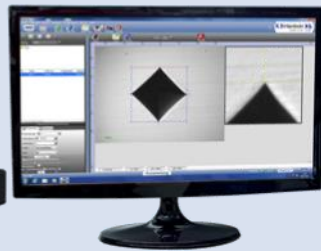




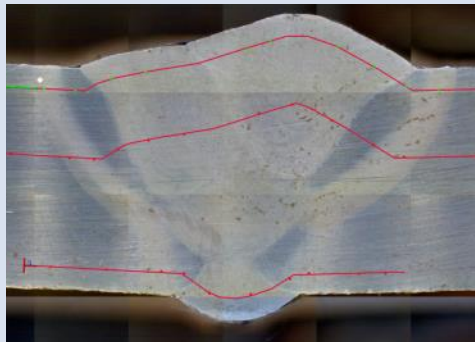
KB 250-750 MHSR Hardness Testing Range 0,2 kgf - 750 kgf



KB 250 MHSR FA Universal Fully Automatic



KB 750 MHSR Video Universal Single Measurement



KB 250-750 MHSR

VIDEO, SA, FA


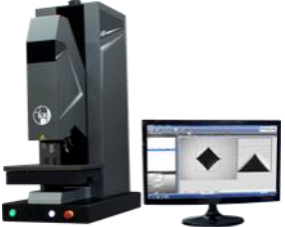
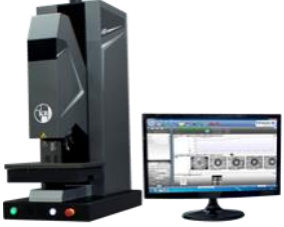
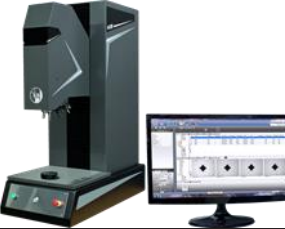
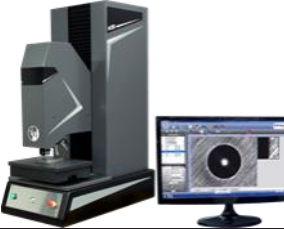
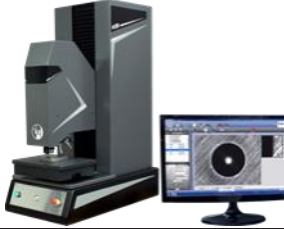
6-fold Automatic Turret

8-fold Automatic Turret

Universal
Hardness Testing Machine

Vickers
Knoop
Brinell
Rockwell

Hardness tester for micro, low load and macro range KB 250 MHSR

VIDEO	SA (semi automatic machine)	FA (fully automatic machine)
		
		
Control via PC	Control via PC Motorized X/Y-table	Control via PC Motorized X/Y-table
Software KB Hardwin XL Video	Software KB Hardwin XL Semi	Software KB Hardwin XL FA/ FA basic
5 MPs USB camera	5 MPs USB camera	5 MPs USB camera
7x optical zoom optional	7x optical zoom optional	7x optical zoom optional

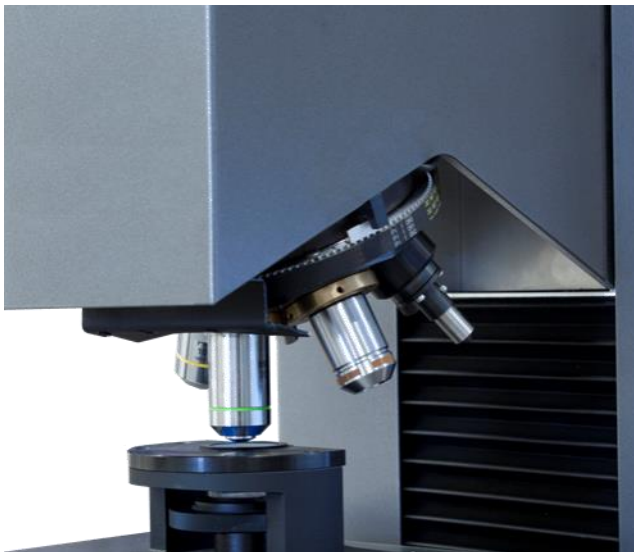
**KB Hardwin XL
BASIC**

**KB Hardwin XL
SEMI**

**KB Hardwin XL
FULLY**

The new generation of micro/macro hardness testing machines from KB Prüftechnik GmbH convince by **extraordinary precision and reproducibility**. The user enters a whole new world of hardness testing by the use of the new hardness testing software KB Hardwin XL. The KB hardness testing machines can superiorly test **Brinell, Vickers and Knoop**.

