



OIML Precision Weights

Troemner UltraClass Platinum, UltraClass Gold, UltraClass and Class E0*, OIML R 111 Class E1, E2, F1, and F2



General Information

Troemner OIML Precision Weights conform to the standards of the Organisation Internationale de Metrologie Legale International Recommendation 111-1 (OIML R 111). They are manufactured from the finest stainless steels available including Troemner Alloy 8 Stainless Steel which possesses closely controlled density (8.03 g/cm³), extremely low magnetic properties, good stability, and resistance to corrosion.

OIML R 111 weight specifications are designed so the specifications on surface finish, markings, construction, material density and magnetic properties become more restrictive as weight tolerances decrease in order to enable the weight to maintain its tolerance over time. The tolerances for the various classes are established in a manner that enables the weights of higher classes to calibrate weights of the next lower class. For example, Class E2 weights can be used to calibrate Class F1 weights. To learn more about available weight classes and suggested weight applications, please see the "Selecting Weight Classes" section beginning on page 15.

Suggested Markets

Suggested Markets for OIML Precision Weights include, but are not limited to, pharmaceutical, forensic and nuclear industries.

Why UltraClass?

Available exclusively from Troemner, UltraClass weights are the most precise two-piece weights available with weight tolerances that equal or exceed Class E0*, OIML R 111 E1 and E2 tolerances. Troemner UltraClass weights combine high precision with the advantage of two-piece construction (1 g and larger), avoiding costly replacement issues associated with one-piece weights. To learn more about available weight classes and suggested weight applications, please see the "Selecting Weight Classes" section beginning on page 15.

Tolerance Classes

Please see the Tolerance Chart on pages 19-20 or on our website at www.troemner.com for specific information on the tolerances of each weight of a given OIML Class.



Construction and General Shape

As specified in OIML R 111, Troemner's OIML Precision Weights are available in one or two-piece construction.

Milligram Weights - Troemner OIML Precision Weights 500 mg and below are flat weights made of stainless steel or aluminum. Weights are one-piece construction with one side turned up to make them easy to handle with forceps. Corners and edges are smooth. There are no markings permitted on any weight 500 mg and below. The nominal value of weights 500 mg and below is determined by the shape of the weight according to the following table.



Milligram Wire Weights - Weights 500 mg and below are also available in wire construction with the same shape configuration as listed in the above table. Troemner's OIML wire weights have one end turned up to allow for easy handling with forceps. Flat milligram weights come standard when ordered. To order milligram wire weights, specify the Troemner part number followed by "-wire".



Shape	Denomination
Pentagon	500 mg, 50 mg, 5 mg
Square	200 mg, 20 mg, 2 mg
Triangle	100 mg, 10 mg, 1 mg

Gram Weights - Weights 1 g and above can be either one or two-piece construction. Troemner OIML Precision Weights 1 g and larger are cylindrical in shape with a tapered neck for easy gripping. They are perfectly flat on top to stack easily on center. Weight bottoms are slightly recessed to expose the smallest possible area to wear.

One-piece construction indicates the weight is manufactured from a single uniform piece of stainless steel, the weight has no other material added to it, and it has no method of adjustment other than removing material by polishing. Class E0*, OIML R 111 Class E1, and E2 weights 1 g and larger are of one-piece construction.

Two-piece construction indicates that the weight is constructed of two pieces of stainless steel. In the case of Troemner OIML Precision Weights, this means that the weight body is constructed of one piece of material and the lifting knob or head is constructed from a different piece of material. Although the head and body may come from different bars of material, they are the same grade and type of material with the same densities. The knob or head screws into the body and one can barely tell that the weight is not constructed of one piece of material. There is a cavity below the knob thread in the body which contains adjusting material, typically the same material from which the weight is made. OIML R 111 Class F1 and F2 and UltraClass Series weights 1 g and larger are cylindrical in

