



Standard Test Method for Impact Testing of Miniaturized Charpy V-Notch Specimens¹

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1. Scope*

1.1 This test method describes notched-bar impact testing of metallic materials using Miniaturized Charpy V-Notch (MCVN) specimens and test apparatus. It provides: (a) a description of the apparatus, (b) requirements for inspection and calibration, (c) safety precautions, (d) sampling, (e) dimensions and preparation of specimens, (f) testing procedures, and (g) precision and bias.

1.2 This standard concerns Miniaturized Charpy V-Notch specimens, for which all linear dimensions, including length and notch depth, are reduced with respect to a type A standard impact test specimen in accordance with Test Methods E23. These are not the same as sub-size specimens, described in Annex A3 of Test Methods E23, for which length, notch angle and notch depth are the same as for the standard type A Charpy specimen. See also 1.5 below.

1.3 Comparison of the MCVN data with conventional Charpy V-Notch (CVN) data or application of the MCVN data, or both, to the evaluation of ferritic material behavior is the responsibility of the user of this test method and is not explicitly covered by this test method.

1.4 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.5 This standard does not address testing of sub-size specimens as discussed in Test Methods E23. The reader should understand the distinction between miniature and sub-size. Miniature specimens are shorter than sub-size specimens so that more tests can be conducted per unit volume of material. Moreover, miniature specimens are designed so that the stress fields which control fracture are similar to those of conventional Test Methods E23 specimens.

1.6 The MCVN test may be performed using a typical Test Methods E23 test machine with suitably modified anvils and striker or using a smaller capacity machine.

1.7 *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. Referenced Documents

2.1 ASTM Standards:²

A370 Test Methods and Definitions for Mechanical Testing of Steel Products

E23 Test Methods for Notched Bar Impact Testing of Metallic Materials

E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods

E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

E2298 Test Method for Instrumented Impact Testing of Metallic Materials

2.2 ISO Standards:³

ISO 148 Metallic materials -- Charpy pendulum impact test -- Part 1: Test method

ISO 14556 Steel -- Charpy V-notch pendulum impact test -- Instrumented test method

3. Summary of Test Method

3.1 The essential features of the MCVN impact test are: (a) a suitable miniature three point bend specimen, (b) anvils and supports on which the test specimen is placed to receive the blow of the moving mass, (c) a moving mass (striker) that has been released from a sufficient height to cause the mass to break the specimen placed in its path, (d) a device for determining the energy absorbed by the broken specimen, and optionally (e) instrumentation for measuring applied force as a function of time during specimen loading (refer to Test Method E2298).

¹ This test method is under the jurisdiction of ASTM Committee E28 on Mechanical Testing and is the direct responsibility of Subcommittee E28.07 on Impact Testing.

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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 Available from International Organization for Standardization (ISO), 1, ch. de la Voie-Creuse, Case postale 56, CH-1211, Geneva 20, Switzerland, <http://www.iso.org>.