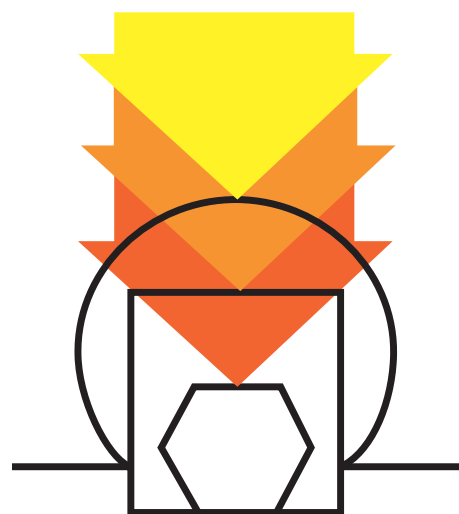


# PRODUCTION RANGE

HARDNESS  
TESTERS



**AFFRI**<sup>®</sup> **SYSTEM**  
**AFFRI**

[www.affri.com](http://www.affri.com)

ISO 9001:2000 REGISTERED



**AFFRI® introduces  
an automatic  
hardnesstester system  
for the future**

**SYSTEM  
AFFRI**

Since 1964 AFFRI® has been producing hardness testers combining test loads together with innovative devices which, together, make up the AFFRI SYSTEM®. The power supply can be mechanical, electro-mechanical, hydro-mechanical or pneumo-mechanical.

The AFFRI SYSTEM® has long surpassed the traditional philosophies using dead-weights and elevating screws found in conventional hardness testers.

The novel AFFRI SYSTEM® is protected by patents registered over the years.

An increase in operational performance had already been obtained using closed-loop load control (Patent AFFRI® N. 1175158), however, even this improvement is moderate in comparison with the high qualitative and practical performance levels reached by the AFFRI SYSTEM®.

A further improvement in performance was achieved when AFFRI® made the hardness tester, working in Rockwell and Brinell tests, truly automatic: a single initiation starts and performs the continuous test sequence comprising positioning, automatic contact and measurement.

The fully automatic control ensures that the speed throughout the entire test cycle remains unchanged even in the load-cell version due to the leading technology of the AFFRI SYSTEM® (patent pending).



Head office (Induno Olona Italy)



Manufacturing unit (Induno Olona - Italy)



Northern Europe sales and service (Brussels- Belgium)

# AFFRI® instruments conform to International Standards and are fully certified by International Calibration Laboratory.

<b>SIT</b>	<b>SERVIZIO DI TARATURA IN ITALIA</b> <i>Calibration Service in Italy</i>	
<small>Il SIT è uno dei firmatari dell'accordo multilaterale della European cooperation for the Accreditation of Laboratories (EAL) per il mutuo riconoscimento dei certificati di taratura. SIT is one of the signatories to the Multilateral Agreement of EAL for the mutual recognition of calibration certificates.</small>		
<b>CENTRO DI TARATURA</b> <i>Calibration Centre</i>	istituto da <i>established by</i>	
 <b>TRASDUTTORI MISURE TARATURE</b>	<b>T.M.T.</b> Via S. Francesco d'Assisi, 8 10040 RIVALTA DI TORINO (TO) Tel. (011) 909.10.04 - Fax 904.73.84	
<b>CERTIFICATO DI TARATURA N. 8865</b> <i>Certificate of Calibration No.</i>		<b>Pagina 1 di 4</b> <i>Page of</i>
<ul style="list-style-type: none"><li>- Data di emissione <i>date of issue</i></li><li>- destinatario <i>addressee</i></li><li>- richiesta <i>application</i></li><li>- in data <i>date</i></li></ul>	<ul style="list-style-type: none"><li>28/02/98</li><li>AFFRI - Induno Olona</li><li>////</li><li>////</li></ul>	<p>Il presente certificato di taratura è rilasciato in base all'accreditamento SIT N. 17/M concesso dall'Istituto Metrologico Primario competente in attuazione della legge n. 273/1991 che ha istituito il Sistema Nazionale di Taratura (SNT). Tale Istituto, nei campi di misura ed entro le incertezze precisate nell'accreditamento stesso, garantisce:</p> <ul style="list-style-type: none"><li>- il mantenimento della riferibilità degli apparecchi usati dal Centro a campioni nazionali delle unità del Sistema Internazionale delle Unità (SI);</li><li>- la correttezza metrologica delle procedure di misura adottate dal Centro.</li></ul>
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Certification by direct and indirect method

## NON FERROUS METALS

T E N S I L		T E N S I L		V I C K E R S	
N.mm²	σ	Kg/mm²		HV30	
1540	157	466	440	1710	
1471	150	453	433	1663	
1432	146	440	423	1556	
1402	143	428	413	1478	
1373	140	416	405	1400	
1334	136	404	395	1323	
1304	133	392	387	1245	
1275	130	381	377	1160	
1245	127	370	368	1076	
1216	124	360	359	1004	
1177	120	350	350	940	
1147	117	341	341	903	
1118	114	332	332	870	
1088	111	323	323	840	
1059	108	314	314	813	
1030	105	306	306	787	
1000	102	298	298	762	
971	99	290	290	738	
951	97	283	283	715	
922	94	276	276	693	
902	92	269	269	672	
873	89	262	262	652	
853	87	256	256	632	
833	85	250	250	612	
824	84	244	244	593	
804	82	239	239	575	
784	80	234	234	558	
755	77	225	225	542	
725	74	216	216	526	
706	72	210	210	510	
686	70	205	205	495	
667	68	200	200	485	
657	67	195	195	475	
637	65	190	190	465	
618	63	185	185	450	
608	62	180	180	440	
588	60	176	176	430	
578	59	172	172	420	
559	57	169	169	410	
549	56	165	165	400	
539	55	162	162	390	
529	54	159	159	380	
519	53	156	156	370	
500	52	153	153	360	
490	50	146	146	350	
470	48	141	141	340	
-	-	139	139	330	
-	-	137	137	320	
461	47	135	135	310	
-	-	132	132	300	
441	45	130	130	290	
-	-	127	127	280	
421	43	125	125	270	
-	-	123	123	260	
412	42	121	121	250	
-	-	119	119	240	
402	41	117	117	230	
-	-	116	116	220	
-	-	112	112	210	
382	39	110	110	200	
-	-	108	108	190	
-	-	107	107	180	
362	37	106	106	170	
-	-	104	104	160	
-	-	103	103	150	
343	35	101	101	140	
-	-	100	100	130	
-	-	98	98	120	
323	33	97	97	110	
-	-	95	95	100	
-	-	94	94	90	
-	-	92	92	80	
304	31	90	90	70	
-	-	89	89	60	
-	-	88	88	50	
294	30	86	86	40	
-	-	84	84	30	
284	29	83	83	20	
-	-	81	81	10	
274	28	80	80	0	
N.mm²	Kg/mm²	HV30	HB30		

