

# HARDNESS TESTING OF PLASTICS (SHORE)

PROFESSIONAL  
MEASURING



2020

# KERN Pictograms

- 
**Adjusting program (CAL):**  
 For quick setting of the instrument's accuracy. External adjusting weight required
- 
**Data interface Infrared:**  
 To transfer data from the measuring instrument to a printer, PC or other peripheral devices
- 
**Protection against dust and water splashes IPxx:**  
 The type of protection is shown in the pictogram.
- 
**Calibration block:**  
 standard for adjusting or correcting the measuring device
- 
**Control outputs (optocoupler, digital I/O):**  
 to connect relays, signal lamps, valves, etc.
- 
**ZERO:**  
 Resets the display to "0"
- 
**Peak hold function:**  
 capturing a peak value within a measuring process
- 
**Analogue interface:**  
 to connect a suitable peripheral device for analogue processing of the measurements
- 
**Battery operation:**  
 Ready for battery operation. The battery type is specified for each device
- 
**Scan mode:**  
 continuous capture and display of measurements
- 
**Analog output:**  
 for output of an electrical signal depending on the load (e.g. voltage 0 V - 10 V or current 4 mA - 20 mA)
- 
**Rechargeable battery pack:**  
 rechargeable set
- 
**Push and Pull:**  
 the measuring device can capture tension and compression forces
- 
**Statistics:**  
 using the saved values, the device calculates statistical data, such as average value, standard deviation etc.
- 
**Mains adapter:**  
 230V/50Hz in standard version for EU. On request GB, AUS or USA version available
- 
**Length measurement:**  
 captures the geometric dimensions of a test object or the movement during a test process
- 
**PC Software:**  
 to transfer the measurement data from the device to a PC
- 
**Power supply:**  
 Integrated, 230V/50Hz in EU. More standards e.g. GB, AUS or USA on request
- 
**Focus function:**  
 increases the measuring accuracy of a device within a defined measuring range
- 
**Printer:**  
 a printer can be connected to the device to print out the measurement data
- 
**Motorised drive:**  
 The mechanical movement is carried out by an electric motor
- 
**Internal memory:**  
 to save measurements in the device memory
- 
**Network interface:**  
 For connecting the scale to an Ethernet network
- 
**Motorised drive:**  
 The mechanical movement is carried out by a synchronous motor (stepper)
- 
**Data interface RS-232:**  
 bidirectional, for connection of printer and PC
- 
**KERN Communication Protocol (KCP):**  
 It is a standardized interface command set for KERN balances and other instruments, which allows retrieving and controlling all relevant parameters and functions of the device. KERN devices featuring KCP are thus easily integrated with computers, industrial controllers and other digital systems
- 
**Fast-Move:**  
 the total length of travel can be covered by a single lever movement
- 
**Profibus:**  
 For transmitting data, e.g. between scales, measuring cells, controllers and peripheral devices over long distances. Suitable for safe, fast, fault-tolerant data transmission. Less susceptible to magnetic interference.
- 
**Verification possible:**  
 The time required for verification is specified in the pictogram
- 
**DAkKS calibration possible:**  
 The time required for DAkKS calibration is shown in days in the pictogram
- 
**Data interface USB:**  
 To connect the measuring instrument to a printer, PC or other peripheral devices
- 
**GLP/ISO record keeping:**  
 of measurement data with date, time and serial number. Only with SAUTER printers
- 
**Factory calibration:**  
 The time required for factory calibration is specified in the pictogram
- 
**Bluetooth® data interface:**  
 To transfer data from the balance to a printer, PC or other peripherals
- 
**Measuring units:**  
 Weighing units can be switched to e.g. non-metric at the touch of a key. Please refer to website for more details
- 
**Package shipment:**  
 The time required for internal shipping preparations is shown in days in the pictogram
- 
**WLAN data interface:**  
 To transfer data from the balance to a printer, PC or other peripherals
- 
**Measuring with tolerance range (limit-setting function):**  
 Upper and lower limiting can be programmed individually. The process is supported by an audible or visual signal, see the relevant model
- 
**Pallet shipment:**  
 The time required for internal shipping preparations is shown in days in the pictogram

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## Sales conditions



**All prices are valid as of January 1st 2020** until a new version of the SAUTER catalogue is released. In Europe, all prices do not include the applicable V.A.T.