* E0 is a theoretical tolerance that is 50% of OIML R 111 Class E1

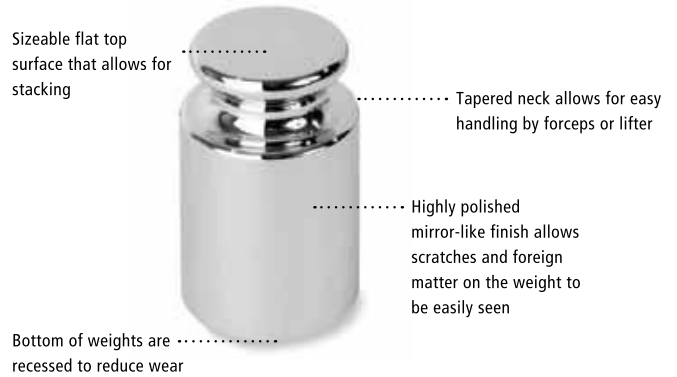
shape and are of two-piece construction.

Surface Finish

All surfaces are polished to a perfect, mirror-like finish and meet or exceed OIML R 111 specifications. For OIML R 111 surface finish specifications visit www.troemner.com.

Material Specifications

The table below describes the material used in the construction of Troemner OIML Precision Weights.



Weight Range	Base Material	Density
Milligram Weights 5 mg — 500 mg	316 Stainless Steel	7.95 g/cm ³ at 20°C
Milligram Weights 1 mg — 2 mg	3003-H14 Aluminum	2.7 g/cm ³ at 20°C
Class E0*, OIML R 111 Class E1 & E2 and UltraClass Series Weight 50 kg	316 Stainless Steel	7.95 g/cm ³ at 20°C
Class E0*, OIML R 111 Class E1 & E2 and UltraClass Series Weights 1 g — 20 kg	Troemner Alloy 8	8.03 g/cm ³ at 20°C
Class F1 & F2 Weights 1 g and larger	316 Stainless Steel	7.95 g/cm ³ at 20°C

E0*, E1 and E2 weights are one-piece weights
 UltraClass Series, Class F1 and F2 weights 1g and larger are two-piece weights
 Milligram weights are one-piece weights

* E0 is a theoretical tolerance that is 50% of OIML R 111 Class E1



OIML Precision Weights Weight Sets



Weight Set Configuration Information

Troemner weight sets are supplied in a 5-2-2-1 series unless a 5-3-2-1 series is specified. 5-2-2-1 means that weights beginning with a "2" are doubled in each decade and weights beginning with a "5" and "1" are single in each decade. For example, a set with 5-2-2-1 series from 50 g to 1 g includes; one 50 g, two 20 g, one 10 g, one 5 g, two 2 g, and one 1 g. A 50 g to 1 g set in a 5-3-2-1 series would contain one 50 g, one 30 g, one 20 g, one 10 g, one 5 g, one 3 g, one 2 g, and one 1 g. If a 5-3-2-1 set is required, please contact a Troemner Sales Representative at [800-249-5554](tel:800-249-5554) or troemner@troemner.com to discuss your specific needs.

NOTE: The following weight set table shows each weight set in a 5-2-2-1 series.

Large Metric Sets

Troemner weight sets where the largest weight is 1 kg and above are supplied in a handcrafted wood case. Inside the wood case there is a compartment which holds a polycarbonate case containing weights 500 g and below. 1 kg and 2 kg weights are held in their individual polycarbonate weight cases inside the felt-lined compartment. For weights 5 kg, 10 kg, and 20 kg, a felt-lined compartment for each weight exists within the wood case (50 kg weights are not supplied in a case, however a case can be purchased separately). The case also features compartments for lifters and forceps supplied with each set. Weight sets where the largest weight is 10 kg and above are supplied with a Complete Accessory Kit, which includes a microfibre cloth, nylon glove, small and wide brushes, and forceps.