New innovative developments allow new possibilities of automation which combines the function of a fully automatic machine and a universal hardness tester in one machine. The configuration levels combined with numerous additional options suit the KB hardness

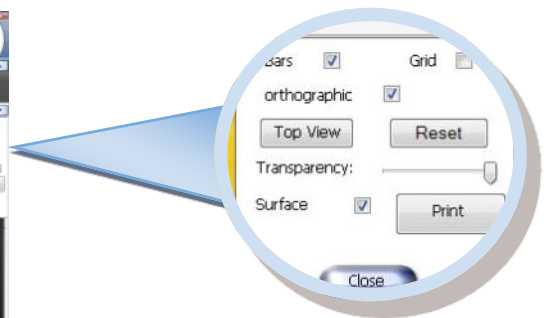
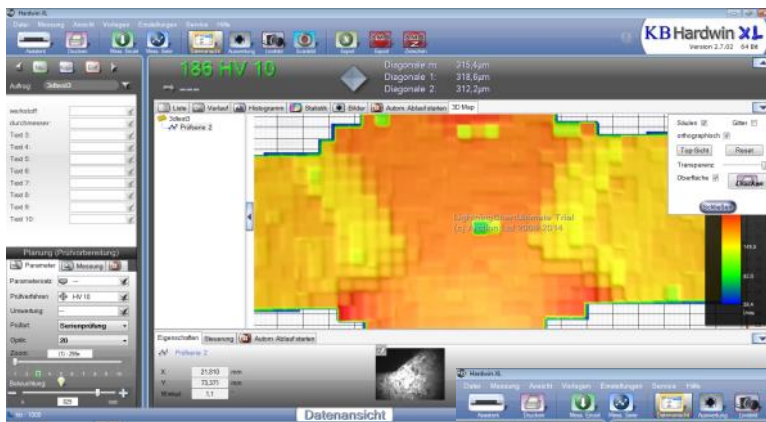


- Standard automatic 6-fold turret
- 6 freely configurable positions for KB 250 MHSR
- 8 freely configurable positions for KB 750 MHSR
- Fastest test tool change in 0,5 seconds
- High precision $1/2,5''$ 5 Megapixels camera 2500 x 2000
- Standard 4x digital zoom in three steps
- Flexible expansion stages starting with single measurements up to a fully automatic test process
- Data export in txt, Word, Excel, PDF
- Hierarchically structured user management
- Individually designable test reports
- Network capable
- Automatic load change

Options:

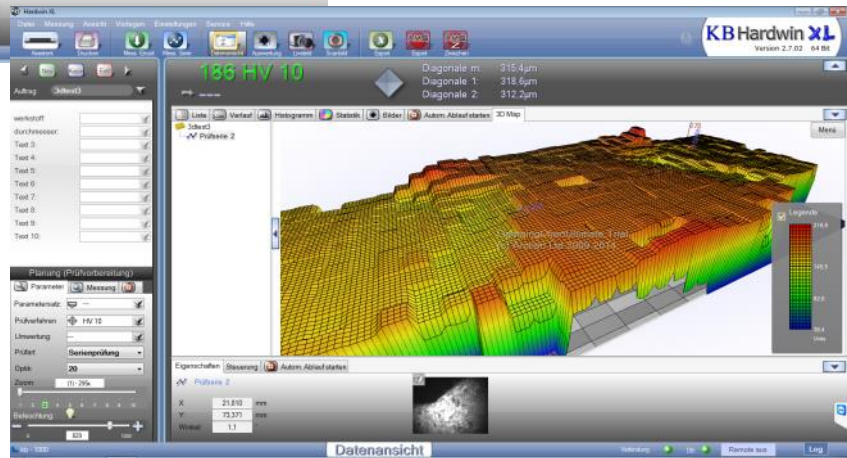
- Huge automatic X/Y-stage travel distance 300x200 mm
- Rotating indentation for testing thin coatings according to Knoop and Vickers
- Optional 7x optical zoom with 10 steps
- Suitable overview camera for each procedure

Mapping



The option mapping shows the hardness profile of the sample either in 2D or 3D.