**At SAUTER there is no minimum order value.** For orders less than € 15.00 there is no re-sale discount available.

**Delivery Conditions:** we supply ex works Balingen, i.e. the transport costs are invoiced. Any goods supplied, remain SAUTER's property until Measuring in a tolerance area (limit value function). Upper and lower limit value is programmable. The measurement process is supported by an acoustic and visual signal, see respective models complete payment for the goods sold has been received.



Delivery is usually via courier service.



When you see this symbol by truck, please ask for prices.

### Extract from general terms and conditions:

Court of jurisdiction/Legal domicile: 72336 Balingen, Germany;  
Commercial register N°: HRB 400865, AG Stuttgart;  
Managing director: Albert Sauter. For the full Terms and Conditions, please refer to the website. [www.kern-sohn.com/en/kern/agbs.html](http://www.kern-sohn.com/en/kern/agbs.html)

**Price changes and product changes** are likely in individual cases due to product modifications as well as error.

**Sale or return:** within 14 days of purchase. Not valid for order-specific adaptations such as special productions, cable extensions, special weights, etc. or test services such as calibration etc. Depending on the time and effort involved, there may be processing and storage costs, please ask for details.

**Warranty:** 2 years. (Does not apply to consumables such as batteries, rechargeable battery packs, etc.)

## After-Sales-Service



**Repair services** within 1 week at our plant in Balingen, transportation costs are additional. Our expert Service technicians will be pleased to assist you and will make sure that your device is quickly back in operation.

**Price reduction on a new device:** if repair costs are exceeding the current value of the defective device, a new device will be offered at a discount price. This offer is valid only up to 2 years after warranty expiration.

**Spare parts service** within 48 hours, transportation costs are additional.

## Visit us our online shop: [www.sauter.eu](http://www.sauter.eu)

### Online-Shop

At your disposal round the clock. Delivery and service via your specialist dealer.

### Measuring instruments Quick-Finde

Find the product you want with the "Measuring instruments Quick-Finder" in no time.

### Calibration

In our accredited DAkks calibration laboratories, we produce internationally recognised DAkks and Factory calibration certificates for balances and test weights as well as measuring instruments.



## Services



**KERN DirectCash:** The quick, secure COD procedure for protection against non-payment. With the KERN DirectCash COD system, you can safely deliver orders to end customers with unknown credit rating, with no risk of non-payment. Please request further details on this procedure.

### Hire Purchase

Financing is available using KERN hire purchase – easy and convenient.

Hire Purchase gives you the option of purchasing any product from the range against a simple monthly installment. The product value is financed over the period of the agreement. On payment of the last installment, the ownership of the contract item automatically transfers from the contractor to the contractee.

The Hire Purchase Agreement can – if you so choose – be set for a period of between one and five years. This package includes the transfer of items as well as the guarantee for the entire transfer period.

Compared with buying the product, KERN hire purchase offers the advantage that the initial financial investment is largely not applicable. This is particularly relevant when purchasing a number of products, for example when refitting a laboratory, a company department or a hospital ward. In addition the monthly installments constitute a direct cost and the item does not have to be capitalised by the purchaser. Do you have queries to our hire purchase? Our customer consultants are glad to help you.

## Marketing support



### Catalogues, brochures, branch prospectuses – your own personalised marketing tools

Our catalogue and branch prospectuses are available free of charge. A neutral version of the catalogue, without the SAUTER address imprint, is also available for your marketing activities free of charge, larger quantities on request..

On demand we will print your company address on address labels free of charge, for the backside of the catalogue, larger quantities on request. In this way you will receive your individual marketing tool.

Our catalogues and branch prospectuses are available in following languages: DE, GB, FR, IT, ES

### Special offers

Special offers, special models and opportunities – something for everybody and always up to date – just drop in!

### One-Stop-Shopping

From force gauge to test stand – everything from one supplier.

### Downloads

For each model there is an individual brochure, user manual or pictures.



## Hardness testing of plastics (Shore)

To determine the hardness of plastics, in 1915 Albert Shore developed an extremely simple process: A pin made of hardened metal and of a defined shape is held by a spring and is then pushed into the test item. Depending on the depth of the penetration, the material tested is either harder or softer. This procedure is described in DIN ISO 7619-1:2012.

