ORION® D200 mobile rebound hardness tester (DIN 50156)

Separate impact unit type D and wireless printer

Application:
For determining and directly displaying hardness values in line with HL (Leeb), HB, HV, HRB (Rockwell B), HRC, HS (Shore) and tensile strength in N/mm². Suitable for large components made from steel, stainless steel, cast iron, aluminium alloys, brass, bronze and copper forged alloys from a mass of approx. 5 kg upwards.

Execution:
- Separate impact unit type D, HM ball diameter 3 mm
- Backlit, 3.9", colour, LCD touch screen display (240 x 320 pixels)
- Individual value and mean value display, absolute range, no. of measurements
- Dynamic rebound method in line with ASTM A956 and DIN 50156
- Probe test direction can be selected depending on the position of the surface being measured
- internal memory for 500 measurements
- Wireless printer
- Material groups: 1.) Low-alloy/unalloyed steel, 2.) Tool steel, 3.) Corrosion-resistant steel, 4.) Grey cast iron GG, 5.) Spheroidal cast iron, 6.) Aluminium cast alloys, 7.) Brass, 8.) Bronze, 9.) Copper forged alloys, 10.) Forged steel

Advantage:
- Standard conversion tables integrated in the device are split into ten material groups
- Hardness values are immediately displayed according to a pre-defined hardness scale
- Wireless printer for documenting individual measurements or measurement series

Delivery:
Display unit, separate impact unit, hardness reference block, wireless printer, charger, cleaning brush, USB cable, stylus, software and transport case.

Notes:
Components with a reduced mass of < 5 kg must be suitably positioned vibration-free on a large metal subsurface.

Measuring range (low-alloy steel)		560-950 HL | 81-955 HV | 81-654 HB | 32.5-97.9 HS | 38.4-99.5 HRB | 20-68.4 HRC | 375-2639 N/mm²
Hardness accuracy		± 6 HL
Hardness revolution		1 HL | 1 HB | 1 HV | 1 N/mm² | 1 HS | 0.1 HRC | 0.1 HRB
Rechargeable battery/battery designation		1.2 V NiMH AAA
Length x width x height		130 x 87 x 28 mm
42160...	Ident. No.	095
		●

Prod. Gr. 423

ORION® D400 mobile rebound hardness tester (DIN 50156)

Separate impact unit type D

Application:
For determining and directly displaying hardness values in line with HL (Leeb), HB, HV, HRB (Rockwell B), HRC, HS (Shore) and HRA. Suitable for large components made from steel, stainless steel, cast iron, aluminium alloys, brass, bronze and copper forged alloys from a mass of approx. 5 kg upwards.

Execution:
- Separate impact unit type D, HM ball diameter 3 mm
- Backlit LCD display (128 x 64 pixels)
- Individual value and mean value display, absolute range, no. of measurements
- Dynamic rebound method in line with ASTM A956 and DIN 50156
- Probe test direction can be selected depending on the position of the surface being measured
- internal memory for 1974 measurements
- Material groups: 1.) Low-alloy/unalloyed steel, 2.) Tool steel, 3.) Corrosion-resistant steel, 4.) Grey cast iron GG, 5.) Spheroidal cast iron, 6.) Aluminium cast alloys, 7.) Brass, 8.) Bronze, 9.) Copper forged alloys

Advantage:
- Standard conversion tables integrated in the device are split into nine material groups
- Hardness values are immediately displayed according to a pre-defined hardness scale

Delivery:
Display unit, separate impact unit D, hardness reference block (HLD value), software with connecting cable, batteries, coupling compound, cleaning brush and transport case.

Notes:
Components with a reduced mass of < 5 kg must be suitably positioned vibration-free on a large metal subsurface.

Measuring range (low-alloy steel)		200-900 HL | 80-940 HV | 80-650 HB | 32-100 HS | 60-100 HRB | 20-68 HRC | 59-86 HRA
Hardness accuracy		± 4 HL (0.5% at 800 HL)
Hardness revolution		1 HL | 1 HB | 1 HV | 1 HS | 0.1 HRC | 0.1 HRB
Rechargeable battery/battery designation		1.2 V Mignon AA
Length x width x height		122 x 65 x 22 mm
Memory (measurements) (PCS)		1974
42160...	Ident. No.	115
		●

Prod. Gr. 423

ORION® Mobile UCI UCI-3000 hardness tester (DIN 50159)

Separate manual sensor

Application:
For determining and directly displaying hardness values in line with HB (Brinell), HV (Vickers), HRA (Rockwell A), HRB (Rockwell B), HRC (Rockwell), HS (Shore) on metallic materials. Ideal for fine-grain materials and alloys. Includes 50 N standard probe for performing e.g. hardness tests on nitride-hardened, case-hardened and high-frequency-hardened parts and coating tests (from 30 microns with 10 N probe). Suitable test attachments are optionally available for curved surfaces.