Weight Set	Part #*	20 kg	10 kg	5 kg	2 kg	1 kg	500 g	200 g	100 g	50 g	20 g	10 g	5 g	2 g	1 g	500 mg	200 mg	100 mg	50 mg	20 mg	10 mg	5 mg	2 mg	1 mg
20 kg — 1 g	7406	1	1	1	2	1	1	2	1	1	2	1	1	2	1									
20 kg — 1 mg	7407	1	1	1	2	1	1	2	1	1	2	1	1	2	1	1	2	1	1	2	1	1	2	1
10 kg — 1 g	7408		1	1	2	1	1	2	1	1	2	1	1	2	1									
10 kg — 1 mg	7409		1	1	2	1	1	2	1	1	2	1	1	2	1	1	2	1	1	2	1	1	2	1
5 kg — 1 kg	7442			1	2	1																		
5 kg — 1 g	7410			1	2	1	1	2	1	1	2	1	1	2	1									
5 kg — 1 mg	7411			1	2	1	1	2	1	1	2	1	1	2	1	1	2	1	1	2	1	1	2	1
2 kg — 1 g	7412				1	1	1	2	1	1	2	1	1	2	1									
2 kg — 1 mg	7413				1	1	1	2	1	1	2	1	1	2	1	1	2	1	1	2	1	1	2	1
2 kg — 1 g	7414				2	1	1	2	1	1	2	1	1	2	1									
2 kg — 1 mg	7415				2	1	1	2	1	1	2	1	1	2	1	1	2	1	1	2	1	1	2	1
1 kg — 1 g	7416					1	1	2	1	1	2	1	1	2	1									
1 kg — 1 mg	7417					1	1	2	1	1	2	1	1	2	1	1	2	1	1	2	1	1	2	1

* For creating a complete part #, refer to page 54.

NOTE: The following weight set table shows each weight set in a 5-2-2-1 series.

Medium Metric Sets

Troemner weight sets where the largest weight is 500 g and below are supplied in attractive, durable, high quality, **patented** polycarbonate cases with a compartment for each weight within the case. There is also a compartment for a brush, forceps, and a USB Flash Drive which contains the electronic certificate. (Weight sets ordered with Traceable Certificate or Statement of Accuracy will not have a USB Flash Drive; a printed certificate will be sent with the weights.) The cases are designed with custom inserts and bumpers so that each weight stays securely in its compartment.



Weight Set	Part #*	500 g	200 g	100 g	50 g	20 g	10 g	5 g	2 g	1 g	500 mg	200 mg	100 mg	50 mg	20 mg	10 mg	5 mg	2 mg	1 mg	
500 g — 1 g	7418	1	2	1	1	2	1	1	2	1										
500 g — 1 mg	7419	1	2	1	1	2	1	1	2	1	1	2	1	1	2	1	1	2	1	
200 g — 1 g	7420		1	1	1	2	1	1	2	1										
200 g — 1 mg	7421		1	1	1	2	1	1	2	1	1	2	1	1	2	1	1	2	1	
200 g — 1 g	7422		2	1	1	2	1	1	2	1										
200 g — 1 mg	7423		2	1	1	2	1	1	2	1	1	2	1	1	2	1	1	2	1	
100 g — 1 g	7424			1	1	2	1	1	2	1										
100 g — 1 mg	7428			1	1	2	1	1	2	1	1	2	1	1	2	1	1	2	1	
50 g — 1 g	7429				1	2	1	1	2	1										
50 g — 1 mg	7433				1	2	1	1	2	1	1	2	1	1	2	1	1	2	1	

* For creating a complete part #, refer to page 54.

NOTE: The following weight set table shows each weight set in a 5-2-2-1 series.

Small Metric Sets

Troemner weight sets where the largest weight is 5 g and below are supplied in attractive, durable, high quality, **patented** polycarbonate cases with a compartment for each weight within the case. There are also compartments for a brush and forceps. Each Milligram Case includes an inner lid that keeps weights clean and secure when in use and during shipping.