Currently, there are two types of devices used for this test: Mechanical measuring devices with drag indicator and electronic measuring devices.

Both types of measuring devices can be operated with test stands (such as the SAUTER TI series). With a test stand, measurements can be carried out more consistently and accurately.

At this time, KERN does not calibrate Shore hardness testing instruments. As an alternative, we recommend that the measuring device is operated with a calibrated kit of hardness comparison plates (such as SAUTER AHBA 01).



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## Quick-Finder

Readout [d] HS	Measuring range [Max] HS	Hardness type	Model  SAUTER	Price excl. VAT, ex works €	Page
1,0 HA	100 HA	A	<b>HBA 100-0.</b>	<b>105,-</b>	65
1,0 HA0	100 HA0	A0	<b>HBO 100-0.</b>	<b>135,-</b>	65
1,0 HD	100 HD	D	<b>HBD 100-0.</b>	<b>140,-</b>	65
0,1 HA	100 HA	A	<b>HDA 100-1.</b>	<b>375,-</b>	66
0,1 H0	100 H0	0	<b>HDO 100-1.</b>	<b>375,-</b>	66
0,1 HD	100 HD	D	<b>HDD 100-1.</b>	<b>375,-</b>	66
-	-	A/A0	<b>TI-AC.</b>	<b>240,-</b>	67
-	-	D	<b>TI-D.</b>	<b>300,-</b>	67
-	-	A/0	<b>TI-ACL</b>	<b>300,-</b>	67
-	-	D	<b>TI-DL</b>	<b>360,-</b>	67



## Compact handheld durometer with drag indicator

### Features

- Typical application: measurement of penetration (Shore)
- Particularly recommended for internal comparison measurement. Standard calibrations e. g. to DIN 7619-1 are not possible because of very narrow standard tolerances
- **Shore A** rubber, elastomers, neoprene, silicone, vinyl, soft plastics, felt, leather and similar material
- **Shore D** plastics, formica, epoxides, plexiglass etc.
- **Shore A0** foam, sponge etc.
- **Max mode:** Records the **peak value indication** by drag pointer
- Can be attached to the test stands SAUTER TI-AC (for Shore A and A0), TI-D. (for Shore D)
- Delivery in a plastic box
- The measuring tips are not interchangeable

### Technical data

- Measuring precision: 3 % of [Max]
- Dimensions W×D×H 60×25×115 mm
- Net weight approx. 160 g
- Screws to screw on to the TI: M7 fine thread
- Material thickness of the sample, min. 4 mm

### Accessories

- Shore comparison plates for testing and calibration of Shore hardness testing devices. By regular comparison, the measuring accuracy increases significantly.
- **7 hardness comparison plates** for Shore A, tolerance up to ± 2 HA, SAUTER AHBA-01, **€ 95,-**
  - **3 hardness comparison plates** for Shore D, tolerance up to ± 2 HD, SAUTER AHBD-01, **€ 75,-**
  - **Factory calibration of the comparison plates**, SAUTER 961-170, **€ 95,-**
  - **Test stand** for HBA and HB0, SAUTER TI-AC., **€ 240,-**
  - **Test stand** for HBD, SAUTER TI-D., **€ 300,-**

### STANDARD



Model	Hardness type	Measuring range		Price excl. of VAT ex works €
		[Max] HS	[d] HS	
<b>SAUTER</b>				
<b>HBA 100-0.</b>	Shore A	100 HA	1,0 HA	<b>105,-</b>
<b>HB0 100-0.</b>	Shore A0	100 HA0	1,0 HA0	<b>135,-</b>
<b>HBD 100-0.</b>	Shore D	100 HD	1,0 HD	<b>140,-</b>



## Professional Shore hardness tester

### Features

- **Shore A, 0 and D** to measure the hardness of plastics through penetration measurement
- **Shore A** rubber, elastomers, neoprene, silicone, vinyl, soft plastics, felt, leather and similar material
- **Shore 0** foam, sponge
- **Shore D** plastics, formica, epoxides, plexiglass etc.
- **Delivered in a robust carrying case**
- Particularly recommended for internal comparison measurement. Standard calibrations e. g. to DIN 7619-1 are not possible because of very narrow standard tolerances
- Can be attached to the test stands TI-ACL (for Shore A and 0), TI-DL (for Shore D) to improve measuring uncertainty
- Large display with backlight
- Selectable: AUTO-OFF function or continuous operation, battery level indicator