FOR ROIS SHORE D	ROCKWELL C			ROCKWELL D			ROCKWELL A			SUPER ROCKWELL 45 N			SUPER ROCKWELL 30 N			SUPER ROCKWELL 15 N		
	68	77	85.5	75.5	84.5	93.3	45 N	30 N	15 N	45 N	30 N	15 N	45 N	30 N	15 N			
105	67	76	85	74.5	83.5	93												
104	66	75.5	84.5	73	83	92.5												
103	66	74.5	84	72	82	92												
101	64	74	83.5	71	81	91												
99	63	73	83	70	80	91.5												
97	62	72.5	82.5	69	79	90.5												
94	61	71.5	81.5	67	78.5	90												
92	60	71	81	66	77.5	90												
90	59	70	80.5	65	76.5	89.5												
87	58	69	80	64	75.5	-												
84	57	68.5	79.5	63	75	89												
81	56	67.5	79	62	74	88.5												
79	55	67	78.5	61	73	88												
77	54	66	78	59.5	72	87.5												
76	53	65.5	77.5	58.5	71	87												
74	52	64.5	77	57.5	70.5	86.5												
72	51	64	76.5	56	69.5	86												
70	50	63	76	55	68.5	85.5												
69	49	62	75.5	54	67.5	85												
68	48	61.5	74.5	52.5	66.5	84.5												
67	47	60.5	74	51.5	66	84												
65	46	60	73.5	50	65	83.5												
64	45	59	73	49	64	83												
63	44	58.5	72.5	48	63	82.5												
61	43	57.5	72	46.5	62	82												
59	42	57	71.5	45.5	61.5	81.5												
58	41	56	71	44.5	60.5	81												
56	40	55.5	70.5	43	59.5	80.5												
55	39	54.5	70	42	58.5	80												
54	38	54	69.5	41	57.5	79.5												
53	37	53	69	39.5	56.5	79												
52	36	52.5	68.5	38.5	56	78.5												
51	35	51.5	68	37	55	78												
50	34	50.5	67.5	36	54	77												
49	33	50	67	35	53	76.5												
48	32	49	66.5	33.5	52	76												
46	31	48.5	66	32.5	51.5	75.5												
45	30	47.5	65.5	31.5	50.5	75												
44	29	47	65	30	49.5	74.5												
43	28	46	64.5	29	48.5	74												
42	27	45.5	64	28	47.5	73.5												
41	26	44.5	63.5	26.5	47	72.5												
40	25	44	63	25.5	46	72												
39	24	43	62.5	24	45	71.5												
38	23	42.5	62	23	44	71												
37	22	41.5	61.5	22	43	70.5												
36	21	40	60	20.5	42	70												
35	18.5			19.5	41.5	69.5												
34	16.5																	
33	15																	
32	12.5																	
31	9.5																	
SHORE D	8																	
	7																	
	6																	
	4.5																	
	3																	
	2																	
C																		

Minimum thickness m					
ø	F				
mm	N	40	60	8	
2.5	1839	(HB / 30)			
5	1226	2.0	1.3	1.	
10	9810	8.0	5.3	4.	
10	29430	(HB / 30)			
METALTESTER		Scale 80-500			0.6
		0.53	0.42		

Minimum thickness m					
F	Kg				

SCALE	TEST METHOD	LOAD
	ROCKWELL indenter	N
HRC	▽ 120°	1471
HRA	▽ 120°	588
HRD	▽ 120°	981
HRB	Ø 1/16"	981
HRE	Ø 1/8"	981
HRF	Ø 1/16"	588
HRG	Ø 1/16"	1471
HRK	Ø 1/8"	1471
Superficial Rockwell		
HR15N	▽ 120°	147
HR30N	▽ 120°	294
HR45N	▽ 120°	441
HR15T	Ø 1/16"	147
HR30T	Ø 1/16"	294
HR45T	Ø 1/16"	441
BRINELL		
HB 10/3000	Ø 10 (HB 30)	29430
HB 5/750	Ø 5 (HB 30)	7357
HB 2.5/187.5	Ø 2.5 (HB 30)	1839
HB 2.5/62.5	Ø 2.5 (HB 10)	613
HB 10/500	Ø 10 (HB 5)	4905
HB 5/125	Ø 5 (HB 5)	1226
HB 2.5/31.2	Ø 2.5 (HB 5)	306
VICKERS		
HV10	◇ 136	981
HV15	◇ 136	147
HV30	◇ 136	294
HV60	◇ 136°	588

Minimum thickness measurable <b>ROCKWELL <math>\nabla</math> Diam</b>						
F	HRC					
	20	30	40	50	60	70
HR15N	0.41	0.33	0.26	0.19	0.14	0.09
HR30N	0.69	0.58	0.47	0.36	0.26	0.17
HR45N	0.91	0.77	0.63	0.50	0.37	0.25
HRA	1.0	0.9	0.8	0.7	0.6	0.5
HRC	1.8	1.6	1.4	1.2	1.0	0.8
METALTESTER	0.38	0.32	0.26	0.20	0.14	0.08

Minimum thickness measurable BRINELL										
∅	F	HB								
mm	N	40	60	80	100	150	200	300	400	500
2.5	1839	(HB / 30)			2.40	1.60	1.20	0.80	0.60	0.48
5	1226	2.0	1.3	1.0	0.80	0.53	(HB / 5)			
10	9810	8.0	5.3	4.0	3.2	2.1	1.6	(HB / 10)		
10	29430	(HB / 30)			9.6	6.3	4.8	3.2	2.4	1.9
METALTESTER		Scale 80-500		0.63	0.53	0.42	0.32	0.22	0.16	0.10
		0.53	0.42	0.32	0.27	0.15	0.10	Scale 40 - 200		

Minimum thickness measurable <b>VICKERS ∇ Diam</b>									
F Kg	HV								
	20	50	100	200	300	400	600	800	1000
HV0.200	0.19	0.12	0.09	0.06	0.05	0.04	0.04	0.03	0.03
HV1	0.43	0.28	0.19	0.14	0.12	0.10	0.08	0.07	0.06
HV2	0.62	0.39	0.28	0.19	0.16	0.14	0.12	0.10	0.09
HV5	1.0	0.62	0.44	0.31	0.25	0.22	0.18	0.15	0.14
HV10	1.4	0.87	0.62	0.43	0.36	0.31	0.25	0.22	0.19
METALTESTER	0.70	0.60	0.50	0.37	0.32	0.26	0.18	0.08	0.06
METALTESTER/2	0.65	0.55	0.45	0.30	0.28	0.20	0.10	0.06	0.05

[illegible]

