

SERIE RSD

Automatic hardness testers

Rockwell, Superficial Rockwell, Brinell, Vickers
Test loads from 3 to 187.5 kgf

ASTM E-18, ASMT E-10
ISO 6508, ISO 6506



PORTABLE!

In compliance with:
ASTM E-18, E-10
ISO 6508, 6506



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330 RSD

AUTOMATIC SYSTEM

The RSD hardness testers are extremely accurate systems for automatic preloading, loading and measurements. RSD AFFRI® System hardness testers achieve the highest level of depth accuracy and measurement resolution available for Rockwell tests. Thanks to the AFFRI® System, the real indentation measurement is guaranteed without any external interference in any condition.

ONE DRIVE MEASUREMENTS

Just pull the start lever and the head moves down performing the hardness test cycle in automatic succession without breaching a phase:

1. Automatic contact with the specimen
2. Automatic clamping and activation of the reference surface point
3. Automatic preloading and loading
4. Automatic measure
5. Automatic return stroke when releasing the lever

The entire test cycle is complete and the result appears on the display. Fully automatic, the tester can easily be used by operators of every level.

! The measurement is not affected by operator influences.
! The tester can easily be used by operators of every level.



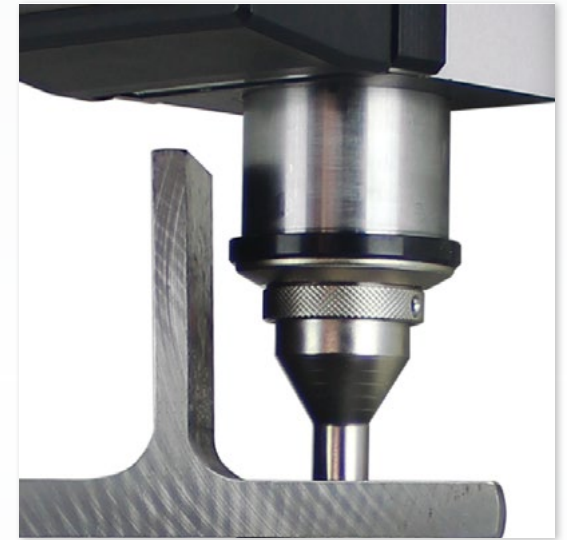


MEASURING STROKE

The RSD measuring head is equipped with a vertical sliding stroke of 50 mm / 2" including automatic contact with test surface with one single drive input. This is a stand-alone extra stroke which works separately from the total head stroke.



The test cycle is quick! The time needed for one complete measurement is 15" including 10" of dwell time. The pressure applied on the lever doesn't affect the result at all.



Single specimen with side steps or "U" shape can be tested in the inside area. The stroke also allows easy and fast tests on pieces with different thicknesses without acting on the tester head or the elevating screw.

- The activation of the test cycle is automatic, it starts when the head makes contact with the sample which is automatically recognized at any position within
- the 50 mm / 2" of vertical stroke.

330 RSD

AUTOCOMPENSATION SYSTEM

The system automatically recognise the surface of the specimen. When testing unstable samples or defective parts, the measuring head will follow the sample without losing contact. The measuring of the real indentation depth is not affected by sample settles.

The top surface referencing design minimizes errors caused by problems associated with oil, dirt or scale. This reduces sample preparation time and increases both accuracy and speed.



CLAMPING SYSTEM

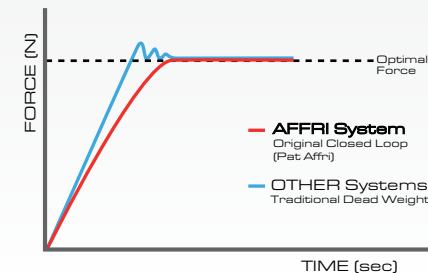
The clamping system blocks the specimen before the measurement cycle. Secure contact is always maintained, even in the unlikely event of any specimen movement during the operation cycle. The clamping system moves with the head for the whole measuring stroke generating a constant pressure when the specimen is clamped.

