 kg - 200 g	60.00
<b>50037</b>	Lifter, 5 kg and 2 kg	45.00

**SECONDARY CASE**

Part #	Size	Price
<b>34697</b>	100 g - 1 mg	\$180.00

# Metric Sets

Range: 5 kg

CLASS E1*			CLASS E2*			REPLACEMENT CASES	
Set Size	Part #	Price	Set Size	Part #	Price	Part #	Price
5 kg - 1 mg	<b>30785</b>	\$9,885.00	5 kg - 1 mg	<b>30786</b>	\$5,630.00	<b>30602</b>	\$1,565.00
5 kg - 100 mg	<b>30789</b>	9,505.00	5 kg - 100 mg	<b>30790</b>	5,410.00	<b>30602</b>	1,565.00
5 kg - 1 g	<b>30793</b>	9,125.00	5 kg - 1 g	<b>30794</b>	4,875.00	<b>30602</b>	1,565.00
5 kg - 100 g	<b>30797</b>	6,440.00	5 kg - 100 g	<b>30798</b>	4,270.00	<b>30603</b>	1,565.00
5 kg - 1 kg	<b>30802</b>	5,445.00	5 kg - 1 kg	<b>30803</b>	3,630.00	<b>30604</b>	1,435.00

\*Calibration Report included, Statement of Accuracy not available, Class E1 or E2

CLASS F1			CLASS F2		OPTIONAL	OPTIONAL	REPLACEMENT CASES	
Set Size	Part #	Price	Part #	Price	Calibration Report	Mass Value Certificate	Part #	Price
5 kg - 1 mg	<b>30787</b>	\$4,210.00	<b>30788</b>	\$3,850.00	\$1,330.00	\$800.00	<b>30602</b>	\$1,565.00
5 kg - 100 mg	<b>30791</b>	4,285.00	<b>30792</b>	3,740.00	1,165.00	725.00	<b>30602</b>	1,565.00
5 kg - 1 g	<b>30795</b>	3,965.00	<b>30796</b>	3,400.00	1,015.00	605.00	<b>30602</b>	1,565.00
5 kg - 100 g	<b>30800</b>	3,635.00	<b>30801</b>	3,120.00	715.00	365.00	<b>30603</b>	1,565.00
5 kg - 1 kg	<b>30804</b>	3,420.00	<b>30805</b>	2,875.00	370.00	210.00	<b>30604</b>	1,435.00

CLASS M1			OPTIONAL	REPLACEMENT CASES	
Set Size	Part #	Price	Traceable Certificate	Part #	Price
5 kg - 1 mg	<b>126169</b>	\$2,220.00	\$740.00	<b>126164</b>	\$200.00
5 kg - 1 g	<b>126168</b>	1,920.00	470.00	<b>126164</b>	200.00

# Metric Sets

Range: 5 kg

## WEIGHT SET CONTENTS

5 kg - 1 mg	5 kg - 100 mg	5 kg - 1 g	5 kg - 100 g	5 kg - 1 kg
1 - 5 kg	1 - 5 kg	1 - 5 kg	1 - 5 kg	1 - 5 kg
2 - 2 kg	2 - 2 kg	2 - 2 kg	2 - 2 kg	2 - 2 kg
1 - 1 kg	1 - 1 kg	1 - 1 kg	1 - 1 kg	1 - 1 kg
1 - 500 g	1 - 500 g	1 - 500 g	1 - 500 g	-
2 - 200 g	2 - 200 g	2 - 200 g	2 - 200 g	-
1 - 100 g	1 - 100 g	1 - 100 g	1 - 100 g	-
1 - 50 g	1 - 50 g	1 - 50 g	-	-
2 - 20 g	2 - 20 g	2 - 20 g	-	-
1 - 10 g	1 - 10 g	1 - 10 g	-	-
1 - 5 g	1 - 5 g	1 - 5 g	-	-
2 - 2 g	2 - 2 g	2 - 2 g	-	-
1 - 1 g	1 - 1 g	1 - 1 g	-	-
1 - 500 mg	1 - 500 mg	-	-	-
2 - 200 mg	2 - 200 mg	-	-	-
1 - 100 mg	1 - 100 mg	-	-	-
1 - 50 mg	-	-	-	-
2 - 20 mg	-	-	-	-
1 - 10 mg	-	-	-	-
1 - 5 mg	-	-	-	-
2 - 2 mg	-	-	-	-
1 - 1 mg	-	-	-	-

### Piece Count

28	20	16	8	4
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### Total Weight

11.11111 kg	11.111 kg	11.11 kg	11 kg	10 kg
Part #	Part #	Part #	Part #	Part #
<b>30785-Class E1</b>	<b>30789-Class E1</b>	<b>30793-Class E1</b>	<b>30797-Class E1</b>	<b>30802-Class E1</b>
<b>30786-Class E2</b>	<b>30790-Class E2</b>	<b>30794-Class E2</b>	<b>30798-Class E2</b>	<b>30803-Class E2</b>
<b>30787-Class F1</b>	<b>30791-Class F1</b>	<b>30795-Class F1</b>	<b>30800-Class F1</b>	<b>30804-Class F1</b>
<b>30788-Class F2</b>	<b>30792-Class F2</b>	<b>30796-Class F2</b>	<b>30801-Class F2</b>	<b>30805-Class F2</b>
<b>126169-Class M1</b>	-	<b>126168-Class M1</b>	-	-

## ADDITIONAL ACCESSORIES

Part #	Description	Price
<b>36092</b>	Statement of Accuracy*	\$45.00
<b>11714</b>	Weight gloves, white cotton	5.00
<b>11711</b>	Tweezer	3.00
<b>152414</b>	Premium tweezer	35.00
<b>25836</b>	Serial number	15.00
<b>50035</b>	Weight forceps, plastic, 200 g - 500 g	35.00
<b>11755</b>	Leaf weight cover	35.00
<b>50000</b>	Tong assembly 1 kg - 200 g	60.00
<b>50037</b>	Lifter, 5 kg and 2 kg	45.00

## SECONDARY CASE

Part #	Size	Price
<b>34697</b>	100 g - 1 mg	\$180.00

## Metric Sets

Range: 10kg

### CLASS E2\*

Set Size	Part #	Price	Part #	Price
10 kg - 1 mg	<b>65213</b>	\$8,000.00	<b>65218</b>	\$1,995.00
10 kg - 100 mg	<b>96419</b>	7,740.00	<b>65218</b>	1,995.00
10 kg - 1 g	<b>96415</b>	7,515.00	<b>65218</b>	1,995.00
10 kg - 100 g	<b>96420</b>	6,575.00	<b>65218</b>	1,995.00
10 kg - 1 kg	<b>96421</b>	5,870.00	<b>65218</b>	1,995.00

### REPLACEMENT CASES

\*Calibration Report included, Statement of Accuracy not available Class E2

### CLASS F1

Set Size	Part #	Price
10 kg - 1 mg	<b>65214</b>	\$6,625.00
10 kg - 100 mg	<b>96429</b>	6,510.00
10 kg - 1 g	<b>96430</b>	6,405.00
10 kg - 100 g	<b>96467</b>	6,005.00
10 kg - 1 kg	<b>96432</b>	5,370.00

### CLASS F2

Part #	Price
<b>65215</b>	\$5,890.00
<b>96445</b>	5,790.00
<b>96446</b>	5,705.00
<b>96444</b>	5,350.00
<b>96448</b>	4,785.00

### OPTIONAL

Calibration Report
\$1,420.00
1,265.00
1,120.00
820.00
510.00

### OPTIONAL

Mass Value Certificate
\$850.00
780.00
660.00
420.00
270.00

### REPLACEMENT CASES

Part #	Price
<b>65218</b>	\$1,995.00
<b>65218</b>	1,995.00

### ADDITIONAL ACCESSORIES

Part #	Description	Price
<b>11714</b>	Weight gloves, white cotton	\$5.00
<b>152414</b>	Premium tweezer	35.00

# Metric Sets

Range: 10kg

## WEIGHT SET CONTENTS

10 kg - 1 mg	10 kg - 100 mg	10 kg - 1 g	10 kg - 100 g	10 kg - 1 kg
1 - 10 kg	1 - 10 kg	1 - 10 kg	1 - 10 kg	1 - 10 kg
1 - 5 kg	1 - 5 kg	1 - 5 kg	1 - 5 kg	1 - 5 kg
2 - 2 kg	2 - 2 kg	2 - 2 kg	2 - 2 kg	2 - 2 kg
1 - 1 kg	1 - 1 kg	1 - 1 kg	1 - 1 kg	1 - 1 kg
1 - 500 g	1 - 500 g	1 - 500 g	1 - 500 g	-
2 - 200 g	2 - 200 g	2 - 200 g	2 - 200 g	-
1 - 100 g	1 - 100 g	1 - 100 g	1 - 100 g	-
1 - 50 g	1 - 50 g	1 - 50 g	-	-
2 - 20 g	2 - 20 g	2 - 20 g	-	-
1 - 10 g	1 - 10 g	1 - 10 g	-	-
1 - 5 g	1 - 5 g	1 - 5 g	-	-
2 - 2 g	2 - 2 g	2 - 2 g	-	-
1 - 1 g	1 - 1 g	1 - 1 g	-	-
1 - 500 mg	1 - 500 mg	-	-	-
2 - 200 mg	2 - 200 mg	-	-	-
1 - 100 mg	1 - 100 mg	-	-	-
1 - 50 mg	-	-	-	-
2 - 20 mg	-	-	-	-
1 - 10 mg	-	-	-	-
1 - 5 mg	-	-	-	-
2 - 2 mg	-	-	-	-
1 - 1 mg	-	-	-	-

### Piece Count

29	21	17	9	5
----	----	----	---	---

### Total Weight

21.11111 kg	21.11105 kg	21.111 kg	21 kg	20 kg
Part #				
<b>65213-Class E2</b>	<b>96419-Class E2</b>	<b>96415-Class E2</b>	<b>96420-Class E2</b>	<b>96421-Class E2</b>
<b>65214-Class F1</b>	<b>96429-Class F1</b>	<b>96430-Class F1</b>	<b>96467-Class F1</b>	<b>96432-Class F1</b>
<b>65215-Class F2</b>	<b>96445-Class F2</b>	<b>96446-Class F2</b>	<b>96444-Class F2</b>	<b>96448-Class F2</b>

## ADDITIONAL ACCESSORIES

Part #	Description	Price
<b>36092</b>	Statement of Accuracy*	\$45.00
<b>11714</b>	Weight gloves, white cotton	5.00
<b>11711</b>	Tweezer	3.00
<b>152414</b>	Premium tweezer	35.00
<b>25836</b>	Serial number	15.00
<b>50035</b>	Weight forceps, plastic, 200 g - 500 g	35.00
<b>11755</b>	Leaf weight cover	35.00
<b>50000</b>	Tong assembly 1 kg - 200 g	60.00
<b>50037</b>	Lifter, 5 kg and 2 kg	45.00

\*Not available for Class E2

## SECONDARY CASE

Part #	Size	Price
<b>34697</b>	100 g - 1 mg	\$180.00

# Metric

Range: 20kg

### CLASS E2\*

Set Size	Part #	Price	Part #	Price
20 kg - 1 mg	<b>65210</b>	\$11,100.00	<b>65219</b>	\$1,890.00
20 kg - 100 mg	<b>96416</b>	10,800.00	<b>65219</b>	1,890.00
20 kg - 1 g	<b>96414</b>	10,470.00	<b>65219</b>	1,890.00
20 kg - 100 g	<b>96417</b>	9,585.00	<b>65219</b>	1,890.00
20 kg - 1 kg	<b>96418</b>	8,530.00	<b>65219</b>	1,890.00

### REPLACEMENT CASES

\*Calibration Report included, Statement of Accuracy not available, Class E2

### CLASS F1

Set Size	Part #	Price
20 kg - 1 mg	<b>65211</b>	\$8,660.00
20 kg - 100 mg	<b>96428</b>	8,505.00
20 kg - 1 g	<b>96425</b>	8,410.00
20 kg - 100 g	<b>96426</b>	8,010.00
20 kg - 1 kg	<b>96427</b>	7,380.00

### CLASS F2

Part #	Price
<b>65212</b>	\$7,700.00
<b>96447</b>	7,575.00
<b>96441</b>	7,490.00
<b>96442</b>	7,135.00
<b>96443</b>	6,570.00

### OPTIONAL

Calibration Report
\$1,600.00
1,375.00
1,225.00
925.00
615.00

### OPTIONAL

Mass Value Certificate
\$975.00
835.00
720.00
480.00
325.00

### REPLACEMENT CASES

Part #	Price
<b>65219</b>	\$1,890.00
<b>65219</b>	1,890.00

**Metric**

Range: 20 kg

**WEIGHT SET CONTENTS**

20 kg - 1 mg	20 kg - 100 mg	20 kg - 1 g	20 kg - 100 g	20 kg - 1 kg
1 - 20 kg	1 - 20 kg	1 - 20 kg	1 - 20 kg	1 - 20 kg
1 - 10 kg	1 - 10 kg	1 - 10 kg	1 - 10 kg	1 - 10 kg
1 - 5 kg	1 - 5 kg	1 - 5 kg	1 - 5 kg	1 - 5 kg
2 - 2 kg	2 - 2 kg	2 - 2 kg	2 - 2 kg	2 - 2 kg
1 - 1 kg	1 - 1 kg	1 - 1 kg	1 - 1 kg	1 - 1 kg
1 - 500 g	1 - 500 g	1 - 500 g	1 - 500 g	-
2 - 200 g	2 - 200 g	2 - 200 g	2 - 200 g	-
1 - 100 g	1 - 100 g	1 - 100 g	1 - 100 g	-
1 - 50 g	1 - 50 g	1 - 50 g	-	-
2 - 20 g	2 - 20 g	2 - 20 g	-	-
1 - 10 g	1 - 10 g	1 - 10 g	-	-
1 - 5 g	1 - 5 g	1 - 5 g	-	-
2 - 2 g	2 - 2 g	2 - 2 g	-	-
1 - 1 g	1 - 1 g	1 - 1 g	-	-
1 - 500 mg	1 - 500 mg	-	-	-
2 - 200 mg	2 - 200 mg	-	-	-
1 - 100 mg	1 - 100 mg	-	-	-
1 - 50 mg	-	-	-	-
2 - 20 mg	-	-	-	-
1 - 10 mg	-	-	-	-
1 - 5 mg	-	-	-	-
2 - 2 mg	-	-	-	-
1 - 1 mg	-	-	-	-

**Piece Count**

30	22	18	10	6
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**Total Weight**

41.11111 kg	41.11105 kg	41.111 kg	41 kg	40 kg
Part #				
<b>65210-Class E2</b>	<b>96416-Class E2</b>	<b>96414-Class E2</b>	<b>96417-Class E2</b>	<b>96418-Class E2</b>
<b>65211-Class F1</b>	<b>96428-Class F1</b>	<b>96425-Class F1</b>	<b>96426-Class F1</b>	<b>96427-Class F1</b>
<b>65212-Class F2</b>	<b>96447-Class F2</b>	<b>96441-Class F2</b>	<b>96442-Class F2</b>	<b>96443-Class F2</b>

**ADDITIONAL ACCESSORIES**

Part #	Description	Price
<b>36092</b>	Statement of Accuracy	\$45.00
<b>11714</b>	Weight gloves, white cotton	5.00
<b>11711</b>	Tweezer	3.00
<b>152414</b>	Premium tweezer	35.00
<b>25836</b>	Serial number	15.00
<b>50035</b>	Weight forceps, plastic, 200 - 500 g	35.00
<b>11755</b>	Leaf weight cover	35.00
<b>50000</b>	Tong assembly 1 kg - 200 g	60.00
<b>50037</b>	Lifter, 5 and 2 kg	45.00

**SECONDARY CASE**

Part #	Size	Price
<b>34697</b>	100g - 1 mg	\$180.00

Accessories  
**Sealing Plugs**



**SEALING PLUGS**

Part #	Diameter	Price
<b>Lead Plugs</b>		
11749	2 3/4 in (69.8 mm)	\$3.50
11750	1 7/8 in (47.6 mm)	2.75
11751	1 in (25.4 mm)	2.50
11752	1/2 in (12.7 mm)	2.50
11753	1 1/4 in (31.7 mm)	2.50
11760	9/16 in (14.3 mm)	2.50
11761	5/8 in (15.9 mm)	2.50
11765	3/4 in (19.1 mm)	2.50
11785	7/8 in (22.2 mm)	2.50
<b>Aluminum Plugs</b>		
11744	3/8 in (9.5 mm)	1.20
11745	1/2 in (12.7 mm)	1.20
11746	5/8 in (15.9 mm)	1.20
11762	1 in (25.4 mm)	1.20
11767	9/16 in (14.3 mm)	2.50
11775	7/8 in (22.2 mm)	2.00
11776	3/4 in (19.1 mm)	1.20
<b>Backup Plugs</b>		
11748	2 3/4 in (69.8 mm)	3.95
11766	3/4 in (19.1 mm)	3.35
11710	1 in (25.4 mm)	1.40
11699	1 7/8 in (47.6 mm)	1.40
<b>Backup Plugs Stainless Steel</b>		
44992	1 in (25.4 mm)	1.20
44993	5/8 in (15.9 mm)	3.00
44994	3/8 in (9.5 mm)	3.50
<b>Stainless Steel Plugs</b>		
11709	15/16 in (23.0 mm)	2.50

TEST WEIGHTS

www.ricelake.com | Phone: 800-472-6703

**RICE LAKE**

# Gloves/Transfer Equipment



### Cotton 11714

- Essential tool for proper weight-handling
- Proper protection for preventing hand residue
- Residue can throw off a weight's calibration and certification for accuracy
- Rice Lake recommends using cotton gloves to handle all precision weights

### Plastic 11773

Plastic gloves are an acceptable handling tool to keep dirt and residue off your weights. Better than handling precision weights bare-handed, plastic gloves are economical, disposable, convenient, and help maintain the integrity of your weights.

### GLOVES

Part #	Description	Price
11714	White cloth (pair)	\$5.00
11773	Vinyl glove	1.50

### TRANSFER EQUIPMENT

Part #	Description	Price
11711	Forceps, 3 5/8 in 100 g - 1 mg	\$3.00
50035	Forceps, 4 3/4 in	35.00
11747	Plastic bar 200 g - 4 kg	15.00
11712	Metal handle 5 kg +	60.00
65640*	Metal forceps	15.00
50037	Weight lifter, OIML 2 kg and 5 kg	45.00
50000	Tong assembly, 24 cm x 7.5 cm	60.00
152414	Tweezers, premium, 140 mm	35.00
157109	Tweezers, premium, 220 mm	40.00

\* Not recommended for use with polished weights.



## Guidelines for Selecting a Case

- Find the diameter, height and total mass of the weights that will need a case
- Review case dimensions to determine best fit
- Note weight limits of the case and choose accordingly

### Things to keep in mind:

- Foam needs 0.5 inches between weights and edge of case
- Always select the smallest case best fitting your need
- Weights should always be stored and transported in the upright position
- The shoulder edge of the weight should be level with the foam insert
- Some cases are recommended for storage only and should not be used for shipping

## Medium-Duty Cases

Medium-duty cases are primarily used for manually transporting test weights as they effectively absorb shock and resist changes in environment.

### ABS Plastic Part Numbers 11531, 11534 and 11572

- ABS plastic is considered superior for its strength, gloss, and electrical insulation properties—an excellent choice for encasing weights
- All metal hardware establishes the security of your weights
- Top-mounted handle makes transporting the weights effortless
- Custom-cut foam inserts are used for insulating between the weights
- Three sizes available

### Wooden Case Part Number 34645

- Walnut-constructed and felt-lined
- Built-to-order and designed specifically for our weight sets
- Available in 5 - 20 kg capacities
- Secured by hinged latches
- Case keeps weights free of dust and contaminants
- Protects your weights in storage and during transportation
- Cases should be packed in an external box during shipping to protect them

### PVC Case Part Number 11596

- Available in capacities from 100 g - 1 mg for precision laboratory SST weight sets
- Also available for ASTM Class 0 weights in 100 g - 1 mg capacities

## Industrial-Quality Cases

These heavy-duty cases are designed to be used in place of large wooden cases when portability is desired. The recessed latches provide protection insurance for your weights.

### Black Thermo-formed Cases 156989, 156285 and 156284

- Excellent for transporting weights
- Recessed, heavy-duty latches confidently secure contents
- Ergonomic handles retain preferred treatment of weights
- Metal hardware resists natural wear and tear
- Special case cuttings are required for heavy duty cases at an additional charge

### Black Injection-Molded Watertight Case 158121

- Designed for custom weight sets
- Ergonomic top-mounted handle provides ideal weight positioning
- Interior is custom-molded to the weights to be stored

## Light-Duty/Single Weight Cases

Light-duty/single weight cases can be used for storage and shipping smaller capacity weights within additional materials.

### Plastic Case Part Number 87982

- Light-duty plastic cases are used for shipping lighter capacity weights—typically single weights not exceeding 5 lb
- Plastic hinges, latches, and side mounted handle keep this case extremely lightweight and portable
- Uncut foam is included while custom-cut is available for an extra charge
- Custom-cut foam insert protects each weight from impact during transport

### Leatherette Case Part Number 69229, 69228 and 69429

- Secure storage of single weights with snap lid
- Considered light duty and used for storage and shipping
- Leatherette in a non-porous material—ideal weight protection
- Three sizes of leatherette cases available

### Acrylic, Clean Room Case Part Number 89179 and 89180

- Ideal for all clean room environments
- Tough, clear acrylic protects your valuable investment
- Provide compliance for stringent clean room requirements
- Not recommended for shipping, developed exclusively for storage
- Available as an accessory only
- Rice Lake recommends shipping weights using wooden or plastic weight cases

Accessories  
Cases



Shown with optional insert



PN 11534

PN 87982



PN 158121



PN 156989



PN 156285



PN 156284



PN 21230



PN 11531



PN 11572



PN 69429



PN 69229



PN 69228

PELICAN CASES

Part #	Width	Length	Closed Height	Price
21230	22 in	17 in	8 in	\$345.00
21229	17 in	11 3/4 in	6 in	230.00

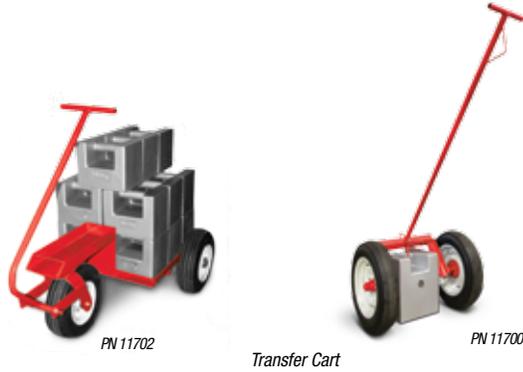
REPLACEMENT CASES

Part #	Width **	Length **	Closed Height **	Price
<b>Acrylic Clean Room Cases</b>				
89180	4.7 in	8.7 in	2.8 in	\$185.00
89179	-	-	1.8 in	100.00
89181	5 1/4 in	12 in	4 in	295.00
89182	8 1/2 in	13 1/4 in	5 3/4 in	465.00
<b>Leatherette</b>				
69429	3 3/4 in	1 7/8 in	1 1/16 in	30.00
69229	3 7/16 in	2 1/2 in	7/8 in	30.00
69228	4 in	4 in	4 1/2 in	42.00
<b>Plastic</b>				
87982	9 1/2 in	6 in	3 1/2 in	65.00
<b>ABS Plastic</b>				
11531	13 1/2 in	7 5/8 in	6 in	200.00
11534	14 3/8 in	9 3/8 in	7 5/8 in	210.00
11572	8 3/8 in	6 1/2 in	7 1/8 in	150.00
<b>Sealers Cube Wt - with precut foam insert*</b>				
40783	14 3/8 in	9 3/8 in	7 5/8 in	290.00
<b>Heavy Duty Industrial Cases</b>				
156989	16.3 in	22.4 in	10.5 in	690.00
156285	11.4 in	16.4 in	9.0 in	462.00
158121	9.5 in	12.63 in	4.75 in	265.00
156284	9.9 in	9.9 in	11.0 in	372.00
<b>Protection Containers</b>				
80420	Capsule			3.00
50038	Vial			3.00

\* Metric or Avoirdupois, no storage pocket

\*\* Inside case dimensions

# Transfer Cart/Touch-Up Paint/Canvas Dust Covers



### TRANSFER CART

Part #	Width	Handle Width	Height	Price
<b>11700</b>	36 1/2 in (927.1 mm)	74 1/2 in (1892.3 mm)	29 in (736.6 mm)	\$1,395.00

For use on smooth, level surfaces— especially for moving 500 or 1,000 lb heavy-capacity weights.

