

Standard Specification for Test Coupons for Steel Castings¹

This standard is issued under the fixed designation A1067/A1067M; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope*

1.1 This specification defines the geometries of several separately-cast and integrally-cast test coupons for use as specified in the applicable casting product or common requirements standard. This standard does not address procedures for molding, casting, heat treating, machining, or testing; these items are addressed as needed and appropriate by the applicable product or common requirements standard.

Note 1—The test coupons described herein were formerly defined in multiple casting specifications. Those standards now reference this document when test coupons are required and should be consulted for applicable manufacturing and processing requirements.

1.2 Units—The values stated in either SI units or inchpound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in nonconformance with the standard.

1.3 This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

2. Ordering Information

2.1 The applicable casting product standard or common requirements standard or both provide information regarding the number of coupons, molding materials to be used, heat treatment concerns, and other processing issues.

3. Materials and Manufacture

3.1 Unless specified otherwise by the purchaser, test coupons shall be poured from the same heat, or from the same master heat, or from a sub-heat from the same master heat as the castings they are to represent.

3.2 Except where specified herein or in the applicable product or common requirements standard, the details of the gating and risering of the coupons are left to the discretion of the producer.

3.3 The test coupons shall be processed and heat-treated as specified in the applicable product or common requirements specification. Except when specified otherwise, the portion of the test coupon from which the test specimen or specimens are to be machined may be cut from the riser or feeder prior to heat treatment.

4. Performance Requirements

4.1 The primary function of the test coupon is to provide sound specimens useable for the determination of mechanical, physical, corrosion, or other properties of the metal used to produce the castings. If the test results conform to the stated requirements, then the test coupon may be considered to have functioned acceptably.

5. Other Requirements

5.1 The casting producer shall establish procedures for the identification and traceability of the coupons from pouring through testing.

6. Dimensions and Permissible Variations

6.1 The drawings shown in this standard are not necessarily drawn to scale. The values shown in the tables constitute the dimensional requirements.

6.2 The drawings shown in this standard depict the more commonly used test coupons (Figs. 1-9). Other designs may be suitable when shown to produce acceptable properties or where agreed.

7. Workmanship, Finish, and Appearance

7.1 Care should be taken in the preparation and pouring of the molds to avoid the creation of inclusions or other anomalies in the resulting test specimens.

8. Sampling

8.1 Care shall be taken in the production and processing of the test coupon to assure that it is representative of the casting or castings it represents.

¹ This specification is under the jurisdiction of ASTM Committee A01 on Steel, Stainless Steel and Related Alloys and is the direct responsibility of Subcommittee A01.18 on Castings.

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*Use of and size of taper is at the discretion of the foundry

FIG. 1 Test Coupons for Castings

9. Number of Tests and Retests

9.1 Sufficient test coupons shall be produced to provide the needed number of test specimens.

10. Certification

10.1 Certification of the test coupon is not applicable, except when specified by the casting purchaser.

11. Product Marking

11.1 Marking of test coupons other than as necessary to provide the identification and traceability described in 6.1 is

not needed, except where specified by the casting purchaser and agreed by the producer.

12. Keywords

12.1 Castings; steel; stainless steel; test coupon; test bar; heat; master heat; sub-heat



FIG. 2 Test Coupon for Tension Test



FIG. 3 Design and Dimensions of the ICI Test Coupon

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FIG. 4 Cast-to-Shape Test Coupon for Tension Test Specimen





The taper is to be selected by the producer for ease of drawing the pattern from the mold. where:

N = number of specimens to be cut from one side of the coupon,

D = diameter of the specimens, and

 W_{tot} = total width of metal required to remove the coupon from the casting, and to machine specimens from the coupon.

NOTE - Longitudinal axis and gage length of test specimen must be within shaded zone.

FIG. 5 Specimen from Casting







FIG. 7 Prolongation Test Coupon



NOTE 1—Longitudinal axis and gage length of test specimen must be within cross-hatched zone. FIG. 8 Thermal Buffer Pads



FIG. 9 Cylindrical Coupon for Centrifugal Castings

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SUPPLEMENTARY REQUIREMENTS

There are currently no supplementary requirements for this standard.

APPENDIX

(Nonmandatory Information)

X1. MOLD MATERIAL

X1.1 A test coupon is used to demonstrate that the metal can obtain the specified minimum properties, not that the casting has certain properties. Thus it serves as a check of the composition and heat treatment. It is not (and cannot be) a check of the gating and feeding system used for the casting – or of any of the other processing variables.

X1.2 Since the coupons are used to demonstrate the capability of the metal, any design that produces compliant properties should be acceptable. There are a few exceptions:

X1.2.1 The mold material used for the test coupons must not be a more powerful chill than the material used for the casting. (Chilling may provide improved properties in some instances.) Conversely, test coupons may be produced using a mold material that is a less powerful chill (more insulating) than that used for the casting.

X1.2.2 In the case of a heavy section casting, a heavy section coupon may be appropriate for thickness-sensitive alloys. (This is related to the chilling issue; a thin section test coupon cools more quickly than a thick section casting.)

X1.3 Pursuant to the above, a test specimen taken from a sacrificial casting and which produces test results that comply with the requirements of the applicable product standard should be considered as acceptable.

SUMMARY OF CHANGES

Committee A01 has identified the location of selected changes to this standard since the last issue (A1067/A1067M - 12) that may impact the use of this standard. (Approved Nov. 1, 2012.)

(1) The minimum length of the coupon (Fig. 9) was changed from 4 in. (100 mm) to 5 in. (125 mm), and the SI equivalent for the diameter from 130 to 125 mm.

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