The clamping system assures perfect stability of any test piece throughout the test cycle. No additional accessories or support for the specimen are required.

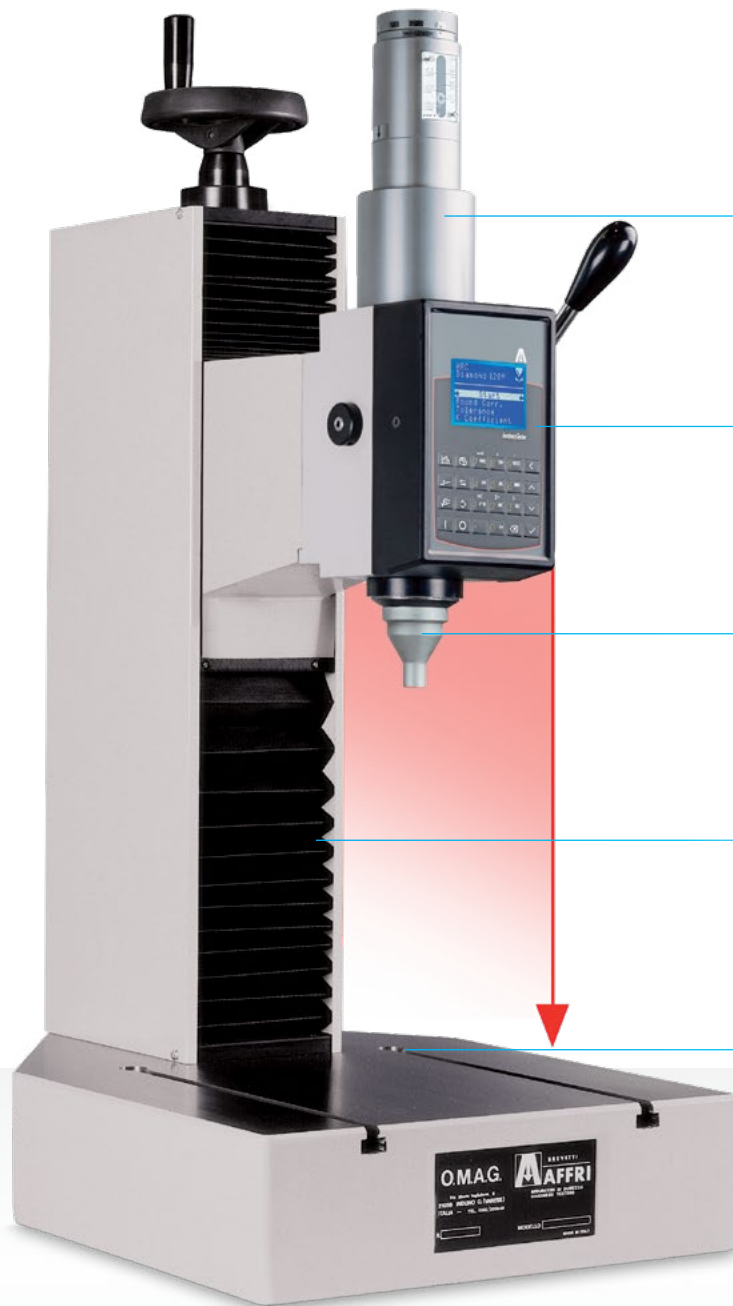


LOAD CELL TECHNOLOGY

The exclusive Affri latest generation of dynamometric load cells control load forces assuring perfect linearity in every range. Load forces are applied directly on the measuring axis. There are no ratio load forces nor levers, eliminating problems associated with traditional dead weight testers. The application by dynamometric load cell assures absolute accuracy in any test condition: results are not affected by any structural deflection, misalignment or vibration. The system can also operate in an inclined position. The R & R. data is at the top of its class and not surpassed by any other competitor under the same test conditions.



! THE FIRST TEST RESULT IS CORRECT AND ABSOLUTE, SAVING TIME AND MONEY, THUS INCREASING OUTPUT AND PRODUCTIVITY



EASY LOAD

Test loads can be selected with the rotary knob and the precision graded index. Just spin the knob to move the reference line till the right load is reached.