SCALE	SYMBOL	PENETRATOR	MINOR LOAD N	MAJOR LOAD N	FIELD OF APPLICATION
ROCKWELL	HRA	CONE 120°	98	588	Hardened Metals, cementation layers, thin sheet (>0.4 mm)
	HRB	BALL 1/16"	98	981	Non-ferrous metals, construction steel
	HRC	CONE 120°	98	1471	Tempered, cemented, hardened and quenched Steel
	HRD	CONE 120°	98	981	Cementated surface with a medium layer of cementation
	HRE	BALL 1/8"	98	981	Cast iron, alloy magnesium aluminium, anti-friction metals, plastic (ASTM D785-60T)
	HRF	BALL 1/16"	98	588	Alloy copper, sheet (> 0.6 mm.)
	HRG	BALL 1/16"	98	1471	Phosphorous bronze, beryllium copper, medium hardness tempered cast iron
	HRH	BALL 1/8"	98	588	Aluminium, zinc, lead abrasive stone
	HRK	BALL 1/8"	98	1471	Anti-friction metals and reduced hardness metals
	HRL	BALL 1/4"	98	588	Like HRK, hard rubber (AS TM D 530-59 T) synthetic materials (ASTM D 785-60 T)
	HRM	BALL 1/4"	98	981	Like HRK and HRL, chipboard panels (ASTM D 805-52)
	HRP	BALL 1/4"	98	1471	Like HRK, HRL, HRM
	HRR	BALL 1/2"	98	588	Like HRK, HRL, HRM
	HRS	BALL 1/2"	98	981	Like HRK, HRL, HRM
	HRV	BALL 1/2"	98	1471	Like HRK, HRL, HRM, HRP, HRR, HRS
SUPERFICIAL ROCKWELL	HR15N	CONE 120°	29.4	147	Like HRA, HRC, HRD but for layers or thin sheet (> 0.15 mm)
	HR30N			294	
	HR45N			441	
	HR15T	BALL 1/16"	29.4	147	Like HRB, HRF, HRG but for thin sheet (> 0.25 mm)
	HR30T			294	
	HR45T			441	
	HR15W	BALL 1/8"	29.4	147	Softer metals, in thin layers eg thin anti-friction metal covering
	HR30W			294	
	HR45W			441	
	HR15X	BALL 1/4"	29.4	147	Sinterised metals (ASTM B 347-59 T)
	HR30X			294	
	HR45X			441	
	HR15Y	BALL 1/2"	29.4	147	Like HRX
	HR30Y			147	
	HR45Y			441	
VICKERS	HV3	PIRAMID 136°		29.4	All metals (hard and soft)
	HV10	PIRAMID 136°		98	All metals (hard and soft)
	HV15	PIRAMID 136°		147	All metals (hard and soft)
	HV30	PIRAMID 136°		294	All metals (hard and soft)
	HV60	PIRAMID 136°		588	All metals (hard and soft)
BRINELL	HB T 30 C	2.5 Carbide ball		1839	Cast iron, steel with hardness above 400 HB
	HB T 30 S	2.5 Carbide ball		1839	Cast iron, steel with hardness below 400 HB
	HB T 10	2.5 Carbide ball		613	Aluminium, bronze, copper, brass
	HB 2.5	2.5 Carbide ball		153	Aluminium, bronze, copper, brass
	HB 5	2.5 Carbide ball		306	Aluminium, bronze, copper, brass
	HB 2.5	5 Carbide ball		1226	Aluminium, bronze, copper, brass
	HB 1.25	10 Carbide ball		1226	Aluminium, bronze, copper, brass
	HB 30	2.5 Carbide ball		1839	Steel, cast iron



	page
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3302 MRS	4
3332 MRS / MRS A	5
250 MRS	6
330 RSD / 330 RS-SD	6
330 RS / 330 RS-S	7
270 RSD / 270 RS-S	7
270 RS / 270 RS-S	8
331 RSD / 331 RS-SD	8
331 RS / 331 RS-S	9
206 RSD DIGITRONIC 206 RS-SD DIGITRONIC	9
206 RS / 206 RS-S	10
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## HOW TO READ AFFRI'S CATALOGUE

<b>P</b>	Motorized pneumatic action
<b>M</b>	Motorized electrical action
<b>RS</b>	Rockwell semiautomatic « AFFRI SYSTEM » inside
<b>S</b>	Superficial Rockwell
<b>D</b>	Digital
<b>RT</b>	Traditional Rockwell system (manual cycle)

<b>EX</b>	Economic Rockwell manual cycle
<b>MX</b>	Economic Rockwell motorized cycle
<b>V</b>	Vickers
<b>TV</b>	Vision trough camera
<b>VM</b>	Vickers Micro



## Reference Hardness Tester for calibration laboratories

This highly accurate Hardness Tester is designed for laboratories calibrating Test Blocks. It includes Affri System technology and a fully automatic system to perform calibration in accordance with the International Standards ASTM, EN ISO-JIS .

- **Integral AFFRI System**
- **Absolute measurement**
- **The Start button initiates an uninterrupted test sequence comprising:**
  - approach the piece
  - clamping
  - impression of reference surface
  - complete measurement cycle with subsequent release
- **The result is not influenced by deflections during the test cycle**
- **Large and fixed table supporting test pieces**

Designed for different applications: A) EN ISO 6508-3 for Rockwell; B) EN ISO 6508-3 for Super Rockwell; C) EN ISO 6506-3 for Brinell; D) EN ISO 6507-3 for Vickers. The excellent accuracy and repeatability fully meet the requisite standards. A table of practical results obtained on AFFRI machines and another reference machine shows AFFRI's high comparable performance (①):

The integral Affri system of this machine operates on the same principle as that adopted in the regular production machines shown this catalogue.

Values obtained with Master reference hardness tester and with Affri reference hardness tester using the same indenter and test blocks for the range (26 HRC, 44 HRC, 65 HRC)

①

	Nominal Hardness 26 HRC		Nominal Hardness 44 HRC		Nominal Hardness 65 HRC	
	Master Reference Tester (HRC)	AFFRI Reference Tester (HRC)	Master Reference Tester (HRC)	AFFRI Reference Tester (HRC)	Master Reference Tester (HRC)	AFFRI Reference Tester (HRC)
	26.05	26.34	44.27	44.31	64.99	65.17
	26.13	26.64	44.28	44.34	65.04	65.12
	26.20	26.25	44.29	44.32	65.11	65.16
	26.32	26.18	44.25	44.32	65.07	65.20
	26.34	26.21	44.24	44.32	65.16	65.16
Average	26.21	26.32	44.27	44.32	65.07	65.16
Standard deviation	0.12	0.19	0.02	0.01	0.07	0.03

AUTO CONTACT WITH TEST PIECE AND  
AUTOMATIC TEST CYCLE







## Reference Hardness Tester for calibration laboratories

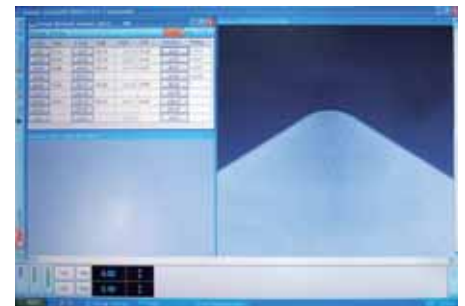
This highly accurate Hardness Tester is designed for laboratories calibrating Test Blocks. It includes Affri System technology and a fully automatic system to perform calibration in accordance with the International Standards ASTM, EN ISO-JIS.