Execution:
- Includes separate 50 N manual probe, Vickers 136° indenter
- Manual probe 145 mm long
- Colour LCD display, backlit
- Individual, min./max and mean value display, with graphic diagrams
- Applied Vickers method in line with ASTM A 1038 or DIN 50159
- Memory for 12,900 measurements divisible into 100 blocks
- USB interface
- Software UCI 3000
- Further manual probes 10 N and 98 N are available upon request

Advantage:
- For all test devices without correction value input
- Standard conversion tables integrated in the device
- Hardness values are immediately displayed according to a pre-defined hardness scale
- 3 freely selectable scales for individual material adjustments

Delivery:
Display unit, standard probe 50 N, rechargeable battery, charger, USB connecting cable, CD with software for data transmission and evaluation in Excel, transport case

Min./max. HV measuring range		240-940 HV
Min./max. HRC measuring range		20-70 HRC
Min./max. HB measuring range		90-460 HB
DIN		50159
Hardness accuracy		HB 4% | HV 3% | HRC 1.5%
Memory (measurements) (PCS)		12900
Hardness revolution		1 HB | 1 HV | 0.1 HRC | 0.5 HRC | 1 HRC | 0.1 HRB | 0.5 HRB | 1 HRB
Testing method		Vickers
Vickers pyramid (Degree)		136
Min./max. working temperature		-10 to 40 °C
Display type		Colour LCD display
Backlight		Yes
Data transmission type		USB
Number of rechargeable batteries/batteries (PCS)		1
Rechargeable battery/battery designation		9 V block; 6LR61; 6AM6
42170...	Ident. No.	**610**
		●

Prod. Gr. 423

ATORN® SHORE hardness testers (ISO 868)

Shore A for soft materials and Shore D for hard materials

Application:
Ident. No. 100: For determining Shore A hardness in line with DIN ISO 7619-1, ISO 7619-1, ISO 868 and ASTM D 2240. Suitable for e.g. soft rubber, elastomers, natural rubber, neoprene, polyester, cast resins etc.
Ident. No. 110: For determining Shore D hardness in line with DIN ISO 7619-1, ISO 7619-1, ISO 868 and ASTM D 2240. Suitable for e.g. hard rubber, acrylic glass, stiff thermoplastics, Formica, vinyl sheets, cellulose/acetate, hard rubber materials etc.

Execution:
- Trailing pointer
- Large glare-free display rotates through 360°
- Accurate to 0.5 hardness units

Advantage:
- Ergonomic handles for excellent handling

Ident. No. 100

Ident. No. 110

Model		HD-3000 Shore A	HD-3000 Shore D
Scale value, Shore		1	1
Shore error limit		± 0.5	± 0.5
Meter Ø (mm)		57	57
Trailing pointer		Yes	Yes
Contact force (DIN 53505) (N)		12.5	50
42195...	Ident. No.	**100**	**110**
		●	●

Prod. Gr. 426

ATORN® Test sample set
for Shore hardness testers

Application:
For checking Shore hardness testers

Execution:
- Incl. factory calibration certificate

Ident. No. 140

Ident. No. 150

Number of test samples (PCS)			7	3
Shore hardness range			30 | 40 | 50 | 60 | 70 | 80 | 90	60 | 75 | 85
42195...	ATORN test sample set Shore A	Ident. No.	140 ●	-
42195...	ATORN test sample set Shore D	Ident. No.	-	150 ●

Prod. Gr. 426

ATORN® Test stand for Shore hardness tester

Application:
For mounting ATORN SHORE hardness testers. Ideal for accurate and reproducible individual and series measurements.

Execution:
- Robust aluminium test unit
- Height adjustable

Advantage:
- Tilt lever for shock-free and constant test force

Overhang (mm)			115
Test table Ø (mm)			98
Max. sample thickness (mm)			180
Test unit material			Alu construction
42195...	ATORN test stands for Shore hardness tester	Ident. No.	120 ○

Prod. Gr. 426

Test stand with SHORE A hardness tester

ATORN® Shore D loading weight
For ATORN test stands

Loading weight (g)			4000
Load weight material			Stainless steel A2, 1.4305
42195...	ATORN loading weight Shore D	Ident. No.	130 ○

Prod. Gr. 426

Hardness comparison plates

Periodic testing of hardness testing devices

Periodic testing is an important part of monitoring hardness testing devices in terms of the quality management system and must be performed with calibrated and certified hardness reference plates in accordance with ISO 6506-3:2015 (Brinell, part 1 appendix), ISO 6507-3:2005 (Vickers part 1 appendix), ISO 4545-3 (Knoop), ISO 6508-3:2015 (Rockwell part 1 appendix), ASTM E10-14 (Brinell), ASTM E18-15 (Rockwell) and ASTM E384-11 (Vickers and Knoop), and must be documented accordingly.

