Selecting Weight Classes

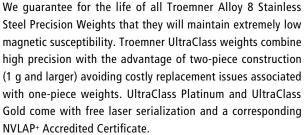## Weight Applications by Class

In order to select the appropriate weight for your laboratory, you must first determine exactly how you intend to use the weight. Your unique application will help determine exactly which Troemner weight will suit your needs. Troemner's Tolerance Chart can be viewed on pages 19-20 or at www.troemner.com to assist you in selecting the appropriate weights.

The following guidelines explain the applications of the different classes of weights:

Troemner UltraClass Series

Available exclusively from Troemner, these weights are developed to meet the most demanding calibration needs with the ability to be adjusted. Consistent automated measurement means that Troemner UltraClass weights are the most precise two-piece weights available with weight tolerances that equal or exceed comparable ANSI/ASTM E617 and OIML R 111 class tolerances. Troemner UltraClass weights, 1 g through 20 kg, are made from our exclusive stainless steel, Troemner Alloy 8 (excluding Electronic Balance).

We guarantee for the life of all Troemner Alloy 8 Stainless Steel Precision Weights that they will maintain extremely low magnetic susceptibility. 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. UltraClass Platinum and UltraClass Gold come with free laser serialization and a corresponding NVLAP+ Accredited Certificate.

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Two-piece construction means the weight is made of multiple pieces of stainless steel. The body of the weight is the primary piece and the knob of the weight is the secondary piece. The knob has a thread that screws into the body and is tightened. There is a cavity below the knob thread within the body which contains adjusting material, typically the same material from which the weight is made.

Troemner UltraClass weights and weight sets are available in a full range of weight denominations. UltraClass Platinum, UltraClass Gold, and UltraClass are available for Troemner Analytical Precision Weights, OIML Precision Weights and Electronic Balance Weights. Troemner UltraClass weights are two-piece alternatives to the one-piece weights with uncertainties slightly larger than the one-piece weights.

Troemner UltraClass Platinum - The weight tolerance is equal to ANSI/ASTM E617 Class 000 and OIML R 111 Class E0*. This class is used as a primary standard for calibrating other reference standards and weights where the stability of the environment and careful handling are assured. This class is appropriate for calibrating high-precision analytical balances with a readability as low as 0.0001 mg.

Troemner UltraClass Gold - The weight tolerance is equal to ANSI/ASTM E617 Class 00 and OIML R 111 Class E1. This class is used as a reference standard for calibrating other reference standards and weights where the stability of the environment and careful handling are assured. This class is appropriate for calibrating high-precision analytical balances with a readability as low as 0.001 mg.

Troemner UltraClass - The weight tolerance is equal to ANSI/ASTM E617 Class 0 and exceeds OIML R 111 Class E2. This class is used as a reference standard for calibrating other reference standards and is appropriate for calibrating high-precision analytical balances with a readability as low as 0.01 mg.

Laser etching

Troemner UltraClass Comparison Chart

Weight Class	Equivalent Class Tolerances	Material	Lifetime Guarantee	Positive Calibration Tolerance Guarantee	Standard Laser Serialization
UltraClass Platinum	ANSI/ ASTM Class 000 OIML Class E0*	Alloy 8	X	X	X
UltraClass Gold	ANSI/ ASTM Class 00 OIML Class E1	Alloy 8	X	X	X
UltraClass	ANSI/ ASTM Class 0 & exceeds OIML Class E2	Alloy 8	X	X	

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

ANSI/ASTM E617 Classes

ANSI/ASTM Class 000 - Used as a primary reference for calibrating other reference standards and weights. Class 000 weights are intended to be used in metrology laboratories where the stability of the environment and careful handling are assured. Although very stable, one-piece construction Class 000 weights have no method of adjustment and are not suitable for general laboratory use. Class 000 is 1/3 the tolerance of Class 00 and the uncertainty is the best measurement reported in our NVLAP[+] scope of accreditation which is guaranteed to be 1/3 the tolerance or better.

ANSI/ASTM Class 00 - Used as a primary reference for calibrating other reference standards and weights. Class 00 weights are intended to be used in metrology laboratories where the stability of the environment and careful handling are assured. Although very stable, one-piece construction Class 00 weights have no method of adjustment and are not suitable for general laboratory use. Class 00 weight tolerances are equal to OIML R 111 E1 tolerances and are tighter than Class 0. The uncertainty is guaranteed to be 1/3 the tolerance.

ANSI/ASTM Class 0 - Used as a primary reference for calibrating other reference standards and weights. Class 0 weights are intended to be used in metrology laboratories where the stability of the environment and careful handling are assured. Although very stable, one-piece construction Class 0 weights have no method of adjustment and are not suitable for general laboratory use. The uncertainty is guaranteed to be 1/3 the tolerance.

ANSI/ASTM Class 1 - Can be used as a reference standard in calibrating other weights and is appropriate for calibrating high-precision analytical balances with a readability as low as 0.1 mg to 0.01 mg.

ANSI/ASTM Class 2 - Appropriate for calibrating high-precision top loading balances with a readability as low as 0.01 g to 0.001 g.

ANSI/ASTM Class 3 - Appropriate for calibrating balances with moderate precision and with a readability as low as 0.1 g to 0.01 g.

Troemner's Primary Standards Laboratory

Selecting Weights and Certificates

ANSI/ASTM Class 4 - For calibration of semi-analytical balances and for student use.

ANSI/ASTM Class 5 - For student laboratory use.

ANSI/ASTM Class 6 - This class meets the specifications of OIML R 111 Class M2.

ANSI/ASTM Class 7 - For rough weighing operations in physical and chemical laboratories, such as force measuring apparatus.

OIML R 111 Classes

OIML Class E0* - Used as a primary reference for calibrating other reference standards and weights where the stability of the environment and careful handling are assured. Class E0* weights have no method of adjustment and are not suitable for general laboratory use. Class E0* is 1/2 the tolerance of E1 and the uncertainty is the best measurement reported in our NVLAP[+] scope of accreditation which is guaranteed to be 1/3 the tolerance or better.

OIML Class E1 - Used as a primary reference for calibrating other reference standards and weights where the stability of the environment and careful handling are assured. Class E1 weights have no method of adjustment and are not suitable for general laboratory use. The uncertainty is guaranteed to be 1/3 the tolerance.

OIML Class E2 - Can be used as a reference standard in calibrating other weights and is appropriate for calibrating high-precision analytical balances with a readability as low as 0.1 mg to 0.01 mg.

OIML Class F1 - Appropriate for calibrating high-precision top loading balances with a readability as low as 0.01 g to 0.001 g.

OIML Class F2 - For calibration of semi-analytical balances and for student use.

OIML Class M1, M2, M3 - Economical weights for general laboratory, industrial, commercial, technical and educational use. Typically fabricated from cast iron or stainless steel.

NIST Classes

NIST Class F - Primarily used to test commercial weighing devices by state and local weights and measures officials, device installers, and service technicians. Class F weights may be used to test most accuracy Class III scales, all scales of Class IIIL or IIII, and scales not marked with a class designation.

Refer to Troemner's Tolerance Chart on pages for specific information on the tolerance of each weight in a given class. Troemner's Uncertainty Chart and Tolerance Chart are also available on www.troemner.com for additional reference.