

Overview of Weight Specifications



Precision & Balance Matched Only By Nature.



Troemner offers the most comprehensive selection of precision weights and mass standards. Our weight selection includes every imaginable size and type from 5000 lb cast iron test weights to the extremely precise, highly polished one and two-piece stainless steel weights.

At Troemner, careful attention is paid to every detail of production. Weight bottoms are slightly recessed to expose the smallest possible area to wear. Weight heads and necks are precisely shaped to give a solid, sure grip to forceps or weight lifters. Troemner uses the finest materials available for the production of all of our weights and mass standards. For your most demanding applications, our precision weights are manufactured from Troemner Alloy 8, which is a specially developed stainless steel. Troemner Alloy 8 possesses closely controlled density, extremely low magnetic permeability, good stability and resistance to corrosion and handling damage.

We manufacture and calibrate weights to meet or exceed the highest tolerance standards of ANSI/ASTM, OIML and NIST.



ANSI/ASTM E617:

Standard Specification for Laboratory Weights and Precision Mass Standards

Mostly used in the United States, this specification covers various classes of weights and mass standards used in laboratories ranging from Class 0 to Class 7. Tolerances and design restrictions for each class are described in order that both individual weights and weight sets can be chosen for the appropriate applications. This specification also recognizes OIML R 111 that describes classes E1, E2, F1, F2, M1, M2 and M3.



OIML R 111:

Weights of Classes E1, E2, F1, F2, M1, M2, M3

This international document describes the physical characteristics and metrological requirements of weights that are used for the verification of weighing instruments, for the verification of weights of a lower class of accuracy and with weighing instruments. This document includes a recommendation for seven classes of weights in tiers of uncertainty.



NIST Handbook 105-1:

Specifications and Tolerances for Field Standard Weights

These specifications and tolerances are specific for reference and field standard weights (NIST Class F). Reference and field standard weights are used to test weighing devices where the weight of the item is required to determine the item's price. This document sets minimum requirements for standards used primarily to test commercial or legal for trade weighing devices for compliance with NIST Handbook 44. These devices include but are not limited to delicatessen scales, jewelry scales, postal and parcel post scales and dairy product scales. This specification permits the use of a weight at its nominal value in normal testing operation, where the tolerance on the item under test is at least three times as great as the tolerance of the weight. This Handbook also specifies the design, marking, adjusting cavities, and density of these weights. Any variation in design from Handbook 105-1 must be submitted to NIST for approval.

More information on these weight specifications is available in Troemner's Mass Standards Handbook that can be found at the end of this desk reference.

Weight Applications

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

- **ANSI/ASTM Class 0** - Used as primary reference standards for calibrating other reference standards and weights.
- **Troemner UltraClass** - Available exclusively from Troemner, these weights were developed to meet the most demanding calibration needs with the ability to be adjusted. Troemner UltraClass weights are the most precise two-piece weights available with weight tolerances 50% greater than ANSI/ASTM E617 Class 1 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

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weights. Troemner UltraClass weights and weight sets are available in a full range of weight denominations.

- **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, with a readability as low as 0.1 g to 0.01 g.
- **ANSI/ASTM Class 4** - For calibration of semi-analytical balances and for student use.
- **ANSI/ASTM Class 5** - For student laboratory use.



ANSI/ASTM Style Weights

- **ANSI/ASTM Class 6** - Student brass weights are typically calibrated to this class. This class also 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.
- **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 IIII or IIII, and scales not marked with a class designation.
- **OIML Class E1** - Used as primary reference standards for calibrating other reference standards and weights.



OIML Style Weights



- **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 brass. Class M2 is commonly used for student brass weights.



Troemner's online Weight Selector takes the guess work out of choosing the correct weight for your application. Visit us at www.troemner.com and let us help you find exactly what you need.

