



## How to Choose the Correct Portable Hardness Tester:

### Leeb vs UCI Hardness Testing Instruments

Both technologies are excellent portable hardness testing methods, but they are designed for different applications.

### Choose Leeb Hardness Testing When:

- ✓ The part is **large and heavy** - (For perspective, the calibration block provided is a 2.5” thick, 3” diameter round block of Steel. This represents an optimal mass for effective testing.)
- ✓ The surface is relatively rough
- ✓ You need fast testing on castings, forgings, weldments, and large machined components
- ✓ You are primarily interested in steel hardness
- ✓ The material thickness is approximately 1" (25 mm)

### Typical applications:

- Steel castings
- Large forgings
- Pressure vessels
- Heavy machinery components
- Mill rolls
- Structural steel

### Advantages

- Fast and easy to use
- Little surface preparation required
- Large measuring range



- Excellent for heavy parts
- Lower cost

### Limitations

- Not suitable for thin materials
  - Less effective on small parts
  - Results can be affected by mass and rigidity
  - Not ideal for coatings but can test case-hardened layers with substantial mass using the C impact device.
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### Choose UCI Hardness Testing When:

- ✓ When **Non-Destructive Testing** is needed.
- ✓ The part is **thin or lightweight**, too thin or small for Leeb type testers
- ✓ You need to test heat-treated surfaces
- ✓ You need to test small components
- ✓ The surface finish is smooth – Choice of probes capable of testing 400µin and below.
- ✓ The material thickness is as little as 0.080" (2 mm)

### Typical applications:

- Aerospace components
- Tool steels
- Gears
- Shafts
- Thin wall tubing
- Weld heat affected zones
- Heat-treated surfaces



### Advantages

- Works on thin materials
- Excellent for small parts
- Small indentation - **NON\_DESTRUCTIVE**
- Good for finished components

### Limitations

- Requires smoother surface finish - 400uin and below (probe dependent)
- More sensitive to operator technique
- Generally slightly slower test than Leeb -(Approx 2 second test time)
- Not ideal for rough castings

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### Quick Selection Guide

Application	Best Choice
Large steel casting	Leeb
Forging	Leeb
Pressure vessel	Leeb
Thin sheet metal	UCI
Aerospace aluminum	UCI
Small gear teeth	UCI
Heat-treated shaft	UCI
Large structural steel	Leeb
Weld inspection	UCI
Rough cast surface	Leeb

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### A Simple Rule

If the part is large, heavy, and rough → use **Leeb**.

If the part is thin, small, heat-treated, or requires a small indentation/ NON-DESTRUCTIVE→ use **UCI**.



Many companies that test a wide variety of components ultimately purchase a combination tester that includes both technologies. This allows the operator to use Leeb on large heavy parts and switch to UCI for smaller or thinner components without needing a second instrument.

**Phase II 6000 series UCI hardness testers combine UCI and Leeb in one unit.**