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HARDNESS TESTING OF METALS (UCI)

Ultrasonic contact impedance (UCI) hardness testing devices are filling wisely a void in the area of hardness testing.

This area of testing is, on one hand, dominated by mobile hardness testing devices which are using the Leeb procedure and, on the other hand, by stationary hardness testing devices which are predominantly carrying out destructive tests.

Because of the high demands required by this system on the minimum weight and thickness of the test object, the Leeb procedure is not suitable for the majority of tests for small test objects. A good example of this is hardness testing of the flanks of gear wheels. Often in this test, the question is whether the flanks have been hardened or whether the hardened layer has already been removed.

UCI hardness testing devices therefore are offering significantly better measurement performance at small test objects in comparison with Leeb hardness testing devices.

One advantage of the UCI hardness testing devices compared with stationary hardness testing machines is, that the test object does not have to be cut out of the whole object.

By using the optional support rings, the minimum weight of the test object can even be reduced from 300 g to 100 g.

By means of optional ISO calibration, SAUTER UCI hardness testing devices can be used not only for internal testing purposes but also for measurements where the results have to be changed externally.

Quick-Finder

Hardness scale	Model	Page
	SAUTER	
HV 1	**HO 1K**	82
HV 2	**HO 2K**	82
HV 5	**HO 5K**	82
HV10	**HO 10K**	82

PREMIUM ★★★

Premium UCI hardness testing device for Rockwell, Brinell and Vickers

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Mini statistics function: Display of the measuring result, the number of measurements, the maximum and minimum value as well as the average value and the standard deviation

Scope of delivery: Standard block for calibration (approx. 61 HRC), USB cable, display unit, UCI sensor unit, transport case, software to transfer the saved data to the PC, other accessories

Test stand for repeatable movements during testing. In this way you can avoid errors which could occur in manual handling of the sensor. This ensures even more stable measurements and more precise measuring results, see *Accessories*

Features

- Application: This ultrasound hardness testing device is ideally suited for mobile hardness testing, where the main emphasis is on obtaining rapid and precise results
- Principle: The SAUTER HO measures by using a vibrating rod which vibrates at ultrasonic frequency and is pressed onto the sample at a defined test force. At the lower end there is a Vickers indenter. Its resonant frequency increases, as soon as an indentation is created when it comes into contact with the sample. Through appropriate adjustment of the device, the resulting change in resonant frequency is matched with the corresponding Vickers hardness
- Examples: The SAUTER HO ultrasound hardness testing system is primarily used for measuring small forgings, castings, welding points, punched parts, casting tools, ball bearings and the flanks of gear wheels as well as for measuring the influence of warmth or heat
- Advantages compared with Rockwell and Brinell: Almost non-destructive testing by smaller test force and thus only microscopic indentation craters
- Advantages compared with Vickers: Demanding optical measuring is not required. You can therefore carry out measurements directly on-site, for example, on a permanently installed workpiece
- Advantages compared with Leeb: The high requirements concerning the proper weight of the test object can be widely omitted
- Standards: The device meets following technical standards: DIN 50159-1; ASTM-A1038-2005; JB/T9377-2013
- Measurement data memory saves up to 1000 measurement groups each with 20 individual values
- Calibration: The device can be set to both standard hardness test blocks as well as to up to 20 reference calibration values. When doing this it is possible to measure different materials quickly, without having to re-adjust the device to the individual materials

Technical data

- Measuring ranges: HRC: 20,3–68; HRB: 41–100; HRA: 61-85,6; HV: 80–1599; HB: 76–618; Tensile strength: 255–2180 N/mm^2
- Measurement precision: ± 3 % HV; ± 1,5 HR; ± 3 % HB
- Display units: HRC, HV, HBS, HBW, HK, HRA, HRD, HR15N, HR30N, HR45N, HS, HRF, HR15T, HR30T, HR45T, HRB.
- Rechargeable battery pack integrated, as standard, operating time up to 12 h without backlight, charging time approx. 8 h
- Minimum weight of the test object: 300 g for direct measurement with the sensor (included); 100 g with supporting ring (optional)
- Minimum dimensions the test surface size around: approx. 5×5 mm (recommended)
- Overall dimensions W×D×H 28×83×160 mm
- Net weight approx. 0,95 kg

Accessories

- External impact sensor Type D, as standard, can be reordered, SAUTER AHMO D
- 5 Calibration and adjustment plate (hardness test blocks) with defined and tested steel hardness for regular testing and adjustment of hardness testing devices. The hardness values are indicated. A key feature of the plates is the low-granular, homogenous finish of the steel, ⌀ 90 mm
  28 to 35 HRC, SAUTER HO-A09
  38 to 43 HRC, SAUTER HO-A10
  48 to 53 HRC, SAUTER HO-A11
  58 to 63 HRC, SAUTER HO-A12
- 6 Test stand for repeatable movements during testing. Smooth-running mechanical system, stroke length 34 mm, maximum height of the test object within the test stand 240 mm, swivel probe device for measurements outside the base plate, very robust construction, net weight approx. 9 kg, SAUTER HO-A08
- Motorised probe. Enables testing at the touch of a button while maintaining the same procedure (while stocks last)
  HV 0,3, SAUTER HO-A15
  HV 0,5, SAUTER HO-A16
  HV 0,8, SAUTER HO-A17
  HV 1, SAUTER HO-A18

SAUTER HO 1K, HO 2K

- 1 Support ring, flat, SAUTER HO-A04N
- 2 Support ring, small cylinder, ⌀ 8-20 mm, SAUTER HO-A05N
- 3 Support ring, large cylinder, ⌀ 20-80 mm, SAUTER HO-A06N

SAUTER HO 5K, HO 10K

- 1 Support ring, flat, SAUTER HO-A04
- 2 Support ring, small cylinder, ⌀ 8-20 mm, SAUTER HO-A05
- 3 Support ring, large cylinder, ⌀ 20-80 mm, SAUTER HO-A06
- 4 Deep-hole protective cover, SAUTER HO-A07

STANDARD

OPTION

Model	Hardness scale	Min. weight of test item	Min. thickness of test item	Option **Factory calibration certificate**
SAUTER		g	mm	KERN
HO 1K	HV 1	300	2	961-270
HO 2K	HV 2	300	2	961-270
HO 5K	HV 5	300	2	961-270
HO 10K	HV 10	300	2	961-270