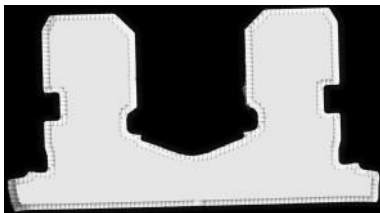
The operator can observe the hardness profile of the complete sample with one view.



Scanning with KB Hardwin XL and the KB X/Y-stage

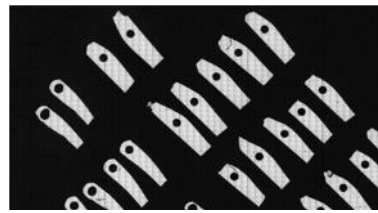
Contour scan with the microscope camera:

Just the outline contour of the sample will be scanned with the microscope camera. The single pictures will be assembled.



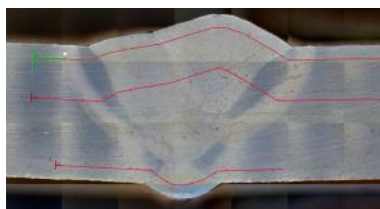
Area scan with the microscope camera:

The complete sample will be scanned with the microscope camera. The size of the scan area can be freely chosen. The single pictures will be assembled.



Area scan with the overview camera:

The complete sample will be scanned with the second camera. The size of the area can be freely chosen. The single pictures will be assembled.



Snapshot with the overview camera:

One single picture will be made by the overview camera.



Planning and operation

Menu navigation

- Perfect test process by a clearly arranged and user-oriented menu navigation
- Assistant for easy operation: Solve standard tasks quickly on your own
- Apply different magnifications and load steps in one test procedure



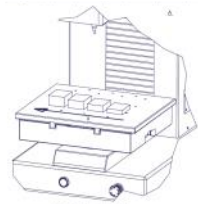
USB camera 5 Megapixels

The 5 Megapixels USB camera achieves high quality pictures which are needed for the auto measurement. The 5 Megapixels camera enlarges the optical measuring range enormously due to more picture information.



Different sample height (for SA and FA)

Samples of different height can be tested automatically. They must be positioned ascending X-direction.



Load step change during one test procedure

Different load steps and magnifications can be applied during one test procedure without breaking into the test process.

		Nr.	Härte	Methode	Umgewert
Messwerte	1	450	HV 5	---	
	2	450	HV 5	---	
	3	457	HV 5	---	
	4	842	HV 1	---	
	5	717	HV 1	---	

Operating system

KB Hardwin XL supports Windows XP, Vista (32 bit), 7 (32 bit/ 64 bit) and 8. The use of a personal computer makes KB Hardwin XL network compatible.



Conversion tables

Conversion tables according to DIN 50150 and DIN EN ISO 18265 (without copper conversion) are basically included.

HB	Nmm ²
HRC	Nmm ²
HV	Nmm ²

Post-editing and archive

Measuring a substitution

There are three possibilities to re-measure an already existing indentation. Primarily, the image will be re-opened and then can be measured. The second possibility is to do a new picture of the old indentation on the live camera. Also a new indentation can be set on the sample. The new value replaces the old one.

Nr.	Härte	Methode	Umgewertet	Optik/Zoom
1	463	HV 0,05	---	80x
2	269	HV 0,05	---	80x
3	876			
4	404			

Fast access on filed test orders

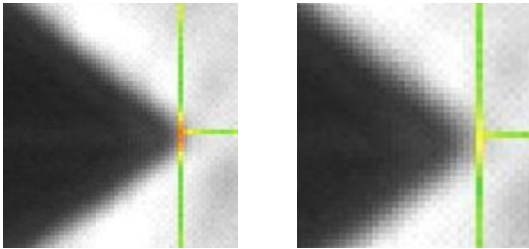
Pictures which belong to a previous test order can be re-addressed by one click.

		Nr.	Härte	Methode	Umgewertet	Optik/Zoom
Messwerte	1	624	HV 1	---	10x (8)	646,8x
	2	571	HV 1	---	10x (8)	646,8x
	3	536	HV 1	---	10x (8)	646,8x
	4	502	HV 1	---	10x (8)	646,8x
	5	520	HV 1	---	10x (8)	646,8x

Measurement

Operator independent manual measurement

Due to the pixel-precise display of the indentation picture and the coloured measuring marks each indentation is evaluated the same by each operator.