COMMAND PANEL

The front panel is IP64 resistant to water, oil and dust. The buttons of the intuitive keyboard are large and disclosed, easy to push when using protective gloves. The computer is embedded inside the panel together with the archive hard disk.



PROTECTED INDENTER

The indenter is protected and retracted, it only moves down after the specimen is fully clamped and stable, minimizing the risk of accidental damages. The exclusive Affri diamond indenter has a longer life-span than any other indenter on the market.



LONG CAPACITY

Total vertical stroke up to 300mm / 12" (On request it can be extended at more than 700mm / 27"). Move up the measuring head or get close to the sample using a handy wheel. No risk of bad collisions or accidental hurts.



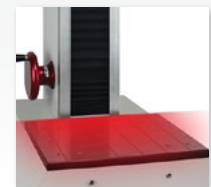
T-SLOTS

Universal T-slots with standard dimension for supports accommodation. Use the anvil support or fix reference stops for multi sample testing in the same position. Affri produces custom solutions for accurate accommodation of any sample.



LARGE BASE

The RSD wide work table is capable of bearing masses up to 2000 kg which allows for steady hardness measurements on bulky or irregular pieces which cannot be easily received by the regular bench hardness testers. Also, it offers a comfortable working base for small pieces. Size can be customized.



206 RSD

Traditional testing stand with fixed head and adjustable elevating work table. For small and medium specimens.

ONE DRIVE MEASUREMENTS

The 206 RSD hardness tester is a system for automatic preloading, loading and measurements. Just pull the start lever:

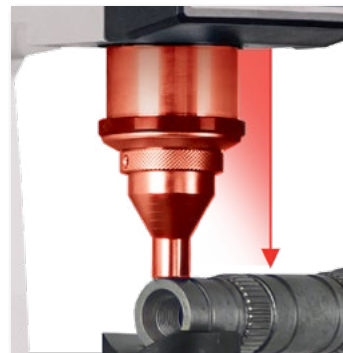
1. Automatic contact with the specimen
2. Automatic clamping and activation of the reference surface point
3. Automatic preloading and loading
4. Automatic measure
5. Automatic return stroke when releasing the lever

The entire test cycle is complete and the result appears on the display.



VERTICAL MEASURING STROKE

The 206 RSD measuring head is equipped with a vertical sliding stroke of 50 mm / 2" including automatic contact with the test surface. The stroke also allows easy and fast tests on pieces with different thicknesses without acting on the elevating screw.



CLAMPING SYSTEM

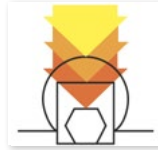
The clamping system blocks the specimen before the measurement cycle. Secure contact is always maintained, even in the unlikely event of any specimen movement during the operation cycle. No additional accessories or supports for the specimen are required.



! The test is not affected by operator influences and can easily be used by operators of every level. The pressure applied on the lever doesn't affect the result.



ANY TEST POINT



From round to flat surfaces, the tester automatically and quickly makes contact with any test area, up or down, outside or inside it. Special accessories are available for testing inside tubes or over inclined plates.

EXTREME PRECISION

The 206 RSD hardness tester guarantees maximum reliability even in bad conditions. The synergy between the tester features allows for a correct result even if the piece is badly positioned. The measurement is not compromised if the piece is dirty with oil or dust.

ELEVATING WORKING BASE

Vertically sliding chromed work table capable of bearing masses up to 2000 kg which allows for steady hardness measurements on bulky or irregular pieces. It is possible to install different types of piece holder anvils: from large plane tables to V shaped anvils or special solutions for irregular specimens.



L.I.S.A.

Laser pointing system (Pat. AFFRI). Allows for a precise test position pointing before the contact between the indenter and the sample. Excellent solution for gear teeth and blades and cutting tools edges.