Weight Set	Part #*	5 g	2 g	1 g	500 mg	200 mg	100 mg	50 mg	20 mg	10 mg	5 mg	2 mg	1 mg	0.5 mg	0.2 mg	0.1 mg	0.05 mg
5 g — 10 mg	7444	1	2	1	1	2	1	1	2	1							
5 g — 1 mg	7441	1	2	1	1	2	1	1	2	1	1	2	1				
500 mg — 10 mg	7443				1	2	1	1	2	1							
500 mg — 1 mg	7440				1	2	1	1	2	1	1	2	1				
0.5 mg — 0.05 mg	7439													1	2	1	1

* For creating a complete part #, refer to page 54.



OIML Precision Weights



OIML Precision Weights

Individual Weights

Metric Individual Weights

Troemner individual weights 1 mg through 10 kg are supplied in attractive, durable, high quality, **patented** polycarbonate cases with custom inserts designed specifically for the style and size of the weight. The polycarbonate cases have a locking lid and a custom bumper designed to hold the weight securely in place. Protective polypropylene cases with reinforced corners are provided for weights larger than 10 kg. Wood cases are available for individual weights 1 g and larger at an additional cost. These handcrafted cases feature a wood exterior with an interior foam insert cut specifically for the size of the weight (see page 60 for example).

Weight	Part #*
50 kg	7505
20 kg	7508
10 kg	7509
5 kg	7510
2 kg	7512
1 kg	7513
500 g	7514
200 g	7516
100 g	7517
50 g	7518
20 g	7520
10 g	7521
5 g	7522
2 g	7524
1 g	7525

* For creating a complete part #, refer to page 54.

Metric Individual Milligram Weights

Troemner Milligram Weights are available in flat or wire construction. Flat milligram weights will be shipped unless "-wire" is indicated at the end of the part number upon ordering.

Weight	Part #*	Weight	Part #*
500 mg	7526	2 mg	7436
200 mg	7528	1 mg	7537
100 mg	7529	0.5 mg	7538
50 mg	7530	0.2 mg	7539
20 mg	7532	0.1 mg	7540
10 mg	7533	0.05 mg	7541
5 mg	7534		

* For creating a complete part #, refer to page 54.





Creating Your Complete OIML Precision Weight Part Number

1. Select a Part

Select a part # from the preceding tables for each product that you wish to order.

2. Select an Available Class Designation

Select a class designation from the following table. For help selecting the correct class for your application, please review the "Selecting Weight Classes" section beginning on page 15.

Troemner Available Classes	Code	OIML R 111 Available Classes	Code
UltraClass Platinum	UCP	Class E1	E1
UltraClass Gold	UCG	Class E2	E2
UltraClass	UC	Class F1	F1
Class E0*	E0*	Class F2	F2

3. Select a Certificate Code (optional)

Select a certificate code from the following table. All weights and weight sets ordered without a certificate come with Troemner's Statement of Accuracy. To learn more about Troemner's certificates, please review the "Certificate Options" section beginning on page 23.

Available Certificates	Code
NVLAP+ Accredited Mass Code Report of Mass Values	MC
NVLAP+ Accredited Primary Reference Certificate	PR
NVLAP+ Accredited Certificate	W
UKAS++ Accredited Certificate	NA
NVLAP+ Accredited Density Determination Calibration Certificate	WDC-1111+++
NVLAP+ Accredited Magnetic Susceptibility Determination Calibration Certificate	MAGCAL-1111+++

+++ Reference part number on order as a separate line item

4. Create Your Complete Part Number(s)

Specify the Part Number + Class Code + Certificate Code (optional) for each product that you wish to order.

Part #	Class Code	Certificate Code	Example		
[]	+	[]	+	[]	7505—E1NA

* E0 is a theoretical tolerance that is 50% of OIML R 111 Class E1
 + NVLAP Laboratory Code 105013-0
 ++ UKAS Accredited Calibration Laboratory No. 0516



OIML Precision Weights

Weight Cases

Weight Cases

Troemner can provide you with the weight cases you need for proper handling and protection of your OIML Precision Weights and Weight Sets. Please contact a Troemner Sales Representative at 800-249-5554 or troemner@troemner.com for specific information on new cases, replacement cases, or special cases you need to store and protect your weights.