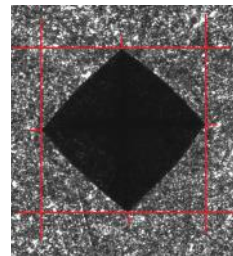


Red: too hard

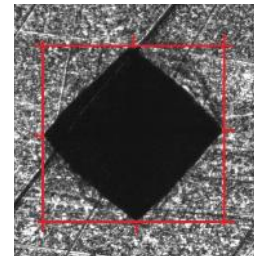
Yellow: ok

The improved automatic evaluation is now even more precise especially on not good surfaces.

Etched, sintered or scratched samples cannot interfere the automatic test procedure.



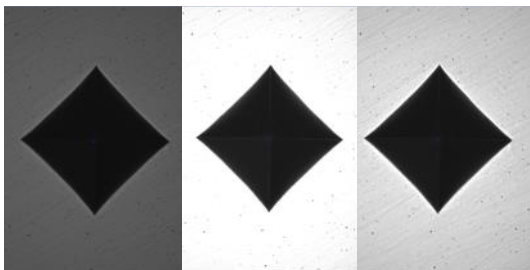
Etched surface



Scratched surface

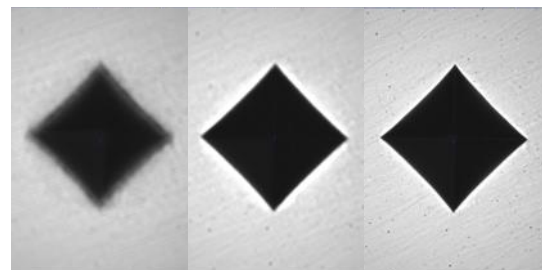
Automatic light control

High reproducibility and precision with the KB light control since the optimal illumination is achieved without operator influence. This is especially important at automatic test procedure when the sample surface or the magnifications are changing.



Unique auto focus

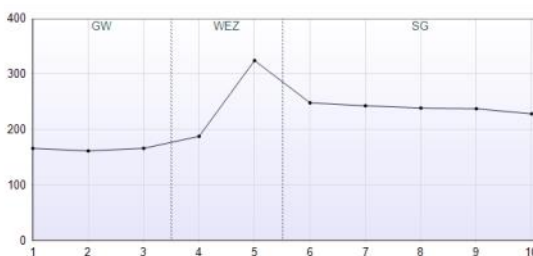
The KB auto focus works reliably, quickly and precisely. The correct position does not need to be set by the operator at first.



Welding test

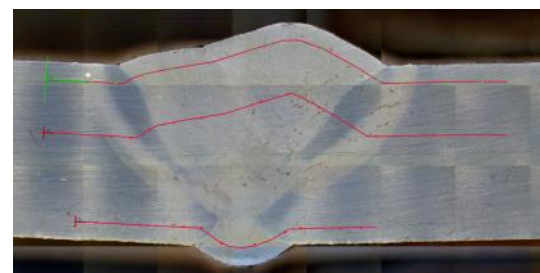
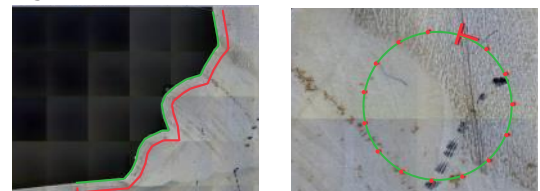
Diagram with display of the zones

The assigned zones will be shown in the diagram and the data evaluation.



Tools

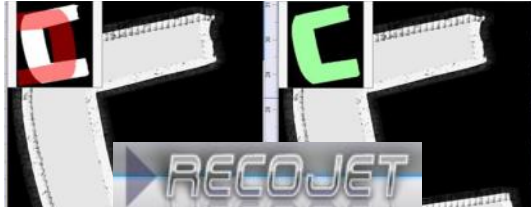
The polygonal tool, circle tool and splitter tool help to define the test orders individually, simple and according to the standards.



Software options

Part Recognition Reco Jet

- After the scanning the right previously saved counter line with pattern will be recognized.
- Position and angle will be identified accurately
- The pattern will be applied automatically on the right sample coordinates
- Extensive time saving since the pattern of samples has to be generated only one time.



