

BRINELL HARDNESS

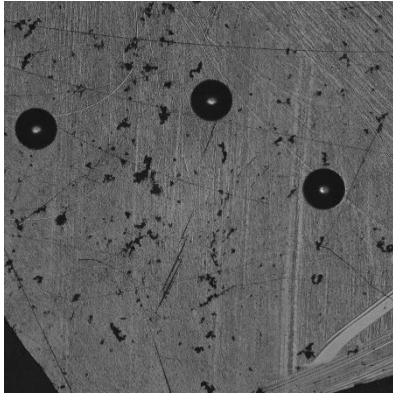


Figure 1: Original image with three of the five Brinell indents.

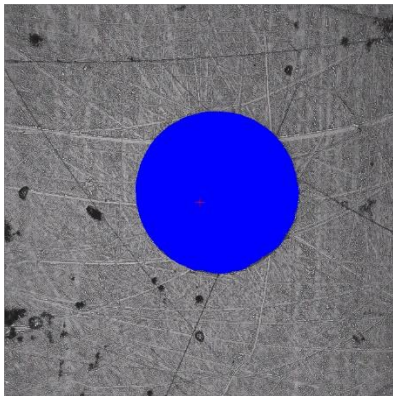


Figure 2: Indents as measured, binarized into blue bitplane.

Equipment

Analysis System: Clemex CMT
Hardness tester: ZwickRoell ZHU 250 CL
Camera: Clemex S3 4.0M (B&W)
Magnification: 25X and 100X
Stage: Motorized Marzhauser
 200X100 mm
Indenter: Brinell

Sample Description

One steel sample is submitted for hardness test.

Purpose of Analysis

Demonstrate the ability of the Clemex CMT to automatically perform and measure indentations on the material.

Procedure

A 2.5 mm diameter WC Brinell indenter and 62.5 kgf load were used during the hardness measurements. Five areas were selected across the center of the material to build the indent pattern and the automatic analysis was initiated. Five indentations were automatically made, once completed, the motorized turret brought the 10X objective in place, automatically focused on each indent and measured accordingly.

Results

Indent #	Hard. (HB)	Depth (μm)	H Diag. (μm)	V Diag. (μm)
1	374	0	463.8	454.5
2	376	2006	462.3	448.8
3	386	3282	458.1	441.9
4	384	4821	463.1	437.6
5	388	6000	458.9	440.6

The measurements were repeated on the 5 indents for three times. The average Brinell hardness in the center of the material is around 382 HB.