<b>11702</b>	24 in (609 mm)	35 in (889 mm)	14 in (355 mm)	1,600.00
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### Hook Replacement Parts

<b>22643</b>	Short hook for 1,000 lb weight	40.00
<b>22644</b>	Long hook for 1,000 lb weight	40.00

For use on smooth, level surfaces—for holding up to fifteen 50 lb grip-handle weights.



Touch-up/Repair Paint

### TOUCH-UP/REPAIR PAINT

Part #	Color	Price
<b>88561</b>	Aerosol spray (gold)	\$25.00
<b>88562</b>	Aerosol spray (silver)	25.00
<b>88563</b>	Aerosol spray (primer)	25.00

Spray paint ships UPS ground only

### CANVAS DUST COVERS



Canvas Dust Covers

Capacity	Weight Part #	Cover Part #	Price
200 lb	<b>(12890)</b>	<b>11720</b>	\$175.00
500 lb	<b>(12844)</b>	<b>11722</b>	175.00
750 lb	<b>(12880)</b>	<b>11723</b>	175.00
1,000 lb	<b>(12850)</b>	<b>11724</b>	175.00
1,250 lb	<b>(12858)</b>	<b>11727</b>	175.00
2,000 lb	<b>(12866)</b>	<b>11729</b>	175.00
5,000 lb	<b>(12888)</b>	<b>11735</b>	175.00
100 kg	<b>(12817)</b>	<b>11738</b>	175.00
250 kg	<b>(12782)</b>	<b>11740</b>	175.00
500 kg	<b>(12797)</b>	<b>11741</b>	175.00
1,000 kg	<b>(12801)</b>	<b>11742</b>	175.00
2,000 kg	<b>(12821)</b>	<b>11743</b>	175.00



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**ESPAÑOL** | Visit [ricelake.com/spanish](http://ricelake.com/spanish) to see all RLWS materials available in Spanish

# Ordering Weights and Weight Sets

1. Please describe your application and tell us what you need to accomplish with the weight(s) or weight set.
2. What is the maximum amount of weight you will need at any one time?
3. What is the minimum amount of weight you will need at any one time?
4. What tolerance are you looking for?
5. Is your tolerance driven by the equipment under test; the application; an internal specification document; or another source?
6. What "style" (ASTM, OIML, NIST) is required or preferred?
7. What configuration do you need (5-3-2-1 or 5-2-2-1)?
8. Do you need something that is custom manufactured?
9. What is your budget for this project?
10. Tell us about the environment. Is it:
  - a. indoor/outdoor?
  - b. wet/dry?
  - c. windy/still?
  - d. corrosive, hazardous, or explosive?
  - e. a clean room?
  - f. an environment with biohazard, electrostatic or magnetic conditions to consider?
  - g. an environment with other noteworthy conditions? If so, what are they?
11. Are you replacing an existing weight or weight set?
12. If the answer to question number 11 is yes:
  - a. What do you like/dislike about the existing weights?
  - b. What configuration is the existing set?
  - c. What style is the existing set?
  - d. What laboratory documentation is needed for the existing set?
13. Does this weight set need to be Legal for Trade?
14. Do you need ISO/IEC 17025 and ISO 9000 laboratory documentation?
15. If you do not need ISO/IEC 17025 and ISO 9000 laboratory documentation, do you need traceability to NIST?
16. Do you need true mass value?
17. Do you need a book version of the Calibration Report?
18. If you do not need any documentation, you still have the option of an Rice Lake Statement of Accuracy (see page 241).
19. If you are getting any of the laboratory documentation above, do you need a recall date?

Your existing weights and weight sets should be recertified on a managed periodic basis. The recertification period is determined by a number of factors, including but not necessarily limited to, the environment, frequency of use, demands of the process, quality of the weighing devices in question, age of the weights in question and handling during use.
20. What other precision services/equipment (recalibration, balances, accessories, static electricity) do you use?



# Ordering Laboratory Documentation

## New Weights

Traceable and Weight Calibration Certificates can be purchased with every weight we sell. To order either document with your purchase of a new weight or weight set, you should:

1. Note on your purchase order to add these services.
2. Call or fax the order and we will quote you the additional price immediately.

## Existing Weights

Your existing weights and weight sets should be recertified on a managed periodic basis determined by a number of factors, including but not necessarily limited to: the environment, frequency of use, demands of the process, quality of the weighing devices in question, age of the weights in question, and handling during use.

When calibrating existing weights there are many factors that affect the cost: age, design, abuse, required finish, tolerance and class needed. To accurately estimate the cost of our calibration service, we offer the following four-hour response options:

- Complete the Weight Recalibration Request form available online at [www.ricelake.com/recalibration](http://www.ricelake.com/recalibration) or on page 275.
- Return the Weight Recalibration Request form with the weights and we will evaluate the weights and phone you with a quote.
- Call and tell us what weights you have and what service you need and we will give you a quote over the phone.

## Lost Document Fees

Replacement documentation is provided free of charge if reported lost within 60 days of the date of the original document.

If reported lost after 60 days from the date of the original document, a fee of \$50.00 plus shipping will be charged.

A faxed copy is available, free of charge, on certificates ordered after 7/1/2011.



## 4-Day Turnaround for Weights and Calibration Services

Please call **800-472-6703** or visit our website at **ricelake.com** to receive a copy of the Weight Recalibration.

*Weight Recalibration Request forms must be received at Rice Lake during the hours of 6:30 a.m. to 6:30 p.m. Monday through Friday and on Saturday from 8:00 a.m. to noon central standard time.*



# How Will an NVLAP-Accredited Calibration Lab Benefit Me?

**Certification of Accreditation available for download at [www.ricelake.com/accreditation](http://www.ricelake.com/accreditation).**



While the present benefits of using an NVLAP-accredited lab for your weight calibration services are readily apparent, the future benefits—both in the U.S. and abroad—when the NVLAP program gains widespread approval, will be truly exciting.

Rice Lake Weighing Systems' metrology staff has participated in NIST/OWM training seminars, regional metrology groups such as MidMAP and round robin measurement programs with state labs since regional groups were established in the early 1980s. Now, with the NVLAP program in place, Rice Lake Weighing Systems has demonstrated its ability to meet accreditation requirements equal to the state calibration labs.

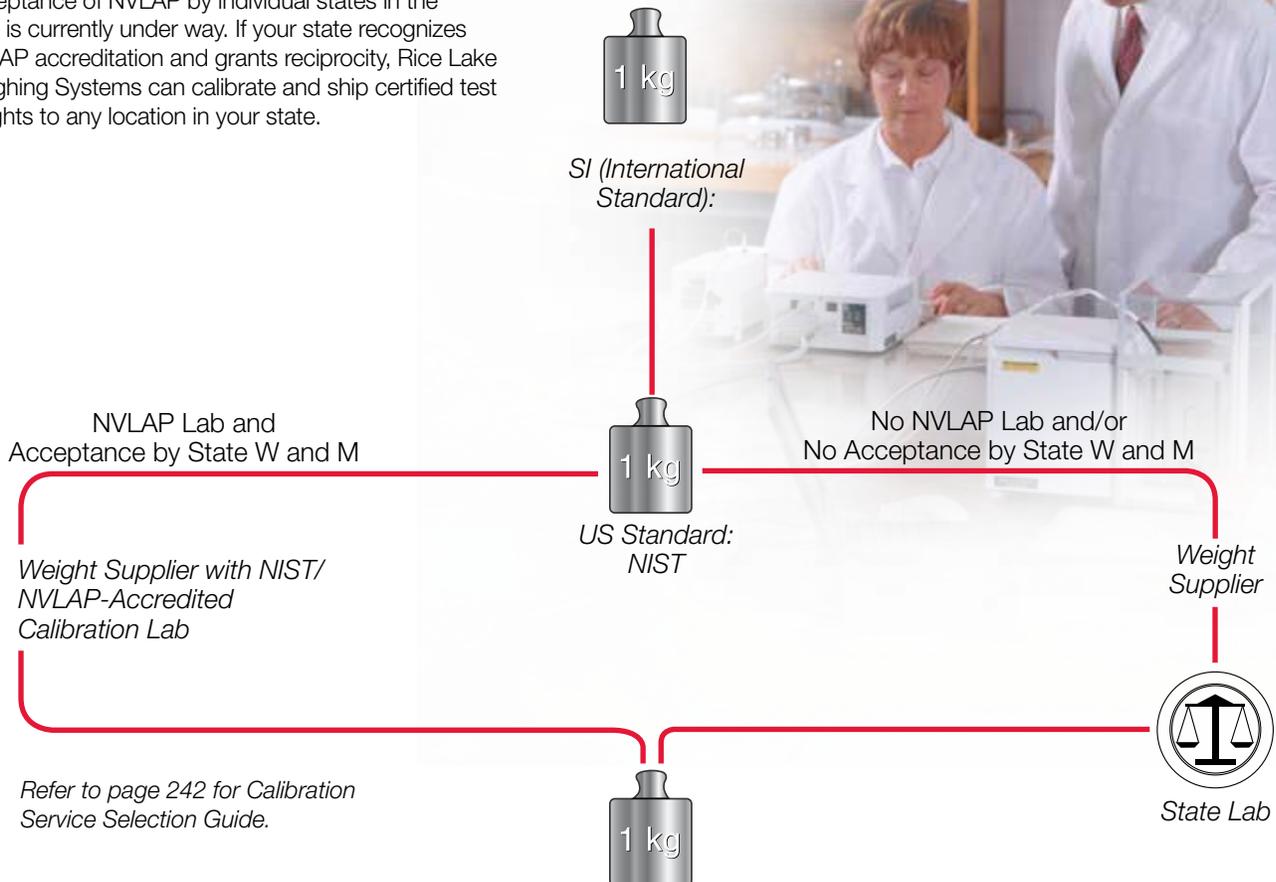
For international customers, NVLAP-accredited calibration validates the traceable link to the SI (international standard) so often required by ISO 9000 registered companies. The NVLAP program brings a measure of reciprocity and universal standardization that the weights and measures industry has long sought. The NVLAP standards were tailored to the calibration requirements of the major European accreditation bodies, so ready acceptance of calibrations from American NVLAP-accredited labs is expected by the European community. NVLAP is an International Laboratory Accreditation Cooperation (ILAC) signatory.

Acceptance of NVLAP by individual states in the U.S. is currently under way. If your state recognizes NVLAP accreditation and grants reciprocity, Rice Lake Weighing Systems can calibrate and ship certified test weights to any location in your state.

If your state has not granted reciprocity for NVLAP-accredited calibrations, we will continue to send commercial test weights and mass standards to your local state lab for certification (or to another state lab with a reciprocity agreement). You may place your Legal for Trade test weights into service only after that official lab performs its tests.

Check with your state or local Weights and Measures officials to determine the approval status of Legal for Trade weights in your state before ordering certification by Rice Lake Weighing Systems.

Rice Lake Weighing Systems' NVLAP-accredited lab can certify weights to accuracy echelon I, II and III, and ship them directly to customers. See page 244 for typical uses of these accuracy classes.



# Traceability

## What is Traceability?

Traceability is documentation—essentially a pedigree—showing a direct link to the official U.S. 1 kilogram weight standards housed at the National Institute of Standards and Technology (NIST) in Gaithersburg, Md. These NIST standards are in turn calibrated to the international 1 kilogram standard maintained at the SI (international standard) lab in Sevres, France.

Traceability not only means that a weight or mass standard has links to the NIST 1 kilogram standard, but also that the measurements were appropriate for the accuracy class required for the application. Traceability also requires proof that all environmental factors affecting accuracy were considered at the lab doing the measurement.

There are two types of traceability: direct and indirect.

## Direct Traceability

Direct traceability means a weight or mass standard has been tested by NIST. NIST then issues a report number to the organization for whom they have performed measurements. Because the certificate is valid only for the items tested by NIST, a calibration lab such as Rice Lake Weighing Systems must submit its set of mass standards to NIST for testing. This certificate provides direct traceability for the lab's mass standards, which can then be used in calibrating weights for clients.

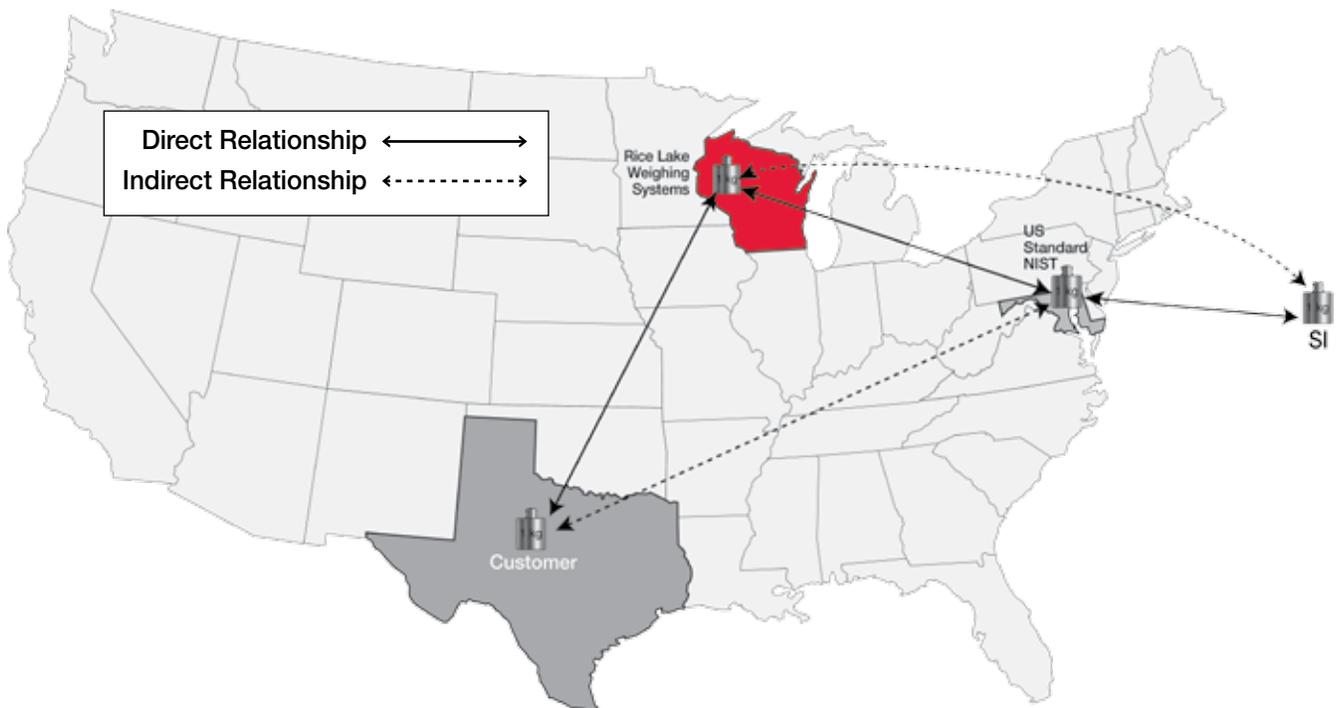
## Indirect Traceability

Indirect traceability exists when a client's weight or mass standard is tested by a metrology lab that has direct traceability and has the necessary measurement control program in place. An important aspect of this measurement control and testing program is the participation in a NIST-certified measurement assurance program, which reduces the possibility of errors.

To clarify the two types of traceability, remember that direct traceability comes directly from NIST. For example, Rice Lake Weighing Systems' calibration lab has direct traceability, as shown in the diagram below. The calibrations we perform for our customers provide indirect traceability. Likewise, when that customer uses its Rice Lake Weighing Systems calibrated test weights to calibrate a balance or scale, it is providing indirect traceability.

## When is Traceability Necessary?

- Federal agencies require measurement traceability to national standards for contract work.
- Military contracts invariably require traceability.
- Pharmaceutical, scientific and medical products manufacturers usually specify traceability.
- ISO 9000 registered companies nearly always require proof of traceability to the international standard.



# Calibration Service Selection Guide

Certification of Accreditation available for download at [www.ricelake.com/accreditation](http://www.ricelake.com/accreditation).

## Answer two Questions

to determine the calibration service you need

1

Do you need an **accredited\*** laboratory certificate to meet **ISO/IEC 17025** and **ANSI/NCSC Z540-1** requirements?

YES

NO

2

### What Weight Class?

### Traceability to NIST?

ASTM 0, 1, 2, 3;  
OIML E1, E2, F1, or F2

ASTM 4, 5, 6, 7;  
NIST F;  
OIML M1, M2, M3

YES

NO



**NVLAP**  
NVLAP Lab Code 105001-0

#### Calibration Certificate

- Weight classes: ASTM 0–3, OIML E1, E2, F1, F2
- Meets all the requirements of the National Voluntary Laboratory Accreditation Program (NVLAP)
- Provides traceability to NIST
- Meets requirements for ISO/IEC 17025 and ANSI/NCSL Z540-1
- Lists the environmental conditions present at time of calibration
- Certificate cites that the test was done by Rice Lake, an accredited laboratory
- Certificate states that Rice Lake is ISO 9001 registered



**NVLAP**  
NVLAP Lab Code 105001-0

#### Traceable Certificate

- Weight classes: ASTM 4–7, NIST F, OIML M1, M2, M3
- Meets all the requirements of the National Voluntary Laboratory Accreditation Program (NVLAP)
- Provides traceability to NIST
- Meets requirements for ISO/IEC 17025 and ANSI/NCSL Z540-1
- Lists the environmental conditions present at time of calibration
- Certificate cites that the test was done by Rice Lake, an accredited laboratory
- Certificate states that Rice Lake is ISO 9001 registered



#### Rice Lake Mass Value Certificate

- Weight classes: ASTM 1–3, OIML, F1, F2
- Uncertainty to tolerance ratios are not guaranteed to be met
- Lists actual weight values, uncertainties, and tolerances
- Measurements are traceable to NIST
- Not an accredited certificate



#### Statement of Accuracy

- (Only applicable to new weights)*
- This is not a Legal for Trade or traceable document
  - Does not give traceability to NIST
  - All weight classes
  - Tolerance statement of the weight
  - Nominal value of the weight is listed
  - Tolerance for the specific weight class is noted
  - Before, after or uncertainties values are not listed

# Documentation

## Traceable Certificate vs. Calibration Certificate

The major difference between the two is the method in which the weights are compared to the known standard. They both give the actual values and uncertainties. The Calibration Certificate will, however, give a smaller uncertainty and a more precise value of the actual mass due to the multiple measurements that are made during the calibrating process.

Both the Traceable Certificate and Calibration Certificate will include the following information:

- Actual mass values or the corrections to the nominal mass of the weight being calibrated vs.  $8 \text{ grams/cm}^3$ .
- The uncertainty of the measurement process as it relates to the item being calibrated.
- The environmental conditions present during the test.
- The assumed density of the weight being tested so that atmospheric buoyancy corrections can be applied.

## Which Document Do I Need?

This is one of the most frequently asked questions we hear at our mass metrology laboratory and often times, the decision has already been made for you depending on the class of weight being evaluated.

Sometimes the answer is obvious, as when a company has legal or contractual requirements that mandate a specific document. Government contracts may dictate a document to meet certain military standard specifications. Often the need for quality control requirements for ISO-9000 guidelines specify that certain standards be met in their weight documentation.

In the absence of any programs or guidelines within your company, the Accuracy Classes for Mass Standards and Test Weights chart on page 244 can be used as a guide to define whether a Calibration Certificate or Traceable Certificate is required.

A Statement of Accuracy is adequate if the actual values and stated uncertainties of the weights are not necessary, and only the tolerances of the specific class are needed. These documents are normally adequate for weights used to calibrate industrial balances and scales more than 6 kg in capacity. The mass standards used by Rice Lake Weighing Systems are used to verify that those weights are within the necessary tolerances. Weights with this document do not meet the requirements needed in Legal for Trade scale applications.

## Legal for Trade Weight Applications

NIST Class F weights are required for all Legal for Trade applications which include any product that is sold by weight. This would include all retail scales, floor and truck scales. For these applications we recommend a traceable certificate, which will give actual values and uncertainties of the weights. Most state weights and measures departments require this information as a minimum to allow weights to be put into field service.

This is usually the same information that the state gives when they certify weights. Check with your state and local Weights and Measures Department for acceptance of our documentation.

# Calibration Certificate



REFERENCE

A customer requesting a Calibration Certificate needing traceability to NIST is looking for actual weight readings, corrections and uncertainty values. To produce this document, a calibration laboratory must maintain a statistical measurement process acceptable by NIST. Also, depending on the weight class and the accuracy required, different standards and procedures need to be incorporated to make sure the level of uncertainty is appropriate for the item being tested. The Calibration Certificate is in compliance with ISO International Standard 17025 and ANSI/NCCL Z540-1 requirements.

The special software used to produce the Calibration Certificate was developed specifically for Rice Lake Weighing Systems. These programs and procedures allow Rice Lake Weighing Systems to achieve and help maintain lower uncertainties.

## The Calibration Certificate includes the following information:

- 1 Name and address of the calibration laboratory
- 2 Contractor name and address
- 3 Client name and address
- 4 Environmental condition at time of test
- 5 Your Traceable Certificate number
- 6 NIST Certificate number

### Procedure Used:

- 7 Mass dissemination
- 8 Identification of the calibrated item and serial number, if applicable
- 9 Nominal mass value
- 10 Conventional mass correction of the weight before adjustment<sup>1</sup>
- 11 As left conventional mass correction of the weight<sup>1</sup>
- 12 A statement of the estimated value of uncertainty<sup>2</sup>
- 13 Tolerance for the specific class
- 14 Record of the weighing equipment
- 15 Calibration and due date of Rice Lake standards. This represents the date that Rice Lake standard is due for recalibration. This Rice Lake standard was used to check the performance of your weight. This date in no way reflects an expiration date of the certificate, nor does it infer or specify a recall date. The expiration of the certificate and the specification of a recall date are user assigned responsibilities under NIST H150-1.
- 16 Assumed density of the weight being tested
- 17 Date calibrated
- 18 Recall date (if requested)
- 19 The NVLAP official logo will be displayed when the documentation meets the scope of accreditation under Lab Code 105001-0
- 20 Conventional mass - mass that weight weighs at 20 degrees Celsius in air of density of 1.2 milligram/cm<sup>3</sup> against a standard density of 8.0 gram/cm<sup>3</sup>.