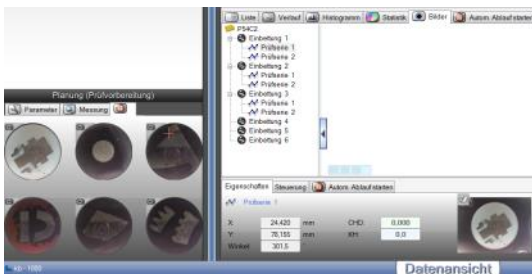
Magazine

Customized magazine patterns can be programmed to test several samples of one kind.



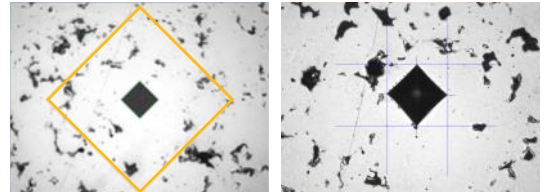
Multiple sample holder

In combination with the sample holder multiple samples can be automatically tested fast, simple and effective.



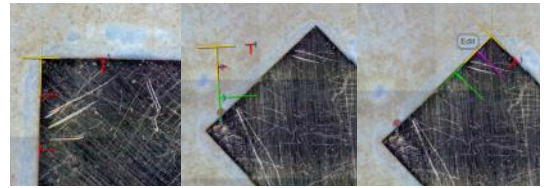
Sinter testing

- CHD tests on sinter material
- Average-values curve is supported
- Automatic elimination of minimum and maximum values
- Interactive elimination of disadvantageously set indentations
- Indentation coordinates will be interactively checked and can be corrected
- Visualisation of the expected indentation size and the acc. to standards allowed distance to the neighbour indentation



Quicklink

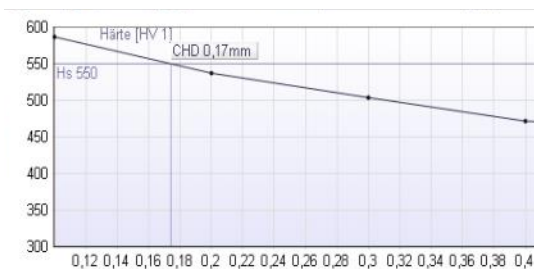
Adjust all test series of one pattern with one click. Orientation on significant points such as symmetry points, reference points, bench marks or pivotal points.



Pattern test

Fully automatic pattern test without any operator influence.


Time saving: The core hardness can be defined. If this value is reached, an adjustable number of indentations will be set before the test procedure will be completed.



Test report

Test Report

Demo - Protocol



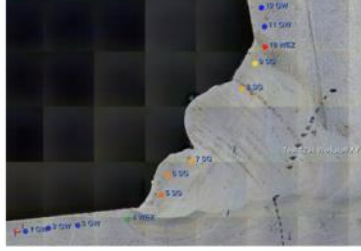

Name: 123

Testmethode: HV 10 Werkstoff: XY-A344

Kunde: Meyer AG Zeichnungs-Nr: A4-B5

Auftrags-Nr: 123-456-789 Prüfmittel-Nr: PM10-a

Lieferant: Schmitt Prüfer: Anna Musterfrau

Nr.	Härte	Position	Nr.	Härte	Position	Nr.	Härte	Position
1.	123							
1.	166	0.89	2.	162	2.81	3.	166	5.24
4.	188	9.46	5.	248	12.4	6.	243	13.13
7.	239	15.18	8.	238	20.01	9.	229	21.27
10.	270	22.25	11.	156	22.37	12.	153	22.29

Seite 1 von 1
Signature: *Anna Musterfrau*


Customized logos can be embedded

Number and content of the property labels are freely adjustable.

The selection of the picture depends on each type of report and can be adjusted to individual needs. If necessary the picture of each indentation can be displayed.

Diagrams and patterns can be integrated into the report.

