



IMPORTANT!!! PLEASE READ BELOW

Dear Charpy Machine Verification Program Customer,

Due to the current operational status of the NIST Boulder campus, we cannot guarantee receiving and handling packages containing questionnaires and broken Charpy samples (SRMs 2092, 2096, and 2098) in a timely manner. **Therefore, to avoid possible delays in the verification of your machine, please do not mail in your broken Charpy specimens and follow the instructions below for electronic transmission of your results.**

During this period, the indirect verification of your Charpy machine(s) by testing NIST specimens will be performed through the evaluation of your questionnaire and the inspection of your tested samples **via high-quality digital pictures**.

After completing your tests, you are kindly requested to download and complete the NIST fillable PDF questionnaire from <https://www-s.nist.gov/srmors/questionnaires/2092.pdf> and email it to us at charpy@nist.gov, along with digital pictures of your tested samples. Please note that the hyperlinked, fillable PDF questionnaire can be used for SRMs 2092, 2096, and 2098.

For the photos, please:

- Take photos of the specimens grouped or taped together (with transparent scotch tape only, please) **so that the marks left by the anvils are clearly visible** and can be examined, as in the examples shown below.
- Send photos of both specimen halves bearing anvil marks.
- **The required minimum resolution for the digital photos is 1024 × 768.**
- Specimens from different energy levels can either be grouped in the same picture (as shown below), or photographed separately, i.e., low-energy in photo 1, high-energy in photo 2, and super-high energy in photo 3.
- Do not send pictures of individual specimens (we need to verify the alignment of the anvil marks among the different specimens tested).
- Make sure that the specimens in the pictures are clearly identified (energy level and lot number). This can be achieved in one of the following ways:
 - (a) Taking pictures of broken specimens together with the box(es) that contained the samples when they were purchased (see example below).



(b) Adding a label to the photo, indicating which lot pictured specimens come from (see example below).



(c) Indicating the full lot id in the name of the electronic file(s), e.g., “LL-170.jpg”, “HH-165.jpg”, “SH-51.jpg”, etc.

Again, what we need to examine in the photos are primarily the marks/indents created by the anvils on the specimens during the fracture process (see below).



The required minimum resolution for the digital photos is 1024 × 768.



UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899-0001

Note that, if your pictures are not adequate for our evaluations, you may be asked to take them again. Once we receive the questionnaire and the digital photos by email, we will be able to evaluate your results and, if these are found acceptable, issue and email to you Verification Letters and Stickers according to ASTM E23 and/or ISO 148-2.

If you have questions or concerns, do not hesitate to contact charpy@nist.gov. For technical questions, please email enrico.lucon@nist.gov.

Enrico Lucon & Ray Santoyo
Charpy Machine Verification Program
NIST – Division 647
325 Broadway
Boulder, Colorado 80305-3337
[NIST Charpy Website](#)

This questionnaire will assist you in performing a successful Charpy impact verification test. The lot number, serial number, and absorbed energy results of the tested specimens must be provided in order to obtain certified values. For more details, please consult the current ASTM E23 standard. This information is necessary to evaluate the condition of your machine. A downloadable, fillable, and printable PDF version of this questionnaire is available at <https://www-s.nist.gov/srmors/questionnaires/2092.pdf>.

NOTE: in order to expedite processing, please fill out electronically or WRITE LEGIBLY!

What type of Verification Letter do you require? Only ASTM Only ISO Both

Location of Machine

Company

Address

City

State/Province

Country

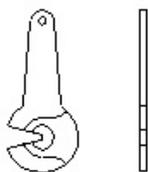
ZIP/Postal Code

Email Address (required for receipt of Verification Letters)

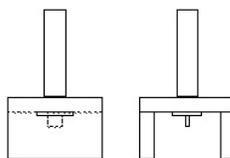
Test Machine (please indicate the energy units used:)

1. Machine Manufacturer _____ Serial Number _____
2. What is the maximum energy capacity of the machine?
3. What is the typical range in absorbed energy of the steels tested at your facility?
4. If the machine is adjustable, what capacity was used for this test? _____ N/A
5. Is your machine mounted according to the requirements of ASTM E23 and the machine manufacturer's recommendations? YES NO
6. Is your machine equipped with carbide striker and/or anvils? YES (striker) YES (anvils) N/A
7. Are your anvils and/or striker newly installed? YES NO
8. Please indicate your specific pendulum design below.

C-type



U-type



Other (Please sketch.)

9. If shrouds are used, do they comply with the ASTM E23 requirements? YES NO N/A

10. Do your anvils and striker conform to ASTM E23 requirements and tolerances? YES NO
11. When was your machine last verified by NIST (MM/DD/YY)? Date:
12. Is your machine compensated or not compensated for windage and frictional losses?

Pre-Test Checks and Operations

1. Does the striker pass through the center of the anvils within 0.40 mm (0.016 in.)? YES NO
2. With the pendulum in the free hanging position, engage the energy indicator. The indicator should read within 0.2 % of the machine capacity being used.
3. What is the friction/windage loss of your machine?
4. With the specimen removed from your machine and the pendulum released from its latched position, what is the dial reading after a free swing?
This reading should be zero. If this reading is not zero and your machine is compensated for windage and friction, please adjust the dial to read zero. If your machine is not compensated for windage and friction, please correct the energy values for windage and friction by windage and friction losses.