Refer to page 236 for Calibration Service Selection Guide.

<sup>1</sup> The Conventional Mass Correction is the deviation from the Nominal Value, reported in milligrams. A minus sign indicates that the weight is less than the nominal value.

<sup>2</sup> All measurements have a degree of uncertainty regardless of precision and accuracy. This is caused by two factors, the limitation of the measuring instrument (systematic error) and the skill of the experimenter making the measurements (random error).

**Procedure Used:**  
Mass dissemination using NIST  
SOP 5, NIST SOP 28

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RICE LAKE

# Traceable Certificate



REFERENCE

A customer requesting a Traceable Certificate needs proof of traceability to NIST, actual mass values and uncertainties. Comparisons must be made between the item being tested and a known standard being used. The laboratory performing the testing must verify that the proper procedures and standards are being used so that the uncertainties are suitable for the test that is required. The known standard and procedure used for the tolerance test is essential to the traceable document. The Traceable Certificate is in compliance with ISO International Standard 17025 and ANSI/NCSL 2540-1 requirements.

Prior to the comparison between the known standard and the item(s) submitted for test, the known standard must be sufficiently tested over time to produce predictable measurements. Also, the procedure used to do the comparison must be accurate enough so the uncertainty of the measurement is small enough to generate a valid certificate.

**This certificate should contain all of the data related to the tolerance test. After testing, a Traceable Certificate is issued and will include:**

- 1 Name and address of the calibration laboratory
- 2 Contractor name and address
- 3 Client name and address
- 4 Environmental condition at time of test
- 5 Your Traceable Certificate number
- 6 NIST Certificate number

**Procedure Used:**

- 7 Modified substitution
- 8 Identification of the calibrated item and serial number, if applicable
- 9 Nominal mass value
- 10 Conventional mass correction of the weight before adjustment<sup>1</sup>
- 11 As left conventional mass correction of the weight<sup>1</sup>
- 12 A statement of the estimated value of uncertainty<sup>2</sup>
- 13 Tolerance for the specific class
- 14 Record of the weighing equipment
- 15 Calibration and due date of Rice Lake standards. This represents the date that Rice Lake standard is due for recalibration. This Rice Lake standard was used to check the performance of your weight. This date in no way reflects an expiration date of the certificate, nor does it infer or specify a recall date. The expiration of the certificate and the specification of a recall date are user assigned responsibilities under NIST H150-1.
- 16 Assumed density of the weight being tested
- 17 Date calibrated
- 18 Recall date if requested
- 19 The NVLAP official logo will be displayed when the documentation meets the scope of accreditation under Lab Code 105001-0
- 20 Conventional mass - mass that weight weighs at 20 degrees Celcius in air of density of 1.2 milligram/cm<sup>3</sup> against a standard density of 8.0 gram/cm<sup>3</sup>.

<sup>1</sup> The Conventional Mass Correction is the deviation from the Nominal Value, reported in milligrams. A minus sign indicates that the weight is less than the nominal value.

<sup>2</sup> All measurements have a degree of uncertainty regardless of precision and accuracy. This is caused by two factors, the limitation of the measuring instrument (systematic error) and the skill of the experimenter making the measurements (random error).

**Traceable Calibration CERTIFICATE**  
ANSI/NCSL 2540-1-1994, Part 1 & ISO/IEC 17025 Accredited

Contractor: **Rice Lake Weighing Systems**  
230 W Coleman St  
Rice Lake, WI 54888

Client: **Rice Lake Weighing Systems**  
230 W Coleman St  
Rice Lake, WI 54888

City & State: Rice Lake, WI 54888

Date Recalibrated: 18 JUL 2015

Date Calibrated: 20 JUL 2015 to 21 JUL 2015

Temperature Range: 21.75 °C to 22.37 °C

Pressure Range: 721.3 mmHg to 727.3 mmHg

Relative Humidity Range: 49 % to 55 %

Air Density: 1.278 mg/cm<sup>3</sup> to 1.3438 mg/cm<sup>3</sup>

Traceable Report #: SAMPLE-V

NIST Certificate #: 68428841-01, 68428441-14

Tested By: T2, W, JZ

Procedure: Modified Substitution (M05-0023)

Contractor Req Recall Date: 2 Years

Primary Standard Calibration Date: 03/16/15, 11/25/13 Date: 03/16/15, 11/24/17

Description of Weights: 10 mg - 100 g Saini Finish Weight Kit, NIST Class F, 3M SAMPLE-V

Although there are two NIST numbers, use as both may apply.

Nominal Value	ML	Conventional Mass Cor. As Found (mg)	As Left (mg)	Unc. K12 (mg)	Tol.* (mg)	Balance Used	Standard Set Used Calibration MM-DD-YY/MM-DD-YY	Assumed Density (g/cm <sup>3</sup> )
10 mg		0.0900	0.0900	0.0013	0.21	501Q	K594Q 04-22-15/07-22-15	7.95
20 mg		0.1211	0.1211	0.0013	0.26	501Q	K594Q 04-22-15/07-22-15	7.95
20 mg	-	0.1220	0.1220	0.0013	0.26	501Q	K594Q 04-22-15/07-22-15	7.95
50 mg		0.1115	0.1115	0.0014	0.35	501Q	K594Q 04-22-15/07-22-15	7.95
100 mg		0.1953	0.1953	0.0012	0.43	501Q	K594Q 04-22-15/07-22-15	7.95
200 mg		0.2351	0.2351	0.0012	0.54	501Q	K594Q 04-22-15/07-22-15	7.95
200 mg	-	0.2377	0.2377	0.0012	0.54	501Q	K594Q 04-22-15/07-22-15	7.95
500 mg		0.1725	0.1725	0.0015	0.72	501Q	K594Q 04-22-15/07-22-15	7.95
1 g		0.356	0.356	0.008	0.90	636Q	D663Q 04-22-15/07-22-15	7.84
2 g		0.36	0.36	0.11	1.12	636Q	D663Q 04-22-15/07-22-15	7.84
2 g	-	0.18	0.18	0.11	1.12	636Q	D663Q 04-22-15/07-22-15	7.84
5 g		0.639	0.639	0.067	1.5	636Q	D663Q 04-22-15/07-22-15	7.84
10 g		0.79	0.79	0.11	2.0	636Q	D663Q 04-22-15/07-22-15	7.84
20 g		1.65	1.65	0.29	4.0	1221Q	D663Q 04-22-15/07-22-15	7.84
20 g	-	1.72	1.72	0.29	4.0	1221Q	D663Q 04-22-15/07-22-15	7.84
50 g		3.70	3.70	0.32	10	1221Q	D663Q 04-22-15/07-22-15	7.84
100 g		7.08	7.08	0.38	20	1221Q	D663Q 04-22-15/07-22-15	7.84

Prepared By: **Rice Lake Weighing Systems**  
330 West Coleman Street, Rice Lake, WI 54888 • USA  
TEL: 715-224-9111 • FAX: 715-224-9507 • www.ricelake.com  
An ISO 9001 registered company

Page 1 of 1 Page

Dated: 24 JUL 2015

Sig Dennis Metzger

**NVLAP** logo

**Procedure Used:**  
Modified substitution using NIST SOP 8,  
Rice Lake Work Instruction W105-0023

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RICE LAKE

# Rice Lake Traceable Mass Value Certificate

A customer requesting a Rice Lake Traceable Mass Value Certificate, needs proof of traceability to NIST and actual values and uncertainties. Comparisons must be made between the item being tested and the standard being used. The known standard used for the tolerance test is essential to the traceable document.

Prior to comparison between the known standard and the item submitted for testing, the known standard must be sufficiently tested over time to produce predictable measurements.

This certificate should contain all of the data related to the test. After testing, a Rice Lake Traceable Mass Value Certificate is issued. Although the Rice Lake Traceable Mass Value Certificate provides traceability to NIST, it is not a NVLAP accredited document. If an accredited document is required, please refer to the TMAP Traceable Certificate and/or TMAP Calibration Certificate.

## The Rice Lake Traceable Mass Value Certificate includes the following information:

- 1 Name and address of the calibration laboratory
- 2 Contractor name and address
- 3 Client name and address
- 4 Environmental condition at time of test
- 5 Your Traceable Certificate number
- 6 NIST Certificate number

### Procedure Used:

- 7 Modified substitution
- 8 Identification of the calibrated item and serial number, if applicable
- 9 Nominal mass value
- 10 Conventional mass correction of the weight before adjustment<sup>2</sup>
- 11 As left conventional mass correction of the weight<sup>2</sup>
- 12 A statement of the estimated value of uncertainty<sup>1</sup>
- 13 Tolerance for the specific class
- 14 Record of the weighing equipment
- 15 Calibration and due date of Rice Lake standards.

This represents the date that Rice Lake standard is due for recalibration. This Rice Lake standard was used to check the performance of your weight. This date in no way reflects an expiration date of the certificate, nor does it infer or specify a recall date. The expiration of the certificate and the specification of a recall date are user assigned responsibilities under NIST H150-1.

- 16 Assumed density of the weight being tested
- 17 Date calibrated
- 18 Recall date if requested
- 19 Conventional Mass - mass that weight weighs at 20 degrees Celsius in air of density of 1.2 milligrams/cm<sup>3</sup> against a standard density of 8.0 grams/cm<sup>3</sup>.

<sup>1</sup> The Conventional Mass Correction is the deviation from the Nominal Value, reported in milligrams. A minus sign indicates that the weight is less than the nominal value.

<sup>2</sup> All measurements have a degree of uncertainty regardless of precision and accuracy. This is caused by two factors, the limitation of the measuring instrument (systematic error) and the skill of the experimenter making the measurements (random error).



**Procedure Used:**  
Modified Substitution using NIST SOP 8, Rice Lake Work Instruction W105-0023

# Statement of Accuracy\*

A customer requesting a Statement of Accuracy, needs proof that the nominal values represented by the mass in question have been designed and manufactured to within exact specifications.

The Statement of Accuracy provides just such a document when and where traceability to NIST, and/or the need for a NVLAP accredited document is not a concern. The Statement of Accuracy is the lowest level of documentation offered by Rice Lake Weighing Systems. Check with your internal procedures and policies to determine what type of documentation you require and thoroughly review the Rice Lake Traceable Mass Value Certificate, Traceable Certificate and Calibration Certificate options prior to selecting this laboratory documentation.

## The Statement of Accuracy includes the following information:

- 1 Name and address of the company that adjusted the weights
- 2 Part number
- 3 Description/Serial number
- 4 Tolerance for the specific class
- 5 Name and address of company that items were sold to
- 6 Name and address of company that items are shipped to

\*Only applicable to new weights. Not a Legal for Trade or traceable document.

**RICE LAKE STATEMENT OF Accuracy**

Ship To: **6** GRAINGER  
THE MINOOKA DISTRIBUTION CTR  
701 GRAINGER WAY  
MINOOKA IL 60447  
UNITED STATES OF AMERICA

Sold To: **5** GRAINGER  
ACCOUNTS PAYABLE DEPARTMENT  
PM - 911  
PALATINE IL 60038  
UNITED STATES OF AMERICA

Date: 09-29-15  
Purchase Order Number: 461595434  
Accuracy Report Number: 2346267-97

**THIS IS NOT A LEGAL-FOR-TRADE OR TRACEABLE DOCUMENT**

Qty	Part Nbr	Description	Tolerance
1	<b>2</b> 12809101	Weight, 940L, 50lb NIST Class F Cast Iron Paired. Density 7.2 <b>3</b>	2.3 g <b>4</b>

PAGE 1 ... END

Weights listed above were compared to mass standards that are calibrated and traceable to the National Institute of Standards and Technology.

Prepared By: **1**

**Rice Lake Weighing Systems**  
2303 W. Coleman Dr. • Rice Lake, WI 54980 • USA  
TEL: 715-234-8171 • FAX: 715-234-8987 • [www.ricelake.com](http://www.ricelake.com)  
An ISO 9001 registered company

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PK 7108-1016

# Rice Lake Certificate Selection Guide

RICE LAKE CERTIFICATE SELECTION GUIDE					
	Item on Certificate	NVLAP Calibration Certificate	NVLAP Traceable Certificate	Rice Lake Mass Value Certificate	Statement of Accuracy
	17025:2005 and ANSI/NCSL Z-540-1 Accredited Certificate	YES	YES	NO	NO
1	Name and address of calibration laboratory	YES	YES	YES	YES
2	Contractor (sold to) name and address *	YES	YES	YES	YES
3	Client (ship to) name and address *	YES	YES	YES	YES
4	The Traceable Report number of the Certificate for the item under test	YES	YES	YES	NO
5	Environmental conditions at time of test	YES	YES	YES	NO
6	NIST Certificate number	YES	YES	YES	NO
7	Procedure used	YES	YES	YES	NO
8	Identification of the item(s) and serial number (if applicable)	YES	YES	YES	YES
9	Nominal mass value	YES	YES	YES	NO
10	Conventional mass correction of the weight before adjustment <sup>2</sup>	YES	YES	YES	NO
11	As left conventional mass correction of the weight <sup>1</sup>	YES	YES	YES	NO
12	Estimated uncertainty of the measurement <sup>2</sup>	YES	YES	YES	NO
13	The tolerance for the specified class	YES	YES	YES	YES
14	Equipment number for the mass comparator/ Balance used to perform the test	YES	YES	YES	NO
15	The standards used to calibrate the item under test and the date the standard was calibrated by Rice Lake and date due for recalibration	YES	YES	YES	NO
16	Assumed density of the item(s)	YES	YES	YES	YES
17	Legal For Trade document		NIST Class F	NO	NO
18	True mass values	Available upon request	NO	NO	NO
19	Book form certificate (long form certificate)	Available upon request	NO	NO	NO
20	Disclaimers	Required for satin finish weights certified to ASTM Class 1	Required for cast iron grip handle and slotted weights smaller than 5 kg to ASTM Class 6	Required for satin finish weights certified to ASTM Class 1	NO
*	Can be specified by customer or client				
<sup>1</sup>	The Conventional mass correction is the deviation from the nominal value, reported in milligrams. A minus sign indicates that the weight is less than the nominal value.				
<sup>2</sup>	A reported value with a stated uncertainty is required for Traceability.				

# Rice Lake Certificate Selection Guide (continued)

RICE LAKE CERTIFICATE SELECTION GUIDE				
Weight Class	Accredited to 17025:2005 and ANSI/NC SL Z540-1 NVLAP Calibration Certificate	Accredited to 17025:2005 and ANSI/NC SL Z540-1 NVLAP Traceable Certificate	Non-Accredited Certificate Rice Lake Mass Value Certificate <sup>3</sup>	Non Accredited and not legal for trade Statement of Accuracy
ASTM 00				
ASTM 0	YES	-	-	-
ASTM 1	YES **	-	YES ** <sup>3</sup>	YES <sup>2</sup>
ASTM 2	YES	-	YES <sup>3</sup>	YES <sup>2</sup>
ASTM 3	YES	-	YES <sup>3</sup>	YES <sup>2</sup>
ASTM 4	-	YES	-	YES <sup>2</sup>
ASTM 5	-	YES	-	YES <sup>2</sup>
ASTM 6	-	YES **	-	YES <sup>2</sup>
ASTM 7	-	YES	-	YES <sup>2</sup>
OIML E1	YES			
OIML E2	YES	-	-	-
OIML F1	YES	-	YES <sup>3</sup>	YES <sup>2</sup>
OIML F2	YES	-	YES <sup>3</sup>	YES <sup>2</sup>
OIML M1	-	YES	-	YES <sup>2</sup>
OIML M2	-	YES	-	YES <sup>2</sup>
OIML M3	-	YES	-	YES <sup>2</sup>
NIST F	-	YES	-	YES <sup>2</sup>
NIST M - obs	-	-	YES <sup>3</sup>	-
NIST S - obs	YES *	-	YES ** <sup>3</sup>	-
NIST S-1 - obs	YES **	-	YES <sup>3</sup>	-
NIST P - obs	-	-	YES <sup>3</sup>	-
NIST T - obs	-	YES	-	-
NIST C - obs	-	YES	-	-
** Satin finish weights require a disclaimer because the surface finish of satin finish weights do not meet the requirements of 5.7.1 and Table 6 of the ASTM E 617-13 standard				
*** Cast iron weights 5kg or less require a disclaimer because they do not meet the requirement for density listed in 5.6 and Table 5 of the ASTM E 617-13 standard				
<sup>2</sup> Only applicable to new weights				
<sup>3</sup> Uncertainty to tolerance ratios are not guaranteed to be met				

# Selecting Mass Standards and Test Weights

The following pages of this catalog contain all the information you'll need to place your mass standard or test weight order. If you're new to the specialized field of metrological weights, the selection process can be broken into five simple steps:

1. Determine the regulatory standard that applies to your application. The international standard (OIML) is summarized on pages 246-247; the U.S. standard (ASTM E 617) is summarized on page 248-250; the U.S. commercial standard for Legal for Trade applications (NIST Handbook 105-1) is summarized on page 251.
2. Determine the accuracy class appropriate for your application by reviewing the accuracy and tolerance information below and on pages 252-259, as well as your internal ISO documentation and any applicable manufacturer's instructions.
3. Determine the type of laboratory documentation you require using the information on page 237.
4. Using the information from steps 1-3, select the weight or weight set and appropriate laboratory documentation for your application.
5. If your weights will require Legal for Trade certification prior to placing them in service, decide if you would like the certification to be handled by Rice Lake Weighing Systems' metrology lab, accredited by the National Voluntary Laboratory Accreditation Program (NVLAP), or sent to your state lab. For information on the certification process of NVLAP-accredited labs, see page 234.

## Accuracy Classes

CURRENT STANDARD AND TEST WEIGHT ACCURACY CLASSES				OBSOLETE STANDARD
Typical Use	OIML <sup>1</sup>	ASTM E617 <sup>2</sup>	NIST 105-1 <sup>3</sup>	NBS CIR. 547 <sup>4</sup>
<b>Weight Calibration Certificate Essential</b>				
<b>Primary Laboratory Reference Standard</b> High precision standards for calibration of weights and special precision analytical balances accuracy Classes I and II (class number depending on precision).	E1	00		
	E2			
		0,1		M,S
<b>Weight Calibration Certificate Recommended</b>				
<b>High Accuracy Balances</b> Working standard for precision analytical work, built-in weights and external weights used to calibrate moderate precision balances	F1	2		
		3		S1
	F2			
<b>Traceable Certificate Acceptable</b>				
<b>Industrial Scales and Balance</b> Accuracy Class III industrial scales, dial scales, trip balances, platform scales. Also used for accuracy Class IIIIL and IIII, and weights used to calibrate scales in Legal for Trade applications.		4		P
	M1	5		Q
	M2	6	F	T
	M3	7		

<sup>1</sup> See pages 246-247 for more information on OIML weight classifications  
<sup>2</sup> See pages 248-250 for more information on ASTM E617 weight classifications  
<sup>3</sup> See page 251 for more information on NIST 105-1 Class F weight classification  
<sup>4</sup> Listed for reference only. NBS Cir. 547 has been superseded by ASTM E 617 classifications

## Conversions

OBSOLETE CLASSES	CURRENT CLASSES
Class A, B, M & J	Class 0, E2
Class S	Class 1, 2
Class S1	Class 3, F1
Class P	Class 4, F2
Class Q	Class 5
Class C	Class F, 6, 7
Class T	Class 7

# Selecting Mass Standards and Test Weights (continued)

## Accuracy Classes, NIST Handbook 44



Class	Value of the Verification Scale Division (d or e <sup>1</sup> )	Number of scale <sup>4</sup> divisions (n)	
		Minimum	Maximum
<b>SI Units</b>			
I	Equal to or greater than 1 mg	50,000	-
II	1 to 50 mg, inclusive	100	100,000
	Equal to or greater than 100 mg	5000	100,000
III <sup>2,5</sup>	0.1 to 2 g, inclusive	100	10,000
	Equal to or greater than 5 g	500	10,000
III L <sup>3</sup>	Equal to or greater than 2 kg	2000	10,000
III	Equal to or greater than 5 g	100	1,200
<b>U.S. Customary Units</b>			
III <sup>5</sup>	0.0002 to 0.005 lb, inclusive	100	10,000
	0.005 to 0.125 oz inclusive	100	10,000
	Equal to or greater than 0.01 lb	500	10,000
	Equal to or greater than 0.25 oz	500	10,000
III L <sup>3</sup>	Equal to or greater than 5 lb	2000	10,000
III	Greater than 0.01 lb	100	1,200
	Greater than 0.25 oz	100	1,200

<sup>1</sup> For Class I and II devices equipped with auxiliary reading means (i.e., a rider, a vernier, or a least significant decimal differentiated by size, shape, or color), the value of the verification scale division “e” is the value of the scale division immediately preceding the auxiliary means.

<sup>2</sup> A Class III scale marked “For prescription weighing only” may have a verification scale division (e) not less than 0.01 g.

(Added 1986) (Amended 2003)

<sup>3</sup> The value of a scale division for crane and hopper (other than grain hopper) scales shall be not less than 0.2 kg (0.5 lb). The minimum number of scale divisions shall be not less than 1000.

<sup>4</sup> On a multiple range or multi-interval scale, the number of divisions for each range independently shall not exceed the maximum specified for the accuracy class. The number of scale divisions, n, for each weighing range is determined by dividing the scale capacity for each range by the verification scale division, e, for each range. On a scale system with multiple load receiving elements and multiple indications, each element considered shall not independently exceed the maximum specified for the accuracy class. If the system has a summing indicator, the nmax for the summed indication shall not exceed the maximum specified for the accuracy class.

(Added 1997)

<sup>5</sup> The minimum number of scale divisions for a Class III hopper scale used for weighing grain shall be 2000.

[Nonretroactive as of January 1, 1986]

(Amended 1986, 1987, 1997, 1998, 1999, 2003, and 2004)

Table 3 - Parameters for Accuracy Classes - Handbook 44

# Weight Classification, International Laboratory Weights and Precision Mass Standards



INTERNATIONAL ORGANIZATION OF LEGAL  
METROLOGY RECOMMENDATIONS OIML R111

## OIML Weight Classification and Selection

OIML is a worldwide, intergovernmental organization whose primary aim is to harmonize the regulations and metrological controls applied by national metrological services, or related organizations of member states.

### The two main categories of OIML publications are:

- International Recommendations (OIML R), which are model regulations that establish the metrological characteristics required of certain measuring instruments and which specify methods and equipment for checking their conformity; the OIML member states shall implement these Recommendations to the greatest possible extent.
- International Documents (OIML D), which are informative in nature and intended to improve the work of metrological services.