Messwerte / Results



Name: Test 123

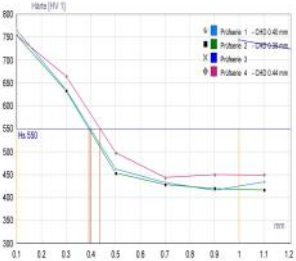
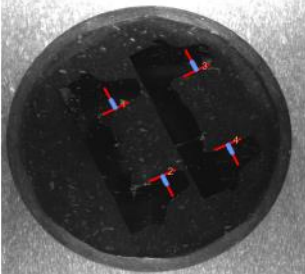
Testmethode: HV 1 Bediener: Hr. Müller

Auftrags-Nr: A358-C5 Schicht: N4

Material-Nr: M834-2X

Begleit-Nr: 62435-24573

Verfahren: CHD
Grenzhärte: 550
Kernhärte: 0.00

Nummer	Härte	Randabstand
1. Prüferserie 1 KH: 0.00 CHD: 0.40 mm		
1	765 HV 1	0.1 mm
2	635 HV 1	0.3 mm
3	462 HV 1	0.5 mm
4	433 HV 1	0.7 mm
5	416 HV 1	0.9 mm
6	434 HV 1	1.1 mm
2. Prüferserie 2 KH: 0.00 CHD: 0.39 mm		
1	754 HV 1	0.1 mm
2	633 HV 1	0.3 mm
3	454 HV 1	0.5 mm

Seite 1 von 2
Date / Signature

The test reports can be freely adjusted by the report generator.

KB includes the generator in each software packet with standard report types. Special test report types can be programmed on request.

The test reports can also be programmed by the operator if required.

The file format of the report can be chosen between PDF, Excel, RTF, JPEG, PNG, EMF, TTY, CSV XML etc.

Data management

Data export

The data export is supported by **html**, **pdf**, **Excel**, **Word** or **txt**.



Scanner

KB Hardwin XL supports bar code scanner as well as QR code scanner.

Thus, the sample data can be easily downloaded.



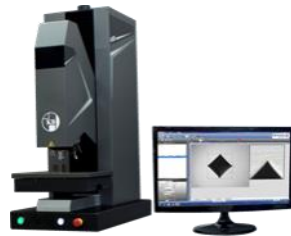
Automated data management



Sample with bar or QR code on the lot slip



The code will be scanned and the saved order information and parameters will be downloaded of the ERP server.



The test order will be processed.




The measuring results will be exported and saved on the ERP server.



Load steps (controlled by one load cell)

 **Vickers** acc. to DIN EN ISO 6507 and ASTM E 384

Laststufe	0,2	0,3	0,5	1	2	3	5	10	20	30	40	50	60	80	100	120
KB 250 MHSR																
KB 750 MHSR																

 **Knoop** acc. to DIN EN ISO 6505 and ASTM E 384

Laststufe	0,2	0,3	0,4	0,5	0,6	0,7	0,8	0,9	1
KB 250 MHSR									
KB 750 MHSR									

 **Brinell** acc. to DIN EN ISO 6506 and ASTM E 10

Laststufe	1/1	1/1,25	1/2,5	1/5	1/10	1/30	2,5/6,25	2,5/15,625	2,5/31,25	2,5/62,5	2,5/187,5	5/25	5/62,5	5/125	5/250	5/750	10/125	10/250	10/500	
KB 250 MHSR																				
KB 750 MHSR																				