Designed for Vickers and Brinell as per ISO 6507-3, ISO 6506-3 Standards

- **Integral AFFRI System**
- **Absolute measurement**
- **The Start button initiates an uninterrupted test sequence comprising:**
  - **approach the piece**
  - **clamping**
  - **impression of reference surface**
  - **complete measurement cycle with subsequent release**
- **The result is not influenced by deflections during the test cycle**
- **Large and fixed table supporting test pieces**



Measure of the geometry on Rockwell, Vickers indenters as per ISO 6508-3 ISO 6507-3

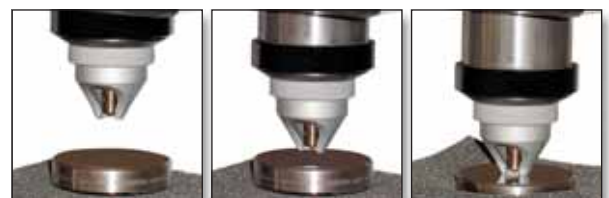


Automatic measure on Rockwell indenter profile including radius



Measure of Vickers indenter profile and coincidence at edge point

## AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE



## AFFRI SYSTEM IS THE NEW GENERATION OF HARDNESS TESTERS

**A SINGLE INPUT TO START in automatic sequence** without interruption applies the minor and major load and measure the Rockwell indentation automatically. All test operations are managed through a single start command to reduce operator fatigue and to increase test repeatability and accuracy to the maximum.

**AUTOMATIC CONTACT WITH THE TEST PIECE.** The AFFRI® system can perform automatic contact with the test piece surface without moving the piece. It automatically moves the indenter and the measuring system until contact is made, the piece is clamped, the force applied and indentation is measured automatically on Rockwell, Vickers or Brinell procedure.

- The system is capable of measuring accurately even if the test piece deflects up to 50 mm during measurement. This automatic compensation provide accurate results under adverse test conditions.
- External source of vibration don't create any influence on result.
- The test piece is CLAMPED AUTOMATICALLY and locked in position before the test force (20 to 400 Kg) is applied.
- The test forces are controlled test by test trough load cell and closed loop Affri system to assure high performance conform to ISO-JIS Standards.
- Perfect and effective measurments even at the first test with AFFRI® system inside
- Accuracy is stable in every condition
- No need to be levelled when installed
- It can be utilised by everybody also not schooling people only one start input and wait for test result
- An emergency push button is also included



## 3302 MRS



### Technical characteristics (code 1404)

Preload	(10 Kg) 98.07 N - (3 Kg) 29.4 N
Rockwell loads	(10 60 100 150 Kg) 98.10 588.60 981 1471.50 N
SuperRockwell loads	(3 15 30 45 Kg) 29.43 147.15 294.30 441.45 N
Brinell loads	(5 6.25 10 15.6 25 30 31.2 62.5 125 187.5 Kg - on request extra 250 Kg) 49.05 61.3 98.1 153.23 245 294.43 306.5 613 1226 1839 N (on request 2452)
Vickers Knoop loads	(3 5 10 15 20 30 60 100 Kg) 29.43 49.05 98.1 147.15 196 294.3 588.6 981 N
Optional test loads	49 132 358 961 N (for plastic, rubber as per EN-ISO 2039 std) (250 Kg) 2452.5 N Brinell
Shore	A - B - C - D
Accuracy: Conformation standards	EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18 - EN-ISO 2039 / JIS
Feasible tests	Rockwell HRC A D B F G L M R    Brinell HB 30, HB 10, HB 5, HB 2.5; Break Nmm <sup>2</sup> Twin    Superficial Rockwell HRN+HRT    Vickers (indentations only)    EN-ISO 2039
Mode of operation	automatic with load cell and closed loop Affri patent
Action	Only one start input moves down head to reach and clamp the test surface from 0 to 400 mm distance and automatically starts the hardness cycle in automatic succession without breaking a phase: approach to the piece; clamping of the piece; activation of reference surface; entire test cycle performance and release of piece
Mobile Indenter	from 0 to 400 mm
Self clamping	100 N
Self aligning to test surface	from 0 to 400 mm
Automatic compensation of deflection piece	from 0 to 400 mm
Operativity	it can work if not levelled, inclined or near to vibration area, without loosing accuracy
Temperature range	+ 5° to + 50° C
Digital reading	Rockwell - Brinell (Vickers conversion) Resolution: 0.1 HR - 0.1HB ( 0.01 HR unit, at request)
Total height capacity	400 mm motorized (more upon request)
Total depth capacity	200 mm
Dimension of base	330x390 mm
Max load of test piece	2000 Kg
Power supply	220V 50÷60Hz - 200VA
Fields of application: for all metals:	iron, steel, tempered steel, brass, aluminium and nitriding, cementation, hard facing, plastics
Net weight	120 Kg
Packing weight	160 Kg
Packing measurements	70x72xH190

## 3332 MRS / MRS A



Technical characteristics: 3332 MRS (code 1403)		3332 MRS A (code 1409)
Preload	(10 Kgf) 98.07 N - (3 Kgf) 29.4 N	
Rockwell loads	(10 60 100 150 Kgf) 98.10 588.60 981 1471.50 N	
SuperRockwell loads	(3 15 30 45 Kgf) 29.43 147.15 294.30 441.45 N	
Brinell loads	(5 6.25 10 15.6 25 30 31.2 62.5 125 187.5 Kgf - on request extra 250 Kgf) 49.05 61.3 98.1 153.23 245 294.43 306.5 613 1226 1839 N (on request 2452)	
Vickers Knoop loads	(3 5 10 15 20 30 60 100 Kgf) 29.43 49.05 98.1 147.15 196 294.3 588.6 981 N	
Optional test loads	49 132 358 961 N (for plastic, rubber as per EN-ISO 2039 std)	(250 Kgf) 2452.5 N Brinell
Shore	A - B - C - D	
Accuracy	Conformation standards EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18 - EN-ISO 2039 / JIS	
Feasible tests	Rockwell HRC A D B F G L M R	Brinell HB 30, HB 10, HB 5, HB 2.5; Break Nmm <sup>2</sup>
Twin	Superficial Rockwell HRN+HRT	EN-ISO 2039
Mode of operation	automatic with load cell and closed loop Affri patent	
Action	Only one start input moves down head to reach and clamp the test surface from distance multiple of 50 mm and automatically starts the hardness cycle in automatic succession without breaking a phase: approach to the piece; clamping of the piece; activation of reference surface; entire test cycle performance and release of piece	
Mobile Indenter	from 0 to 50 mm	from 0 to 500 mm
Self clamping	200 ÷ 4000 N	100 N
Self aligning to test surface	from 0 to 50 mm	from 0 to 500 mm
Automatic compensation of deflection piece	from 0 to 400 mm	
Operativity	it can work if not levelled, inclined or near to vibration area, without losing accuracy	
Temperature range	+ 5° to + 50° C	
Digital reading	Rockwell - Brinell (Vickers conversion) Resolution: 0.1 HR - 0.1HB (0.01 HR unit, at request)	
Floating head	from 0 to 50 mm multiples, till 400 mm	from 0 to 500 mm without break including test cycle
Total height capacity	400 mm (more upon request) manual	500 mm (more upon request) motorized
Total depth capacity	200 mm	
Dimension of base	330x390 mm	
Max load of test piece	2000 Kg	
Power supply	220V 50÷60Hz - 200VA	
Fields of application:	For all metals: iron, steel, tempered steel, brass, aluminium and nitriding, cementation, hard facing, plastics	
Net weight	100 Kg	
Packing weight	140 Kg	
Packing measurements	70x72xH100	

