



Hardness testing of metals (Leeb)

Determining the hardness of metals is of particular significance during the preparation and use of metallic materials. Usually, hardness is determined using test machines in accordance with Vickers, Rockwell or Brinell.

For mobile measurements, the rebound method according to Dietmar Leeb, which was first used in 1978, has prevailed. To do this, a standardised impact body (such as SAUTER AHMO D01) is shot against the item to be tested. The rebound of the impact body leads to a deformation of the upper surface, which results in a loss of kinetic energy. This loss of energy is determined by measuring the speed and herefrom the Leeb hardness value (HL) is calculated.

These measuring devices can be used in any location. Usually they are equipped with a large internal data memory, which allows to record the measurements at goods receipt or in production.

Our range is equipped with compact measuring devices of the so-called "Pen Type" shape (HN-D) or measuring devices with external sensors connected by cables.



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Hardness testing of metal

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Quick-Finder

Readout	Sensor	Model	Price excl. VAT, ex works €	Page
[d] HL		SAUTER		
1	D	HK-D	1250,-	68
1	D	HK-DB	1290,-	68
1	D	HMM	1090,-	69
1	D	HMO	1770,-	71
1	D	HN-D	860,-	70
1	D	HMM-NP	870,-	69



Premium Leeb hardness tester – now also with hardness comparison block included

Features

- External impact sensor standard (Type D)
- Mobility: In comparison with stationary table-top devices and testing devices with an internal sensor, using the SAUTER HK-D offers the highest level of mobility and flexibility
- All measurement directions possible (360°) thanks to an automatic compensation function
- **1** SAUTER HK-DB.: Hardness comparison block, hardness approx. 800 HLD, included in delivery
- **2** Delivered in a sturdy carrying case
- Measurement value display: Rockwell (Type A, B, C), Vickers (HV), Shore (HS), Leeb (HL), Brinell (HB)
- Internal memory for up to 600 data groups, with up to 32 values per group forming the average value of the group
- Mini statistics function: displays the measured result, the average value, the impact direction, date and time
- Automatic unit conversion: The measuring result is automatically converted into all specified hardness units

- Measuring with tolerance range (limit-setting function): Upper and lower limiting can be programmed individually. The process is supported by an audible and visual signal.
- Matrix display: Backlit multi-function display for all relevant functions at a glance
- Robust metal housing

Technical data

- Measuring precision: ± 1 % at 800 HLD
- Minimum sample radius (concave/convex): 50 mm (with support ring: 10 mm)
- Minimum sample material thickness: 3 mm with coupling on fixed base
- The lowest weight of the test item on solid support unit: 2 kg with fixed coupling
- Dimensions W×D×H 132×82×31 mm
- Permissible ambient temperature -10 °C/40 °C
- Battery operation, batteries not standard 2× 1.5 V AA, operating time up to 200 h
- Net weight approx. 0,45 kg

Accessories

- Plug-In for data transfer of measuring data from the measuring instrument and transfer to a PC, e.g. in Microsoft Excel®, SAUTER AFI-1.0, € 90,-
- Data transfer software, KERN SCD-4.0, € 150,-
- Support rings for secure positioning, SAUTER AHMR 01, € 320,-
- Impact body Type D, net weight approx. 5,5 g, hardness ≥ 1600 HV, tungsten carbide, Impact ball Ø 3 mm, in accordance with the standard ASTM A956-02, SAUTER AHMO D01, € 115,-
- External impact sensor Type C. Low energy sensor: requires only 25 % impact energy compared to type D, for testing tiny or light objects or the surface of hardened layer, SAUTER AHMR C, € 640,-
- External impact sensor Type D, SAUTER AHMR D, € 290,-
- External impact sensor Type D+15. Slim front section for holes, grooves or re-entrant surfaces, SAUTER AHMR D+15, € 640,-
- External impact sensor Type DL, for very narrow surfaces (Ø 4,5 mm), SAUTER AHMR DL, € 1590,-
- External impact sensor Type G. High energy sensor: 900 % impact energy compared to type D, SAUTER AHMR G, € 1590,-
- Connection cable impact sensor SAUTER HMO-A04, € 95,-
- **3** Test block Type D/DC, Ø 90 mm (± 1 mm), net weight < 3 kg, hardness range 790 ± 40 HL, SAUTER AHMO D02, € 190,- 630 ± 40 HL, SAUTER AHMO D03, € 190,- 530 ± 40 HL, SAUTER AHMO D04, € 190,-
- Factory calibration certificates for SAUTER AHMO D02, AHMO D03, AHMO D04, SAUTER 961-132, € 120,-