OPTIC MEASUREMENTS

BRINELL AND VICKERS (ISO 6506 - 6507 / ASTM E10 - E384)

Rotating arm with self-alignment of the optic with the indentation axis: Automatic centering with no need to move the specimen, Interchangeable objectives, Camera USB 2.0 - 1.2 megapixel. Software for Vickers, Knoop and Brinell indentation reading: Automatic and manual measure, zoom, focus signal, trace CHD case depth diagram, statistic, create test report, memory of image.

RSD MAG

The **FIRST** real standardized **PORTABLE** hardness tester conform to **Rockwell and Brinell standards ASTM E18 E10 and ISO 6508 6506.**



The AFFRI magnetic portable hardness tester solves all types of problems. It can be used as a conventional hardness tester or as a portable system for on-site testing when test pieces are too large or too heavy for a bench hardness tester. The load cell inside has no impact force, while the AFFRI vertical movement permits a fully automatic test cycle in any direction, even upside down.

HANDY AND SIMPLE

It is so easy to use that there is no need for any particular preparation by the operator:

1. Identify the test area and place the hardness tester on the test sample
2. Locking the magnetic lever the tester will strongly adhere to the test piece and remain clamped for the entire test cycle
3. Sliding 50 mm the indenter makes contact with different surfaces or misaligned surfaces
4. Start the test and in 4 seconds the result will appear on the display

FROM PORTABLE TO BENCH TOP

To convert the RSD MAG from a portable to a regular bench top hardness tester, combine it with two different sizes of stand support, 670H or 460L. This system fully conforms to hardness testing standards and allows testing in laboratory on small pieces and prepared samples without the need to buy another hardness tester. Measurements will be fast and easy as an AFFRI bench tester including the clamping system and the auto-compensation of deflections.



MAGNETIC CLAMPING BASE

Thanks to its magnetic clamping base it is possible to perform hardness tests on very bulky samples directly in the production department. It is completely uninfluenced by direction so that it is operative up to 360° degrees of positioning, even upside down.

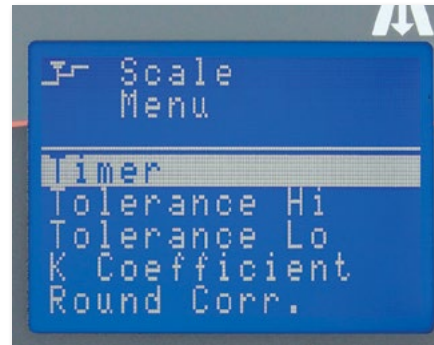
Different bases are available to allow strong fixing on any surface including round and flat specimens.



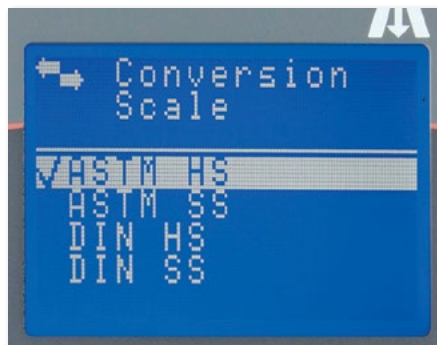
SOFTWARE RSD



Set of the hardness test methods



Measurement settings



Conversion scales tables



Results with average and conversion



Storable and printable statistics



Intuitive keyboard with direct commands.
IP 64 protection.

USER FRIENDLY

Main LCD control panel in front of the measuring head for setting up the test parameters, including powerful software and electronics:

- Large LCD and lots of functions: Simultaneous view of 2 scales, the one of the test and the one chosen from the list of conversion scales. Conversion values for all hardness scales HR, HB, HV, HSD, HK, HRN, HRT, N/mm.
- Precise test settings: Check load is applied correctly. Select dwell time. Calibration by direct and indirect method conform to ASTM E 18 ISO 6508.
- Dynamic results: Simultaneous view of the range of results for statistics. Results average updated at the last measure. Statistic CP CPX CX Histogram and number of tests corresponding to tolerance values (Lo, Hi, Ok). Create 10 file record data with 350 measures each.
- Unique performances: Temperature measure in C° useful for certification tests according to ASTM E 18 ISO 6508. Depth of indentation in 0,01 microns. Acoustic signal for dwell time and for preload. Printer connection output RS 232C or USB. Back light LCD display 128 x 64 pixels. Touch key pad board with IP 64 protection. Powered by rechargeable battery for 100% portability of the hardness tester (OPTION).

