



Standard Specification for Reference Masses and Devices for Determining Mass and Volume for Use in the Physical Testing of Hydraulic Cements¹

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1. Scope

1.1 This specification covers the minimum requirements for scales, balances, reference masses, and glass graduates used in the physical testing of hydraulic cements.

1.2 Requirements for analytical reference masses and balances are not included in this specification, but are to be found in Test Methods C114. The use of restrictive terminology, classes, ranges, etc. has been intentionally avoided to allow the use of this specification by other standards-writing bodies with similar requirements for reference masses and devices for determining mass, if desired.

1.3 These requirements are not sufficiently descriptive to be used as the sole specifications for the purchase of reference masses or devices for determining mass without amplification.

1.4 Values in SI units shall be obtained by measurement in SI units or by appropriate conversion, using the Rules for Conversion and Rounding given in IEEE/ASTM SI-10, of measurement made in other units.

2. Referenced Documents

2.1 *ASTM Standards*:²

C114 Test Methods for Chemical Analysis of Hydraulic Cement

E617 Specification for Laboratory Weights and Precision Mass Standards

IEEE/ASTM SI-10 Standard for Use of the International System of Units (SI): The Modern Metric System

3. Terminology

3.1 *Definitions*:

¹ This specification is under the jurisdiction of ASTM Committee C01 on Cement and is the direct responsibility of Subcommittee C01.95 on Coordination of Standards.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

3.1.1 *accuracy, n*—degree of conformity of the indication of a device for determining mass to the true value of an applied mass.

3.1.2 *balance, n*—a device for determining mass that compares a mass with standard masses.

3.1.3 *precision, n*—reproducibility of the readings of a device for determining mass when a given test mass is applied.

3.1.4 *range of mass determination, n*—the range of indications of a device from the minimum test load plus any aids or containers on the load-receiving elements to the maximum test load with the same aids or containers, as specified by the particular method of test being used.

3.1.5 *readability, n*—the smallest fraction of a division to which the index scale of a device for determining mass can be read with ease either by estimation or by use of a vernier.

3.1.6 *reference mass, n*—a piece of material of known specified mass for use in comparing or measuring the mass of other masses (See Note 1).

3.1.6.1 *Discussion*—The definition of “reference mass” was formerly incorrectly designated “weight;” weight is a force (See IEEE/ASTM SI-10).

3.1.7 *scale, n*—a device for determining mass having a load-receiving element and an index scale (possibly in combination with the use of internal masses or proportional masses), almost always calibrated to indicate mass; generally of lesser accuracy than a balance.

3.1.8 *sensitivity, n*—the minimum change of applied mass required to perceptibly move the indicating element of a device for determining mass.

3.1.9 *sensitivity requirement, n*—the minimum change in position of rest of the indicating element of a device for determining mass in response to a specified change of mass load on the load-receiving element.

3.1.10 *test load, n*—the mass to be determined in a single determination, exclusive of aids or containers, as specified in the test method being followed.

3.1.11 *tolerance, n*—precision and accuracy criteria for reference masses or devices for determining mass.

acceptance tolerance—the maximum permissible deviation from correct indication for new or newly reconditioned or