To avoid a potential systematic measurement error, the test parameters must be derived from the associated certificate. Without a certificate, hardness reference plates are practically useless.

This check is required each time the machine settings are changed, e.g. after switching the test procedure or the indenter. In addition, at least 1 or 2 test impressions are required per (working) day, per hardness range and hardness scale. Documentation is normatively prescribed or at the very least strongly recommended, as an audit usually includes a review of the documentation of the results of periodic testing. Please consult the corresponding currently applicable standards for further information.

Hardness reference plates (ISO DIN EN ISO 6506-3)

test procedure HBW

Application:
For indirect and periodic checking of functionality and measurement inaccuracy of hardness testers in line with the HBW test method.

Execution:
- Fine-grained, homogeneous steel
- DAkkS certificate

Notes:
HBW 2.5, triangular, 70 x 70 x 6 mm, HBW 5/HBW 10 with hardness value 150, rectangular, 150 x 100 x 16 mm, HBW 5/HBW 10 from hardness value 200, square, 100 x 100 x 16 mm

Technical data:
- ISO: DIN EN ISO 6506-3

Ident. No. 002–020, 040

Ident. No. 022–030, 042–054

	HBW 2.5/187.5		HBW 5/750		HBW 10/3000	
Testing method	HBW		HBW		HBW	
Ball Ø (mm)	2.5		5.0		10.0	
Test force (N)	1838.74		7355		29420	
Hardness value	**42365...** Ident. No.		**42365...** Ident. No.		**42365...** Ident. No.	
150	**002**	●	**020**	○	**040**	○
200	**004**	●	**022**	●	**042**	●
250	**006**	●	**024**	●	**044**	●
300	**008**	●	**026**	○	**046**	●
350	**010**	●	**028**	○	**048**	○
400	**012**	●	**030**	○	**050**	●
450	**014**	○	-	-	**052**	○
500	-	-	-	-	**054**	○

Prod. Gr. 424

Hardness reference plates (ISO DIN EN ISO 6507-3)

test procedure HV

Application:
For indirect and periodic checking of functionality and measurement inaccuracy of hardness testers in line with the HV test method.

Execution:
- Fine-grained, homogeneous steel
- DAkkS certificate

Notes:
HV 1 to HV 10, triangular, 35 x 35 x 35 x 6 mm, HV 30, triangular, 70 x 70 x 70 x 6 mm

Technical data:
- ISO: DIN EN ISO 6507-3

Ident. No. 138–196

Ident. No. 198–210

	HV 1		HV 3		HV 5		HV 10		HV 30	
Testing method	HV 1		HV 3		HV 5		HV 10		HV 30	
Hardness value	42365... Ident. No.		42365... Ident. No.		42365... Ident. No.		42365... Ident. No.		42365... Ident. No.	
240	138	○	-	-	168	○	184	●	198	●
300	140	●	-	-	170	○	186	●	200	●
400	142	○	158	○	172	●	188	●	202	●
540	144	●	160	○	174	●	190	●	204	●
620	146	●	-	-	176	○	192	●	206	○
720	148	●	164	●	178	●	194	●	208	●
840	150	●	166	○	-	-	196	●	210	○

Prod. Gr. 424

Hardness reference plates (ISO DIN EN ISO 6508-3)

Test procedure HRA

Application:
For indirect and periodic checking of functionality and measurement inaccuracy of hardness testers in line with the HRA test method.

Execution:
- Fine-grained, homogeneous steel

- Square, 60 x 60 x 16 mm
- DAkkS certificate

Technical data:
- ISO: DIN EN ISO 6508-3

Hardness value				60	70	80
		Testing method				
42365...	HRA	HRA	Ident. No.	302 ○	304 ○	306 ●

Prod. Gr. 424

Hardness reference plates (ISO DIN EN ISO 6508-3)

Test procedure HRB

Application:
For indirect and periodic checking of functionality and measurement inaccuracy of hardness testers in line with the HRB-W test method.

Execution:
- Fine-grained, homogeneous steel

- Square, 60 x 60 x 16 mm
- DAkkS certificate

Technical data:
- ISO: DIN EN ISO 6508-3

Hardness value				60	90	100
		Testing method				
42365...	HRB	HRB-W	Ident. No.	312 ●	316 ●	318 ○

Prod. Gr. 424

Hardness reference plates (ISO DIN EN ISO 6508-3)

Test procedure HRC

Application:
For indirect and periodic checking of functionality and measurement inaccuracy of hardness testers in line with the HRC test method.

