



National Institute of Standards & Technology

Certificate of Analysis

Standard Reference Materials 2092 & 2096

Low and High-Energy Test Specimens for Charpy V-Notch Impact Testing Machines

Standard Reference Materials (SRMs) 2092 and 2096 are intended primarily for the certification of Charpy V-Notch testing machines in accordance with ASTM Standard E-23. Each SRM consists of five 10 x 10 x 54 mm bars of 4340 alloy steel. The bars are fabricated from vacuum melted, vacuum arc remelted steel rods. The bars are cut to finished lengths, machined, and heat-treated in SRM lots of 1200 bars. Each bar is identified by a Series number (two letters followed by two digits) identifying the lot from which the bar came and an identification number (three or four digits) representing the location of the bar within the lot. These numbers are stamped on one end of each bar.

Bar sample specimens taken at random from each SRM lot are tested at the NIST Boulder Laboratory on several Charpy V-Notch test machines representative of the wide variety of such machines commercially available. The specimen data generated are then statistically evaluated to assure the quality of the lot and a certified energy value for the lot is established. The table below lists the energy ranges for the bar lots covered by SRM 2092 and SRM 2096.

Note - these are not certified energy range mean values. Actual certified values are not released until SRM 2092 and 2096 user specimens have been sent to the Boulder Laboratory for evaluation. Users wishing to obtain certified values before the NIST machine performance evaluation reports for their particular specimens are issued, must contact the NIST Boulder Charpy Program Coordinator at Telephone: (303) 497-3351; FAX: (303) 497-5030. The identification numbers for the specific specimens of interest, should be provided at the time of request.

<u>SRM No.</u>	<u>Energy Range</u>		
	<u>(ft-lbs)</u>	<u>(J)</u>	<u>(m-Kg)</u>
2092	9-15	12-20	1.2-2.1
2096	65-85	88-115	9.0-11.7

Use: Prior to testing a Charpy V-Notch testing machine, the machine should be checked to assure compliance with sections 4 and 5 of ASTM Standard E-23. Specimens are to be tested at -40 °F (-40 °C) and in accordance with the testing procedures of Sections 12.2.1 and 12.2.3 of E23-92. An accurate machine will produce an average value at the low and high energy level within 1.0 ft-lb or 5% of the certified energy value, whichever is greater.

The overall direction and coordination of the technical measurements leading to certification of test specimens and machines, evaluation of test results and issuance of the report on machine conformance are under the direction of the NIST Materials Reliability Division, Boulder, Colorado.

Technical and support aspects concerning the preparation and issuance of these Standard Reference Materials are coordinated through the Standard Reference Materials Program by P. A. Lundberg.

Gaithersburg, MD 20899
February 19, 1993
(Revision of certificate dated 3-26-90)

William P. Reed, Chief
Standard Reference Materials Program

(over)

Notice to User: Each unit of SRM 2092 and 2096 consists of five specimens with identical series (lot) numbers.

For certification, both SRMs, five specimens from same lot of each energy level must be broken. A total of ten specimens are broken sequentially in accordance with ASTM Standard E-23.

This SRM is anticipated to have an indefinite shelf life under normal storage conditions. The SRM is coated with oil, wrapped in a corrosion inhibiting paper, and sealed in a plastic envelope. We recommend that the SRM be retained in this package to protect it from moisture until it is used. The protective oil coating should be wiped from the SRM just prior to testing.

Certification of Machine: The National Institute of Standards and Technology (NIST) will issue a report of its findings to user's facility upon receipt of the fractured specimens and completed questionnaire. If the machine to be certified produces acceptable values, this report will certify its conformance. If the machine produces values outside the allowable tolerance of the certified energy values, this report will suggest changes in machine design, repair or replacement of machine parts, changes in testing techniques, etc. Fractured specimens and completed questionnaires should be returned to Charpy Program Coordinator, NIST Code 853, 325 Broadway, Boulder, CO 80303. A plastic, self-locking bag is provided for the return of broken specimens. The broken pieces should be taped together as described in the wrapping instructions (last page of the questionnaire).

The certification you will receive is valid for one year from the date of the test.

If a user's machine is moved or undergoes any major repairs or adjustments, the current certification becomes invalid and the machine must be recertified. Removal of the pendulum, replacement of the anvils or adjustment of the height of drop are examples of such major repairs or adjustments. If a specimen requires over 80% of the machine capacity to fracture, the machine should be checked to assure that the pendulum is straight, the anvils or striker have not been damaged and that all bolts are still tight.

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

Note to International Customers: Overseas shipments should be sent by airmail so that after the packages have been cleared by U.S. Customs, they will be forwarded directly to NIST-Boulder. If more rapid shipment is necessary, choose an overnight delivery service that will handle U.S. Customs clearance and will deliver directly to NIST-Boulder. Unless delivery is assured, airfreight packages may be returned to the customer by U.S. Customs instead of being forwarded to NIST-Boulder.