International Recommendations and International Documents are published in French (F) and English (E), and are subject to revision.

OIML publications may be obtained from the organization's headquarters:

Bureau International de Metrologie Legale 11  
Rue Turgot - 75009 Paris  
France Telephone: 33 (1) 48 78 12 82 and 42 85 27 11  
Fax: 33 (1) 42 82 17 27  
Telex: 234 444 SVP SERV F ATTN. OIML  
www.OIML.org

## General Information on Weight Classes: E1, E2, F1, F2, M1, M2

This recommendation contains the principle physical characteristics and metrological requirements for weights which are used:

- For the verification of weighing instruments.
- For the verification of weights of a lower class of accuracy.

The nominal values of mass of the weights covered by this recommendation range from 1 milligram (mg) to 50 kilograms (kg).

This recommendation applies to weights in classes of accuracy as follows: E1, E2, F1, F2, M1, M2 and M3.

## Weights used for the verification of weighing instruments

The classes of accuracy of the weights used for the verification of weighing instruments shall be specified in the appropriate International Recommendations relating to these instruments.

## Weights used for the verification of weights of a lower class of accuracy

- E1 Weights intended to ensure traceability (see OIML R 33, paragraph A.3) between national mass standards (with values derived from the International Prototype of the kilogram) and weights of Class E2 and lower. Class E1 weights or sets of weights shall always be accompanied by a calibration certificate.
- E2 Weights intended to be used for the initial verification of weights of Class F1. They may be used as Class E1 weights if they comply with the requirements for surface roughness and magnetic susceptibility of Class E1 weights and if their calibration certificate gives the appropriate data.
- F1 Weights intended to be used for the initial verification of weights of Class F2.
- F2 Weights intended to be used for the initial verification of weights of Class M1 and possibly M2.  
M1 weights intended to be used for the initial verification of weights of Class M2.
- F1, F2 Weights used with instruments of accuracy Class I.
- F2 Weights intended to be used for important commercial transactions (e.g. gold and precious stones) on weighing instruments of accuracy Class II.
- M1 Weights intended to be used with weighing instruments of accuracy Class II.
- M2 Weights intended to be used in normal commercial transactions and on weighing instruments of accuracy Class III.
- M3 Weights intended to be used on weighing instruments of accuracy Classes III and IV.

The accuracy of weights used with weighing instruments shall be chosen in accordance with the requirements of OIML R 76 "Nonautomatic weighing instruments."

## Excerpts from the Standard Specification for Laboratory Weights and Precision Mass Standards as Regulated by the Organization Internationale De Metrologie Legale (OIML): 2004 Edition (E) Publication OIML R 111-1

This specification covers various classes of weights and mass standards used in laboratories, and weights used for field standards and commercial measurement.

# Weight Classification, International Laboratory Weights and Precision Mass Standards



INTERNATIONAL ORGANIZATION OF LEGAL  
METROLOGY RECOMMENDATIONS OIML R111

## Construction

### Class E1 and E2 Weights

Class E1 and E2 weights shall be solid and have no cavity open to the atmosphere. They shall have an integral construction, i.e., consist of a single piece of material.

### Class F1 and F2 Weights

Class F1 and F2 weights from 1 gram to 50 kilograms may be one or more pieces from the same material. Class F1 and F2 weights may contain an adjusting cavity; however, the volume of this cavity shall not exceed one-twentieth of the total volume of the weight, and the cavity shall be closed either by means of the lifting knob or by any other suitable device.

## Calibration or Initial Verification

Certain categories of new weights may either be calibrated individually or be subject to initial verification, depending on their intended use and the national legislation of the country.

Calibration weights shall be accompanied by a certificate which gives at least the conventional mass of each weight, its expanded uncertainty and the value of the coverage factor  $k$  (see coverage factor  $k$ ).

Class E1 weights shall always be accompanied by certificates.

The certificate for Class E1 weights shall mention at least the values of conventional mass, the expanded uncertainty and the coverage factor  $k$ , and the density or volume for each weight.

The optional certificate for Class E2 weights shall mention at least:

- The values of conventional mass of each weight and the extended uncertainty and the coverage factor  $k$ , or
- The information required for Class E1 weights certificates (under the conditions of the above paragraph).

## Recalibration or Periodic Verification

The categories of weights which are subject to calibration or initial verification should either be recalibrated or have a periodic verification. This makes it possible to verify that the weights maintain their metrological properties. Any weights found defective at the time of the periodic verification shall be discarded or readjusted.

## Uncertainty of Measurement Standard Uncertainty

Uncertainty of the result of a measurement expressed as an estimated standard deviation.

## Combined Standard Uncertainty

Standard uncertainty of a measurement result. When that result is obtained from the values of a number of quantities, it is equal to the positive square root of the appropriate sum of the variances and covariances of these quantities. The variance of quantity is the square of its standard deviation.

## Expanded Uncertainty

The expanded uncertainty  $U$  is obtained by multiplying the combined standard uncertainty by the coverage factor  $k$ .  $U = k \cdot u_c$

Coverage factor  $k$  — level of confidence

In most cases, it is appropriate to use the factor  $k = 2$ .

For the normal distribution, the factor  $k = 2$  signifies that the limits of expanded uncertainty apply when the confidence level is approximately 95%.

## Uncertainties for Weights

$u_2 = u_A \div u_B$  with  $u_A$ ,  $u_B$ : standard uncertainties of category A and B, respectively.

## **Excerpts from the Standard Specification for Laboratory Weights and Precision Mass Standards as Regulated by the Organization Internationale De Metrologie Legale (OIML): 2004 Edition (E) Publication OIML R 111-1**

This specification covers various classes of weights and mass standards used in laboratories, and weights used for field standards and commercial measurement.

# Weight Classification, U.S. Laboratory Weights and Precision Mass Standards



## Weight Classification and Selection

Selection of type and class depends upon the application of the weights. For primary standards, stability and information about the values of the weights is more important than the closeness of the values to nominal. Weights to be used with balances of low precision do not require small tolerances nor need the choice of materials to be limited to those of high stability. The suggested application table should serve as a guide in selecting weights for specific applications.

### Type

Weights are divided into two types based upon the design:

#### Type I

These weights are of one-piece construction and contain no added adjusting material. They should be specified when weights are to be used as standards of the highest order and where maximum stability is required. A precise measurement of density can be made only for one-piece weights.

#### Type II

Weights of this type can be of any appropriate design such as screw-knob, ring or sealed plug. Adjusting material can be used as long as it is of a material at least as stable as the base material and is contained in such a way that it will not become separated from the weight.

## Physical Characteristics

Class 0 must be Type I, one-piece construction, and Classes 1–7 can be either Type I or II depending on the application. All weights must meet other design requirements for density, hardness, permitted surface area, surface finish, magnetic properties, corrosion resistance, surface protection and markings. Class selection depends upon the degree of stability required. Density limitations are important in minimizing the effects of air buoyancy in high precision measurements. Class 0 weights shall not bear any indication of nominal value.

## Class

Tolerance limitations are described in Classes 0, 1, 2, 3, 4, 5, 6 and 7 as shown in the weight tolerance tables. Classes with small numerical designations represent smaller tolerances. Classes 0, 1 and 2 are used primarily in metric but are also available in avoirdupois denominations. Classes 3, 4, 5, 6 and 7 include tolerances for metric, avoirdupois pound, avoirdupois ounce, troy ounce, pennyweight and grain weights. Class 1 through 7 tolerances are comparable to those in the obsolete NIST Circular 547, Section 1, with the following exception: Class 1 replaces the smaller tolerances of Classes M and S, while Class 2 replaces the larger tolerances of Classes M and S.

## Excerpts from the Standard Specification for Laboratory Weights and Precision Mass Standards: ASTM E 617-13

This specification covers various classes of weights and mass standards used in laboratories, and weights used for field standards and commercial measurement are excluded, as NIST Handbook 105-1 and NIST Handbook 44 cover those classes of weights.



# Weight Classification, U.S. Laboratory Weights and Precision Mass Standards



**Application Table X1.1 ASTM E617-13**

Class	Type	Application
0, 00, 000	I	Primary laboratory reference standards
0	I	Reference standards used for calibrating Class 1 weights
0	I	Reference standards used for calibrating Class 2 weights
1	I	Reference standards used for calibrating Class 3 weights
1	II	Calibration weights used with calibration Class I balances
1	I or II	Built in weights for high quality analytical balances
1,2	I or II	Calibration weights used with calibration Class II balances, laboratory weights for routine analytical work
2	I or II	Standards used for calibrating Class 4 weights
3	I or II	Standards used for calibrating Class 5 weights
4	I or II	Standards used for calibrating Class 6 weights
4,5,6	I or II	Calibration weights used with Class III, III L and III L balances, dial scales, trip balances and platform scales
5,6	I or II	Student laboratory use
7	I or II	Rough weighing operations in physical and chemical laboratories such as force measuring apparatus

**Term Abbreviations NIST Handbook 44, Appendix C**

Name of Unit	Accepted Abbreviation
1 assay ton (AT) <sup>11</sup>	29.167 grams
1 carat (c)	200 milligrams (exactly) / 3.086 grains
1 dram apothecaries (dr ap or ʒ)	60 grains (exactly) / 3.888 grams
1 dram avoirdupois (dr avdp)	27 11/32 (= 27.344) grains 1.772 grams
1 gamma (γ)	1 microgram (exactly)
1 grain	64.798 91 milligrams (exactly)
1 gram (g)	15.432 grains 0.035 ounce, avoirdupois
1 hundredweight, gross or long <sup>12</sup> (gross cwt)	112 pounds (exactly) / 50.802 kilograms
1 hundredweight, gross or short (cwt or net cwt)	100 pounds (exactly) / 45.359 kilograms
1 kilogram (kg)	2.205 pounds
1 milligram (mg)	0.015 grain
1 ounce, avoirdupois (oz avdp)	437.5 grains (exactly) / 0.911 troy or apothecaries ounce / 28.350 grams
1 ounce, troy or apothecaries (oz t or oz ap or ʒ)	480 grains (exactly) / 1.097 avoirdupois ounces / 31.103 grams
1 pennyweight (dwt)	1.555 grams
1 point	0.01 carat / 2 milligrams
1 pound, avoirdupois (lb avdp)	7000 grains (exactly) / 1.215 troy or apothecaries pounds / 453.592 37 grams (exactly)
1 micropound (μlb) [the Greek letter mu in combination with the letters lb]	0.000 001 pound (exactly)
1 pound, troy or apothecaries (lb t or lb ap)	5760 grains (exactly) / 0.823 avoirdupois pound / 373.242 grams
1 scruple (s ap or ʒ)	20 grains (exactly) / 1.296 grams
1 ton, gross or long <sup>13</sup>	2240 pounds (exactly) / 1.12 net tons (exactly) / 1.016 metric tons
1 ton, metric (t)	2204.623 pounds / 0.984 gross ton / 1.102 net tons
1 ton, net or short (tn) <sup>21</sup>	2000 pounds (exactly) / 0.893 gross ton / 0.907 metric ton

# Metric Weight Tolerances



**Tolerance for weights of denominations between those listed can be determined as follows:**

- If the unit of measure is non-metric, convert the nominal value to a metric unit.
- For weights that are between those listed, the tolerance for the next lower weight shall be applied.

**OIML R111-I 2004**

Nominal Size	Class E1	Class E2	Class F1	Class F2	Class M1	Class M2	Class M3
	mg						
5,000 kg			25,000	80,000	250,000	800,000	2,500,000
3,000 kg							
2,000 kg			10,000	30,000	100,000	300,000	1,000,000
1,000 kg		1,600	5,000	16,000	50,000	100,000	500,000
500 kg		800	2,500	8,000	25,000	80,000	250,000
300 kg							
200 kg		300	1,000	3,000	10,000	30,000	100,000
100 kg		160	500	1,600	5,000	16,000	50,000
50 kg	25	80	250	800	2500	8000	25,000
30 kg							
25 kg							
20 kg	10	30	100	300	1000	3000	10,000
10 kg	5	16	50	160	500	1600	5000
5 kg	2.5	8.0	25	80	250	800	2500
3 kg							
2 kg	1.0	3.0	10	30	100	300	1000
1 kg	0.5	1.6	5	16	50	160	500
500 g	0.25	0.8	2.5	8.0	25	80	250
300 g							
200 g	0.1	0.30	1.0	3.0	10	30	100
100 g	0.05	0.16	0.5	1.6	5	16	50
50 g	0.03	0.10	0.30	1.0	3.0	10	30
30 g							
20 g	0.025	0.080	0.25	0.8	2.5	8	25
10 g	0.020	0.060	0.20	0.6	2.0	6	20
5 g	0.016	0.050	0.16	0.5	1.6	5	16
3 g							
2 g	0.012	0.040	0.12	0.4	1.2	4	12
1 g	0.010	0.030	0.10	0.3	1.0	3	10
500 mg	0.008	0.025	0.08	0.25	0.8	2.5	
300 mg							
200 mg	0.006	0.020	0.06	0.20	0.6	2	
100 mg	0.005	0.016	0.05	0.16	0.5	1.6	
50 mg	0.004	0.012	0.04	0.12	0.4		
30 mg							
20 mg	0.003	0.010	0.03	0.10	0.3		
10 mg	0.003	0.008	0.025	0.08	0.25		
5 mg	0.003	0.006	0.020	0.06	0.20		
3 mg							
2 mg	0.003	0.006	0.020	0.06	0.20		
1 mg	0.003	0.006	0.020	0.06	0.20		

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# Weight Classification, U.S. Field Standard



## Specification and Tolerances for Field Standard Weights (NIST Handbook 105-1, Class F, Revised 1990)

These specifications and tolerances are minimum requirements for standards used primarily to test weighing devices.

### Introduction

A Class F field standard weight (after this, called “weight”) is intended to be used primarily to test commercial weighing devices for compliance with the requirements of NIST Handbook 441. Class F weights may be used to test most accuracy Class 2 III scales, all scales of Class III L or IV, and scales not marked with a class designation.

A weight shall be verified to be within tolerance prior to use. The within-tolerance status of a weight shall be rechecked as often as regulations or circumstances require, especially when damage to it is known or suspected.

### General

These specifications apply to new weights placed in service after the publication of this standard; the tolerances apply to all weights in service.

A weight in service prior to the publication of this standard that has maintained Class F tolerances between verification tests shall continue to be acceptable.

The specifications permit the use of a weight at its nominal value in normal testing operations, where the tolerance on the item under test is at least three times as great as the tolerance of the weight<sup>3</sup>.

### A partial list of specifications from Handbook 105-1

#### 1. Material

- 1.1 A weight made of brass or a fabricated weight (such as a laminated weight or a weight of nonuniform density) shall not be placed in service after the publication date of this standard (1990).
- 1.2 A weight smaller than 5 grams/0.01 pound shall be constructed of stainless steel, tantalum, nickel-chromium alloy, aluminum alloy, or other material sufficiently resistant to corrosion and oxidation that the surface need not be protected or coated.
- 1.3 A weight of 5 grams/0.01 pound up to and including 5 kilogram/10 pound shall be constructed of material having a hardness of Rockwell B 80 or greater (such as 300-series stainless steel), and be resistant to abrasion, corrosion, denting, and chipping.
- 1.4 A weight larger than 5 kilograms/10 pounds shall be constructed of materials such as iron, steel, or stainless steel, have a hardness of Rockwell B 80 or greater, and be resistant to abrasion, corrosion, denting, and chipping. Cast iron may be used for weights 10 kilograms/20 pound and larger. Body filler (e.g., fiberglass, putty, or plaster) shall not be used to correct a poor casting or finish.

#### 2. Finish

- 2.1 The surface finish of a new weight machined from round bar stock shall have a roughness average

of 0.80 micrometers (32 microinches) or better, determined by use of a handheld surface roughness indicator (available from several manufacturers) or more accurate method, and be free of scratches, dents, and chipped corners or edges, determined by visual examination. A beaded or blasted finish (with roughness average 1.25 micrometers (50 microinches) or better) is acceptable on a cube weight to facilitate gripping.

- 2.2 A weight 5 kilograms/10 pounds or less shall not have a surface coating.
- 2.3 A weight larger than 5 kilograms/10 pounds constructed of materials susceptible to corrosion or tarnishing shall have a protective surface coating. A light coat of sprayed-on flat aluminum paint is recommended. Lacquer is also acceptable. Epoxy paint or plated surfaces are not acceptable. A coating is recommended for the bottom of a weight, particularly if the bottom is recessed. If paint or lacquer is used, it shall be hard and resistant to chipping. Cast metric and avoirdupois field standards shall be color coded (i.e. gold for metric and silver for avoirdupois) to differentiate the weights.
- 2.4 The surface finish of a cast weight shall have a roughness average of between 12.5 and 25 micrometers (50 and 1000 microinches), determined by use of a handheld surface roughness indicator or more accurate method, and be free of sharp surface irregularities such as scabbing (as defined in ASTM A 025), visible cracks or holes which affect the surface finish average. Surface imperfections corrected by machining or welding are acceptable.
- 2.5 For a cast weight with a pipe handle, the casting near the handle must not be heavily cracked; the visible space between the handle and casting shall be as small as possible, consistent with good manufacturing practices. For cast weight with a handle welded in place, the welded seam shall be continuous and show not obvious air holes or cracks as determined by a visual examination.
- 2.6 Plating or coating shall not be used on a sheet metal type weight.

<sup>1</sup> NIST Handbook 44, Specifications Tolerances, and Other Technical Requirements for Weighing and Measuring Devices. (See current edition.)

<sup>2</sup> See Handbook 44, Section 2, Scales Code.

<sup>3</sup> See Handbook 44, Appendix A, par. 3.2.

# Weight Tolerance, Metric

## ASTM E617-13

Nominal Size	Class 000	Class 00	Class 0	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7
	mg	mg	mg	mg	g and mg	g and mg	g and mg	g and mg	g and mg	g and mg
5,000 kg					25g	50g	100g	250g	500g	750g
3,000 kg					15	30	60g	150	300	450
2,000 kg					10	20	40g	100	200	300
1,000 kg					5	10	20g	50	100	150
500 kg					2.5	5	10g	25	50	75
300 kg					1.5	3	6.0g	15	30	45
200 kg					1	2	4.0g	10	20	30
100 kg					500mg	1	2.0g	5	10	15
50 kg	13mg	25mg	63mg	125mg	250	500mg	1.0g	2.5	5	7.5
30 kg	7.5	15	38	75	150	300	600mg	1.5	3	4.5
25 kg	6.25	12.5	31	62	125	250	500	1.2	2.5	4.5
20 kg	5.0	10	25	50	100	200	400	1.0	2	3.8
10 kg	2.5	5.0	13	25	50	100	200	500mg	1	2.2
5 kg	1.3	2.5	6.0	12	25	50	100	250	500mg	1.4
3 kg	0.75	1.5	3.8	7.5	15	30	60	150	300	1.0
2 kg	0.5	1.0	2.5	5.0	10	20	40	100	200	750mg
1 kg	0.25	0.5	1.3	2.5	5.0	10	20	50	100	470
500 g	0.13	0.25	0.60	1.2	2.5	5.0	10	30	50	300
300 g	0.075	0.15	0.38	0.75	1.5	3.0	6.0	20	30	210
200 g	0.05	0.10	0.25	0.50	1.0	2.0	4.0	15	20	160
100 g	0.025	0.05	0.13	0.25	0.50	1.0	2.0	9	10	100
50 g	0.015	0.030	0.060	0.12	0.25	0.60	1.2	5.6	7	62
30 g	0.014	0.026	0.037	0.074	0.15	0.45	0.90	4.0	5	44
20 g	0.013	0.025	0.037	0.074	0.10	0.35	0.7	3.0	3	33
10 g	0.010	0.020	0.025	0.050	0.074	0.25	0.5	2.0	2	21
5 g	0.005	0.010	0.017	0.034	0.054	0.18	0.36	1.3	2	13
3 g	0.005	0.010	0.017	0.034	0.054	0.15	0.30	0.95	2	9.4
2 g	0.005	0.010	0.017	0.034	0.054	0.13	0.26	0.75	2	7.0
1 g	0.005	0.010	0.017	0.034	0.054	0.10	0.20	0.50	2	4.5
500 mg	0.002	0.003	0.005	0.010	0.025	0.080	0.16	0.38	1	3.0
300 mg	0.002	0.003	0.005	0.010	0.025	0.070	0.14	0.30	1	2.2
200 mg	0.002	0.003	0.005	0.010	0.025	0.060	0.12	0.26	1	1.8
100 mg	0.002	0.003	0.005	0.010	0.025	0.050	0.10	0.20	1	1.2
50 mg	0.002	0.003	0.005	0.010	0.014	0.042	0.085	0.16	0.5	0.88
30 mg	0.002	0.003	0.005	0.010	0.014	0.038	0.075	0.14	0.5	0.68
20 mg	0.002	0.003	0.005	0.010	0.014	0.035	0.070	0.12	0.5	0.56
10 mg	0.002	0.003	0.005	0.010	0.014	0.030	0.060	0.10	0.5	0.4
5 mg	0.002	0.003	0.005	0.010	0.014	0.028	0.055	0.080	0.2	
3 mg	0.002	0.003	0.005	0.010	0.014	0.026	0.052	0.070	0.2	
2 mg	0.002	0.003	0.005	0.010	0.014	0.025	0.05	0.06	0.2	
1 mg	0.002	0.003	0.005	0.010	0.014	0.025	0.05	0.05	0.1	
0.5 mg	0.002	0.003	0.005	0.010	0.014	0.025	0.05	0.05	0.1	
0.3 mg	0.002	0.003	0.005	0.010	0.014	0.025				
0.2 mg	0.002	0.003	0.005	0.010	0.014					
0.1 mg	0.002	0.003	0.005	0.010						
0.05 mg	0.002	0.003	0.005							