RSD serie hardness testers can easily be used by operators of every level. The test cycle is fully electronically controlled.

Data output via RS 232 C for connection to printer and computer for diagram plotting and statistics. Hyperterminal is needed. USB adapter available.



INDENTERS

700.0.3.010 - Diamond 120° HR
700.0.3.011 - Diamond 136° HV
700.0.3.002 - Ball W ϕ 1mm
700.0.3.004 - Ball W ϕ 2,5mm
700.0.0.003 - Ball W ϕ 5mm
700.1.3.008 - Ball W ϕ 10mm
700.0.3.003 - Ball W ϕ 1/16"
700.0.3.005 - Ball W ϕ 1/8"
700.0.3.007 - Ball W ϕ 1/4"
700.1.6.001 - Ball W ϕ 1/2"
700.0.3.016 - 70mm extenden
diamond indenter 120° HR
026.4.0.002 - 70mm Indenter guide
clamping piece ϕ 12mm

TEST BLOCKS

601.0.0.001 - HRA
601.0.0.002 - HRB
601.0.0.003 - HRC
601.0.0.004 - HRD
601.0.0.010 - HR15N
601.0.0.011 - HR30N
601.0.0.012 - HR45N
601.0.0.020 - HR15T
601.0.0.021 - HR30T
601.0.0.022 - HR45T
600.0.0.003 - HBW 2.5/62.5
601.0.0.005 - HBW 2.5/187.5
600.0.0.001 - HBW 5/125
602.0.0.003 - HV10
602.0.0.004 - HV30

ANVILS

A013.0.000 - Fix anvil support
A014.0.001 - Flat anvil ϕ 60mm
A014.0.002 - Flat anvil ϕ 150mm
A014.0.003 - V face anvil ϕ 60mm for diameters from 8 to 220mm
A014.0.004 - Double Spot anvil ϕ 25mm flat + V for diameters from 5 to 30 mm
A009.0.005 - V Support H 50mm
A009.0.006 - V Support H 100 mm

EXTRA ACCESSORIES

022.0.3.009 - Fix Clamping piece
431216 - Microscope 20x div 0.01 field 6 mm, including LED
A010.0.022 - Table for hardness tester
A017.4.000 - Self centring clamping base for round samples
E008.010 - L.I.S.A. Laser indicator patented Affri System
A049.1.001 - Adjustable vice from 0 to 50mm
A009.0.001 - Manual table 100x100mm with 10 μ m step



ACCESSORIES

Affri provides a large variety of accessories to fulfil any purpose of test. Customized solutions based on client needs can be made for perfect tests on rough pieces. A series of different anvils is available to test every size of test piece. Variety of accessories to facilitate testing on small or oddly shaped items. Large variety of high quality indenters with certificate. Ball, cone, tungsten or diamond indenters for each hardness scale Rockwell, Vickers, Brinell, Knoop and Shore. Test blocks for the hardness tester periodic calibration with UKAS/ACCREDIA certificate, for any hardness scale and value.

All AFFRI accessories are customizable according to customers specifications, depending on dimensions and geometry of the samples and finished products.

REAL TIME SUPPORT

Real Time Support. Connect your hardness tester to Internet, so that we can remotely diagnose any technical issue, provide additional operator training and update software version.

Connect to www.affri.com for more details.