## 250 MRS



Technical characteristics (code 1405)	
Preload	(10 Kgf) 98.07 N - (3 Kgf) 29.4 N
Rockwell loads	(10 60 100 150 Kgf) 98.10 588.60 981 1471.50 N
SuperRockwell loads	(3 15 30 45 Kgf) 29.43 147.15 294.30 441.45 N
Brinell loads	(5 6.25 10 15.6 25 30 31.2 62.5 125 187.5 Kgf - on request extra 250 Kgf) 49.05 61.3 98.1 153.23 245 294.43 306.5 613 1226 1839 N (on request 2452)
Vickers Knoop loads	(3 5 10 15 20 30 60 100 Kgf) 29.43 49.05 98.1 147.15 196 294.3 588.6 981 N
Optional test loads	49 132 358 961 N (for plastic, rubber as per EN-ISO 2039 std)
Shore	A - B - C - D
Accuracy	Conformation standards EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18 - EN-ISO 2039 / JIS
Feasible tests	Rockwell HRC A D B F G L M R
Twin	Superficial Rockwell HRN+HRT
Mode of operation	automatic with load cell and closed loop Affri patent
Action	Only one start input moves down head to reach and clamp the test surface from distance multiple of 50 mm and automatically starts the hardness cycle in automatic succession without breaking a phase: approach to the piece; clamping of the piece; activation of reference surface; entire test cycle performance and release of piece
Mobile Indenter	from 0 to 50 mm
Self clamping	200 ÷ 4000 N
Self aligning to test surface	from 0 to 50 mm
Automatic compensation of deflection piece	from 0 to 50 mm
Operativity	it can work if not levelled, inclined or near to vibration area, without losing accuracy
Temperature range	+ 5° to + 50° C
Digital reading	Rockwell - Brinell (Vickers conversion) Resolution: 0.1 HR - 0.1 HB - 0.1 HV (0.01 HR unit, at request)
Total height capacity	215 mm
Total depth capacity	190 mm
Max load of test piece	1000 Kg
Power supply	220V 50÷60Hz - 200VA
Fields of application:	For all metals: iron, steel, tempered steel, brass, aluminium and nitriding, cementation, hard facing, plastics
Net weight	75 Kg
Packing weight	90 Kg
Packing measurements	37x60x100 cm

## AFFRI SYSTEM IS THE NEW GENERATION OF HARDNESS TESTERS

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**AUTOMATIC CONTACT WITH THE TEST PIECE.** The AFFRI® system can perform automatic contact with the test piece surface without moving the piece. It automatically moves the indenter and the measuring system until contact is made, the piece is clamped, the force applied and indentation is measured automatically on Rockwell, Vickers or Brinell procedure.

- The system is capable of measuring accurately even if the test piece deflects up to 50 mm during measurement. This automatic compensation provide accurate results under adverse test conditions.
- External source of vibration don't create any influence on result.
- The test piece is CLAMPED AUTOMATICALLY and locked in position before the test force (20 to 400 Kg) is applied.
- The test forces are controlled test by test trough load cell Affri system to assure high performance conform to ISO-JIS Standards.
- Perfect and effective measurments even at the first test with AFFRI® system inside
- Accuracy is stable in every condition
- No need to be levelled when installed
- It can be utilised by everybody also not schooling people only one start input and wait for test result



## 330 RSD / 330 RS-SD



Technical characteristics: 330 RSD (code 1104)		330 RS-SD (code 1109)
Preload	(10 Kg) 98.07 N	(3 Kg) 29.4 N
Test loads	(60-100-150 kgf) Rockwell 588-980-1471 N (10-60-100 kgf) Vickers 98.07-588-980 N (62.5-125-187.5 kgf) Brinell 612-1225-1839 N	(15-30-45 kgf) Rockwell 147-294-441 N (3-15-30 kgf) Vickers 29-147-294 N (15.6-31.2 kgf) Brinell 153-306 N
Accuracy	Conformation standards EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18 / JIS	
Feasible tests	Rockwell HRC A D B F G L M R	Rockwell sup. HRN+HRT
Twin	Brinell HB 30; HB 10; HB 5; Break Nmm²	Brinell HB 30; HB 5; HB 2.5
Mode of operation	Manual	
Action	Only one start input moves down head to reach and clamp the test surface from distance multiple of 50 mm and automatically starts the hardness cycle in automatic succession without breaking a phase: approach to the piece; clamping of the piece; activation of reference surface; entire test cycle performance and release of piece.	
Mobile Indenter	from 0 to 50 mm multiples till 400 mm	
Mobile clamping	from 0 to 50 mm multiples till 400 mm	
Self aligning to test surface	from 0 to 50 mm multiples till 400 mm	
Automatic compensation of deflection piece	from 0 to 50 mm	
Operativity	it can work if not levelled, inclined or near to vibration area, without losing accuracy	
Temperature range	+ 5° to + 50° C	
Reading	digital Rockwell+Brinell+R N N/mm²	digital Rockwell superficial
Reading resolution	0.1 HRC - 0.1 HB	0.1 HRN
Total height capacity	400 mm (more upon request)	
Total depth capacity	200 mm	
Base	330x390 mm with T slots	
Max load of test piece	2000 Kg	
Self clamping	200 ÷ 4000 N	
Power supply	220V 50÷60Hz - 200VA	
Fields of application	For all metals: iron, steel, tempered steel, cast iron, brass, aluminium, copper, metal alloys, hard and soft plastics with a higher thickness than 0.6 mm	Nitriding, cementation, hard facing with depth less to 0.6 mm
Net weight	100 Kg	
Packing weight	110 Kg	
Packing measurements	54x54x99 cm	