# Weight Tolerance, Avoirdupois

## ASTM E617-13

Nominal Size	Class 0	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7
	mg	mg	g and mg	g and mg	g and mg	g and mg	g and mg	g and mg
10,000 lb			23 g	45 g	90 g	227 g	454 g	680 g
5,000 lb			11	22	44	113	227	340
3,000 lb			7	14	28	68	136	204
2,500 lb			6	12	24	57	113	170
2,000 lb			4.5	9	18	45	91	136
1,000 lb			2.3	4.5	9	23	45	68
500 lb			1.7	2.3	4.6	11	23	34
100 lb	57	110	230 mg	460 mg	920 mg	2.3	4.5	6.8
50 lb	29	57	110	220	440	1.1	2.3	4.1
30 lb	17	34	68	140	260	680 mg	1.4	3
25 lb	14	28	56	110	220	570	1.1	2.5
20 lb	12	23	46	92	180	450	910 mg	2
10 lb	5.5	11	22	44	88	230	450	1.3
5 lb	2.7	5.4	11	22	43	110	230	760 mg
3 lb	1.7	3.4	6.8	14	27	68	140	510
2 lb	1.2	2.3	4.6	9.2	18	45	91	430
1 lb	0.55	1.1	2.2	4.4	8.8	27	45	270
0.5 lb	0.27	0.54	1.1	2.2	4.3	15	23	160
0.3 lb	0.17	0.34	0.68	1.4	2.7	10	14	110
0.2 lb	0.12	0.23	0.46	0.92	1.8	8.1	9.7	91
0.1 lb	0.055	0.11	0.22	0.44	1.1	5.1	6.8	56
0.05 lb	0.027	0.054	0.11	0.36	0.77	3.0	4.5	33
0.03 lb	0.017	0.034	0.068	0.32	0.59	2.0	3.2	19
0.02 lb	0.017	0.034	0.046	0.23	0.45	1.8	2.3	19
0.01 lb	0.012	0.023	0.034	0.16	0.34	1.2	1.4	12
0.005 lb	0.0075	0.015	0.024	0.14	0.27	0.86	0.91	7
0.003 lb	0.0075	0.015	0.024	0.11	0.22	0.64	0.91	5
0.002 lb	0.0075	0.015	0.024	0.091	0.19	0.50	0.91	4
0.001 lb	0.0075	0.015	0.024	0.068	0.15	0.36	0.91	3
0.0005 lb	0.009	0.023	0.07	0.15	0.3	0.9	3	
0.0003 lb	0.009	0.023	0.07	0.15	0.3	0.9	3	
0.0002 lb	0.009	0.023	0.07	0.15	0.3	0.9	3	
0.0001 lb	0.009	0.023	0.07	0.15	0.3	0.9	3	
0.00005 lb	0.009	0.023	0.07	0.15	0.3	0.9	3	
0.00003 lb	0.009	0.023	0.07	0.15	0.3	0.9	3	
0.00002 lb	0.009	0.023	0.07	0.15	0.3	0.9	3	
0.00001 lb	0.009	0.023	0.07	0.15	0.3	0.9	3	

# Weight Tolerance, Ounces

## ASTM E617-13

Nominal Size	Class 0	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7
	mg							
<b>10 oz</b>	0.4	0.7	1.4	2.8	5.4	19	45	320
<b>8 oz</b>	0.3	0.6	1.2	2.3	4.5	16	23	180
<b>5 oz</b>	0.18	0.35	0.70	1.4	2.8	12	16	160
<b>4 oz</b>	0.14	0.28	0.55	1.1	2.3	9.5	11	110
<b>3 oz</b>	0.12	0.23	0.45	0.91	1.8	8.2	8.1	73
<b>2 oz</b>	0.07	0.13	0.26	0.64	1.3	5.9	5.4	48
<b>1 oz</b>	0.04	0.07	0.14	0.42	0.86	3.9	3.2	28
<b>1/2 oz</b>	0.02	0.04	0.08	0.3	0.59	2.5	2.3	25
<b>1/4 oz</b>	0.015	0.03	0.06	0.2	0.43	1.5	1.4	9.1
<b>1/8 oz</b>	0.015	0.029	0.058	0.16	0.31	1.1	0.91	4.3
<b>1/16 oz</b>	0.013	0.025	0.050	0.12	0.24	0.73	0.91	4.3
<b>1/32 oz</b>	0.008	0.015	0.030	0.095	0.19	0.5	0.91	4.3
<b>1/64 oz</b>	0.006	0.012	0.024	0.077	0.15	0.36	0.91	4.3
<b>0.50 oz</b>			0.080	0.3	0.59	2.5	2.3	25
<b>0.3 oz</b>			0.068	0.23	0.45	1.8	1.4	9.1
<b>0.2 oz</b>			0.057	0.19	0.38	1.4	0.91	5.9
<b>0.1 oz</b>			0.050	0.14	0.29	0.91	0.91	4.3
<b>0.05 oz</b>			0.050	0.11	0.23	0.64	0.91	2.0
<b>0.03 oz</b>			0.030	0.095	0.19	0.45	0.91	2.0
<b>0.02 oz</b>			0.023	0.077	0.18	0.4	0.91	2.0
<b>0.01 oz</b>			0.023	0.064	0.14	0.3	0.91	2.0
<b>0.005 oz</b>			0.023	0.054	0.11	0.23		
<b>0.003 oz</b>			0.023	0.05	0.095	0.19		
<b>0.002 oz</b>			0.023	0.044	0.086	0.16		
<b>0.001 oz</b>			0.023	0.038	0.077	0.13		
<b>0.0005 oz</b>			0.023	0.031	0.064	0.11		
<b>0.0003 oz</b>			0.023	0.029	0.059	0.095		
<b>0.0002 oz</b>			0.023	0.027	0.054	0.086		
<b>0.0001 oz</b>			0.023	0.026	0.05	0.073		

# Weight Tolerance, Troy Ounces

## ASTM E617-13

Nominal Size	Class 0	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7
			mg	mg	mg	g and mg	g and mg	
1,000 oz t			160mg	310mg	620mg	1.6g	3.2 g	
500 oz t			80	160	310	770mg	1.5	
300 oz t			45	90	190	470	940mg	
200 oz t			31	62	120	310	620	
100 oz t			16	31	62	160	320	
50 oz t			8	16	31	77	150	
30 oz t			4.6	9.1	19	47	94	
20 oz t			3.1	6.2	12	35	58	
10 oz t			1.6	3.1	6.2	21	32	
5 oz t			0.8	1.6	3.1	12	16	
3 oz t			0.46	0.91	1.9	8.4	9.3	
2 oz t				0.71	1.4	6.4	8.0	
1 oz t				0.45	0.91	4.2	4.2	
0.5 oz t				0.31	0.62	2.6	2.6	
0.3 oz t				0.24	0.49	1.9	1.9	
0.2 oz t				0.20	0.40	1.5	2.3	
0.1 oz t				0.15	0.30	0.97	2.0	
0.05 oz t				0.12	0.23	0.65	2.0	
0.03 oz t				0.097	0.19	0.49	2.0	
0.02 oz t				0.084	0.17	0.41	1.1	
0.01 oz t				0.071	0.14	0.31	1.0	
0.005 oz t				0.056	0.11	0.23	1.0	
0.003 oz t				0.049	0.097	0.19	1.0	
0.002 oz t				0.044	0.091	0.17	0.50	
0.001 oz t				0.038	0.078	0.14	0.50	
0.0005 oz t				0.033	0.065	0.11	0.50	
0.0003 oz t				0.030	0.060	0.097	0.50	
0.0002 oz t				0.028	0.056	0.084	0.50	
0.0001 oz t				0.026	0.052	0.071	0.50	

# Weight Tolerance, Pennyweight and Grain

## ASTM E617-13

Nominal Size	Class 0	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7
					g and mg	g and mg	g and mg	
10,000 dwt					0.31 g	0.78 g	1.5 g	
5,000 dwt					0.16	0.39	0.78	
3,000 dwt					91 mg	0.23	0.46	
2,000 dwt					62	0.16	0.32	
1,000 dwt					31	78mg	0.16	
500 dwt					16	41	82mg	
300 dwt					9.1	28	56	
200 dwt					6.2	21	42	
100 dwt					3.1	12	24	
50 dwt					1.6	7.8	16	
30 dwt					1.2	5.3	11	
20 dwt					0.91	4.2	8.4	
10 dwt					0.62	2.6	5.2	
5 dwt					0.44	1.7	3.4	
3 dwt					0.34	1.3	2.6	
2 dwt					0.3	0.97	1.9	
1 dwt					0.23	0.65	1.3	

Nominal Size	Class 0	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7
					mg	mg	mg	
10,000 gr					13	36	36	
5,000 gr					6.5	22	22	
3,000 gr					3.9	15	15	
2,000 gr					2.6	11	11	
1,000 gr					1.4	6.3	6.3	
500 gr					0.91	3.2	3.2	
300 gr					0.65	2.3	2.3	
200 gr					0.57	1.4	1.4	
100 gr					0.4	0.91	0.91	
50 gr					0.3	0.91	0.91	
30 gr					0.25	0.71	0.71	
20 gr					0.21	0.58	0.58	
10 gr					0.17	0.42	0.42	
5 gr					0.14	0.31	0.31	
3 gr					0.12	0.25	0.25	
2 gr					0.11	0.22	0.22	
1 gr					0.091	0.17	0.17	
0.5 gr					0.078	0.14	0.14	
0.3 gr					0.071	0.12	0.12	
0.2 gr					0.064	0.11	0.11	
0.1 gr					0.056	0.091	0.091	
0.05 gr					0.052	0.071	0.071	
0.03 gr					0.051	0.071	0.071	
0.02 gr					0.05	0.071	0.071	
0.01 gr					0.05	0.070	0.071	

# Weight Tolerance, Carats, Apothecary Scruples

## ASTM E617-13

Nominal Size	Class 0	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7
				mg	mg	mg	mg	mg
<b>5,000 c</b>				10	20	50	100	470
<b>3,000 c</b>				6.0	12	36	60	334
<b>2,000 c</b>				4.0	8.0	27	44	287
<b>1,000 c</b>				2.0	4.0	15	20	160
<b>500 c</b>				1.0	2.0	9	10	100
<b>300 c</b>				0.69	1.3	6	8	70
<b>200 c</b>				0.52	1.0	4.4	5	44
<b>100 c</b>				0.35	0.7	3	3	33
<b>50 c</b>				0.25	0.50	2	2	21
<b>30 c</b>				0.19	0.40	1.4	2	13
<b>20 c</b>				0.16	0.33	1	2	13
<b>10 c</b>				0.13	0.26	0.75	2	13
<b>5 c</b>				0.10	0.20	0.5	2	13
<b>3 c</b>				0.086	0.17	0.39	1	3
<b>2 c</b>				0.075	0.15	0.32	1	3
<b>1 c</b>				0.060	0.12	0.26	1	3
<b>0.5 c</b>				0.050	0.10	0.2	1	3
<b>0.3 c</b>				0.044	0.089	0.18	0.5	0.88
<b>0.2 c</b>				0.040	0.080	0.15	0.5	0.88
<b>0.1 c</b>				0.035	0.070	0.12	0.5	0.88
<b>0.05 c</b>				0.030	0.060	0.1	0.5	0.88
<b>0.03 c</b>				0.028	0.056	0.08	0.2	
<b>0.02 c</b>				0.027	0.053	0.07	0.2	
<b>0.01 c</b>				0.025	0.050	0.06	0.2	
Apothecary Ounce								
<b>12 oz ap</b>					7.5	15	45	290
<b>10 oz ap</b>					4.5	9	36	280
<b>6 oz ap</b>					3.5	7	23	184
<b>5 oz ap</b>					3.0	6	18	144
<b>4 oz ap</b>					2.5	5	16	128
<b>3 oz ap</b>					1.50	3	11	110
<b>2 oz ap</b>					1.00	2	9.1	91
<b>1 oz ap</b>					0.60	1.2	4.5	40
Apothecary Dram								
<b>6 dr ap</b>					0.40	0.8	3.6	36
<b>5 dr ap</b>					0.30	0.6	2.7	27
<b>4 dr ap</b>					0.27	0.55	2.3	23
<b>3 dr ap</b>					0.20	0.4	1.8	18
<b>2 dr ap</b>					0.20	0.4	1.8	18
<b>1 dr ap</b>					0.17	0.35	1.4	14
Apothecary Scruple								
<b>2 s ap</b>					0.17	0.35	1.4	14
<b>1 s ap</b>					0.15	0.30	0.91	9.1

# Weight Tolerances

## NIST 105-1 Class F

Tolerances are based on the 1975 revised tolerance structure used by State Weights and Measures.



### Metric

105-1	
Denomination Metric	F g and mg
5,000 kg	500g
3,000 kg	300g
2,000 kg	200g
1,000 kg	100g
500 kg	50g
300 kg	30g
200 kg	20g
100 kg	10g
50 kg	5.0g
30 kg	3.0g
25 kg	2.5g
20 kg	2.0g
10 kg	1.0g
5 kg	500mg
3 kg	300mg
2 kg	200mg
1 kg	100mg
500 g	70mg
300 g	60mg
200 g	40mg
100 g	20mg
50 g	10mg
30 g	6.0mg
20 g	4.0mg
10 g	2.0mg
5 g	1.5mg
3 g	1.3mg
2 g	1.1mg
1 g	0.90mg
500 mg	0.72mg
300 mg	0.61mg
200 mg	0.54mg
100 mg	0.43mg
50 mg	0.35mg
30 mg	0.30mg
20 mg	0.26mg
10 mg	0.21mg
5 mg	0.17mg
3 mg	0.14mg
2 mg	0.12mg
1 mg	0.10mg

### Avoirdupois

### Pounds

105-1	
Denomination Metric	F g and mg
10,000 lb	450g
5,000 lb	230
3,000 lb	140
2,500 lb	110
2,000 lb	91
1,000 lb	45
500 lb	23
100 lb	4.5
50 lb	2.3
40 lb	
30 lb	1.4
25 lb	1.1
20 lb	910 mg
15 lb	
10 lb	450
9 lb	
8 lb	
7 lb	
6 lb	
5 lb	230
4 lb	
3 lb	140
2 lb	91
1 lb	70
0.5 lb	45
0.3 lb	27
0.2 lb	18
0.1 lb	9.1
0.05 lb	4.5
0.03 lb	2.7
0.02 lb	1.8
0.01 lb	1.5
0.005 lb	1.2
0.003 lb	0.99
0.002 lb	0.87
0.001 lb	0.70
0.0005 lb	
0.0003 lb	
0.0002 lb	
0.0001 lb	
0.00005 lb	
0.00003 lb	
0.00002 lb	
0.00001 lb	

### Avoirdupois

### Ounces

105-1	
Denomination Metric	F mg
12 oz	
10 oz	
8 oz	45
6 oz	
5 oz	
4 oz	23
3 oz	
2 oz	11
1 oz	5.4
1/2 oz	2.8
1/4 oz	1.7
1/8 oz	1.3
1/16 oz	1.1
1/32 oz	0.87
1/64 oz	0.69
0.5 oz	2.8
0.3 oz	1.8
0.2 oz	1.6
0.1 oz	1.3
0.05 oz	1.0
0.03 oz	0.85
0.02 oz	0.75
0.01 oz	0.60
0.005 oz	
0.003 oz	
0.002 oz	
0.001 oz	
0.0005 oz	
0.0003 oz	
0.0002 oz	
0.0001 oz	

# Metric Weight Tolerances

## Conversion Factors for Units of Measure

To convert one unit of measure to another, use our online conversion calculator at [www.ricelake.com/precision](http://www.ricelake.com/precision)

### Units of Mass Not Greater Than Pounds and Kilograms all underlined figures are exact

Units	Grains	Apothecaries Scruples	Pennyweights	Avoirdupois Drams	Apothecaries Drams	Apothecaries Ounces
1 grain =	<u>1</u>	<u>0.05</u>	0.041 666 67	0.036 571 43	0.016 666 67	0.002 285 714
1 apoth. scruple =	<u>20</u>	<u>1</u>	0.833 333 3	0.731 428 6	0.333 333 3	0.045 714 29
1 pennyweight =	<u>24</u>	<u>1.2</u>	<u>1</u>	0.877 714 3	<u>0.4</u>	0.054 857 14
1 avdp. dram =	<u>27.343 75</u>	<u>1.367 187 5</u>	1.139 323	<u>1</u>	0.455 729 2	<u>0.062 5</u>
1 apoth. dram =	<u>60</u>	<u>3</u>	<u>2.5</u>	2.194 286	<u>1</u>	0.137 142 9
1 avdp. oz =	<u>437.5</u>	<u>21.875</u>	18.229 17	<u>16</u>	7.291 667	<u>1</u>
1 apoth. or troy ounce =	<u>480</u>	<u>24</u>	<u>20</u>	17.554 29	<u>8</u>	1.097 143
1 apoth. or troy pound =	<u>5760</u>	<u>288</u>	<u>240</u>	210.651 4	<u>96</u>	13.165 71
1 avdp. lb =	<u>7000</u>	<u>350</u>	291.666 7	<u>256</u>	116.666 7	<u>16</u>
1 milligram =	0.015 432 36	0.000 771 617 9	0.000 643 014 9	0.000 564 383 4	0.000 257 206 0	0.000 035 273 96
1 gram =	15.432 36	0.771 617 9	0.643 014 9	0.564 383 4	0.257 206 0	0.035 273 96
1 kilogram =	15432.36	771.617 9	643.014 9	564.383 4	257.206 0	35.273 96

### Units of Mass Not Greater Than Pounds and Kilograms all underlined figures are exact

Units	Apothecaries or Troy Ounces	Apothecaries or Troy Pounds	Avoirdupois Pounds	Milligrams	Grams	Kilograms
1 grain =	0.002 083 333	0.00 173 611 1	0.000 142 857 1	<u>64.798 91</u>	<u>0.064 798 91</u>	<u>0.000 064 798 91</u>
1 apoth. scruple =	0.041 666 67	0.003 472 222	0.002 857 143	<u>1295.978 2</u>	<u>1.295 978 2</u>	<u>0.001 295 978 2</u>
1 pennyweight =	<u>0.05</u>	0.004 166 667	0.003 428 571	<u>1555.173 84</u>	<u>1.555 173 84</u>	<u>0.001 555 173 84</u>
1 avdp. dram =	0.056 966 15	0.004 747 179	0.003 906 25	<u>1771.845 195 312 5</u>	<u>1.771 845 195 312 5</u>	<u>0.001 771 845 195 312 5</u>
1 apoth. dram =	<u>0.125</u>	0.010 416 67	0.008 571 429	<u>3887.934 6</u>	<u>3.887 934 6</u>	<u>0.003 887 934 6</u>
1 avdp. oz =	0.911 458 3	0.075 954 86	<u>0.062 5</u>	<u>28 349.523 125</u>	<u>28.349 523 125</u>	<u>0.028 349 523 125</u>
1 apoth. or troy ounce =	<u>1</u>	0.083 333 333	0.068 571 43	<u>31 103.476 8</u>	<u>31.103 476 8</u>	<u>0.031 103 476 8</u>
1 apoth. or troy pound =	<u>12</u>	<u>1</u>	0.822 857 1	<u>373 241.721 6</u>	<u>373.241 721 6</u>	<u>0.373 241 721 6</u>
1 avdp. lb =	14.583 33	1.215 278	<u>1</u>	<u>453 592.37.37</u>	<u>453.592 37</u>	<u>0.453 592 37</u>
1 milligram =	0.000 032 150 75	0.000 002 679 229	0.000 002 204 623	<u>1</u>	<u>0.001</u>	<u>0.000 001</u>
1 gram =	0.032 150 75	0.002 679 229	0.002 204 623	<u>1000</u>	<u>1</u>	<u>0.001</u>
1 kilogram =	32.150 75	2.679 229	2.204 623	<u>1 000 000</u>	<u>1000</u>	<u>1</u>

### Units of Mass Not Greater Than Avoirdupois Ounces all underlined figures are exact

Units	Avoirdupois Ounces	Avoirdupois Pounds	Short Hundred-Weights	Short Tons	Long Tons	Kilograms	Metric Tons
1 avoirdupois ounce =	<u>1</u>	<u>0.0625</u>	<u>0.000 625</u>	<u>0.000 031 25</u>	0.000 027 901 79	<u>0.028 349 523 125</u>	<u>0.000 028 349 523 125</u>
1 avoirdupois pound =	<u>16</u>	<u>1</u>	<u>0.01</u>	<u>0.000 5</u>	0.000 446 428 6	<u>0.453 592 37</u>	<u>0.000 453 592 37</u>
1 short hundredweight =	<u>1600</u>	<u>100</u>	<u>1</u>	<u>0.05</u>	0.044 642 86	<u>45.359 237</u>	<u>0.045 359 237</u>
1 short ton =	<u>32,000</u>	<u>2000</u>	<u>20</u>	<u>1</u>	0.892 857 1	<u>907.184 74</u>	<u>0.907 184 74</u>
1 long ton =	<u>35,840</u>	<u>2240</u>	<u>22.4</u>	<u>1.12</u>	<u>1</u>	1016.046 908 8	1.016 046 908 8
1 kilogram =	35.273 96	2.204 623	0.022 046 23	0.001 102 311	0.000 984 206 5	<u>1</u>	<u>0.001</u>
1 metric ton =	35 273.96	2204.623	22.046 23	1.102 311	0.984 206 5	<u>1000</u>	<u>1</u>

Based on NIST Handbook 44, Appendix C - General Tables of Measurement

# Factors in the Environment

To be able to conduct more precise measurements, it is necessary to minimize the factors that contribute to measurement errors. There are a great variety of such error-inducing factors, which can be linked to machine error and performance of the balance itself, as well as the properties and condition of sample being measured, and the measuring environment (e.g., vibration, temperature/humidity). These factors can readily affect the results of measurement on a balance.

This material includes some precautionary notes that the user should bear in mind to eliminate error factors and ensure accurate measurement results.

## 1. Precautions in the Measuring Room

### 1.1 Temperature/Humidity

- Try to maintain constant room temperature as much as possible to prevent condensation and unstable indications due to fluctuations in temperature.
- Low relative humidity tends to induce static electricity. (Relative humidity of about 60 percent is considered ideal).

### 1.2 Vibration/Shaking

- The measuring room should preferably be located on the ground floor or in the basement. Higher floors are more susceptible to heavy vibration and shaking, which make such locations less suitable for measurement. A room facing a railway or road with heavy traffic should also be avoided as much as possible.

### 1.3 Drafts

- Avoid choosing a location subject to a direct draft of airflow from an air-conditioning unit or exposed to direct sunlight, which may cause abrupt fluctuation in temperature.
- Avoid a room subject to a heavy flow of people, since fluctuations in drafts and temperature are likely to occur in such a location.

### 1.4 Gravity

- The gravity acting on a sample varies depending on the latitude or height of the location where measurement is being conducted. For this reason, the same sample may show different weight indications from one place to another. Therefore, make it a rule to calibrate the balance every time it is relocated.

### 1.5 Electromagnetic Waves

- When the balance is located near an object that generates intense electromagnetic waves, it may be hindered from showing accurate weight due to the effects of such waves.

## 2. Precautions on the Measuring Bench

### 2.1 Vibration/Shaking

- If the balance is subjected to vibration during measurement, its indications will become unstable, thus preventing accurate measurement from being conducted. To avoid this situation, select a solid measuring bench that is less susceptible to vibration. (A bench in vibration-proof structure or one made of concrete or stonework will be suitable). Moreover, do not conduct measurement with a soft cloth or paper placed under the balance, since the balance may be rocked out of precise level positioning.
- Place the measuring bench in a location free from vibration as much as possible. It is a good idea to install the measuring bench in a corner of the measuring room, where less vibration is likely to occur than in the center of the room.

### 2.2 Magnetism/Static Electricity

- Avoid operating the balance on a bench that is susceptible to the effects of magnetism or static electricity.

## 3. Precautions on the Samples

### 3.1 Static Electricity

- Generally speaking, objects made of synthetic resin and glass have high electric insulating properties and, therefore, are apt to be electrically charged. Measuring a charged sample may cause unstable indications. With this in mind, be sure to discharge samples before measurement.

### 3.2 Magnetism

- A sample affected by magnetism indicates different weight values depending on where it is located on the measuring pan, along with poor reproducibility of the results.

When a magnetized sample must be measured, first demagnetize it or place an appropriate pedestal on the measuring pan to adequately separate the mechanism part of the balance from the magnetized sample to avoid the effects of magnetism.

### 3.3 Absorption/Evaporation of Moisture

- Measuring a sample with moisture absorbed or evaporated (volatilized) continuously increases or decreases the values indicated. In such case, measure the sample in a container with a small opening and sealed airtight with a cap.