STANDARD



OPTION



Model	Sensor	Measuring range	Readout	Test block	Price excl. of VAT ex works €	Option Factory calibration certificates	
						KERN	€
SAUTER		[Max] HL	[d] HL	Typ D/DC approx. 800 HL			
HK-D	Typ D	170-960	1	not standard	1250,-	961-131	120,-
HK-DB	Typ D	170-960	1	standard	1290,-	961-131	120,-



Advanced features for demanding applications

Features

- **1** Impact (rebound) sensor: The bounce module is accelerated by a spring against the item being tested. Depending on how hard the object is, the kinetic energy of the module will be absorbed. The speed reduction will be measured and converted to Leeb hardness values.
- External impact sensor (Type D) included
- Mobility: In comparison with stationary table-top devices and testing devices with an internal sensor, using the SAUTER HMM. offers the highest level of mobility and flexibility
- All measurement directions possible (360°) thanks to an automatic compensation function
- **2** Standard block for calibration included (790 ± 40 HL)
- **3** Delivered in a robust carrying case
- Internal memory for up to 9 measured values
- Mini statistics function: displays the measured result, the average value, the impact direction, date and time
- SAUTER HMM-NP: identical product features as the SAUTER HMM. model, but comes without the printer

- Measurement value display: Rockwell (B & C), Vickers (HV), Brinell (HB), Shore (HSD), Leeb (HL), tensile strength (MPa)
- Automatic unit conversion: The measuring result is automatically converted into all specified hardness units

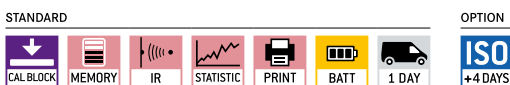
Technical data

- Measuring precision: 1 % at 800 HLD (± 6 HLD)
- Measuring range tensile strength: 375–2639 MPa (steel)
- Minimum sample weight on a solid and stable support: 2 kg with fixed coupling
- Minimum sample material thickness: 3 mm with coupling on fixed base
- Minimum sample radius (concave/convex): 50 mm (with support ring: 10 mm)
- Dimensions W×D×H 80×30×150 mm
- SAUTER HMM.: External mains adaptor for printer, as standard
- Ready for use: Batteries included, 3× 1.5 V AAA, block, operating time up to 30 h, AUTO-OFF function to preserve battery life
- Net weight approx. 0,2 kg

Accessories

- Connection cable, without impact sensor, SAUTER HMM-A02, € 105,-
- **5** Attachment rings for secure positioning, SAUTER AHMR 01, € 320,-
- **4** Impact body, SAUTER AHMO D01, € 115,-
- Test block Type D/DC, Ø 90 mm (± 1 mm), net weight < 3 kg, hardness range 790 ± 40 HL, SAUTER AHMO D02, € 190,- 630 ± 40 HL, SAUTER AHMO D03, € 190,- 530 ± 40 HL, SAUTER AHMO D04, € 190,-
- Paper roll, 1 piece, SAUTER ATU-US11, € 15,-
- Factory calibration certificates for SAUTER AHMO D02, AHMO D03, AHMO D04, SAUTER 961-132, € 120,-

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Model	Sensor	Measuring range	Readout	Price excl. of VAT ex works €	Option Factory calibration certificates	
					KERN	€
SAUTER HMM	Typ D	[Max] HL 170-960	[d] HL 1	1090,-	961-131	120,-
HMM-NP	Typ D	170-960	1	870,-	961-131	120,-



“Pen type” Leeb hardness tester for mobile hardness testing of metals

Features

- User-friendly operation: The compact version enables the product to be used in a significantly wider range of applications compared with traditional devices
- The measuring device has been designed for one-hand operation and this allows the user to work more quickly and flexibly
- Modern LCD display: Optimised for industrial applications: increased luminosity and backlight can be switched on, that way the display can be read from any angle
- All measurement directions possible (360°) thanks to an automatic compensation function
- Internal impact sensor included (Type D)
- Measurement value display: Rockwell (B & C), Vickers (HV), Brinell (HB), Leeb (HL)
Hardness comparison block not included
- Internal data memory for up to 500 measurements with date and time
- Data interface USB, including USB interface cable
- **1** Delivered in a robust carrying case

