

Charpy Impact Testing

University of Saskatchewan - Mechanical Engineering - Materials Science and Metallurgy

Impact Testing with the Charpy Impact Tester

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1. SIGNATURES OF UNDERSTANDING

By signing this form I acknowledge that I have read and understand this SOP, as well as the applicable MSDS's and that I will conduct myself in accordance with this SOP and the general laboratory rules.

NOTE: ALL SIGNATURES MUST BE PRESENT ON THE SOP LOCATED IN THE YELLOW BINDERS IN ROOM 2C26, other SOP's are made available for convenience only. Printed SOP's are valid for 24 hours only, after that time their accuracy must be verified with the **OFFICIAL VERSION** in room 2C26.

Name (Print)	NSID	Dep't	Signature	Date

Reference Only

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2. VERSION HISTORY

Handwritten amendments to the official procedures can be made by a single line through the text, along with the date, and initialed by the authorized individual making the correction. Changes are to be noted below. Formal changes to this SOP are made on the date of revision or sooner, where required.

Section	Changes Made	Date	Initials

3. PURPOSE AND SCOPE

This SOP provides general instructions to conduct charpy impact testing. All general lab safety practices must be followed in addition to those cited in this SOP. This SOP applies to all parties conducting this type of work. Separate SOP's will be available for using a high temperature furnace and a cooling device with or without liquid nitrogen. Consult these SOP's if using elevated or low temperature specimens.

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4. EQUIPMENT AND CONSUMABLES REQUIRED

The following Personal Protective Equipment (PPE) is required for this procedure:

- Closed Toed Shoes
- Long Pants
- Safety glasses, goggles or Face Shield
- This SOP

This procedure may also require the following:

- Heating/cooling chamber
- Metal Tongs
- Insulated gloves for handling hot/cold samples

5. DEFINITIONS AND ABBREVIATIONS

None applicable

6. HAZARDS

6.1. Physical

- **THE CHARPY TESTER CAN NOT BE LEFT UNATTENDED WHILE THE CHAIN IS REMOVED; IF YOU LEAVE THE ROOM EVEN FOR A FEW SECONDS THE PENDULUM MUST BE LOWERED AND LOCKED IN-PLACE WITH THE CHAIN.**
- Impact hazard from the Charpy tester arm and anvil
- Pinch hazard from the Charpy tester arm and anvil
- Shrapnel hazard may be generated during testing when the specimen is struck.
- Burn hazard due to handling of hot samples.
- Burn/Frostbite hazard due to handling of cold samples.

6.2. Chemical and Toxicological

- There are no chemical or toxicological hazards in this procedure.

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7. WASTE DISPOSAL PROCEDURES

All waste Charpy samples and remnants must be placed in a metals container (cardboard box is fine) for recycling.

8. PROCEDURAL STEPS

Stage 1: Setting Up

1. Inspect PPE and verify all required materials are available.
2. Move all samples to be tested to room 2C25 and organize documentation.
3. Obtain key for Charpy tester lock from Departmental Assistant.
4. Put on PPE.
5. Place Charpy tester catch shield in place.
6. Ensure nobody is within the swing radius of the pendulum.
7. If instructing laboratory, ensure all student observers are 3m back from Charpy tester

Stage 2: Procedure

8. Unlock Charpy tester arm and remove chain.
9. Remove safety bolt from Charpy tester.
10. Raise the Anvil manually into the locked position.
11. Set the dial indicator to the 220 ft*lb mark.
12. Ensure nothing is in the path of the pendulum.
13. Hit the quick release handle for an "open run".
14. The result of the open run should be 0 ft*lb. If it is not see the Departmental Assistant for calibration.
15. Return the pendulum to its locked position.
16. Insert safety bolt.
17. Set the dial indicator to the 220 ft*lb mark.
18. Insert specimen, **WHILE INSERTING SPECIMEN ENSURE THAT YOU'RE HEAD/BODY DO NOT GO INTO THE PATH OF THE PENDULUM.**
19. The notch of the specimen should face away from the pendulum and be centered in the gap so that the pendulum strikes directly behind the notched area.
20. Remove safety bolt.
21. Release the pendulum and record the reading.
22. Repeat steps 14-20 for additional specimens.

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Stage 3: Clean-up

23. Return the pendulum to the lowered position and lock in place with the chain and padlock.
24. Insert the safety bolt.
25. Clean up all samples and scraps and place in the metals waste box.
26. Return the key to the Departmental Assistant.

9. REFERENCES

University of Saskatchewan DHSE Documents:

Laboratory Safety Manual:

http://www.usask.ca/dhse/file_view/download.php/Laboratory_Safety_Manual.pdf?id=32&view=1

Reference Only