Rockwell (optional) acc. to DIN EN ISO 6508, ASTM D 785 and ASTM E 18

HRA- HRB- HRC- HRD- HRE- HRF- HRG- HRH- HRK- HRL- HRM- HRP- HRR- HRS- HRV	HR 15/ 30/ 45 W
---	-----------------

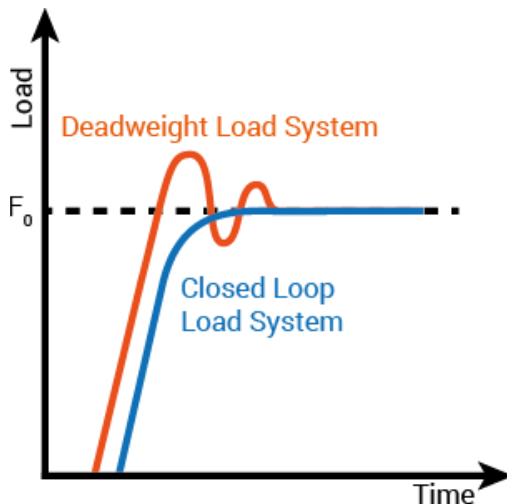


Kugeldruckhärte acc. to DIN ISO 2039 T1 for plastic material

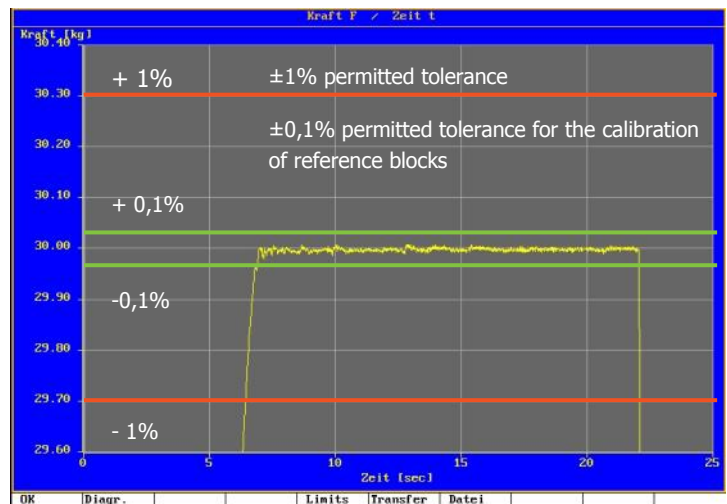
HR 15/ 30/ 45 N	HR 15/ 30/ 45 X
HR 15/ 30/ 45 T	HR 15/ 30/ 45 Y

What does load control mean?

- Load control is the **load application** controlled by **one load cell**:
Due to the closed loop system the KB 250-750 MHSR series achieves a high precision test load range from 0,2 kgf to 750 kgf without load variation.
- **Maximum Precision:**
The KB hardness testing machines apply the load controlled by a closed loop system. The **controlled load application** provides more accurate loads compared to a position controlled load application because the load will be supervised during the complete test procedure.
- **Load application times: Flexible and according to the standard**
The load application time can be **individually adjusted**.
- **Advantages compared to a deadweight system:**
In the closed loop load system the test load which is applied on the indenter will be constantly measured and adjusted.
- **No overshoot behaviour**

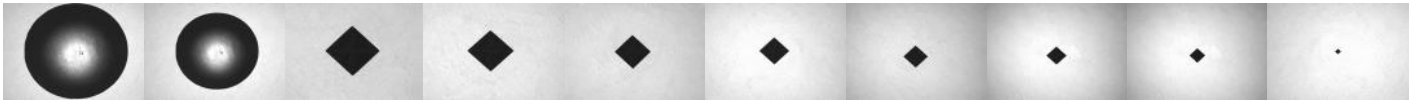


Systematical comparison deadweight to load controlled system



Load control on a KB 250 with 30 kgf

KB optical zoom



Optical magnification

The KB 250 MSHR is optionally equipped with the **KB optical zoom** (1:7 magnification in 10 steps). The optical zoom enlarges optically, not digitally. This allows a high picture quality, even in big magnifications.

Time and cost saving

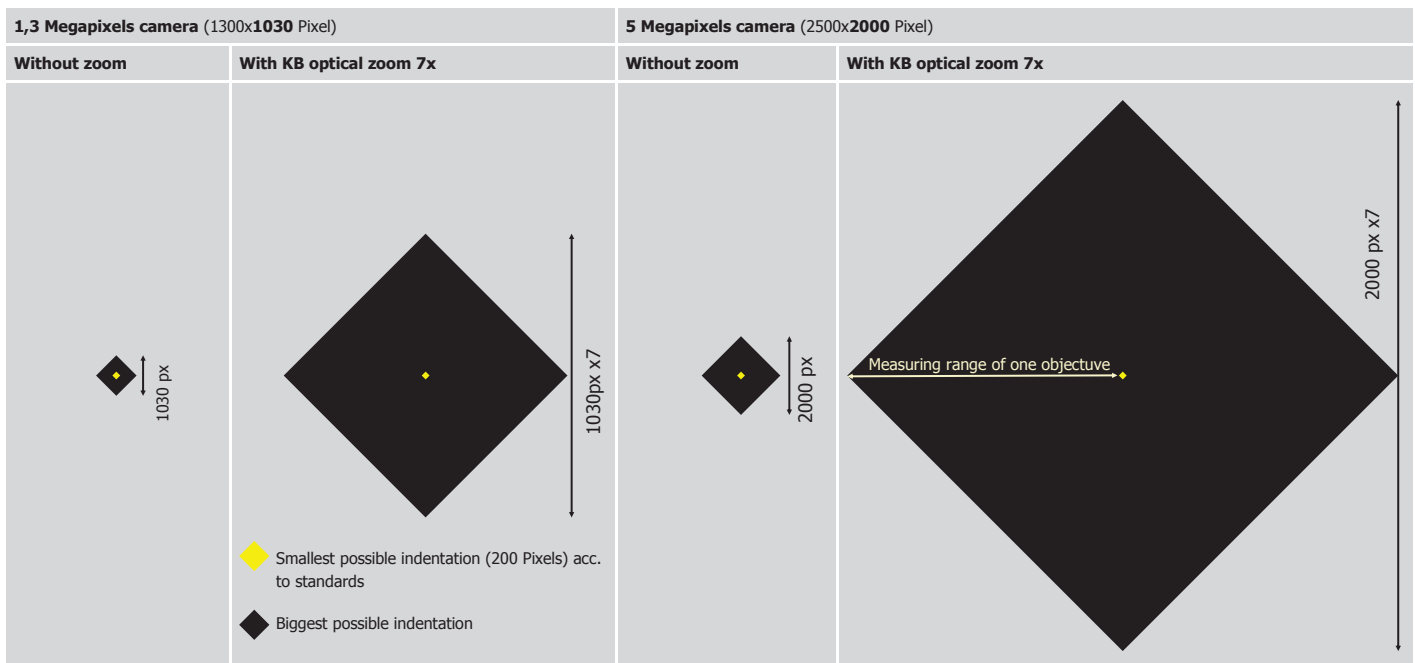
The KB optical zoom reduces costs since it can **replace up to 4 objectives**.

