Microhardness Testing - Mitutoyo

University of Saskatchewan - Mechanical Engineering - Materials Science and Metallurgy

Vickers Hardness Testing with the Mitutoyo MVK-H1 Microhardness 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

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 Vickers Microhardness testing on the Mitutoyo MVK-H1 microhardness tester. 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.

4. EQUIPMENT AND CONSUMABLES REQUIRED

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

- This SOP

This procedure may also require the following:

- Various Self Leveling stage attachments.

5. DEFINITIONS AND ABBREVIATIONS

None applicable

6. HAZARDS

6.1. Physical

- If a finger or hand is placed below the indenter while it is lowered a puncture wound or scrap may occur. Under proper usage there are no entanglement or pinch point hazards.

6.2. Chemical and Toxicological

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

7. PROCEDURAL STEPS

Stage 1: Setting Up

1. Move all samples to be tested to room 2C25 and organize documentation.

Stage 2: Procedure

2. Turn on the MVK-H1 Microhardness tester
3. Swing the 40X ocular into place.
4. Adjust the measurement dials so that there is no gap between the two measurement lines and push the ocular zero button.
5. Rotate the low magnification lens into place.
6. Insert your sample.
7. Focus your sample using the low power lens.

8. Rotate to the 40X lens and focus your sample.
9. Rotate to the desired load force (10-1000gf).
10. Rotate the indenter over top of the specimen.
11. Push the start button and wait until the indenter is fully retracted before touching anything else on the machine.
12. Rotate the 40X lens into position
13. Measure the first diagonal of the indentation by moving the measuring lines apart so that the inside of each line just touches a corner of the indent.
14. Push the button on the measurement eyepiece to store the measurement in memory.
15. Rotate the eyepiece 90° and repeat steps 13 and 14.
16. Record the reading from the display on the machine.
17. Rotate to the 40X objective and find a suitable location for another indent if required, and repeat steps 9-16.

Stage 3: Clean-up

18. Rotate to the low magnification lens.
19. Remove your sample.
20. Turn off hardness tester.
21. Place Dust Cover over hardness tester.

8. 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

ASTM: A 370 Standard Test Methods and Definitions for Mechanical Testing of Steel Products

ASTM: E 140 Standard Hardness Conversion Tables for Metals

ASTM: E 384 Standard Test Method for Microhardness of Materials

ASTM: A 574 Standard Specification for Alloy Steel Socket-Head Cap Screws