Polycarbonate Cases for Weight Sets

Case holds Weight Sets 500 g and below

Troemner's new **patented** Weight Set Case is constructed of high quality polycarbonate. The case is designed for OIML Precision Weight Sets where the largest weight is 500 g or below with "5-2-2-1" configuration. Case includes an inner lid over the milligram weights that keeps weights clean and secure when in use and during shipping. This case only holds metric weights. Avordupois weights or any other style of weights are supplied in a custom case.



Dimensions: 8" L x 7" W x 3.5" H
(20.32cm x 17.78cm x 8.89cm)

Weight	Part #
500 g — 1 mg	WSCO—5001

Polycarbonate Cases for Weight Sets

Case holds Weight Sets 5 g and below

Troemner Weight Sets where the largest weight is 5 g and below are supplied in attractive, durable, high quality, **patented** polycarbonate weight cases. Each case includes a compartment for each weight within the case. Case includes an inner lid that keeps weights clean and secure when in use and during shipping. There are also compartments for the forceps and brush (**not included**).



Dimensions: 3.5" Dia. x 4.5" H
(8.9cm x 11.4cm)

Weight	Part #
5 g — 1 mg	WSCO—0050
500 mg — 1 mg	WSCO—0005

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Wood Cases for Weight Sets

Troemner's Wood Weight Set Cases are manufactured from oak. They hold weight sets where the largest weight is 1 kg or above. Inside the wood case there is a compartment holding a polycarbonate case containing weights 500 g and below. 1 kg and 2 kg weights are held in their individual polycarbonate weight cases inside the felt-lined compartment. For weights 5 kg, 10 kg, and 20 kg, a felt-lined compartment for each weight exists within the wood case (50 kg weights are not supplied in a case, however, a case can be purchased separately).

Weight	Part #
20 kg — 1 mg	WSWO—0001
10 kg — 1 mg	WSWO—0002
5 kg — 1 mg	WSWO—0003
2 kg — 1 mg	WSWO—0004
200 g — 1 mg	WSWO—0005



2 kg and below case shown
Dimensions: 15" L x 10" W x 7.5" H
(38.1cm x 25.4cm x 19.5cm)

Heavy-Duty Cases for Weight Sets

Heavy-Duty Cases are tough, lightweight, rugged and designed to protect your weight set under any shipping circumstance. The dent and shatter resistant resin ensures weights are kept safe and secure. Each case is lined in high quality ethafoam with custom cutouts for weights and cases. The case is manufactured with easy press and pull latches and durable soft grip handles.

Weight	Part #
20 kg — 1 mg	SSCO—20000*
10 kg — 1 mg	SSCO—10000
5 kg — 1 mg	SSCO—05000
(2) 2 kg — 1 mg	SSCO—02200
2 kg — 1 mg	SSCO—02000
1 kg — 1 mg	SSCO—01000
500 g — 1 mg	SSCO—00500

* Weight case includes wheels and a telescoping handle



500 g to 1 mg case shown
Dimensions: 13" L x 9.2" W x 6" H
(33.0cm x 23.4cm x 15.2cm)

Visit our website at www.troemner.com for additional case dimensions.

OIML Precision Weights

Aluminum Cases for Weight Sets

Aluminum Cases are strong, lightweight, and extremely durable. Each case is lined in high quality ethafoam with custom cutouts for weights or cases. Cases are designed with positive locking latches and each case is equipped with a triple digit combination lock.

Visit our website at www.troemner.com for additional case dimensions.

Weight	Part #
10 kg — 1 mg	ASCO—10000
5 kg — 1 mg	ASCO—05000
(2) 2 kg — 1 mg	ASCO—02200
2 kg — 1 mg	ASCO—02000
1 kg — 1 mg	ASCO—01000
500 g — 1 mg	ASCO—00500



2 kg through 1 mg case shown
Dimensions: 18" L x 14" W x 5.5" H
(40.6cm x 22.9cm x 20.3cm)

Polycarbonate Cases for Individual Weights

Case holds weights 10 kg and 5 kg

Troemner's Kilogram Cases are designed to securely hold, protect, and transport your weights sized 10 kg and 5 kg. Each case has a comfortable carrying handle, a recessed grip for removing the lid, side latches for securing the lid in place, and a color-coded insert. Urethane bumpers, both inside the lid and on the bottom of the case, gently hold the weight in place.