## 330 RS / 330 RS-S



Technical characteristics: 330 RS (code 1004)		330 RS-S (code 1008)
Preload	(10 Kgf) 98.07 N	(3 Kgf) 29.4 N
Test loads	(60-100-150 kgf) Rockwell 588-980-1471 N (10-60-100 kgf) Vickers 98.07-588-980 N (62.5-125-187.5 kgf) Brinell 612-1225-1839 N	(15-30-45 kgf) Rockwell 147-294-441 N (3-15-30 kgf) Vickers 29-147-294 N (15.6-31.2 kgf) Brinell 153-306 N
Accuracy	Conformation standards EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18 / JIS	
Feasible tests	Rockwell HRC A D B F G L M R	Rockwell sup. HRN+HRT
Twin	Brinell HB 30; HB 10; HB 5; Break Nmm <sup>2</sup>	Brinell Vickers
Action	Only one start input moves down head to reach and clamp the test surface from distance multiple of 50 mm and automatically starts the hardness cycle in automatic succession without breaking a phase: approach to the piece; clamping of the piece; activation of reference surface; entire test cycle performance and release of piece.	
Mobile Indenter	from 0 to 50 mm multiples till 400 mm	
Mobile clamping	from 0 to 50 mm multiples till 400 mm	
Self aligning to test surface	from 0 to 50 mm multiples till 400 mm	
Automatic compensation of deflection piece from 0 to 50 mm		
Operativity	it can work if not levelled, inclined or near to vibration area, without losing accuracy	
Temperature range	+ 5° to + 50° C	
Read out	analogous automatic zeroing	
Reading resolution	0.5 HRC	0.5 HRN
Total height capacity	400 mm (more upon request)	
Total depth capacity	200 mm	
Base	330x390 mm with T slots	
Max load of test piece	2000 Kg	
Self clamping	200 ÷ 4000 N	
Fields of application	For all metals: iron, steel, tempered steel, cast iron, brass, aluminium, copper, metal alloys, hard and soft plastics with a higher thickness than 0.6 mm	Nitriding, cementation, hard facing with depth less to 0.6 mm
Net weight	100 Kg	
Packing weight	110 Kg	
Packing measurements	54x54x99 cm	

## 270 RSD / 270 RS-SD



Technical characteristics: 270 RSD (code 1103)		270 RS-SD (code 1108)
Preload	(10 Kgf) 98.07 N	(3 Kgf) 29.4 N
Test loads	(60-100-150 kgf) Rockwell 588-980-1471 N (10-60-100 kgf) Vickers 98.07-588-980 N (62.5-125-187.5 kgf) Brinell 612-1225-1839 N	(15-30-45 kgf) Rockwell 147-294-441 N (3-15-30 kgf) Vickers 29-147-294 N (15.6-31.2 kgf) Brinell 153-306 N
Accuracy	Conformation standards EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18 / JIS	
Feasible tests	Rockwell HRC A D B F G L M R	Rockwell sup. HRN+HRT
Twin	Brinell HB 30; HB 10; HB 5; Break Nmm <sup>2</sup>	Brinell HB 30; HB 5; HB 2.5
Mode of operation	manual	
Action	Only one start input moves down head to reach and clamp the test surface from distance multiple of 50 mm and automatically starts the hardness cycle in automatic succession without breaking a phase: approach to the piece; clamping of the piece; activation of reference surface; entire test cycle performance and release of piece.	
Mobile Indenter	from 0 to 50 mm multiples till 270 mm	
Mobile clamping	from 0 to 50 mm multiples till 270 mm	
Self aligning to test surface	from 0 to 50 mm multiples till 270 mm	
Automatic compensation of deflection piece from 0 to 50 mm		
Operativity	it can work if not levelled, inclined or near to vibration area, without losing accuracy	
Temperature range	+ 5° to + 50° C	
Reading	digital Rockwell+Rockwell+Break Nmm <sup>2</sup>	digitale Rockwell/Brinell
Reading resolution	0.1 HRC	0.1 HRN
Total height capacity	270 mm	
Total depth capacity	170 mm	
Base	270x330 mm	
Max load of test piece	2000 Kg	
Self clamping	200 ÷ 4000 N	
Power supply	220V 50÷60Hz - 200VA	
Fields of application	For all metals: iron, steel, tempered steel, cast iron, brass, aluminium, copper, metal alloys, hard and soft plastics with a higher thickness than 0.6 mm	Nitriding, cementation, hard facing with depth less to 0.6 mm
Net weight	80 Kg	
Packing weight	90 Kg	
Packing measurements	54x54x99 cm	

## 270 RS / 270 RS-S



Technical characteristics: 270 RS (code 1003)		270 RS-S (code 1007)
Preload	(10 Kgf) 98.07 N	(3 Kgf) 29.4 N
Test loads	(60-100-150 kgf) Rockwell 588-980-1471 N (10-60-100 kgf) Vickers 98.07-588-980 N (62.5-125-187.5 kgf) Brinell 612-1225-1839 N	(15-30-45 kgf) Rockwell 147-294-441 N (3-15-30 kgf) Vickers 29-147-294 N (15.6-31.2 kgf) Brinell 153-306 N
Accuracy	Conformation standards EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18 / JIS	
Feasible tests	Rockwell HRC A D B F G L M R	Rockwell sup. HRN+HRT
Twin	Brinell HB 30; HB 10; HB 5; Break Nmm²	Brinell Vickers
Action	Only one start input moves down head to reach and clamp the test surface from distance multiple of 50 mm and automatically starts the hardness cycle in automatic succession without breaking a phase: approach to the piece; clamping of the piece; activation of reference surface; entire test cycle performance and release of piece.	
Mobile Indenter	from 0 to 50 mm multiples till 270 mm	
Mobile clamping	from 0 to 50 mm multiples till 270 mm	
Self aligning to test surface	from 0 to 50 mm multiples till 270 mm	
Automatic compensation of deflection piece from 0 to 50 mm		
Operativity	it can work if not levelled, inclined or near to vibration area, without losing accuracy	
Temperature range	+ 5° to + 50° C	
Read out	analogous	
Reading resolution	0.5 HRC	0.5 HRN
Total height capacity	270 mm	
Total depth capacity	170 mm	
Base	270x330 mm with T slots	
Max load of test piece	2000 Kg	
Self clamping	200 ÷ 4000 N	
Fields of application	For all metals: iron, steel, tempered steel, cast iron, brass, aluminium, copper, metal alloys, hard and soft plastics with a higher thickness than 0.6 mm	Nitriding, cementation, hard facing with depth less to 0.6 mm
Net weight	80 Kg	
Packing weight	90 Kg	
Packing measurements	54x54x99 cm	