Testing according to standards DIN EN ISO and ASTM

The KB optical zoom allows testing acc.to standards of a **huge test load range**. The objective change falls away. By the use of the KB optical zoom a picture confirming to standards is always guaranteed.

Systematical display of the measuring ranges of the different cameras

The smallest and the biggest indentation is shown with and without optical zoom.



Overview optical measuring range with the 5 Megapixels camera

Load step	0,2	0,5	1	2	3	5	10	20	30	50	100	62,5	187,5	250	750	
Optical measuring range with digital zoom																
4x objective																Resolution 0,5 µm
10x objective																Resolution 0,3 µm
20x objective																Resolution 0,1 µm
Optical measuring range with optical zoom																
4x objective																Resolution 0,4 µm
10x objective																Resolution 0,16 µm
20x objective																Resolution 0,08 µm

Attention:

If the resolution is lower 0,2 µm even diagonal lengths smaller 40 µm can be measured. This means KB hardness testing machines are testing acc. to standards without changing the objective.

Technical data

	KB 250 MHSR	KB 750 MHSR
Maximum sample weight	120kg (no X/Y-stage)	150kg (no X/Y-stage)
Throat depth	225mm	260mm
Test room height without X/Y-stage	320mm	320mm
Test room height with X/Y-stage	250mm	235mm
Durability of the LED light	> 10 years	> 10 years
Magnification optical zoom	1:7 in 10 steps	1:7 in 10 steps
Resolution Z-axis	0,005µm	
Weight without X/Y-stage	ca. 150kg	ca. 260kg
Weight with X/Y-stage	ca. 160kg	ca. 285kg
Automatic Turret	6-fold	8-fold



Configuration levels and options

Legend	
Symbol	Meaning
-	Not applicable
X	Included
O	Option

	Video	SA	FA Basic	FA
Hardware				
5 Megapixels USB camera	X	X	X	X
Test Table	Diameter 80 mm	Automatic X/Y-satge Travel distance 180x180mm	Automatic X/Y-satge Travel distance or 180x180mm	Automatic X/Y-satge Travel distance 180x180mm
Overview camera	-	O + scanning	O + scanning	O
Load step extension	O	O	O	O
Software				
Auto measurement for Vickers and Knoop	O	O	X	X
Multi Sampling	-	O	O	X
Part recognition „Reco Jet“	-	O + scanning	O + scanning	X
Scanning	-	O + auto focus	O	X
Auto focus	O	O	X	X
Manual pattern	O	-	-	-
Grafical editor	-	X	X	X
Quick link	-	O + scanning	O + scanning	X
Light control	O	O	X	X
Welding test	-	O + scanning	O + scanning	X
Geometrical tools	-	O + scanning	O + scanning	X
Sinter test	-	-	O	O
Multiple sample holder	-	-	O + scanning + multisample	O

Your contact



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