Weight	Part #
10 kg	SWCO—10000
5 kg	SWCO—5000



Dimensions: 6" Dia. x 10.25" H
(15.2cm x 26.0cm)

Polycarbonate Cases for Individual Weights

Case holds weights 2 kg through 1 g

Troemner's **patented** individual Polycarbonate Cases are designed to securely hold and protect your weights sized 2 kg through 1 g. As the lid is rotated open, the color-coded insert and weight move with the lid. This prevents the urethane bumper from rubbing on the weight, further protecting your weight's calibration.

Weight	Part #
2 kg	SWCO—2000
1 kg	SWCO—1000
500 g	SWCO—0500
200 g	SWCO—0200
100 g	SWCO—0100
50 g	SWCO—0050
30 g	SWCO—0030
20 g	SWCO—0020
10 g	SWCO—0010
5 g	SWCO—0005
3 g	SWCO—0003
2 g	SWCO—0002
1 g	SWCO—0001



Large size holds 2 kg through 500 g
Dimensions: 3.5" Dia. x 4.5" H
(8.9cm x 11.4cm)



Small size holds 200 g through 1 g
Dimensions: 2" Dia. x 2.5" H
(5.1cm x 6.4cm)

Polycarbonate Cases for Individual Weights

Case holds weights 500 mg through 1 mg

Troemner's **patented** Milligram Cases hold up to seven sheet metal or wire weights sized 500 mg through 1 mg. Each Milligram Case includes an inner lid that keeps weights clean and secure when in use and during shipping.

Weight	Part #
Up to (7) mg weights	SWCO—0000



Assembled dimensions: 2" Dia. x 2.5" H
(5.1cm x 6.4cm)

Polypropylene Cases for Individual Weights

Troemner's Polypropylene Individual Weight Cases are made of high impact plastic. Cases are made with reinforced metal edges and corners. They also have a padded carrying handle to ensure proper handling during transport.

Visit our website at www.troemner.com for additional case dimensions.

Weight	Part #
50 kg	TWO—100—50KG
20 kg	TWO—100—20KG



25 kg case shown
Dimensions: 8" L x 8" W x 9" H
(20.3cm x 20.3cm x 22.9cm)

Wood Cases for Individual Weights

Individual Wood Cases are made of oak construction with a foam insert to protect weights. Wood Cases for weights sized 2 kg through 1 mg are designed to hold a weight inside a polycarbonate individual case. This “case-in-a-case” feature guarantees the ultimate protection of your weight.

Visit our website at www.troemner.com for additional case dimensions.

Weight	Part #
50 kg	SWCW—0010
20 kg	SWCW—0006
10 kg	SWCW—0007
5 kg	SWCW—0008
Holds 2 kg to 500 g weights in a polycarbonate single case within wood case	SWCW—0002
Holds 200 g to 1 mg weights in a polycarbonate single case within wood case	SWCW—0001



5 kg case shown
Dimensions: 7" L x 7" W x 9" H
(17.8cm x 17.8cm x 22.9cm)

Heavy-Duty Cases for Individual Weights

Heavy-Duty Cases are tough, lightweight, rugged and are designed to protect your weights under any shipping circumstance. The dent and shatter resistant resin is sure to keep weights safe and secure. Each case is lined in high quality ethafoam with a custom cutout for your weight. The case is manufactured with easy press and pull latches and durable soft grip handles.

Visit our website at www.troemner.com for additional case dimensions.

Weight	Part #
50 kg	SSCO—00050
20 kg	SSCO—00020
10 kg	SSCO—00010
5 kg	SSCO—00005



10 kg case shown
Dimensions: 11.8" L x 9.8" W x 7.7" H
(30.0cm x 24.9cm x 19.6cm)