## 331 RSD / 331 RS-SD



Technical characteristics: 331 RSD (code 1110)		331 RS-SD (code 1111)
Preload	(10 Kgf) 98.07 N	(3 Kgf) 29.4 N
Test loads	(60-100-150 kgf) Rockwell 588-980-1471 N (10-60-100 kgf) Vickers 98.07-588-980 N (62.5-125-187.5 kgf) Brinell 612-1225-1839 N	(15-30-45 kgf) Rockwell 147-294-441 N (3-15-30 kgf) Vickers 29-147-294 N (15.6-31.2 kgf) Brinell 153-306 N
Accuracy	Conformation standards EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18 / JIS	
Feasible tests	Rockwell HRC A D B F G L M R	Rockwell sup. HRN+HRT
Twin	Brinell HB 30; HB 10; HB 5; Break Nmm²	Brinell HB 30; HB 5; HB 2.5
Action	Only one start input moves down head to reach and clamp the test surface from distance multiple of 50 mm and automatically starts the hardness cycle in automatic succession without breaking a phase: approach to the piece; clamping of the piece; activation of reference surface; entire test cycle performance and release of piece.	
Mobile Indenter	from 0 to 50 mm multiples till 270 mm	
Mobile clamping	from 0 to 50 mm multiples till 270 mm	
Self aligning to test surface	from 0 to 50 mm multiples till 270 mm	
Automatic compensation of deflection piece from 0 to 50 mm		
Operativity	it can work if not levelled, inclined or near to vibration area, without loosing accuracy	
Temperature range	+ 5° to + 50° C	
Read out	digital Rockwell+Rockwell+R N N/mm²	digital Rockwell/Brinell
Reading resolution	0.1 HRC	0.1 HRN
Total height capacity	270 mm	
Total depth capacity	170 mm	
Base	120x120 mm	
Max load of test piece	2000 Kg	
Self clamping	200 ÷ 4000 N	
Power supply	220V 50÷60Hz - 200VA	
Fields of application	For all metals: iron, steel, tempered steel, cast iron, brass, aluminium, copper, metal alloys, hard and soft plastics with a higher thickness than 0.6 mm	Nitriding, cementation, hard facing with depth less to 0.6 mm
Net weight	100 Kg	
Packing weight	110 Kg	
Packing measurements	54x54x99 cm	



## 331 RS / 331 RS-S



Technical characteristics: 331 RS (code 1112)		331 RS-S (code 1113)
Preload	(10 Kgf) 98.07 N	(3 Kgf) 29.4 N
Test loads	(60-100-150 kgf) Rockwell 588-980-1471 N (10-60-100 kgf) Vickers 98.07-588-980 N (62.5-125-187.5 kgf) Brinell 612-1225-1839 N	(15-30-45 kgf) Rockwell 147-294-441 N (3-15-30 kgf) Vickers 29-147-294 N (15.6-31.2 kgf) Brinell 153-306 N
Accuracy	Conformation standards EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18 / JIS	
Feasible tests	Rockwell HRC A D B F G L M R	Rockwell sup. HRN+HRT
Twin	Brinell HB 30; HB 10; HB 5; Break Nmm²	Brinell HB 30; HB 5; HB 2.5
Action	Only one start input moves down head to reach and clamp the test surface from distance multiple of 50 mm and automatically starts the hardness cycle in automatic succession without breaking a phase: approach to the piece; clamping of the piece; activation of reference surface; entire test cycle performance and release of piece.	
Mobile Indenter	from 0 to 50 mm multiples till 270 mm	
Mobile clamping	from 0 to 50 mm multiples till 270 mm	
Self aligning to test surface	from 0 to 50 mm multiples till 270 mm	
Automatic compensation of deflection piece from 0 to 50 mm		
Operativity	it can work if not levelled, inclined or near to vibration area, without losing accuracy	
Temperature range	+ 5° to + 50° C	
Read out	analogous	
Reading resolution	0.5 HRC	0.5 HRN
Total height capacity	270 mm	
Total depth capacity	170 mm	
Base	120x120 mm	
Max load of test piece	2000 Kg	
Self clamping	200 ÷ 4000 N	
Fields of application	For all metals: iron, steel, tempered steel, cast iron, brass, aluminium, copper, metal alloys, hard and soft plastics with a higher thickness than 0.6 mm	Nitriding, cementation, hard facing with depth less to 0.6 mm
Net weight	100 Kg	
Packing weight	110 Kg	
Packing measurements	54x54x99 cm	

## 206 RSD DIGITRONIC 206 RS-SD DIGITRONIC



Technical characteristics: 206 RSD DIGITRONIC (code 1102)		206 RS-SD DIGITRONIC (code 1107)
Preload	(10 Kgf) 98.07 N	(3 Kgf) 29.4 N
Test loads	(60-100-150 kgf) Rockwell 588-980-1471 N (10-60-100 kgf) Vickers 98.07-588-980 N (62.5-125-187.5 kgf) Brinell 612-1225-1839 N	(15-30-45 kgf) Rockwell 147-294-441 N (3-15-30 kgf) Vickers 29-147-294 N (15.6-31.2 kgf) Brinell 153-306 N
Accuracy	Conformation standards EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18 / JIS	
Feasible tests	Rockwell HRC A D B F G L M R	Rockwell sup. HRN + HRT
Twin	Brinell HB 30; HB 10; HB 5; Break Nmm²	Brinell HB 30; HB 5; HB 2.5
Action	Only one start input moves down head to reach and clamp the test surface from distance multiple of 50 mm and automatically starts the hardness cycle in automatic succession without breaking a phase: approach to the piece; clamping of the piece; activation of reference surface; entire test cycle performance and release of piece.	
Mobile Indenter	from 0 to 50 mm	
Mobile clamping	from 0 to 50 mm	
Self aligning to test surface	from 0 to 50 mm	
Automatic compensation of deflection piece from 0 to 50 mm		
Operativity	it can work if not levelled, inclined or near to vibration area, without losing accuracy	
Temperature range	+ 5° to + 50° C	
Reading resolution	0.1 HRC	0.1HR N
Total height capacity	215 mm	
Total depth capacity	190 mm	
Max load of test piece	1000 Kg	
Self clamping	200 ÷ 4000 N	
Piece selection transmission	included	
Power supply	220V 50÷60Hz - 200VA	
Fields of application	For all metals: iron, steel, tempered steel, cast iron, brass, aluminium, copper, metal alloys, hard and soft plastics with a higher thickness than 0.6 mm	Nitriding, cementation, hard facing with depth less to 0.6 mm
Net weight	68 kg	
Packing weight	88 kg	
Packing measurements	34x54x99 cm	

## 206 RS / 206 RS-S



Technical characteristics: 206 RS (code 1002)		206 RS-S (code 1006)
Preload	(10 Kgf) 98.07 N	(3 Kgf) 29.4 N
Test loads	(60-100-150 kgf) Rockwell 588-980-1471 N (10-60-100 kgf) Vickers 98.07-588-980 N (62.5-125-187.5 kgf) Brinell 612-1225-1839 N	(15-30-45 kgf) Rockwell 147-294-441 N (3-15-30 kgf) Vickers 29-147-294 N (15.6-31.2 kgf) Brinell 153-306 N
Accuracy	Conformation standards EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18 / JIS	
Feasible tests	Rockwell HRC A D B F G L M R	Rockwell sup. HRN + HRT
Twin	Brinell HB 30; HB 10; HB 5; Break Nmm²	Brinell HB 30; HB 5; HB 2.5
Action	Only one start input moves down head to reach and clamp the test surface from distance multiple of 50 mm and automatically starts the hardness cycle in automatic succession without breaking a phase: approach to the piece; clamping of the piece; activation of reference surface; entire test cycle performance and release of piece.	
Mobile Indenter	from 0 to 50 mm	
Mobile clamping	from 0 to 50 mm	
Self aligning to test surface	from 0 to 50 mm	
Automatic compensation of deflection piece from 0 to 50 mm		
Operativity	it can work if not levelled, inclined or near to vibration area, without loosing accuracy	
Temperature range	+ 5° to + 50° C	
Read out	Analogic	
Reading resolution	0.5 HR	0.5 HR
Total height capacity	215 mm	
Total depth capacity	190 mm	
Max load of test piece	1000 Kg	
Self clamping	200 ÷ 4000 N	
Fields of application	For all metals: iron, steel, tempered steel, cast iron, brass, aluminium, copper, metal alloys, hard and soft plastics with a higher thickness than 0.6 mm	Nitriding, cementation, hard facing with depth less to 0.6 mm
Net weight	68 kg	
Packing weight	88 kg	
Packing measurements	34x54x99 cm	

**How to use:** Acting the hand wheel on the base will be performed indenter approach to the test block and acting up lever will act load force for test cycle.

