

Vickers Indent

### ***Vickers Indents:***

- Widely Accepted Hardness Test

### ***Advantages:***

- Can indent and provide a single continuous scale for materials of any type.
- No need to convert hardness scales or change indenters per material.
- All results tested at a specific load are directly comparable.

Using automated systems allow us to indent and measure much faster. In addition, indent grids can be made that generate a *Hardness Map*. This gives our customers a complete understanding of what is happening in their process.

## HARDNESS TESTING

### ***Capabilities Include***

- Comparison of welded area relative to base metal.
- Great indicator of strength and brittleness.
- Indicates areas of welded structures that are most susceptible to fatigue failure and cracking in use.
- Used in conjunction with other testing methods, can provide a way to gain feedback on joining parameters.

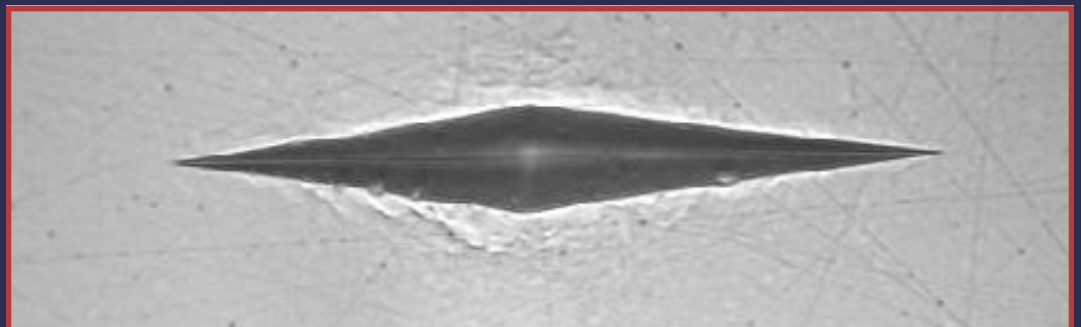
### ***Knoop Indents:***

- Specialized Hardness Test

### ***Advantages:***

- Small diagonal allows many indents to be put close together.
- Continuous scale.
- Possible to indent thin coatings.
- Results are also directly comparable.

Knoop Indent





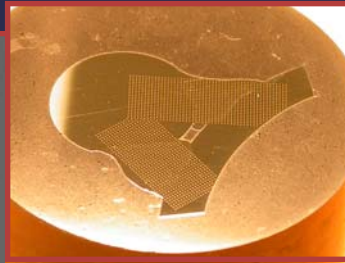
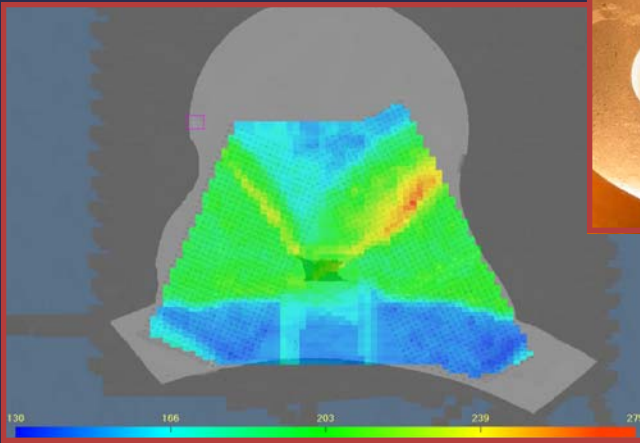
## HARDNESS TESTING

*Hardness Inspection  
Uses: Welding an Anti-  
Rotation Device*

*Grid Patterns offer  
a High Resolution  
advantage over single  
traverses and ensures a  
complete knowledge of  
your process.*

AISI 1018 Rod  
AISI 1008 Bracket

*Production Part - Second weld made  
directly after the first.*



1600 Indents

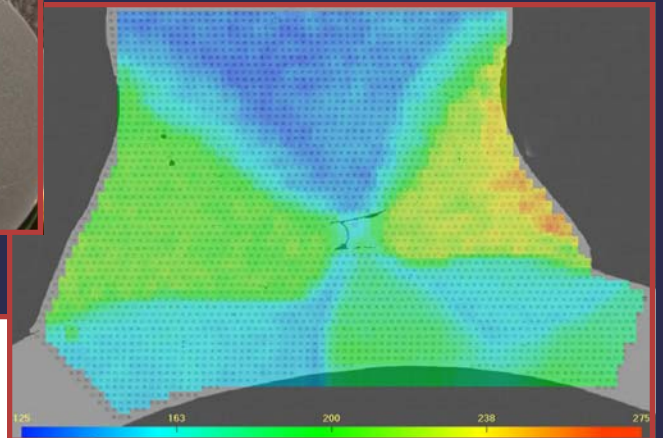


**Note the hardened area in the HAZ of the rod denoted by the red color coding. The resulting heat flow of this weld process caused that area in red to fall slightly outside of the optimum parameters for this material.**

*Cooled Part- Second weld  
made 30 min after the first.*



3200 Indents



**Note that there is no longer a hardened area in the rod. While the second weld hardened slightly; when compared to the first production part, overall hardening is reduced, resulting in better performance.**