### 3.4 Sample Temperature

- A difference in temperature between a sample and the interior of a windshield may cause convection to occur inside the windshield, resulting in erroneous measurement.

## Factors in the Environment (continued)

Therefore, measure a very hot or cold sample only after allowing time for its temperature to acclimatize to room temperature. Moreover, to prevent convection inside the windshield, allow time for the interior of the windshield to acclimatize to room temperature.

- The body heat of a person conducting measurement can also affect measurement results. Avoid holding the sample with bare hands, and use long tweezers or a similar tool instead. Also refrain from putting your hands inside the windshields while measurement is in progress.

### 4. Precautions on the Main Unit of the Balance

#### 4.1 Precautions on Use

- The balance is protected with a transparent dust cover. The dust cover may be statically charged immediately after removal from the packing box or under low humidity conditions. Unstable indications by the balance may be due to a statically charged dust cover. Wipe the dust cover with a damp cloth or use a commercial antistatic agent. Simply operate the balance with the dust cover removed to assist with this problem.
- To achieve more accurate weighing, wait at least 30 minutes after switching on the balance, then use the balance only after loading it several times with an object of weight equal to the weighing capacity.

#### 4.2 Calibration

- Periodically calibrate the balance to ensure accurate measurement at all times.

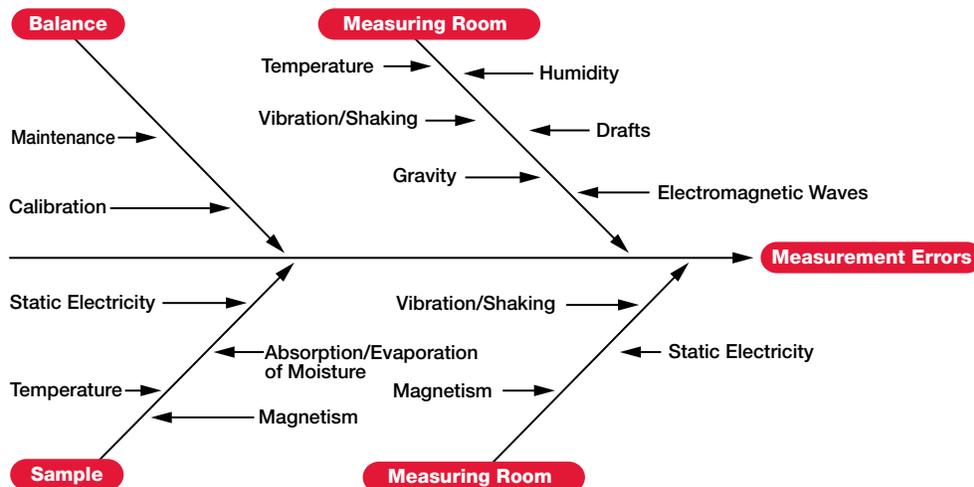
- For more precise calibration, use an external calibration weight that approximates the weighing capacity. Moreover, calibrate the balance only after allowing time for proper acclimation to ambient temperature following power-up.
- Wait at least 30 minutes after switching on the balance, then perform calibration only after loading the balance several times with an object of weight equal to the weighing capacity.

Calibration is also required in the following cases:

- When operating the balance for the first time
- When the balance has not been used for a long time
- When relocating the balance
- When there is wide fluctuation in temperature, humidity or atmospheric pressure

#### 4.3 Maintenance

- When the measuring pan or pan base is contaminated with powder or liquid, erroneous weight values may result or indications may remain unstable. Therefore, be sure to frequently clean the balance. When cleaning the balance, be very careful not to allow dirt or liquid to penetrate inside the mechanism.



# Weights, Balances and Uncertainty

## The factors that can influence which balance is appropriate for your application are:

1. Capability – the need for multiple balances
2. Readability
3. Capacity
4. “Accuracy” vs. “readability”
5. Repeatability and linearity
6. Units of measure
7. Platform dimensions
8. Environmental consideration
9. Communications interface
10. 21 CFR Part 11 compliance
11. Data reporting
12. Legal for Trade requirements

As with any other testing device or sensor in the laboratory, a complete understanding of the factors that can influence proper weighing/test results is very important.

For proper installation and maintenance of a balance, it is important to limit uncertainty. Uncertainty can be defined as a statistical estimated amount or percentage by which an observed or calculated value may differ from the true value.

## Determining Uncertainty

For this exercise, presume that the balance indication, the sensitivity of the weighing device, the application of the load, and the proper zero setting of the device are all operating without question and those elements under the original control of the device manufacturer (i.e., overall design, accuracy readability, sensitivity, drift and off-center loading characteristics) are within the device’s design specifications. What needs to be determined is the impact of other influences on the uncertainty of test results.

Examining the design of the balance’s installation is a critical step in the use of a precision weighing device and is often overlooked. The installation is the most imperative step in preparing for reliable results. If this area of use is understood and secure, reliable test results are more likely to be achieved.

## Electromagnetic Force Restoration

In an electromagnetic force restoration balance, a current is regulated by a servo amplifier in a way that the electromagnetically generated force and the weight force applied to the platform by the object being weighed are in equilibrium (balanced). Maintenance of the equilibrium is controlled by a small sensor known as a position sensor. If weight is added to the weighing pan, this destabilizes the state of equilibrium and the overweight load causes the force-transmitting lever to move upward into the range of the position sensor. This in turn generates an input signal at the servo amplifier, causing a greater amount of current to flow through the coil and therefore increase the counter force until equilibrium is restored. The current simultaneously flows through a resistor where it causes a drop in voltage proportional to the change in weight on the platform. This voltage drop is digitized in an analog/digital converter so that the result is processed in a

digital signal-processing unit (microprocessor), which can then in turn be indicated on a digital display with the appropriate mass indicator.

## Leveling the Balance

Most balances available today include a “bubble level” or “bull’s-eye-level” on the device. Along with this feature, two or more of the legs on the balance are adjustable, allowing for adjustment of the horizontal plane of the device to compensate for an out-of-level working surface. Use the bubble level and adjusting legs to ensure the balance is properly leveled. An out-of-level balance will add uncertainty to test results.

## Room Conditions

Ideally, the laboratory should have the following characteristics at a minimum:

1. Only one door to prevent air drafting.
2. Limited personnel access to prevent drafting and other changes to the environment in the areas of temperature, relative humidity and atmospheric pressure.
3. A limited number of windows, if any at all. If there are windows, a northern exposure is ideal so that exposure to direct sunlight is limited.
4. The work surface that is dedicated to the balance should be located at a corner of the room, immediately opposite to the wall containing the door. Also, the door should swing inward into the laboratory with a balance table positioned so that the door can act as a shield against drafting from sources external to the laboratory.

## Working Surface

Ensure that the working surface is clean, firm, and stable. Make sure that it does not feature dual or tandem connection to the floor and a wall. If at all possible, the working surface should be used only for work involving test measurements with the balance.

## Ergonomics

Ensure that the balance does not need to be moved to meet the various requirements induced by testing and user parameters. Balances are not designed to be relocated between applications, technicians, and laboratories. If a balance is moved after installation, the results of your installation and calibration work are no longer valid. Reinstallation should be performed before the balance is used again.

## Types of Balances

Semi-micro and Micro: four or more place balance  
Analytical Balance: 0.001g (or 1 mg), normally has draft shield  
Top Loader/Precision: 1 - .01 g  
Compact/Portable: 1 g

# Weights, Balances and Uncertainty (continued)

## Wind Currents

Inherent with the sensitivity of most balances is the ability to be affected by even the slightest of air movements. There are two simple ways to evaluate the impact of air currents surrounding the balance.

**Option 1:** A simple device known as a smoke tube will generate a harmless trail of smoke that will follow an ambient air current. Although this is a good visual indication, this method is sufficient only for the time that the test is being conducted.

**Option 2:** Use the balance as a “breeze sensor.” To conduct this test, complete the balance installation and setup following the manufacturer’s instructions. Connect the balance to a computer (according to manufacturer’s instructions). Configure the balance to interval print every 10 seconds. Configure the computer so that the information from the balance is imported into a spreadsheet, such as Microsoft Excel. Begin the test by activating the print sequence on the balance. Interval printing will continue at 10-second intervals for a set period of time to secure an evaluation of the environment surrounding the balance. Once the test has been completed, turn off the interval testing. Chart the results of the data now resident in your spreadsheet. Evaluate the results to determine if there are factors in the environment that you wish to avoid. An optional breeze-break will modify the unwanted behavior. If you are using an analytical-style balance (those devices with an integral breeze-break), this observation should not be overlooked.

## Vibration

This contaminant can result from something as subtle as a person walking by or a constant low-frequency hum of a large piece of manufacturing equipment located several work-areas away from where the balance is located. Anti-vibration pads placed under the feet of the balance can be a low-cost solution.

## Magnetism

Magnetic fields within close proximity to the balance may cause weight errors. Sources of magnetic fields range from small motors, computer displays, and test weights and mass standards. Magnetism in mass standards and test weights cannot be completely eliminated once the device is in the field. The proper care and handling of test weights and mass standards is equally important to minimizing uncertainties as the proper installation and use of a balance.

## Powerline Noise

If possible, insure that the balance is connected to a dedicated power circuit. At a minimum, use a conditioned power strip to ensure against errors in repeatability.

## RFI/EMI

Common devices used in work environments can interfere with the proper operation of a weighing system. These include two-way radios, wireless telephones, cordless phones, and wireless LAN communications. With the balance operating and presenting a stable zero reading, use a two-way radio, cell phone or any other electronic device within close and various proximity to the balance. Any sudden change in reading may indicate some level of interference and corrective action should be considered. Another option is to contract a professional experienced with detecting, measuring and compensating for RFI and EMI.

## Fluctuations in Temperature

Ideally, lab temperature does not change over the course of a normal 24-hour period more than one to two degrees Celsius. Realistically, however, many factors prevent this ideal except in the most controlled environments. To compensate for this, many balances have an internal automatic temperature-sensitive calibration. It is important to purchase and use devices with this feature. When a change in temperature that could affect the outcome of a weight is detected, the operator is notified that recalibration is required, or, on some units, the device’s own internal calibration routine automatically compensates for the temperature change.

The laboratory should be as free from windows and direct sunlight as possible. If such a consideration is impossible, keep weighing areas away from windows, direct sunlight and heat and refrigeration sources. The ideal humidity range for most balances is between 45 percent and 60 percent non-condensing RH.

To maintain the balance’s optimal internal thermal equilibrium, the balance should not ever be turned off. When using a balance with an enclosed weighing chamber, always use a tweezers or other mechanical gripping device to place things in or remove things from the weighing chamber. When choosing a container to hold a weighing sample, select one with a small surface area.

**NOTE:** If using a device with an integral breeze-break, note the difference between the environment inside and outside the weighing chamber. If unsure about the weight vs. temperature properties of the commodities being tested, prepare two “identical” samples of the commodity. These “identical” samples should have the same weight value. Leave one sample outside the weighing chamber next to the balance. Place the other sample inside the weighing chamber, but not on the weighing platform. Add the second sample inside the chamber to equalize to the weighing chamber’s temperature. Weigh the sample inside the weighing chamber once it has equalized to the chamber temperature. Immediately weigh the sample that was outside of the weighing chamber. If there is any difference in weight, you will need to achieve temperature equilibrium between the sample and the weighing chamber before making future weighing transactions.

## Sample Conditions

The weight of a sample will increase or decrease depending on its exposure to volatile substances. Similarly, the sample will behave differently dependent on the evaporation of water or the absorption of moisture by the sample itself. Always use clean and dry weighing containers to hold the sample(s) under test. Keep the weighing platform and/or weighing chamber clean and free from foreign substances that may interfere with the testing results. Use weighing containers with as narrow an opening as possible and keep these containers covered unless direct and specific work is being done with the samples.

# Weights, Balances and Uncertainty (continued)

## Condition of Electrostatic Discharges

ESD usually demonstrates itself in one of two ways:

1. Repeated weighments of the same sample return dissimilar results.
2. The reading on the weight display is unusually unstable even though all other environmental concerns seem to be accounted for.

The following procedures can help counteract ESD. In some instances, following more than one of these procedures may be necessary:

- a. Avoid weighing vessels made of plastic. Glass is preferable.
- b. Ground the device. This can be achieved by running a wire from the chassis of the device to a direct ground connection.
- c. Ground the technician. These solutions include ESD wrist straps, ESD-proof laboratory coats, anti-static hand soap, etc.
- d. Use anti-static brushes to discharge ESD within the weighing chamber.
- e. Discharge ESD in the balance's immediate environment.
- f. There are a number of solutions that provide a constant stream of neutralized ion air that eliminates antistatic build-up.
- g. If the above procedures fail to correct the ESD problem, consider using only metal sample containers.

## Installation

Who is doing the installation? There are basically three types of "installers" for precision weighing equipment: laboratory technicians, maintenance staff or a dealer technician. If you have purchased your balance directly from one of the major catalog suppliers, your options for installation and maintenance are limited to either a laboratory technician or the in-house maintenance staff. Find the individual with the most experience and ensure they thoroughly follow the instructions that come with the device. If you have purchased your balance from a local scale or balance dealer, you have the benefit of requesting installation by a dealer technician. This is the preferable option. A scale or balance dealer's technician is a trained professional, who, by definition, is sensitive to all of the factors that we have discussed in this article. Additionally, you have the benefit of being able to call them back and troubleshoot either the device or the environment if you have difficulty.

## Operator Training and Certification

Who is going to use the balance? Operator training and certification on a weighing device cannot be overstated. Operator errors are not only a result of individuals being inadequately trained, they also add untold degrees of uncertainty to valuable test results. Every operator should have at least a background in weighing technology, even if it is limited only to the device in question. Additionally, they should have a thorough understanding of the test process and the necessity to correctly record data thus preventing an erroneous influence in the significant process evaluation.

you will determine the need to test the balance at its planned location, and perhaps other alternative working sites in order to arrive at the best performance parameters. This will exclude influences of the surroundings or the operating personnel. By controlling the optimum performance of the balance based on its location and proper installation, you can significantly reduce uncertainties in your weighing processes.

With all of these factors under control, you should be able to proceed now using good laboratory weighing practices to determine the standard deviation of your device, as well as the uncertainty of your process.

## Conversions

Abbreviation	Description	Conversion
kg	1 kilogram kilo 10 <sup>3</sup>	1000 grams
mg	1 milligram milli 10 <sup>-3</sup>	0.001 g
µg	1 microgram micro 10 <sup>-6</sup>	0.000 001 g
µlb	1 micro pound micro 10 <sup>-6</sup>	0.000 001 lb

MULTIPLICATION FACTOR	PREFIX	SYMBOL
1,000,000,000 = 10 <sup>9</sup>	giga	G
1,000,000 = 10 <sup>6</sup>	mega	M
1,000 = 10 <sup>3</sup>	kilo	k
100 = 10 <sup>2</sup>	hecto	h
1 = 1		
0.01 = 10 <sup>-2</sup>	centi	c
0.001 = 10 <sup>-3</sup>	milli	m
0.000001 = 10 <sup>-6</sup>	micro	µ
0.00000001 = 10 <sup>-9</sup>	nano	n

Abbreviation	Description	Conversion
T	Tera	1,000,000,000,000
G	Giga	1,000,000,000
M	Mega	1,000,000
k	kilo	1,000
h	hecto	100
dK -or- da	deca	10
	metre, gram, liter, second, celcius	
d	deci	.1
c	centi	.01
m	milli	.001
µ	micro	.000,001
n	nano	.000,000,001
p	pico	.000,000,000,001

UNIT	"kg" RELATIONSHIP	"g" RELATIONSHIP
Nanogram (ng)	10 <sup>-12</sup> 0.000000000001 kg	10 <sup>-9</sup> 0.000000001 g
Microgram (µg)	10 <sup>-9</sup> 0.000000001 kg	10 <sup>-6</sup> 0.000001 g
Milligram (mg)	10 <sup>-6</sup> 0.000001 kg	10 <sup>-3</sup> 0.001 g
Gram (g)	10 <sup>-3</sup> 0.001 kg	1 g
Kilogram (kg)	1 kg	10 <sup>3</sup> g 1000g
Ton (t)	10 <sup>3</sup> kg 1000kg	10 <sup>6</sup> g 100,000g

In summary, careful planning and/or suitable corrective action will minimize and possibly even eliminate many sources of uncertainty within your weighing process. It is possible that

## USP Modifications in Chapter 41 and 1251

After its initial modification to Chapter 41 and 1251 in December 2013, The USP (U.S. Pharmacopeial Convention) is continually refining its requirements for balance calibrations. A balance calibration is a check to verify that the balance's weight display matches the nominal weight value. Many people interpret this to be calibration with adjustment; however, a calibration is a verification not an adjustment.

The USP requirements state that calibrations are applicable when substances must be "accurately weighed." Balance weighing should be performed using calibrated equipment that has been calibrated at capacity and tested for repeatability and accuracy. The balance should also be tested at a minimum weighing point and not used below that point.

REPEATABILITY of the balance is tested by weighing one test weight 10 times. The weight used is within the balance's operating range. The weight does not need to meet any calibration requirements as the weight is used to check that the readings are repeatable. The results are acceptable if "two times the standard deviation of the weighed value, divided by the desired smallest net weight (i.e. smallest net weight that the users plan to use on that balance) does not exceed 0.10 percent."

ACCURACY is acceptable if the balance's weighing value is within 0.10 percent of the test weight value. The accuracy test weight is a calibrated weight with maximum permissible error (mpe), or its uncertainty, of one-third of the applied test limit of the accuracy test.

In order to help laboratories and businesses comply with these updated guidelines, Rice Lake offers Essential Weights™. Designed with convenience in mind without sacrificing precision, Essential Weights are sets stainless steel test weights specifically tailored to your balance.

CHAPTER 41	PREVIOUS	UPDATED
Scope	Defines the requirement for balances used to weigh analytes for quantitative measures	Same scope with new language for added clarity
Calibrated Balance	Not specified	All balances must always be calibrated
Number of Balance Tests	1 - repeatability	2 - repeatability and accuracy
<b>Test 1 - Repeatability</b>		
Limit of repeatability test	≤0.1%	≤0.10%
Expansion factor	3	2
Total replicate weighing procedures	10	10
Acceptance criterion	3*s/m ≤ 0.1%	2*s/m ≤ 0.10%
Other criterion	N/A	If the repeatability obtained is smaller than 0.4 d, where d is the scale interval, replace the standard deviation with 0.41 d
<b>Test 2 - Accuracy</b>		
Limit of accuracy test	N/A	≤0.10%
Test weights	N/A	Between 5% and 100% of the balance capacity
CHAPTER 1251	PREVIOUS	UPDATED
Scope	Applies to all analytical procedures	No change
<b>Balance Test</b>		
Performance Test	Drift check to be performed daily	Risk analysis determines the frequency of any test
Built-in Weights	N/A	Checks can be partially replaced using automatic or manually triggered adjustment by means of built-in weights
Minimum Weight	N/A	The minimum weight applies to the sample weight, not the tare or gross weight
Calculation of Minimum Weight	N/A	Derived by using a test weight up to a few percent of the balance capacity: m=2000*s
Repeatability Test	N/A	As repeatability fluctuates, weighing should be performed at larger values than the minimum weight

Complete, up-to-date information can be found at [www.usp.org](http://www.usp.org).

The new minimum weight requirements establish guidelines for operators to use the balances within a certain range. This is calculated from the repeatability test and begins at a point where the balance's repeatability is less than or equal to 0.10 percent. The specification states that the minimum weighing range will be 0.41 divisions (or the larger repeatability test result).

The impact of these requirements establishes best practices for balance applications. Balances that may have been purchased for applications based on specification sheets may not perform to those specifications in real-life applications. With these requirements, balances will be calibrated (checked) and a routine system established to make sure that the balance meets the application requirements.

# Properties of Magnetism in Mass Standards

## Editor's Note

Since this article was first published, the concern over magnetism in test weights has evolved to a new level. Unfortunately, a number of issues surrounding the measurement of magnetism in mass measurement has created frustration for mass calibration laboratories and for accreditation bodies. NCSLI recently met to bring together interested parties to discuss issues with the intent of coming to some resolutions on how to handle the various issues. As a result of these discussions a number of resolutions was adopted.

1. Laboratories should not include an uncertainty component for magnetism measurements in mass calibrations.
2. NVLAP's position is that for Echelon I and II measurements (corresponding to OIML R 111 classes E1, E2, F1 and F2) laboratories should:
  - 1) State on their certificates whether or not they are screening for magnetism.
  - 2) State that no component is included in their uncertainty statement for magnetism effects.
  - 3) Include a discussion/written agreement as to the laboratory's practice regarding magnetism screening (or lack of screening) as a part of normal contract review with laboratory customers.

So then, why does Rice Lake screen test weights for magnetic influences? Our dedication to provide you with the utmost value for your dollar. Should we fail to test for magnetism, we could inadvertently provide you with erroneous calibration data. This data would not be repeatable in your facility. Therefore the assurance and traceability of your own work could be jeopardized.

Our philosophy always has been and will always be to take care of the customer first.

By testing for magnetic influences prior to executing a test weight calibration, we continue to provide you with a quality of work unparalleled within the industry, keeping your needs first.

## What problems can magnetic balances cause?

When working with balances, magnetic field strength can be increased in a standard that has high susceptibility, even if the standard previously had a low or insignificant magnetic field strength. The solution seems obvious: don't expose the standard to a balance with magnetic properties. This is easier said than done. A balance with magnetic properties will reproduce its measurements as long as there are no other magnetic fields intersecting the balance's own field; thus, the magnetic field of the balance goes undetected. Introducing a standard into the balance's magnetic field, even one with very low field strength, has the potential to increase the magnetism of the standard. In this manner, a standard that formerly had no problems could potentially accumulate serious problems. To avoid this situation, the magnetic field of the balance and the magnetic susceptibility of the standard must be measured.

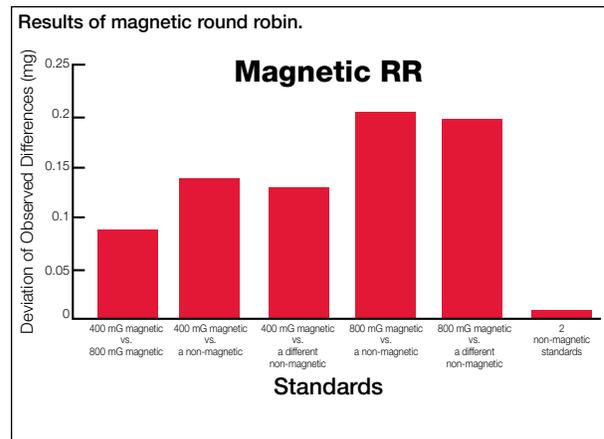
In 1994, a magnetic round robin was performed by several metrology laboratories to test the effect magnetism has on weight measurements. This round robin was designed to show how close the laboratories' results would be after performing a calibration on one kilogram standards with known magnetic properties.

The balances compared and the approximate standard deviation of observed differences for these tests are shown below.