### Technical data

- Tolerance: 1 % of [Max]
- Overall dimensions W×D×H 65×38×162 mm
- Net weight approx. 173 g
- Transfer via RS-232 to the PC, e.g. to Microsoft Excel®
- Battery operation, batteries standard 2× 1.5 V AAA
- Material thickness of the sample, min. 4 mm

### Accessories

- **Data transfer software**, interface cable included, SAUTER ATC-01, € 90,-
- **7 hardness comparison plates** for Shore A, tolerance up to ± 2 HA, SAUTER AHBA-01, € 95,-
- **3 hardness comparison plates** for Shore D, tolerance up to ± 2 HD, SAUTER AHBD-01, € 75,-
- **Factory calibration of the comparison plates**, SAUTER 961-170, € 95,-
- **Test stand** for HDA and HD0, SAUTER TI-ACL, € 270,-
- **Test stand** for HDD, see page 67, SAUTER TI-DL, € 360,-

#### STANDARD



#### OPTION



Model	Hardness type	Measuring range		Readout	Price excl. of VAT ex works €
		[Max] HS	[d] HS		
<b>SAUTER</b>					
HDA 100-1.	Shore A	100 HA	0,1 HA		375,-
HD0 100-1.	Shore 0	100 HO	0,1 HO		375,-
HDD 100-1.	Shore D	100 HD	0,1 HD		375,-



## Lever operated test stand for hardness testing with base plate made of glass

### Features

- For Shore hardness testing of plastics, leather etc.
- **1 Glass plate:** high measurement accuracy by means of superior hardness of the glass plate
- **2 Mechanical construction:** Robust design for precise measuring
- **3 Level adjustment:** For the precise levelling of the base plate, e.g. for the correction of inhomogeneous test objects
- **4 Test stand TI-DL,** with exchangeable longer column for use with digital hardness tester HD
- Hardness tester not included in delivery

- Operation:
  1. The SAUTER hardness testing device HB or HD is fitted in a suspended position
  2. The test object is placed on the round testing table right under the durometer measuring tip
  3. By pressing the lever down, the test weight will be released, and this then presses the measuring tip into the test object with its own weight (see table)
- The accuracy of the displayed result is approx. 25 % higher than in a manual operated test

### Technical data

- Stroke length: 15 mm
- Maximum test object height: 63 mm
- Base plate  $\varnothing$  75 mm
- Overall dimensions WxDxH
  - TI-AC: 150x110x330 mm
  - TI-D: 150x110x400 mm
  - TI-ACL: 150x110x380 mm
  - TI-DL: 150x110x450 mm

STANDARD



Model	Suitable for	Length of column	Poids de contrôle	Net weight approx.	Price excl. of VAT ex works €
<b>SAUTER</b>		mm	kg	kg	
TI-AC.	HBA, HBO	245	1	4,5	240,-
TI-D.	HBD	245	5	8,5	300,-
TI-ACL	HDA, HDO	300	1	4,5	300,-
TI-DL	HDD	300	5	8,5	360,-

## SAUTER service guarantee

“We at SAUTER are only satisfied when we’ve found the very best solution for you. After all, our heritage from the Swabian Jura Mountains and the famous inventive talent of the people that live here, means we have an exceptional reputation to maintain.”

### fast

- 24 hours delivery service – order today, on its way tomorrow
- Sales & service hotline from 8:00 am to 6:00 pm

### reliable

- 2 years warranty

### diverse

- One-stop-shopping: from force gauges up to light measuring instruments – everything from one supplier
- Quick as a flash, find the product you want with the “Measuring instruments Quick-Finder” at [www.sauter.eu](http://www.sauter.eu)



### www.sauter.eu

Information on current product availability, product data sheets, user instructions, useful knowledge, technical glossary, images and much for you to download, practical topic areas, which will guide you to the right product in your industry as well as a smart search engine for measuring instruments



### Our team of consultants will assist you

from Monday to Friday  
 from 8:00 am to 6:00 pm

## Do you have questions about our products?

Our customer consultants will be pleased to assist you:

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### DAkKS Calibration Service



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### Technical Service

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 SAUTER measuring instruments, test benches,  
 force measuring accessories (clamps etc.),  
 SAUTER software