THE MEASURING HEADS



RS-SD From 29.42 to 441.3 N (3 - 45 kgf)

LOAD FORCE RANGE

| | | | | | | |
|-------|-------|-------|-------|-------|-------|-----|
| 29.42 | 147.1 | 153.2 | 294.2 | 306.5 | 441.3 | N |
| 3 | 15 | 15.6 | 30 | 31.2 | 45 | kgf |

SUPERFICIAL ROCKWELL - DIN EN ISO 6508 / ASTM E-18

| | | |
|------------------|------------------|------------------|
| HR15 N/T/S/W/X/Y | HR30 N/T/S/W/X/Y | HR45 N/T/S/W/X/Y |
|------------------|------------------|------------------|

BRINELL HBW / HBWT (At Request) - DIN EN ISO 6506 / ASTM E-10 E-103

| | | |
|------|----------|----------|
| 1/30 | 2.5/15.6 | 2.5/31.5 |
|------|----------|----------|

VICKERS (Generate indentation) - DIN EN ISO 6507 / ASTM E-384

| | | |
|-----|------|------|
| HV3 | HV15 | HV30 |
|-----|------|------|

TEMPERATURE: Measure range from - 40.0 to + 80.0 °C

RSD From 98.07 to 1471 N (10 - 187.5 kgf)

LOAD FORCE RANGE

| | | | | | | |
|-------|-------|-------|-------|------|-------|-----|
| 98.07 | 588.4 | 612.9 | 980.7 | 1226 | 1839 | N |
| 10 | 60 | 62.5 | 100 | 125 | 187.5 | kgf |

ROCKWELL - DIN EN ISO 6508 / ASTM E-18

| | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| HRA | HRB | HRC | HRD | HRF | HRG | HRL | HRM | HRR |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|

BRINELL HBW / HBWT (At Request) - DIN EN ISO 6506 / ASTM E-10 E-103

| | | | |
|------|----------|-----------|-------|
| 1/10 | 2.5/62.5 | 2.5/187.5 | 5/125 |
|------|----------|-----------|-------|

VICKERS (Generate indentation) - DIN EN ISO 6507 / ASTM E-384

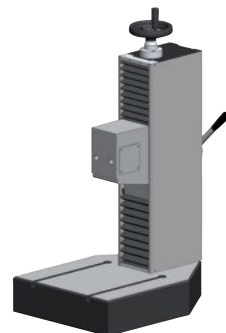
| | | |
|------|------|-------|
| HV10 | HV60 | HV100 |
|------|------|-------|

TEMPERATURE: Measure range from - 40.0 to + 80.0 °C

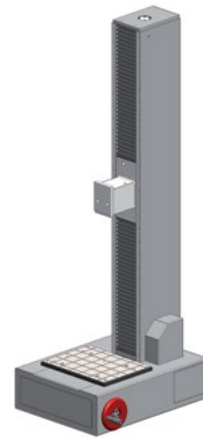
THE STAND SUPPORTS



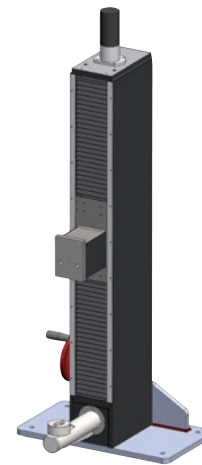
206
Elevating scrow
Height Capacity 215 mm
Depth Capacity 190 mm



330
Big base 390x330 mm
Height Capacity 300 mm
Depth Capacity 190 mm



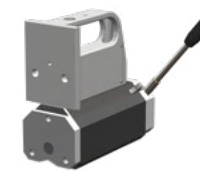
903
Big base 390x330 mm
Height Capacity 700 mm
Depth Capacity 190 mm



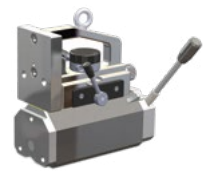
331
Base for rings
Height Capacity 700 mm
Depth Capacity 190 mm



SMX30 (Portable)
300mm/11.8" magnetic
for samples 20mm/0.8"
min thickness



SMX50 (Portable)
500mm/19.7" magnetic
for samples under
20mm/0.8" thickness



SMX55 (Portable)
Magnetic with 10mm/0.4"
horizontal sliding head for
multi indentation