BALANCE COMPARISON	STANDARD DEVIATION
400mG magnetic vs. 800m non-magnetic	0.09mg
400mG magnetic vs. a non-magnetic	0.14mg
400mG magnetic vs. a different non-magnetic	0.14mg
800mG magnetic vs. a non-magnetic	0.2mg
800mG magnetic vs. a different non-magnetic	0.2mg
Non-magnetic vs. another non-magnetic	0.3mg

These tests show that a balance responds to magnetic properties of a mass regardless of the type of force the magnetic properties are exerting. However, the magnetic fields which are present in one balance are not necessarily reproduced in a different balance. Because of this phenomenon, it is difficult to reproduce the measurements from one facility to another. If this theory is true, the link of traceability for standards with magnetic properties is obviously broken because the magnetism causes an inability to reproduce consistent measurement results.

The graph below shows the results of the magnetic round robin, clearly showing the inconsistencies that can occur.



## How does magnetism develop during the manufacturing of mass standards?

The existence of magnetic properties during the manufacturing of mass standards warrants careful consideration. Due to the numerous possibilities of creating magnetic properties, it is difficult to produce a mass standard from austenitic (virtually non-magnetic, highly corrosion resistant) stainless steel completely free of magnetic properties.

## Properties of Magnetism in Mass Standards (continued)

On April 11, 1946, F. A. Gould from the National Physical Laboratory wrote in the *Journal of Scientific Instrumentation*: “Analytical weights of stainless steel have been on the market for several years. The kind of stainless steel used for their construction is one which purports to be reasonably non-magnetic, being of the austenitic variety; and up to the present time the 18/8 type of austenitic steel, that containing 18 percent chromium and 8 percent nickel, has been employed for this purpose in this country. The quality of the finished weights, however, has not been very satisfactory in regard to their magnetic properties, and some have been found permanently magnetized to an appreciable extent.”

Mass standards are manufactured through a variety of methods, including turning, milling and casting. Before beginning the manufacturing process, it is imperative to choose the proper materials. When choosing materials, the most important factors to consider are machinability, corrosion resistance, porosity and magnetic properties. The magnetic properties generally develop when austenitic stainless steel is cold-worked. Although cold-working adds tensile strength, mass standards do not normally require added tensile strength.

### Which Materials Are Best for Manufacturing Mass Standards?

Three hundred (300) series stainless steels are often used to manufacture mass standards because their chemical composition is highly resistant to corrosion. Certain materials found within 300 series stainless steels such as iron, cobalt, and nickel may possess ferromagnetism. Ferromagnetism occurs when a small external magnetic field produces an alignment of atomic magnetic dipole moments, which in some cases can persist even when there is no external magnetic field. This occurs because the magnetism of these substances exerts such a strong force over a small region of space that the magnetism is found on surrounding materials, even when no external magnetic field exists. In addition, cold working these materials often changes the austenite to ferrite in the material.

Several tests were conducted by the National Physical Laboratory, United Kingdom, to evaluate the materials used for manufacturing weights. In one of these tests, finished weights of 18/8 steel obtained from several sources of supply were tested. About half of the weights in these tests exhibited a magnetic permeability of 1.02 or less, but the remainder of the

weights showed higher magnetism. Several weights showed a permeability value of 1.1, and one showed a high permeability value of 2.6. Some of this material was found to have become permanently magnetized to an elevated extent.

Because of the variety of austenitic steel which is available, additional tests were performed to help in the selection of a material with non-magnetic properties. These tests found that 18/8 materials were not satisfactory with respect to magnetic properties. Figure 3 depicts the magnetic permeability of different stainless steel compositions.

When comparing the processes required to manufacture mass standards or to manufacture the stainless steel to produce the standards, this chart provides a general idea of the magnetism problems which may occur. Most purchasing personnel are not aware of the problems of magnetism, so when the purchase of materials takes place, materials are requested by their manufacturing names, such as 310, 304 and 316.

These names are like recipes in that they give a process for heat treating the material and a range for the chemical composition. Most of these materials have a heat treating process that returns the materials to an austenite state after any cold working process. However, sometimes this heat treating process may leave the materials bent or twisted. So in order to supply vendors with the proper materials, a secondary process to straighten the materials must be performed. This process is still within the requirements for the materials, but the cold working during the straightening process leaves the materials with magnetic properties. This is most common in smaller size diameters.

Aside from the risk of the materials having magnetic properties from the start, weight manufacturers add to the possibility of elevating magnetism during the series of cold working processes necessary to produce the mass standard. Manufacturers must use either a saw or lathe operation to start the process. The removal of any metal in this fashion is considered a cold working process. Polishing and stamping are also cold working processes. These operations can and do produce magnetic properties in the standards.

CHEMICAL COMPOSITION									MAGNETIC PERMEABILITY	MAGNETIC PERMEABILITY AFTER COLD ROLLED TO GIVE A 33% REDUCTION IN AREA
C	Si	Mn	S	P	Cr	Ni	W	Cu		
0.03	0.57	0.55			17.45	11.9			1.003	1.10
0.14	0.6	0.58			19.8	12.96			1.003	1.005
0.07	0.24	0.44			10.33	20.7	1.73	2.14	1.015	1.04
0.09	0.23	0.44			10.3	20.26	1.79	2.20	1.013	1.021
0.13	0.19	0.36			9.72	20.28	1.55	2.39	1.021	1.045
0.10	0.26	0.42			10.85	20.71	1.83	2.13	1.016	1.043
0.10	0.26	0.48			10.42	20.77	1.57	2.32	1.012	1.021
0.09	0.22	0.39			10.41	20.17	1.67	2.19	1.014	1.024
0.10	1.71	0.78	0.017	0.011	24.27	20.40			1.002	1.003

# Properties of Magnetism in Mass Standards (continued)

## What Are the Requirements for Magnetic Properties in Mass Standards?

The United States uses the American Society for Testing Materials (ASTM) specification E 617-13 for specifying the requirements of magnetic properties in laboratory weights and precision mass standards. This specification was replaced by the National Bureau of Standards (NBS) Circular 547, Section 1 in 1978 and recognizes the international recommendations of the Organization Internationale De Metrologie Legale (OIML) R111, edition 1994.

According to the ASTM E 617 specification, magnetic properties must be measured in magnetic field gradients because unshielded devices in the vicinity of the measurement can affect the accuracy of measurements. Higher grades of weights have lower magnetic susceptibility. Grades S, S', O and P should not be more magnetic than 300 stainless steel.

The OIML international recommendations include requirements for magnitude of magnetic susceptibility. They state that the metal or alloy used for weights of Classes E1 and E2 shall be practically non-magnetic (magnetic susceptibility  $K$  not to exceed  $K=0.01$  for Class E1,  $K=0.03$  for Class E2, and  $K=0.05$  for Classes F1 and F2).

## How Can Magnetism Be avoided?

Although magnetism cannot be completely avoided, steps can be taken to control the effects of magnetism on the accuracy of weight measurements. The area where the weighing occurs should be tested with a gaussmeter for magnetism created by electrical wiring, motors and any other components in the area. If the testing shows magnetism is present in the area, another location should be chosen for the measuring process.

A gaussmeter should also be used to test the balances for magnetism. Even if the standards have very low magnetic strength, the internal components of a balance may cause varying results. For example, if the components of the balance have a magnetic charge, the standard introduced to the balance will change the force exerted on the load device, causing inconsistent results from one device to another. Balances should be tested whenever there is any suspicion of magnetic problems, such as erratic weight measurements. The gaussmeter shows which part or parts of the balance are magnetized and need to be replaced.

The elimination of magnetism in mass standards is not likely to happen. However, if the proper steps are taken, the magnetism in mass standards can be significantly reduced. Starting with the manufacturing process, the proper methods and materials must be chosen. Then, the mass standards should be tested for magnetic properties. Finally, remember that the magnetism inherent in the environment, balances and standards will cause some degree of inconsistency in mass measurements, no matter what preventive steps are taken.

## How Are the Magnetic Properties of Mass Standards Measured?

Although specific requirements for magnetic susceptibility are a good start, magnetic field strength is also a very important factor that needs to be measured. Susceptibility adds to the potential of an item becoming magnetized or further charged.

Measuring the magnetic field strength of the standard shows whether or not the magnetism is significant enough to cause mass measurement errors.

Richard Davis of Bureau International des Poids et Mesures (BIPM) wrote an article entitled, "New Method to Measure Magnetic Susceptibility," in which he describes a process he developed for measuring magnetic susceptibility. The following pieces of equipment are used to perform the measurements:

### Balance

The balance must have a 5 gram capacity (to leave enough range in the balance to place the column and magnet on it and perform the measurement) and a resolution of greater than or equal to one microgram. The weighing chamber is a glass tube with a removable glass top. The original top is replaced with one made of an aluminum alloy because aluminum contains very little magnetism.

### Magnets

Two high quality cylindrical magnets (constructed of neodymium-iron-boron) are used in this measuring process. Each magnet has a height of 2.5 millimeter and a diameter of 5 millimeter. The axis of magnetization coincides with the geometric axis of the cylinder. Two such magnets are combined to produce a cylinder of height equal to diameter.

### Pedestal

The magnet sits on a tubular pedestal that is centered on the balance pan. Holes drilled through the wall of the tube ensure that the total mass of the magnet and pedestal is well within the capacity of the balance.

### Bridge

Samples are centered on an aluminum alloy bridge that straddles the weighing chamber of the balance. The bridge must be designed so the span can be made level with respect to the balance pan. The span should be as thin as possible, with adequate mechanical rigidity. If the span sags in the middle, samples with a large diameter will be farther from the magnet than samples with a small diameter.

### Gauge Blocks

It is convenient to place the bridge on non-magnetic gauge blocks so that it may be raised or lowered in precise 5 millimeter increments.

### Magnetic Susceptibility Standard

The magnetic susceptibility standard can be the identical shape of the item being tested or a cylindrical shape that has been calibrated by known standards.

Once all of the equipment has been assembled, the distance from the center of the magnets to the top of the bridge must be calculated to determine the magnetic force. This can be done by using the known magnetic standard. After the distance is calculated, the samples that need to be tested may be introduced. The samples are calculated based on the distance from the magnets and the response of the balance. If the samples have different geometrical values, additional calculations must be performed to solve for the volume of magnetic susceptibility.

# Weight Cleaning Procedures

The following is Good Measurement Practices Number 5, "Weight Cleaning Procedures." More information on Good Measurement Practices may be found on the NIST website following links to Weight and Measures, Laboratory Metrology and Calibration Procedures.

It is essential that weights being calibrated as well as the standards used are clean if the calibration is to be accurate and meaningful. Therefore, a cleaning procedure should be considered as a part of every calibration.

## Categories of Weights

For cleaning purposes, weights may be divided into four categories:

1. One-piece weights: This category will include all one-piece weights except lacquered weights, sheet metal weights and small wire weights.
2. Screw-knob weights: This category will include all weights with adjusting cavities except lacquered weights.
3. Lacquered weights: This category includes all lacquered or painted weights.
4. Sheet metal weights and wire weights.

## Cleaning Procedures One-piece Weights

One-piece weights, one gram and larger, are steam cleaned. The weights are either held or placed in a jet of steam and manipulated so that the entire surface of the weight is subjected to the cleaning action of the steam long enough to clean it. A superficial steaming is not enough. The weight is then dried, either by evaporation or careful wiping with a soft non-abrasive material such as high grade cheesecloth, free from oil and other substances that could leave a residue on the weights. Care must be exercised that no water spots are left on the weights as they dry. Visible particles on the weights should be brushed or wiped off before steam cleaning them. If a steam generator is not available, one-piece weights may be cleaned either by immersing them in a hot or boiling distilled water bath in a non-metallic container, or according to the procedures for screw-knob weights. Occasionally, a weight will have foreign material adhering to it that requires the use of solvents. Ethyl alcohol is a good general solvent. If alcohol does not remove the material, other solvents may be used. Alcohol is then used to remove any film left by the other solvents. The weights are then steam cleaned as outlined above.

## Screw-knob Weights

Weights in this category are usually cleaned by wiping with a soft non-abrasive material such as high-grade cheesecloth, free from oils or other substances that would leave a residue of any kind on the surface. Occasionally, a weight will have foreign matter adhering to it that requires cleaning by using solvents, applied with a cloth. Ethyl alcohol is a good general solvent. If alcohol does not remove the foreign material, other solvents may be used. Alcohol is then used to remove any film left by the other solvents.

## Lacquered Weights

The cleaning of lacquered weights requires special care because their protective lacquer coating is soluble in most solvents. Lacquered weights are cleaned by wiping with a soft non-abrasive material, free from oils and other substances that would contaminate the weights, or by brushing with a soft brush such as a camel hair brush, or both. A rubber bulb type syringe may be used to blow off lint or other small particles, however, be careful not to touch the weights with the nozzle. An electrostatic charge may be placed on the surfaces of the weights during the cleaning process or while handling them. This could be especially troublesome in a very dry atmosphere. If reliable mass values are to be obtained, the charge must be bled off the weights before calibration.

## Sheet Metal Weights

Either of the following two procedures may be used in cleaning sheet metal and other small one-piece weights:

### Two-step Method

First, the weights are placed in an acetone bath agitated to help loosen any foreign material. A soft brush, such as a camel hair brush, may be used to agitate the weights. The weights are removed from the acetone, allowed to dry and then steam cleaned. For steam cleaning, the weights are held in front of a jet of steam with forceps until the entire surface has been covered with steam. (See note on the next page). In order that the portion of the surface under the forceps may be steamed, the weight is set down and picked up again with the forceps holding the weight at a different spot than the first time; the weight is again steamed. Do not allow the weights to touch the steam nozzle. A low ash filter paper should be used for drying the sheet metal weights. A circular disk is folded unsymmetrically. The main body of the weight is placed between the folds of the paper with the turned up edge of the weight protruding. The main body of the weight is dried by pressing lightly on the top of the paper. The turned up edge is brushed lightly with a piece of filter paper. In some cases, it may be necessary to brush the body of the weight with filter paper to remove drops of water. Care must be exercised that no water spots are left on the weights as they dry.

### Three-step Method

First, the weights are placed in an acetone bath and agitated with a soft brush to help loosen any foreign material adhering to the weights. The weights are removed from the acetone, allowed to dry, then placed in an ethyl alcohol bath and agitated. The weights are removed from the alcohol bath, allowed to dry, and then steam cleaned and dried as outlined in the two step procedure.

*Note: The smaller fractional weights, say smaller than 1 gram, may be placed in a hot or boiling distilled water bath for the final cleaning instead of steam cleaning them. A hot or boiling distilled water bath also may be used for the final cleaning of all sheet metal weights when a steam generator is not available.*

## Cleaning Interval Weights Under Test

The weights under test are cleaned before calibration.

## Standards

Standards need not be cleaned every time they are used. If the standards are handled carefully, and kept under a reasonable dust tight cover, when not in use, in a clean atmosphere, the interval between cleanings may be several months, or until the calibration procedure checks indicate that the standards are changing and may need cleaning. Under less favorable conditions the interval may be only a few weeks.

# Weight Cleaning Procedures (continued)

The following is Good Measurement Practices Number 5, "Weight Cleaning Procedures." More information on Good Measurement Practices may be found on the NIST website following links to Weight and Measures, Laboratory Metrology and Calibration Procedures.

It is essential that weights being calibrated as well as the standards used are clean if the calibration is to be accurate and meaningful. Therefore, a cleaning procedure should be considered as a part of every calibration.

## Temperature Equilibrium

Newly cleaned weights should be allowed to come to temperature equilibrium before they are calibrated. This may take several hours for the larger weights that have been steam cleaned.

Generally, laboratory weights will come to temperature equilibrium over night.

## Storage

Usually, weights are not placed in the balance immediately after cleaning, but are stored for varying periods. The weights should be stored under cover so that they will stay clean. Weights, one gram and larger, may be stored on a tray lined with filter paper and covered with an inverted glass dish. The smaller weights may be stored in a small glass dish covered with a watch glass. In both cases, the container should be labeled with the weight identification. When the weights are to be moved, carry the tray or dish in a level position so that the weights do not slide around.

When the weights are placed in the balance, they should be carefully brushed to remove any particles that may be on them. A small bulb type rubber syringe is useful in removing lint and other small particles from weights. The particles are blown off the weights. Therefore, neither the nozzle nor any other part of the syringe need touch the weights, and care must be taken that they do not.

## Brushes

All of the equipment used in cleaning and handling weights should, of course, be clean. But, brushes require special attention because they are easily contaminated and often are the last cleaning device used before the weights are calibrated. Only soft brushes, such as camel hair brushes, should be used on weights.

The brushes are cleaned by washing with soap and water, then rinsing in ethyl alcohol and allowed to dry in air. When drying the brushes, place them so that the bristles do not touch anything. New brushes are cleaned before using to remove any oil or other matter that might contaminate the weights. Used brushes are cleaned as often as necessary to be sure that the brushes themselves do not contaminate the weights. Store cleaned brushes in containers that will keep them clean until needed. When handling the brushes, do not touch the bristles, as oil from the skin will contaminate them. When the brushes are laid down, place them so that the bristles do not touch anything.

## Steam Generator

A steam generator may be purchased from a laboratory supply house or one can be constructed.

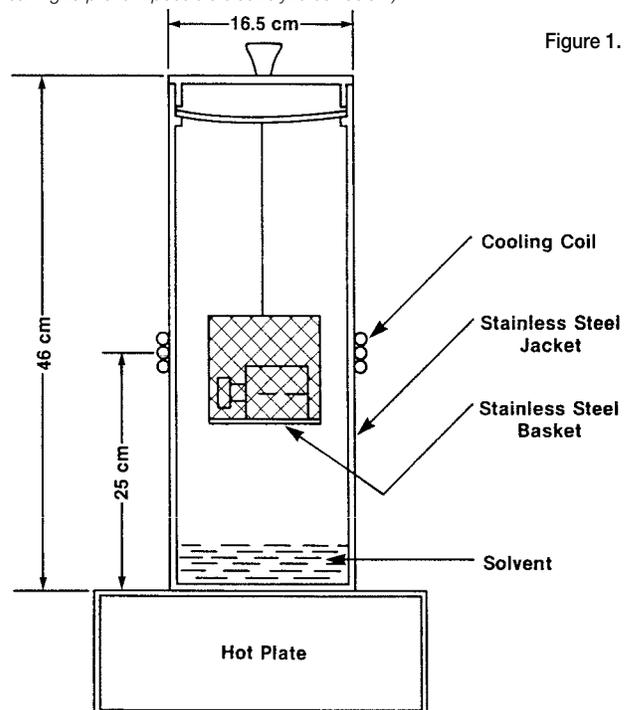
A simple steam generator may be constructed from a 500 milliliters wash-bottle, a two hole stopper, some glass tubing, a hot plate for the heat source, a large graduate and some flexible tubing.

## Vapor Degreaser

Weights may be cleaned by vapor degreasing, using an apparatus such as shown in Figure 1 below.

The apparatus consists of a stainless steel cylinder placed on a hot plate. The cylinder has several loops of copper tubing coiled around the outside center of the cylinder as cooling coils. The cylinder also has a cover to minimize the escape of vapors of the solvents used in the cleaning process. A basket is suspended from the cover inside the cylinder. A single weight or several small weights are placed in the basket. Solvent (e.g. ACS grade trichloro-ethylene) is placed in the cylinder to a depth of about 2.5 centimeters. The solvent is heated to boiling. Cold water is circulated through the cooling coils. The solvent condenses on the weight, thereby cleaning the weight, and drops off into the liquid at the bottom of the cylinder. The cleaning process is run for 15-20 minutes. The standards are then air dried and allowed to return to room temperature. The weights, when removed from the degreaser, are hot so that residual solvent evaporates in a few seconds.

(Caution: Weights should be removed from the degreaser immediately after cleaning to prevent possible electrolytic corrosion.)



# Balance Verification Using Calibrated Weights

The following is an example of how to use test weights with the appropriate pedigree to calibrate and verify an electronic weighing device such as an electromagnetic force restoration balance. Manufacturer's operating and maintenance instructions should always be referenced prior to performing a test or making adjustments. Pay exceptional attention to the manufacturer's discussion on the environment suitable for the device. At the end of these procedures, refer to page 245 for information regarding weighing influence factors. Failure to consider these specifications and conditions will invalidate this procedure. Please contact us if you cannot locate the operating instructions for your device. We may be able to provide a duplicate.

## Equipment Required:

- Balance
  - Accessory printer (to document calibration changes and results\*)
  - Cotton gloves
  - Tweezers
  - Tongs (as appropriate to handle the test weights)
  - Test weight calibration certificate or traceable certificate.
1. Using the manufacturer's operating instructions, set up the balance in the environment in which it is intended for use. Allow the balance to "soak" in the environment for a minimum of 24 hours prior to any testing. This is a critical step. Many of the mechanical structures in a balance are affected by the changes in environment. To ensure a proper test with definable results, the device must be allowed to equalize within its environment.
  2. If the balance is equipped with an internal calibration feature, activate that feature and allow the printer, if so equipped, to document the results.
  3. If the balance is not equipped with an internal calibration feature, use an external electronic balance calibration weight and, following the manufacturer's recommendations, calibrate the balance. Many electronic balances deployed in the field allow you to select the size of calibration weight you wish to use. To minimize the impact of hysteresis on linearity, it is strongly recommended that you use a weight that represents 100 percent of the rated capacity of the device.
  4. Weight selection criteria. Selecting the appropriate size and class of an electronic balance calibration weight is not a difficult process.

**Option 1:** Refer to the instructions provided by the manufacturer of the balance or other weighing device. Generally, the size (capacity) and class of the recommended test weight will be included for your reference.

**Option 2:** Manually calculate the test weight needed based on the best performance from a device with a specific capacity and readability.

- a. Record the capacity of the balance
- b. Record the minimum increment (readability) of the balance
- c. Divide the result from step 2 above by a factor of four. This number results in the appropriate tolerance for the test weight required. For example, if the balance in question has a capacity of 120 grams and a displayed resolution of one milligram (0.001 gram), the result of the calculation would be 0.25 milligram (0.00025 gram).
- d. Refer to the ASTM Weight Tolerance Table on page 242.
- e. In the column titled "Metric Denomination" find the weight value closest to the capacity of the balance. If the exact number is not available, select the next smallest value. For example, a balance has a capacity of 120 grams. The closest

value but smaller than the rated capacity of the balance is 100 g.

- f. Read across the table to the right to locate the tolerance that is closest to, but smaller than the value of 0.25 milligrams calculated in step three. The first value that meets this criteria is 0.13 milligrams, Class 0
- g. To assure the most error-free results, an ASTM Class 0 test weight should be used for this calibration exercise. However, because the value in the next column is .025 milligrams exactly, an ASTM Class 1 device could be selected with satisfactory results.
- h. Now we know that every test weight we purchase for this device must be a minimum of ASTM Class 1.

**Option 3:** Manually calculate the test weight based on the tolerance of the procedure or methodology.

- a. Given: your balance has a capacity of 120 grams
- b. Given: your balance has a readability of 0.0001 grams (0.1 milligrams)
- c. Given: you wish to check your balance at weighing capacities of 5 grams, 10 grams, and 15 grams.
- d. To get the proper results, weights with the following capacities are required: 1 each 5 grams, 1 each 10 grams

You will be able to use the 5 grams test weight alone to test the device at 5 grams; the 10 gram weight alone to test the device at 10 grams; and the 5 gram and 10 gram test weights together to test the device at 15 grams.