Technical data

- Measurement uncertainty ± 4 HLD
- Minimum sample weight on a solid and stable support: 2 kg
- Minimum sample material thickness: 3 mm with coupling on fixed base
- Dimensions WxDxH 35x25x145 mm
- Operation by rechargeable battery, standard, operating time without backlight 16 h, charging time 3 h
- Mains adapter, external, standard
- Net weight approx. 0,07 kg

Accessories

- Plug-In for data transfer of measuring data from the measuring instrument and transfer to a PC, e.g. in Microsoft Excel®, SAUTER AFI-1.0, **€ 90,-**
- **2** Test block Type D/DC, \varnothing 90 mm (± 1 mm), Net weight < 3 kg, hardness range 790 \pm 40 HL, SAUTER AHMO D02, **€ 190,-** 630 \pm 40 HL, SAUTER AHMO D03, **€ 190,-** 530 \pm 40 HL, SAUTER AHMO D04, **€ 190,-**
- Factory calibration certificates for SAUTER AHMO D02, AHMO D03, AHMO D04, SAUTER 961-132, **€ 120,-**

STANDARD



OPTION



Model	Sensor	Measuring range	Readout	Price excl. of VAT ex works €	Option Factory calibration certificates	
					KERN	€
SAUTER HN-D	Typ D	[Max] HLD 170-960	[d] HL 1	860,-	961-131	120,-

Price reduction



Advanced features for professional applications

Features

- Innovative touchscreen
- Automatic recognition of the impact (rebound) sensor connected to the HMO
- Mobility: In comparison with stationary table-top devices and hardness testing devices with internal sensor, the SAUTER HMO offers the highest level of mobility and flexibility
- All measurement directions possible (360°) by defining the direction of impact on the device
- USB bearing for connection to the printer and charging the batteries
- **1** Standard block for calibration included
- Internal memory up to 500 values
- Mini statistics function: Displays the measure value, the average value, the difference between the maximum and minimum values, date and time
- Measurement value display: Rockwell (B & C), Vickers (HV), Brinell (HB), Leeb (HL), tensile strength (MPa)
- Automatic unit conversion: The measuring result is automatically converted into all specified hardness units
- **2** Delivered in a robust carrying case

Technical data

- Measuring precision: 1 % at 800 HLD (± 6 HLD)
- Measuring range tensile strength: 375–2639 MPa (steel)
- Minimum sample weight on a solid and stable support:
 - Sensor D + DC: 2 kg with fixed coupling
 - Minimum sample material thickness:
 - Sensor D + DC: 3 mm with coupling on fixed base
 - Minimum sample radius (concave/convex): 50 mm (with support ring: 10 mm)
- Dimensions W×D×H 83×24×135 mm
- Rechargeable battery pack internal, operating time up to 50 h
- Mains adapter included
- Net weight approx. 228 g

Accessories

- Operation by rechargeable battery pack, operating time up to 50 h, SAUTER HMO-A03, **€ 75,-**
- External impact sensor Type D, as standard, can be reordered, SAUTER AHMO D, **€ 340,-**
- **3** External impact sensor Type DC. Short impact sensor for tests in holes or hollowed objects, SAUTER AHMO DC, **€ 490,-**
- **4** External impact sensor Type G. High energy sensor: 900 % impact energy compared to type D, SAUTER AHMO G, **€ 990,-**
- Support rings for bended testing samples available on request, SAUTER AHMR 01, **€ 320,-**
- **5** Impact body, SAUTER AHMO D01, **€ 115,-**
- Connection cable impact sensor, SAUTER HMO-A04, **€ 95,-**
- Test block Type D/DC, 90×50 mm (± 1 mm), net weight < 3 kg, hardness range
 - 790 \pm 40 HL, SAUTER AHMO D02, **€ 190,-**
 - 630 \pm 40 HL, SAUTER AHMO D03, **€ 190,-**
 - 530 \pm 40 HL, SAUTER AHMO D04, **€ 190,-**
- Paper roll, 1 piece, SAUTER ATU-US11, **€ 15,-**

STANDARD



OPTION



Model	Sensor	Measuring range	Readout	Price excl. of VAT ex works €	Option Factory calibration certificates	
					KERN	€
SAUTER HMO	Typ D	[Max] HL 170-960	[d] HL 1	1770,-	961-131	120,-