



Hildebrand

It has long been acknowledged that the determination of the hardness characteristics of elastomeric materials employing the instrumentation and methodology of International Rubber Hardness Degrees (IRHD) is superior to that of the commonly used 'durometer'.

The [ISO 48](#) (IRHD Method M) and [ASTM D1415](#) (IRHD Micro Test) are far more repeatable and reproducible testing methodologies than 'Shore Scale' hardness testing. The IRHD Method M Microtest is designed for the difficult and arduous task of measuring small, thin, or irregularly configured specimens, o-rings being a perfect example.

Historically, there have been two major obstacles to the widespread use of IRHD:

- ease of use, and
- cost.

The Hildebrand™ System overcomes both of these, making Micro IRHD testing quite simple to perform and cost effective. Finally, the opportunity is here to move the determination of material hardness from the technology pervasive in the early 1900s to that of the 21st century!

The system is controlled by the Windows™ based DuroMeasure™ operating software. The software and RS232C cable are included and may be used with any PC so equipped. The hardness value, graph, hysteresis, statistics, test report, ASCII output file, and label printing are only a few features of this versatile software package!

The DuroMeasure™ software controls the test functions, in their proper sequence, without operator intervention, resulting in precise readings.

The IRHD measurements include:

- IRHD Values;
- IRHD Values / Time;
- Upper & Lower Control Limits;
- Minimum & Maximum Values;
- Mean;
- Standard Deviation;

Also included are:

- Report printing in graphical or tabular format;
- Graph of individual and multiple tests;
- ASCII output file;
- Label printing (specimen ID).



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The Hildebrand™ Micro Hardness IRHD System features a precision ground steel base which provides the necessary mass to assure stability. Integral to the base are a cross spirit level and 3 'thumb wheel' adjusters, which raise and lower the base support stanchions for precisely levelling the instrument.

The twin posts, which support the IRHD controller, are manufactured from high quality stainless steel. This twin post, rack and pinion design allows for precise positioning of the controller using the 'fine' and 'coarse' adjustment hand wheels. A positive locking handle secures the final position.

The integral specimen support table is precision machined and chrome plated for durability. It is controlled by the DuroMeasure™ software, but also has a precise 'fine adjustment' on the Y-axis. The Hildebrand™ Micro Hardness IRHD System also includes a dust cover and a protective ring device for safely storing or transporting the instrument.

Hiltebrand™ Micro IRHD Hardness System: O-ring Positioning Device



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The *optional* o-ring positioning device fully and automatically interfaces with the DuroMeasure™ Micro IRHD Operating Software!

O-rings with a cross-sectional diameter between 0.8 mm and 8 mm may be accommodated. The o-ring specimens are placed on the measuring table and placed against the positioning stop pin.

The o-ring cross-sectional diameter is entered into the DuroMeasure™ software. The measuring table is driven, by the integral electric motors, to the measuring axis (the thickest point).

Hiltebrand™ Micro Hardness IRHD O-ring Positioning Device Features:

- Easy to operate;
- Fully automatic testing cycle;
- Enables precise hardness determination at the measuring axis;
- Guide pin is retracted during the test, imposing no lateral influence on the o-ring;
- Integral flex-arm magnifying lens for precise positioning of specimen;
- Y-axis is adjustable graduations of 0.01 mm;
- Table dimensions: 84 x 128 mm (P/N 222 500);
- Table dimensions: 160 x 208 mm (P/N 222 5211).

Hiltebrand™ Micro IRHD Hardness System: Small Specimen Positioning Device



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The *optional* small specimen positioning device fully and automatically interfaces with the DuroMeasure™ Micro IRHD Operating Software!

This fixture is designed to measure o-rings and similarly configured specimens. Each specimen requires a dedicated support, having a unique identification number. The ID number is entered into the DuroMeasure™ software prior to the test cycle.

The measuring table is driven, by the integral electric motors, to the measuring axis (the thickest point). The specimen support may be rotated to another position, allowing simplified, accurate, multiple determinations on a single specimen.

Hiltebrand™ Micro Hardness Small Specimen Positioning Device Features:

- Easy to operate;
- Fully automatic testing cycle;
- Enables precise hardness determination at the measuring axis;
- Table movement: 27 mm;
- Table dimensions: 84 x 150 mm;
- Custom designed specimen supports are available.

Hiltebrand™ Micro IRHD Hardness System: Specimen Positioning Device



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The *optional* specimen positioning device fully interfaces with the DuroMeasure™ Micro IRHD Operating Software!

This fixture is designed to test small, or irregularly shaped, specimens having one dimension less than 40 mm.

The specimen support platform, 50 mm Ø, contains 60 holes in a matrix of 5 x 5 mm. Guide pins are placed in the 2.02 mm Ø holes to secure the specimen. Modeling clay, or other suitable materials, may be used to further secure oddly shaped specimens.

The digital gauge, integral to the specimen support table, enables allows precise positioning of the specimen. The specimen table pivots 360° on the base which allows for simplified repositioning of the specimen for multiple determinations. The specimen support is locked into position on the base with a spring loaded detent.

Hiltebrand™ Micro Hardness Small Specimen Positioning Device Features:

- Easy to operate;
- Enables precise hardness determination at the measuring axis;
- Digital gauge:
- Measuring range: 0 - 25 mm;
- Functions: On/Off; mm/inch, Hold, Reset;
- Resolution: 0.001 mm/inch;
- Table dimensions: 50 mm Ø;
- Custom designed specimen supports are available.

Hiltebrand™ Micro IRHD Hardness System: Prism Style Specimen Positioning Device



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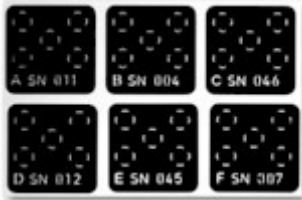
The *optional* prism, or v-block, style specimen positioning device fully interfaces with the DuroMeasure™ Micro IRHD Operating Software!

This fixture is designed to measure hose, tubing, cable, v-belts and similarly configured specimens, ranging in size from 4 to 50 mm in outside diameter. The center prism, or v-block, is removable to accommodate larger specimens. The measuring stanchion is manually positioned, and positively locked into place with the tightening screw.

Hiltebrand™ Micro Hardness Prism Style Specimen Positioning Device Features:

- Easy to operate;
- Enables precise hardness determination at the measuring axis;
- Table movement: 27 mm;
- Table dimensions: 84 x 150 mm;
- Custom designed specimen supports are available.

Hiltebrand™ Micro IRHD Hardness System: IRHD Test Blocks



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The *optional* Micro IRHD Rubber Test Blocks measure 30 mm² x 2 mm in thickness. The blocks are compression molded from high quality elastomeric compounds to yield the nominal Micro IRHD values of 40, 50, 60, 70, 80, & 90 respectively.

Each block has 5 discreet measurement areas. Each area is tested 5 times and the mean value for each area is calculated, these 5 mean values are then averaged to arrive at the 'certified value' for the individual block.

The 'certified value' is reflected on the proprietary calibration certificate issued by Hiltebrand Prüf- und Messtechnik GmbH.

The Micro IRHD Rubber Test Blocks are a valuable reference for *assuring the state of calibration* of any Micro IRHD instrument. **These test blocks are not calibration standards**, and should be calibrated annually as the values will change over time.

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