- e. Given: the tolerance you are looking for in your procedure is 0.5 milligrams
- f. Divide your tolerance of 0.5 milligrams by a factor of 4. This results in a tolerance of 0.125 milligrams
- g. Refer to the ASTM Weight Tolerance table on page 248.
- h. Because more than one weight is being used to accomplish this test, cumulative tolerance will need to be applied considering the tolerances of both a 5 g and 10 g test weight together to ensure that they do not exceed 0.125 milligrams.
- i. Find the first 10 gram weight value in the column titled "Metric Denomination". Read across the chart to find the value that is closest to but smaller than the calculated tolerance of 0.25 mg from step 4c above. This would be the value of 0.074 under ASTM Class 2. ASTM Class 3 cannot be used since that value 0.25 milligram is larger than the calculated tolerance of 0.125 milligram.
- j. Follow the ASTM Class 2 column until you are across from the 5 g test weight, which is the next test weight being used. As listed on the chart, the tolerance for a 5 gram ASTM Class 2 test weight is 0.054 milligrams.
- k. Add this to the tolerance of the 10 grams ASTM Class 2 test weight from step 4 above. The result is 0.74 milligram + 0.054 milligram = 0.128 milligrams. This value is larger than the stated tolerance of 0.125 milligrams. Because of this, tolerances for ASTM Class 1 need to be used to improve performance.
- l. The tolerance for an ASTM Class 1 10 gram test weight is 0.050 milligrams. The tolerance for an ASTM Class 1 5 grams test weight is 0.034 milligrams. When combined, the total accumulated tolerance of 0.084 milligram of is well within the stated tolerance of 0.125 milligrams. Therefore, for this procedure, ASTM Class 1 test weights should be used.

# Balance Verification Using Calibrated Weights (continued)

5. When external (preferred) or internal calibration has been successfully accomplished, select a verification weight that is representative of a typical sample used on a daily basis. If the weighing device is used for samples of exceptionally different values, consider the number of transactions with each typical sample. Develop a representative sample size for this test. The test weights you use for this test should not only be representative of the sample size, but also have the appropriate laboratory documentation and traceability to ensure test validity.
6. Tare or zero the balance and verify that the display reads a stable zero value.
7. With the device reading zero, apply the sample test weight to the balance.
8. Wait until the balance indicates that it is no longer “in-motion.”
9. Write down the reading on the display.
10. Remove the test weight from the balance.
11. Wait until the balance is no longer “in motion” and the display has returned to a stable zero value.
12. Repeat steps 5-10 20 times.
13. Using the results from step 11, calculate a standard deviation
14. Multiply the answer in step 13 by three. This is the random error that is expected for the balance with a 99 percent confidence level. This number now becomes the upper and lower limits for the performance verification. In other words, the balance is performing satisfactorily when the results of a balance reading compared to the practical test weight (PTW) are no more than  $PTW + STDV$  and no less than  $PTW - STDV$ .
15. It is important to now verify the results of the standard deviation against the repeatability specification for the weighing device under test. If the standard deviation value is greater than the repeatability factor of the balance under test consider the following.  
  
Recheck the installation parameter of the balance. Be acutely aware of environmental influences on the balance under test as these can have a significant impact on the device’s performance. If you are confident that all preventative measures have been taken to insure optimal balance performance, contact the manufacturer of the device for additional recommendations.
16. Determine the correction value from the laboratory documentation that accompanies the test weight used to calibrate the balance at 100 percent from step 3. The correction value is the error that was introduced into the balance mechanism and algorithms when the balance was calibrated in step 3. The calibration function in most electronic balances of recent manufacture compensates and sets the linearity of the device from the point in the weighing range representing the calibration load down through and including zero. It is critical that the calibration be performed as close as possible to 100 percent of the balance’s rated capacity. Perform balance calibration with an external calibration test weight since the linear error cannot be deduced by using an internal calibration weight. If the balance

was calibrated at 100 percent of its rated load, 100 percent of the error in the calibration weight was also introduced at that point. This error is reduced to half its original value at the 50 percent load point. It is further reduced to 75 percent at the 25 percent load point. It is possible to make an estimation of the linear error of the calibration by the equation in figure 2.

- A. LE = Linear Error
- B. ECW = Rated Error of the Calibration Weight
- C. L = Load
- D. CL = Calibration Load

17. A study of the points presented so far explains the fallacy of attempting to calibrate a balance at less than 100 percent of its rated capacity. Failure to do so can make the device’s performance completely theoretical and destroy the intent of uncertainty budgets.
18. Using all of this information, it is now possible to determine the anticipated result for the verification process.
19. Using the laboratory documentation for the test weight that represents the typical sample weight, determine the error or correction of the weight. Also, check the uncertainty of the weight that you will use for this process. The uncertainty must be no greater than 25 percent of the random error of the balance being examined from step 15. If the uncertainty of the weight is greater than 25 percent of the random error of the balance, select a test weight of equivalent value but with a higher accuracy class. In the event that the correction on your laboratory documentation is a negative number, the weight in question is below nominal value by that amount. A positive value means the weight is heavier than nominal by that amount.
20. Calculate the anticipated value for performance verification using the following formula where:
  - EV = Expected Value
  - AMV = Actual Mass Value
  - LE = Linear Error (from step 14)

$$AMV = (NV + AM)$$

$$\sqrt{\frac{n \sum x^2 - (\sum x)^2}{n(n-1)}}$$

**Figure 1**

$$LE = \frac{(-1)x(ECW \times L)}{CL}$$

**Figure 2**

## Balance Verification Using Calibrated Weights (continued)

Where AMV = Actual Mass Value; NV = Nominal Value and AM = Apparent Mass vs. 8.0 correction in the following formula:

$$EV = (AMV + LE)$$

21. Verification: Zero the balance and place the verification weight on the balance. If the actual reading is within the random error range established in the calculation of the anticipated value, the verification passes.

Example:

- Balance specification – 100g x 0.1 mg
- Calibration load – 100g (100% of rated capacity)
- Test weight specifications
  - 100g Class 1 electronic balance calibration weight with a correction of + 0.10mg
  - 10g Class 1 electronic balance calibration weight with a correction of + 0.010mg
- Typical sample value – 10g

Following the instructions above (step 14), 20 measurements are taken and the standard deviation is found to be 0.3mg. Applying a factor of three (3 x 0.3 milligram), the value calculates to 0.9 milligram.

$$LE = \frac{(-1) \times (ECW \times L)}{CL} \text{ To cal- OR } 0.01mg = \frac{(-1) \times (1mg \times 10g)^{CU-}}{100g}$$

late the Linear error =

$$EV = (AMV + LE) \text{ OR } 9.99999 = 10 + (-0.01 \text{ mg})$$

Expected value =

Verification range = 9.99999g +/- (-0.9 mg)

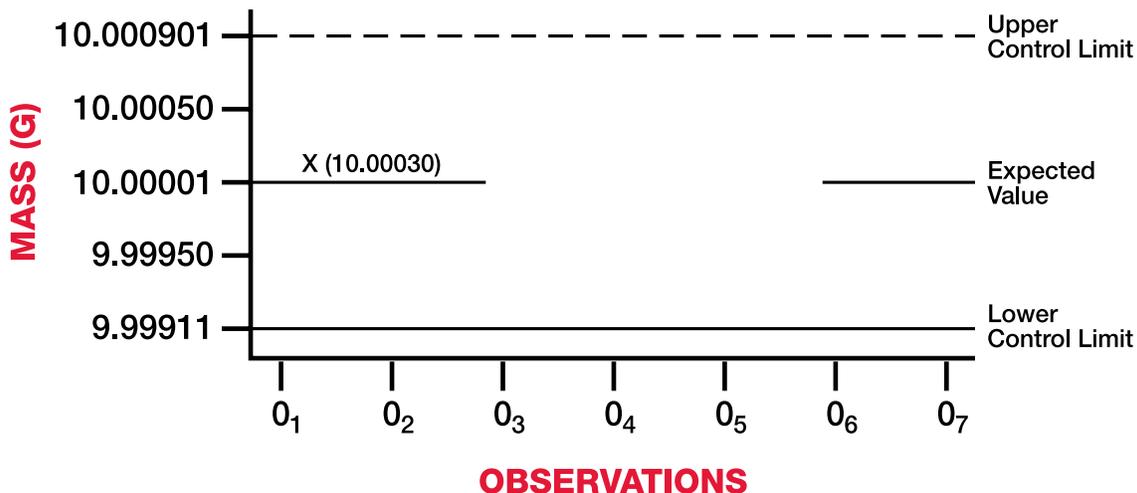
The actual verification is performed and the reading on the balance results in a value of 10.0003 grams. Since this value is within the control limit,

the results of the test is a “pass,” as relative to a “pass/fail” rating system. Refer to the chart below.

22. In the chart below, the methodology explained in this section has been followed. A weight of 10grams is applied to the balance. The reading on the balance is 10.00010. This value has been plotted on the chart as X. It falls within the upper and lower limits and therefore, this verification observation passes.

### Further suggestions

- Perform verifications at different times of the day. If you notice that the results are significantly different at these different times, it may suggest that the environmental conditions within the work space are changing and may have unforeseen impact on the work being conducted.
- Constantly monitor the condition and weight value of your test weights. Under the auspices of NIST H-150, laboratories providing recalibration services are prohibited from recommending or establishing scheduled recall dates without your explicit instructions. To learn more about how to determine when and if a weight is due for recalibration, please contact us. We will be happy to discuss the process with you.
- Keep a constant running record of your test results and chart these results using a program such as Microsoft® Excel. This record can help you understand the data being recorded as well as help you gain additional insight into your laboratory conditions.
- From time to time, recalculate the random error to see if your balance is performing consistently.
- Have your balance serviced according to the manufacturer’s instructions or recommendations by your dealer to ensure it maintains optimum operational parameters.



# Glossary of Terms

## Standard Specification for Laboratory Weights and Precision Mass Standards

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### Accuracy Class of Weights

A class of weights that meets certain metrological requirements intended to keep the errors within specified limits (definition from OIML R 111). Weight designated with “S” prime are higher class weights.

### Adjustment

The process of changing the mass either by polishing or adding and subtracting material, to bring the mass within the tolerance of a specified class.

### As Found

The value of the mass recorded by Rice Lake Weighing Systems after cleaning and before any adjustment based on a density of  $8\text{g}/\text{cm}^3$  at 20 degrees Celsius.

### As Left

The value of the mass after any necessary adjustments are made based on a density of  $8\text{g}/\text{cm}^3$  at 20° C.

### Buoyancy Correction

The calculation needed to compensate for the varying air density in order to ascertain the true mass value.

### Calibration

The acts of determining the mass difference between a standard of known mass value and an “unknown” test weight or set of weights, establishing the mass value and conventional mass value of the “unknown,” and of determining a quantitative estimate of the uncertainty to be assigned to the stated mass or conventional mass value of the “unknown,” or both. Set of operations that establish, under specified conditions, the relationship between values of quantities indicated by a measuring instrument or measuring system, or values represented by a material measure or a reference material, and the corresponding values realized by standards (definition from International Vocabulary of Basic and General Terms in Metrology).

### Certificate of Tolerance Test

Document that certifies that the subject weights are within specified tolerances. Referred to as an Rice Lake Statement of Accuracy or Rice Lake Traceable Mass Value Certificate.

### Certificate of Calibration

Document that presents calibration results and other information relevant to a calibration (definition from NCSL Z-540-1-1994). Referred to as an Rice Lake Calibration Certificate or Rice Lake Traceable Certificate.

### Conventional Mass

Conventional value of the result of weighing in air, in accordance to International Recommendation OIM D28. For a weight taken at 20 degrees Celsius, the conventional mass is the mass of a reference weight of a density of  $8000\text{kg}/\text{m}^3$  which it balances in air of density of  $1.2\text{kg}/\text{m}^3$  (definition from OIM D28).

### Correction

Mass values are traditionally expressed by two numbers, one being the nominal mass of the weight, and the second being a correction. The mass of the weight is the assigned nominal value plus the assigned correction. Positive corrections indicate that the weight embodies more mass than is indicated by the assigned nominal value.

### Density

The unit of mass divided by its volume. For a precision calibration, density testing is required to calculate buoyancy correction.

### International Prototype Kilogram

The platinum iridium cylinder maintained at the International Bureau of Weights and Measures (BIPM), at Sevres, France with an internationally accepted defined mass of one kilogram. Reference Standard A standard, generally of the highest metrological quality available at a given location, from which measurements made at that location are derived (definition from NIST/NVLAP Handbook 150).

### Metrological Traceability

Property of a measurement result whereby the result can be related to a reference through a documented unbroken chain of calibrations, each contributing to the measurement uncertainty.

### Metrological Traceability Chain

Traceability chain sequence of measurement standards and calibrations that is used to relate a measurement result to a reference.

### Metrological traceability to a measurement unit

Unit metrological traceability where the reference is the definition of a measurement unit through its practical realization.

### Set of Weights

A series of weights, usually presented in a case so arranged to make possible any weighing of all loads between the mass of the weight with the smallest nominal value and the sum of the masses of all weights of the series with a progression in which the mass of the smallest nominal value weight constitutes the smallest step of the series (definition from OIML R 111).

### Tolerance

#### (adjustment tolerance or maximum permissible errors)

The maximum amount by which the conventional mass of the weight is allowed to deviate from the assigned nominal value. Tolerance test Verification that the conventional mass of the weights and their corresponding uncertainties as tested are correct within the maximum permissible errors of the respective weight class.

### Traceability

Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties (definition from International Vocabulary of Basic and General Terms in Metrology).

### Uncertainty

Parameter associated with the result of a measurement that characterizes the dispersion of the values that could reasonably be attributed to the measured (definition from NCSL Z-540-1-1994). The range of values within which the true value is estimated to lie. U.S. National prototype standard Platinum iridium kilogram identified as K20, maintained at the National Institute of Standards and Technology, with value assigned relative to the International Prototype Kilogram provides the United States access to the mass unit. Weight (mass standard) A material measure of mass, regulated in regard to its physical and metrological characteristics: shape, dimension, material, surface quality, nominal value, and maximum permissible error (definition from OIML R 111).

# Weight Re-Calibration Request

\* Required fields are denoted with asterisk.

**RLWS Account #:** \_\_\_\_\_  
**\*Bill to:** \_\_\_\_\_  
**Address:** \_\_\_\_\_  
 \_\_\_\_\_  
**City:** \_\_\_\_\_  
**State:** \_\_\_\_\_ **Zip:** \_\_\_\_\_  
**Contact:** \_\_\_\_\_  
**Phone:** \_\_\_\_\_ **Fax:** \_\_\_\_\_  
**Email:** \_\_\_\_\_

**\*Shipping Method:** \_\_\_\_\_  
**Shipping Account #:** \_\_\_\_\_  
 (Shipping address is different from billing address.)  
**Ship to:** \_\_\_\_\_  
**Address:** \_\_\_\_\_  
 \_\_\_\_\_  
**City:** \_\_\_\_\_  
**State:** \_\_\_\_\_ **Zip:** \_\_\_\_\_  
**Country:** \_\_\_\_\_

**\*Payment Information**

**Purchase Order #:** \_\_\_\_\_ **Credit Card #:** \_\_\_\_\_  
**Expiration Date:** \_\_\_\_\_ **Security Code:** \_\_\_\_\_  
**Cardholder's Name:** \_\_\_\_\_

**\*Certification/Report Information**

**Contractor:** \_\_\_\_\_ **Client:** \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**\*Recall Date:**  No  Yes, number of years: \_\_\_\_\_ If replacing weights or cases:  Return old  Dispose of old

**Select type of documentation (only one per quote request):**

- Calibration Certificate (NVLAP accredited and meets ISO/IEC 17025 & ISO 9000 requirements) Classes: 0,1,2,3, E1, E2, F1 and F2
- RLWS Mass Value Certificate (Non-accredited Documentation) Classes: 1,2,3,F1 and F2
- Traceable Certificate (NVLAP accredited and meets ISO/IEC 17025 & ISO 9000 requirements) Classes 4, 5, 6, 7 and F, M1, M2 and M3

Range	Density	Serial Number(s)	*Class of weight(s) described in table to left:								
			ASTM	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> 7
<b>*Number for Weights</b>	<b>Number of Reports</b>		OIML	<input type="checkbox"/> E1	<input type="checkbox"/> E2	<input type="checkbox"/> F1	<input type="checkbox"/> F2	<input type="checkbox"/> M1	<input type="checkbox"/> M2	<input type="checkbox"/> M3	
	<input type="checkbox"/> Individual report for each weight		NIST	<input type="checkbox"/> Class F		<input type="checkbox"/> Other:					
	<input type="checkbox"/> All weights on one report										

Range	Density	Serial Number(s)	*Class of weight(s) described in table to left:								
			ASTM	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> 7
<b>*Number for Weights</b>	<b>Number of Reports</b>		OIML	<input type="checkbox"/> E1	<input type="checkbox"/> E2	<input type="checkbox"/> F1	<input type="checkbox"/> F2	<input type="checkbox"/> M1	<input type="checkbox"/> M2	<input type="checkbox"/> M3	
	<input type="checkbox"/> Individual report for each weight		NIST	<input type="checkbox"/> Class F		<input type="checkbox"/> Other:					
	<input type="checkbox"/> All weights on one report										

For shipment originating outside the USA, weights are being returned for maintenance under:

- Made in USA (HTS 9801.00.1012)
- NOT Made in the USA (HTS 9801.00.2500)

Have these weights been exposed to hazardous materials?  \*\*Yes  No

**Signature:** \_\_\_\_\_ **Title:** \_\_\_\_\_

**Print Name:** \_\_\_\_\_ **Date:** \_\_\_\_\_

*\*\*If yes, please complete Statement of Decontamination form and include a copy of this form and your order along with your weights. If weights have been exposed to hazardous materials, service will not be performed without a completed Decontamination Form.*

To receive a quote for re-calibration, return this form with purchase order via one of the following methods:

- Mail along with weights to Metrology Lab
- Fax to 715-234-6967

For questions, please contact our weights specialists at 800-472-6703 ext. 6655.

#0048 Rev 14, 9/13

**RICE LAKE**  
WEIGHING SYSTEMS

230 W. Coleman St. • Rice Lake, WI 54868 • USA  
 TEL: 800-472-6703 • FAX: 715-234-6967

[www.ricelake.com/recalibration](http://www.ricelake.com/recalibration)

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 Approved: Ann Crowley

## Test Weight Best Practices

Rice Lake's metrology department has retained its world class reputation through its highly trained staff and adherence to stringent handling procedures--from receiving, to calibrating, to shipping. This document highlights the standard procedure we use upon receipt of your test weights. Here you'll also find the best practices that Rice Lake recommends for handling weights and standards to help you maintain the best quality and integrity of your weights.

### Recommended shipping procedures for weights

- Ship weights in cases and materials designed to withstand and repel the abuses of shipping.
- Packaging peanuts should not be used with weights, as this type of packaging clings to the weights creating static electricity which can compromise the lab environment.
- Alternative packing material is recommended as follows:
  - Styrofoam (not peanuts or smaller pieces)
  - Paper (not shredded as this also conducts static electricity)
  - Bubble wrap
- Loose small weights should have crumpled paper (not shredded) packed soundly in between all weights and box.
- Clean room cases should only be used for weight storage and are not recommended for the shipment of weights.
- Shipping of heavy weights (10 pound or larger) in cardboard boxes is not recommended.
- Larger weights should be individually wrapped or protected, supported with stiff packing material and double boxed for structural durability.
- Small weight kits should be held shut with secure latches, rubber bands, or tape, and placed in side boxes or bags.

### Rice Lake Weight Handling Procedure

- All weights and cases are inspected for damage and scheduled for calibration upon arrival to the lab
- All stickers and marker are removed from the weights
- Precision weights receiving NVLAP calibration are checked for magnetism
- A tolerance test is conducted
- Any follow up with the client is completed

### Required Standards Conditions

**All delivered standards to this laboratory are required to arrive with the following conditions:**

- All weights should be clean and in good repair.
- Any cleaning, repair or painting of standards in the metrology lab will incur an extra charge.

### Mass Standards

- Weights should be clean and in good repair.
- Weights shall be identified with a permanent serial number or mark into the surface of the weight.
- Stickers and marker are not allowed and will be removed. The added mass of the sticker may change the mass of the weight, possibly causing the weight to be out of tolerance which will invalidate the reported value on the certificate.
- Individual weight kits shall also be identified with unique serial numbers.
- Cast iron weights should have no evidence of rust, loose paint or adhering debris.
- Analytical weights should be handled carefully. Tolerances are small, so dirt or abuse can throw them out of tolerance.

### Cases

- Interior of cases for weight kits should also be wiped out or vacuumed.
- Cases should be sound with secure latches.

# Statement of Decontamination

All weights exposed to hazardous materials that are returned to Rice Lake Weighing Systems are required to have a completed decontamination form. By accepting authorization to return this product, the customer assumes all responsibility and liability for biological, chemical and radioactive decontamination and cleaning. Rice Lake Weighing Systems will not accept any delivery which does not include a completed decontamination form.

## Customer Information

Company: \_\_\_\_\_ Address: \_\_\_\_\_  
Cust No: \_\_\_\_\_  
Name: \_\_\_\_\_ City: \_\_\_\_\_  
Phone: \_\_\_\_\_ State/Zip: \_\_\_\_\_  
Email: \_\_\_\_\_ Country: \_\_\_\_\_

## Product

Manufacturer: \_\_\_\_\_ Type: \_\_\_\_\_ Serial #: \_\_\_\_\_ Qty: \_\_\_\_\_  
Manufacturer: \_\_\_\_\_ Type: \_\_\_\_\_ Serial #: \_\_\_\_\_ Qty: \_\_\_\_\_  
Manufacturer: \_\_\_\_\_ Type: \_\_\_\_\_ Serial #: \_\_\_\_\_ Qty: \_\_\_\_\_  
Manufacturer: \_\_\_\_\_ Type: \_\_\_\_\_ Serial #: \_\_\_\_\_ Qty: \_\_\_\_\_

## List any exposure to hazardous fluids, gases or substances and attach copies of appropriate MSDS sheets

### Please describe decontamination procedure or process used:

- ETO       Biocides       Irradiation       Manual Disassembly and Cleaning  
 None Required       Other \_\_\_\_\_

I certify that the aforementioned items are free of any radioactive, biohazardous, or otherwise dangerous substances/gases and are safe for human handling. By signing this form, I indicate that I have read and understand Rice Lake Weighing Systems' decontamination policy above and have taken any and all necessary steps to assure this product will not pose a chemical, biological or radioactive threat.

Signature: \_\_\_\_\_ Title: \_\_\_\_\_

Print Name: \_\_\_\_\_ Date: \_\_\_\_\_

To minimize delays, please include a copy of this form and your order along with your weight(s) to be calibrated. Service will not be performed without a completed Decontamination Form.

**RICE LAKE**  
WEIGHING SYSTEMS

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TEL: 800-472-6703 • FAX: 715-234-6967

[www.ricelake.com/precision](http://www.ricelake.com/precision)

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