Calculating the Lower Limit of the Usable Range for Your Machine

(NOTE: CHARPY DATA SHOULD NOT BE GENERATED BELOW THE LOWER LIMIT OF THE MACHINE.)

1. If your machine is equipped with a digital readout, what is the resolution? N/A
2. If your machine is equipped with an analog scale, what is the difference between two adjacent marks on the energy scale at 15 J (11 ft·lbf)? N/A

What is the resolution, *i.e.*, the smallest discernible energy value readable between these marks? (*This is normally 1/2 to 1/4 of the difference between two adjacent marks on the scale.*) N/A

Lower usable limit of your machine: multiply the resolution above by 25. Result:

Example 1 (Digital Readout):

Machine has a capacity of 407 J and is equipped with a digital readout. The resolution of the readout is 0.14 J at 15 J. The lower limit of the usable range for your machine is: $25 \times 0.14 \text{ J} = 3.5 \text{ J}$.

Example 2 (Analog Scale):

Machine has a capacity of 407 J and is equipped with an analog scale. In the case where the energy divisions between the marks at 15 J are 0.5 J, you should be able to estimate to at least 0.25 J. This is your resolution. Multiply by 25. The lower limit of the usable range for your machine is: $25 \times 0.25 \text{ J} = 6.25 \text{ J}$.

Testing Requirements

1. The test temperature for SRM 2092 (low-energy) and SRM 2096 (high-energy) specimens is $-40 \text{ }^\circ\text{C} \pm 1 \text{ }^\circ\text{C}$ ($-40 \text{ }^\circ\text{F} \pm 2 \text{ }^\circ\text{F}$). NIST recommends the specimens be held at temperature for at least 10 minutes, and tested within 5 seconds after removing them from the cooling medium.
2. **IMPORTANT** The test temperature for SRM 2098 (super-high-energy) specimens is $21 \text{ }^\circ\text{C} \pm 1 \text{ }^\circ\text{C}$ ($70 \text{ }^\circ\text{F} \pm 2 \text{ }^\circ\text{F}$).

ELECTRONIC TRANSMISSION OF TEST RESULTS

After completing your tests, please thoroughly complete this questionnaire (a fillable PDF version is also available from <https://www-s.nist.gov/srmors/questionnaires/2092.pdf>) and email it to us at charpy@nist.gov, along with high-quality digital pictures of your tested samples. Detailed instructions for the electronic submission of test results (questionnaire and digital photos of tested samples) are provided on pages 1-3 of this questionnaire. **THIS IS THE RECOMMENDED PROCEDURE FOR RETURNING YOUR MACHINE VERIFICATION RESULTS TO NIST.**

ALTERNATIVE PROCEDURE (not recommended)

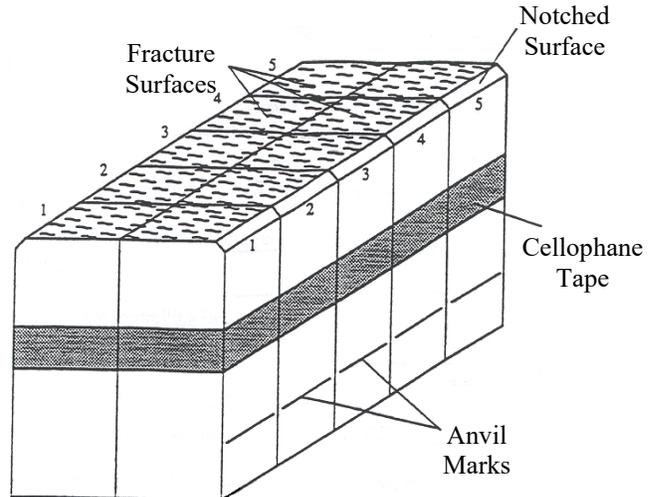
If you prefer to ship your broken samples and questionnaire to NIST Boulder, please follow the instructions below.

Please secure the 5 broken specimens (10 halves) from a particular energy level as one unit, using **clear cellophane tape** according to the following instructions. See also drawing below.

1. Keep broken halves correctly paired (back to back) with the fracture surfaces facing upward and notched surfaces facing outward.
2. The completed questionnaire and the fractured specimens must be shipped to:

Charpy Program Coordinator
 NIST, Division 647
 325 Broadway
 Boulder, CO 80305-3337

Phone: 303/497-3351, Fax: 303/497-5939,
 Email: Charpy@Boulder.NIST.gov



Use the **MAILING LABEL** provided with the specimens, and attach the label so that it is clearly displayed on the **OUTSIDE** of the package. This will expedite delivery to the Charpy Coordinator. International customers, returning specimens from outside the United States, should include the following statement on the U.S.

Customs Declaration:

“Contents include U.S. manufactured steel test bars being returned to the U.S. for evaluation and are valued at less than 10 U.S. dollars.”

TEST RESULTS

INDICATE ENERGY UNITS (please select)

J ft-lbf

Series SRM 2092 (Low Energy)		Series SRM 2096 (High-Energy)		Series SRM 2098 (Super-High Energy)	
Specimen Number	Value	Specimen Number	Value	Specimen Number	Value
Average Value		Average Value		Average Value	

Date of Test _____
(Month / Day / Year)

Company Representative

Company Representative (PRINT) Telephone _____

Company Representative (SIGNATURE) Email _____

Third Party Representative

Third party (company name) Email _____

Naming a third party here gives your permission to release the verification data (NIST letter) to the third party. If an email address is provided, the third party will be copied automatically on the NIST verification letter.