Execution:
- Fine-grained, homogeneous steel

- Square, 60 x 60 x 16 mm
- DAkkS certificate

Technical data:
- ISO: DIN EN ISO 6508-3

Hardness value				20	30	40	45	50	55	60	62/63	65
		Testing method										
42365...	HRC	HRC	Ident. No.	320 ●	322 ●	324 ●	326 ●	328 ●	330 ●	332 ●	334 ●	336 ●

Prod. Gr. 424

Ultrasonic cleaning devices

Fundamentals:
Ultrasonic cleaning is one of the most modern cleaning methods available. It achieves maximum cleanliness of the treated parts, even in hard-to-reach areas, yet is extremely gentle to the material being cleaned.

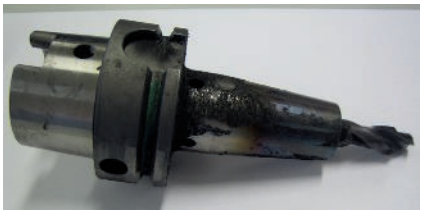
Optimum ultrasonic cleaning depends essentially on four factors:
- Cleaning device
- Cleaning chemicals
- Temperature
- Time

Applications:
- Suitable for removing grease, oils, fluxes, grinding and polishing abrasives, paint residue, oxide layers, scales etc.
- Can be used for ferrous and non-ferrous materials, plastics, glass etc. (mechanical, electronic, optical and medical components)

Ultrasonic cleaning terms
- **Ultrasonic vibrating systems:** high-frequency (HF) energy is produced by an ultrasonic generator, converted into mechanical energy by piezoelectric vibrating systems and added to the bath fluid. This creates millions of microscopic vacuum bubbles that implode as a result of pressure fluctuations. Highly effective fluid flows (jets) are generated that remove dirt particles from the surfaces of immersed items.
- **Sweep function:** this function produces homogeneous sound field distribution by continuously shifting of the sound field maxima. The result is an optimal distribution of cleaning performance in the cleaning bath.
- **Degas and auto-degas function:** fresh cleaning fluid is saturated with air. The bath fluid is degassed to optimise the effect of ultrasound.
- **Pulse function:** can be switched on to increase electronic performance. Compared to the sweep function, approx. 20% more vacuum bubbles (model series xtra ST, XL and X-tra line).
- **Dynamic function:** interplay between sweep and pulse function. The ultrasonic output increases temporarily by up to 20%. Ideal for stubborn dirt. (Model series xtra TT, xtra ST).

Selecting a suitable cleaning tub:
The useful dimensions of the cleaning tub, eventually also of the cleaning basket, depend on the dimensions of the parts to be cleaned and their positioning in the cleaning tub!

Can be used to lean individual parts, multiple parts at the same time or bulk materials. Either a cleaning basket or a handling device with an appropriate fixture for attaching the items to be cleaned can be used in the bath.



Ultrasonic single-frequency cleaning device USR S

single frequency device without heating system

Application:
USR S model ultrasonic cleaning devices without heating systems are designed as single-frequency devices. They are used primarily in laboratories for special applications and/or simple cleaning work in workshops/production facilities. These tasks include cold-cleaning of temperature-sensitive parts, cleaning dusty and lint-covered materials, removing swarf, soot and scale and removing dirt that can be dissolved without using heated cleaning media.

Execution:
- Single-frequency devices 37 kHz
- Table-mounted device with controls on front
- Ultrasonic bath made from special, highly cavitation-proof stainless steel

Advantage:
- Sweep function facilitates homogeneous sound distribution in cleaning bath and improves cleaning performance
- Autodegas/degas functions for rapid degassing
- Integrated fill level marking

Delivery:
Ultrasonic cleaning device basic unit USR S without cover and insert basket. (Exception: USR S/10 incl. plastic cover)

Model				USR S 10	USR S 30
Max. tray contents (l)				0.8	2.75
Tray width (inner) (mm)				190	240
Tray depth (inner) (mm)				85	137
Tray height (inner) (mm)				60	100
Effective ultrasonic capacity (W)				30	80
Max. ultrasound peak capacity (W)				240	320
Max. power drain (W)				30	80
Single frequency (kHz)				37	37
Min./max. nominal voltage				220 / 240 V/AC	220 / 240 V/AC
Outlet connection (in)				0	3/8
Ultrasonic single-frequency cleaning device USR S	**43690...**		Ident. No.	**011** ●	**031** ●
Ultrasonic cleaning device basket	**43690...**	stainless steel insert basket	Ident. No.	**211** ●	**231** ●
Ultrasonic cleaning device covers	**43690...**	Plastic standard cover	Ident. No.	-	**131** ●
Ultrasonic cleaning device immersion baskets for USR	**43690...**	Hostalen immersion basket	Ident. No.	**311** ●	**311** ●
	43690...	Stainless steel immersion basket	Ident. No.	**411** ●	**411** ●

Prod. Gr. 432

Source: Hahn+Kolb Werkzeuge GmbH
Technical data subject to change.
Availability subject to country specific rules and regulations.