National Institute of Standards & Technology

Certificate

Standard Reference Material® 2092

Low-Energy Charpy V-Notch Specimens

(NIST-Verification, 8-mm Striker)

This Standard Reference Material (SRM) is intended primarily for the verification of Charpy machines equipped with an 8-mm striker, in accordance with the current ASTM Standard E23 [1] and the current ISO Standard 148-2 [2]. Each SRM consists of a set of specimens needed to perform a single verification.

Material Description: SRM 2092 is made from 4340 alloy steel. The bars are finished to length, heat-treated, and machined in SRM specimen lots ranging in size from 1200 to 2000 specimens. Each specimen has a lot number and an identification number (three or four digits).

SRM Certification Procedure: Specimens from each SRM lot are tested by the NIST Applied Chemicals and Materials Division on Charpy reference machines. These data are statistically evaluated to ensure the homogeneity of the lot, establish the certified value, and determine the number of SRM specimens required for a user to perform a valid test. A NIST certified value is a value for which NIST has the highest confidence in its accuracy, in that all known or suspected sources of bias have been investigated or taken into account [3]. The measurand is absorbed energy as measured by the NIST Charpy reference machines. Traceability is to the SI unit joule.

The certified value of the SRM is not given on this portion of the certificate. The certified value and the uncertainty associated with it are given in the verification report that is issued by NIST following the verification test (see "Verification of the User's Machine"). If certified values are required immediately after testing you can contact the NIST Charpy Program Coordinator as follows: telephone (303) 497-3351; fax (303) 497-5939; or e-mail charpy@boulder.nist.gov. The lot number, serial number, and absorbed energy results of the tested specimens must be provided in order to obtain certified values.

Expiration of Certification: The certified value and uncertainty furnished in the verification report are valid indefinitely. The verification statement in the report that is issued for an acceptable machine is valid for a maximum of one year from the date on which the SRM was tested. If a user's machine is moved or undergoes any major repairs or adjustments, the current verification will be invalidated, and the machine must be retested and reverified (see "Instructions for Handling, Storage, and Use").

Maintenance of SRM Certification: NIST will monitor this SRM over the period of its certification. If substantial technical changes occur that affect the certification before the expiration of this certificate, NIST will notify the purchaser. Registration (see attached sheet or register online) will facilitate notification.

Overall direction and coordination of the technical measurements leading to verification of test specimens and machines, evaluation of test results, and issuance of the report on machine conformance are under the direction of the NIST Applied Chemicals and Materials Division, Boulder, CO.

Support aspects involved in the issuance of this SRM were coordinated through the NIST Office of Reference Materials.

James Fekete, Chief
Applied Chemicals and Materials Division

Gaithersburg, MD 20899
Certificate Issue Date: 04 April 2019
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Steven J. Choquette, Director
Office of Reference Materials

INSTRUCTIONS FOR HANDLING, STORAGE, AND USE

Handling: The protective oil coating should be wiped from each specimen with a lint-free cloth just prior to testing.

Storage: The SRMs are anticipated to have an indefinite shelf life under normal storage conditions (20 °C ± 20 °C, ≤ 50 % relative humidity).

Use: Prior to verifying a Charpy machine equipped with an 8-mm striker, the machine should be checked to assure compliance with the appropriate sections of the applicable ASTM or ISO Standard. SRM 2092 shall be tested at −40 °C ± 1 °C (−40 °F ± 2 °F) in accordance with the applicable standard (ASTM or ISO). The energy level of the SRM appropriate for verifying the performance of a particular Charpy impact machine can be determined by considering the energy range that should be expected for the SRM, the maximum capacity of the machine, and the requirements of the applicable test method (ASTM or ISO). The certified energy of SRM 2092 specimens is within the range of 13 J to 20 J.

Verification of User's Machine: The NIST Charpy Program Coordinator will issue a verification report of findings to the user's facility upon receipt of the fractured specimens and completed questionnaire. Fractured specimens and completed questionnaires should be returned to the NIST Charpy Program Coordinator, Mail Code 647, 325 Broadway, Boulder, CO 80305-3337. A plastic, self-locking bag is provided for the return of broken specimens. The broken specimen shall be taped together as described in the wrapping instructions included with the questionnaire. The verification report is considered to be the second part of this certificate, and includes the certified value and uncertainty of the SRM.

Shipping Information: Shipping charges for the return of broken specimens are the responsibility of the user. The mailing label provided with each SRM must be used to expedite shipping and, for overseas shipments, clearance by U.S. Customs.

Note to International Customers: Regular overseas shipments of broken specimens should be sent airmail so that after they are cleared by U.S. Customs, they can be forwarded directly to NIST-Boulder. If a more rapid shipping mode is necessary, choose an overnight delivery service that will handle U.S. Customs clearance **AND** will deliver directly to NIST-Boulder. Unless such delivery is assured, air freight packages may be returned to the customer by U.S. Customs.

REFERENCES

[1] ASTM E23; *Standard Test Methods for Notched Bar Impact Testing of Metallic Materials*; Annual Book of ASTM Standards, Vol. 03.01, ASTM, West Conshohocken, PA.

[2] ISO 148-2; *Metallic Materials − Charpy Pendulum Impact Test − Part 2: Verification of Testing Machines;* International Organization for Standardization: Geneva, Switzerland.

[3] May, W.; Parris, R.; Beck II, C.; Fassett, J.; Greenberg, R.; Guenther, F.; Kramer, G.; Wise, S.; Gills, T.; Colbert, J.; Gettings, R.; MacDonald, B.; *Definition of Terms and Modes Used at NIST for Value-Assignment of Reference Materials for Chemical Measurements*; NIST Special Publication 260-136; U.S. Government Printing Office: Washington, DC (2000); available at https://www.nist.gov/sites/default/files/documents/srm/SP260-136.PDF(accessed Apr 2019).

Certificate Revision History: 04 April 2019 (Editorial changes); 17 January 2018 (Title update; editorial changes); 14 February 2017 (Editorial changes); 20 December 2013 (Editorial changes); 13 June 2013 (Lot number removed from title; editorial changes); 31 August 1989 (Original SRM lot certificate date).

Users of this SRM should ensure that the Certificate in their possession is current. This can be accomplished by contacting the SRM Program: telephone (301) 975-2200; fax (301) 948-3730; e-mail srminfo@nist.gov; or via the Internet at https://www.nist.gov/srm.