

Vickers Tester: For Ceramics and Glass Materials

Purpose and Scope:

This document describes the procedures and policies for using the MSE Wilson Vickers/Knoop Hardness Tester. The scope of this document is to establish user procedures. Instrument maintenance and repair are outside the scope of this document.

Responsibilities:

This document is maintained by the department Lab manager. The Lab Manager is responsible for general maintenance and for arranging repair when necessary. If you feel that the instrument is in need of repair or is not operating correctly please notify the Lab Manager immediately. The Lab Manager will operate the instruments according to the procedures set down in this document and will provide instruction and training to users within the department. Users are responsible for using the instrument described according to these procedures. These procedures assume that the user has had at least one training session.

Prerequisites:

All users must read this document and obtain approval and training from the Lab Manager.

Precautions:

Do not use hazardous materials in this instrument or in the lab. Hazardous or noxious materials should be kept in a fume hood and we cannot move our instrument to accommodate them.

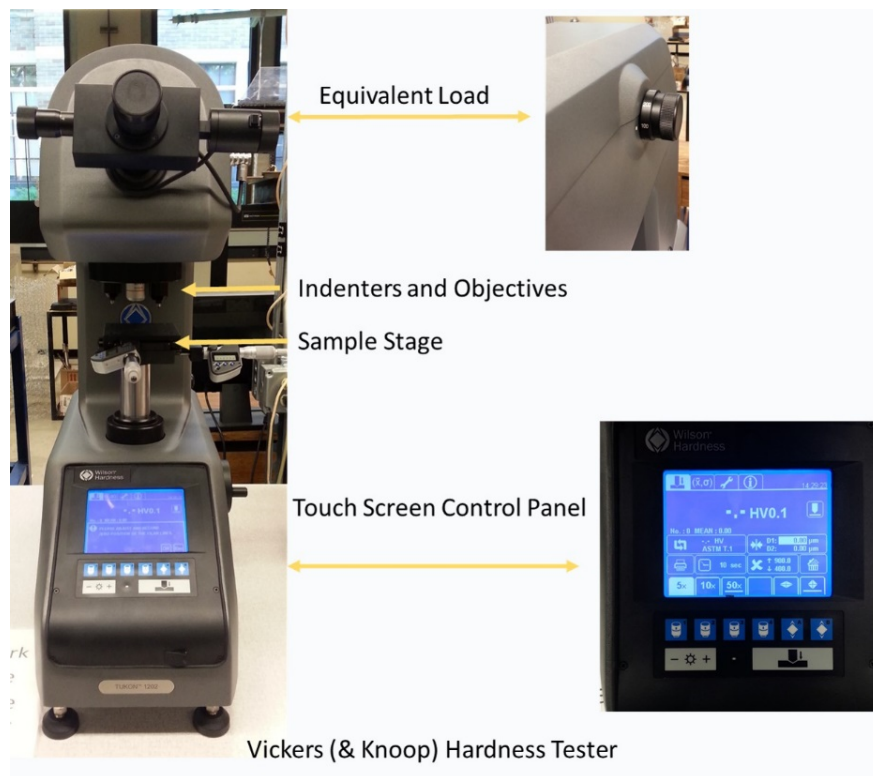


Fig. 1 Vickers Hardness Tester

The Vickers/Knoop hardness tester is a digital tester. The sample must be as flat and smooth as possible on both the top and bottom.

- Turn on the tester.
- The first screen asks the user to adjust the Filar lines as shown here in figure 2.



Fig. 2 Startup panel and Filar Lines

- Using the eye piece adjust the lines until they are almost – but not quite – touching.
- Select OK.
- Place the sample on the stage.
- Select the equivalent load. (you may need to consult a standard to determine the best load for your sample)
- Using the eye piece and the 10X objective, find the surface of the sample by raising (or lowering) the stage using the reel on the side. This is the most challenging step and if you aren't paying attention you can damage the instrument so please be careful.
- When you have found the surface bring it into focus with the 50X objective. The indent area should be flat and free of pores or odd interfaces.
- When ready, press the test button



Fig. 3 Test Button

- Wait for the tester to finish.
- When it has finished it will automatically move to the default objective.
- Using the eye piece find the diamond shaped indent on the surface of the sample.
- Adjust the filar lines so that the points of the diamond are between them.
- Press the select button on the left side of the eye piece.

- Turn 90 degrees and do the same with the second set of points.
- Note the values and repeat up to 5 times.
- The average of the values is the hardness.

If the 5 values are more than 10 % different, you may not be using the correct equivalent load, or your sample isn't flat enough. Re-evaluate your sample surface and check parameters then measure again.

There is also a Knoop indenter. The processes are the same but there is only one measurement to do.

The default indenter and the default objective can be changed by selecting them on the touch screen. If you want to change the objective without changing the default, press the buttons on the manual control panel.