SMX70 (Portable)
Double magnet base
for any application



SMX80 (Portable)
Chain clamping base



SMX90 (Portable)
Electromagnetic base

SERIE RSD

FORCE RANGE

| | RS-SD | RSD |
|-----------------------|---|---|
| Preload: | 29.42 N (3 kgf) | 98.07N (10 kgf) |
| Rockwell: | --- | 588.4 - 980.7 - 1471 N (60 - 100 - 150 kgf) |
| Superficial Rockwell: | 147.1 - 294.2 - 441.3 N (15 - 30 - 45 kgf) | --- |
| Brinell: | 153.2 - 294.2 - 306.5 N (15.625 - 30 - 31.25 kgf) | 98.07 - 612.9 - 1226 - 1839 N (10 - 62.5 - 125 - 187.5 kgf) |
| Vickers/Knoop: | 29.42 - 147.1 - 294.2 N (3 - 15 - 30 kgf) | 98.07 - 588.4 - 980.7 N (10 - 60 - 100 kgf) |

FEASIBLE TESTS

| | RS-SD | RSD |
|-----------------------|---|--|
| Rockwell: | --- | HRA - HRB - HRC - HRD - HRF - HRG - HRL - HRM - HRR |
| Superficial Rockwell: | HR15N - HR30N - HR45N - HR15T - HR30T - HR45T - HR15W - HR30W - HR45W - HR15X - HR30X - HR45X - HR15Y - HR30Y - HR45Y | --- |
| Brinell HBWT: | 1/30 - 2.5/15.6 - 2.5/31.5 | 5/125(3) (Aluminum and its alloys) - 2.5/62.5(2) (Aluminum and its alloys) - 2.5/187.5(6) (Aluminum and its alloys) - 2.5/187.5(5) (Carbon steel) - 2.5/187.5(1) (Cast iron) |
| Vickers/Knoop: | Generate indentation | Generate indentation |
| Temperature: | Measure test temperature range from - 40.0 to + 80.0 °C | Measure test temperature range from - 40.0 to + 80.0 °C |

OPTIONAL TESTS

| | RS-SD | RSD |
|----------------|-------------------------------------|---|
| Brinell HBW: | HB1/30 - HB2.5/15.625 - HB2.5/31.25 | HB1/10 - HB2.5/6.25 - HB2.5/187.5 - HB5/125 |
| Vickers/Knoop: | HV3 - HV15 - HV30 | HV10 - HV60 - HV100 |

TECHNICAL DATA

| | |
|-------------------------|---|
| Conformity Standards: | EN-ISO 6506-2 / EN-ISO 6507-2 / EN-ISO 6508-2 / ASTM-E10 / ASTM-E18 / ASTM-E103 / ASTM-E384 / JIS |
| Load accuracy: | Better than 0.5 % |
| Readout Division: | 0.1 HR / HBWT |
| Indenter Stroke: | 50mm / 2" |
| Height Capacity: | 206RSD: 215 mm / 8.5" - 330RSD: 300 mm / 12" - 903RSD: 500 mm / 19.5" (As option up to 700 mm / 27.5") |
| Depth Capacity: | 190 mm / 7.5" |
| Working table: | 330RSD and 903RSD: 390 x 330 mm / 15 x 13" (More on request. Available optional base for ring shape samples on request) |
| Tolerable Weight: | 2000kg |
| Temperature Range: | From 10 °C to 35 °C |
| Data Output: | RS 232 C (USB as option) |
| Power Supply: | 110 or 220 V / 50÷60 Hz |
| Software: | Afri - OMAG |
| Principle of Operation: | Dynamometric Load Cell |
| Fields Of Use | RSD: For all metals: iron, steel, tempered steel, cast iron, brass, aluminium, copper and metal alloys with more than 0.6 mm thickness. RS-SD: Heat treatment, hardening, nitriding, cementation and hardfacing with less than 0.6 mm depth. |
| Packing: | 206RSD: 50 x 60 x 100 cm / 20 x 23 x 40" - 85kg. 330RSD: 90 x 80 x 115 / 35 x 32 x 45 " - 100kg |