**Force:** the test force is directly to the indenter axis and acted by mechanical dynamometer load cell inside. Accuracy conform to ISO-JIS standards.

**Performance:** it can be utilised by everybody in a simple action

## 206 RT / 206 RTS



Technical characteristics: 206 RT (code 1001)		206 RTS (code 1005)
Preload	(10 kgf) 98.07 N	(3 kgf) 29.4 N
Test loads	(60-100-150kgf) Rockwell 588-980-1471N (10-60-100kgf) Vickers 98.07-588-980N (62.5-125-187.5kgf) Brinell 612-1225-1839N	(15-30-45kgf) Rockwell superficiale 147-294-441N (3-15-30kgf) Vickers 29-147-294N (15.6-31.2kgf) Brinell 153-306N
Mode of operation	manual	
Feasible tests	Rockwell HRC A-D-B-F-G-L-M-R Twin Brinell HB 30; HB 10; HB 5	Rockwell sup. HRN + HRT Brinell HB 30; HB 5; HB 2.5 - HV - 3 - HV - 15
Reading resolution	0.5 HR	0.5 HR
Accuracy	Conformation standards EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18 / JIS	
Operativity	it can work if not levelled, inclined or near to vibration area, without losing accuracy	
Temperature range	+ 5° to + 50° C	
Height capacity	215 mm	
Depth capacity	190 mm	
Diameter of column	60 mm	
Diameter of anvil	60 mm	
Max load of test piece	1000 Kg	
Fields of application	For all metals, steel, hard steel, cast iron, brass, aluminium over 0.6 mm, plastics, soft and hard rubber	Nitriding, cementation, hard facing with depth less to 0.6 mm
Net weight	65 kg	
Packing weight	85 kg	
Packing measurements	37x60x102 cm	

## 206 RTD / 206 RTSD



Technical characteristics: 206 RTD (code 1101)		206 RTSD (code 1106)
Preload	(10 kgf) 98.07 N	(3 kgf) 29.4 N
Test loads	(60-100-150kgf) Rockwell 588-980-1471N (10-60-100kgf) Vickers 98.07-588-980N (62.5-125-187.5kgf) Brinell 612-1225-1839N	(15-30-45kgf) Rockwell superficiale 147-294-441N (3-15-30kgf) Vickers 29-147-294N (15.6-31.2kgf) Brinell 153-306N
Mode of operation	manual	
Feasible tests	Rockwell + Brinell + Vickers	Rockwell superficial + Brinell + Vickers
Reading resolution	0.1 HR	0.2 HR
Accuracy	Conformation standards EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18 / JIS	
Operativity	it can work if not levelled, inclined or near to vibration area, without losing accuracy	
Temperature range	+ 5° to + 50° C	
Height capacity	215 mm	
Depth capacity	190 mm	
Diameter of column	60 mm	
Diameter of anvil	60 mm	
Max load of test piece	1000 Kg	
Fields of application	For all metals, steel, hard steel, cast iron, brass, aluminium over 0.6 mm, plastics, soft and hard rubber	Nitriding, cementation, hard facing with depth less to 0.6 mm
Net weight	65 kg	
Packing weight	85 kg	
Packing measurements	37x60x102 cm	

## 206 EX / 206 EXS



Technical characteristics: 206 EX (code 1114)		206 EXS (code 1115)
Preload	(10 kgf) 98.07 N	29.4N (3 Kgf)
Test Load	588-980-1471 N Rockwell (60-100-150 Kgf) 98.07-588 N Vickers (10-60 Kgf)	147-294 - 441N Superficial Rockwell (15-30-45 Kgf) 29-147-294 N Vickers (3-15-30 Kgf)
Mode of operation	Manual	
Feasible Tests	Rockwell: HRA; HRB; HRC; HRD; HRE; HRF; HRG; HRH; HRK Vickers: HV10; HV60; HV100 only indentation *Brinell (at your request): HB 2.5/62.5; HB2.5/187.5; HB 5/125 HBT 2.5/62.5; HBT 2.5/187.5; HBT 5/125	
Twin	Superficial Rockwell: HRA; HRB; HRC; HRD; HRE; HRF; HRG; HRH; HRK Vickers: HV10; HV60; HV100	
Reading	Rockwell 9 scale (HBT on request)	Rockwell 6 scale
Reading resolution	0.1 HR (0.1 HB)	0.2 HR (0.2 HB)
Accuracy	Conformation standards EN-ISO 6508-2 / 6506-2 / JIS	
Operativity	it can works if not levelled, inclined or near to vibration area, without losing accuracy	
Temperature range	+ 5° to + 50° C	
Height capacity	215 mm	
Depth capacity	190 mm	
Diameter of anvil	60 mm	
Max load of test piece	1000 Kg	
Data output	RS 232C optional	
Power supply	100÷240V 50÷60 Hz 12VA	
Fields of application	For all metals, steel, hard steel, cast iron, brass, aluminium over 0.6mm, plastics, soft and hard rubber	Nitriding, cementation, hard facing with depth less to 0.6 mm
Net weight	65 kg	
Packing weight	85 kg	
Packing measurements	37x60x102 cm	

**How to use:** Acting the hand wheel on the base will be performed indenter approach to the test block and in few seconds the result will appear.

**Force:** the test force is selected and applied through load cell inside directly connected to the indenter axis and closed loop control inside. Accuracy conforms to ISO-JIS standards.

**Performance:** it can be utilised by everybody in a simple action  
 - no need to be levelled when installed - can work also near to vibration

## 250 DRM



Technical characteristics (code 1503)	
Preload	(10 Kgf) 98.07 N - (3 Kgf) 29.4 N
Vickers Knoop loads	(3 5 10 15 20 30 60 100 Kgf) 29.43 49.05 98.1 147.15 196 294.3 588.6 981 N
Rockwell loads	(10 60 100 150 Kgf) 98.10 588.60 981 1471.50 N
SuperRockwell loads	(3 15 30 45 Kgf) 29.43 147.15 294.30 441.45 N
Brinell loads	(5 6.25 10 15.6 25 30 31.2 62.5 125 187.5 Kgf) 49.05 61.3 98.1 153.23 245 294.43 306.5 613 1226 1839 N
Mode of operation	automatic with load cell and closed loop Affri patent
Feasible tests	Rockwell HRC A D B F G L M R
Twin	Superficial Rockwell HRN+HRT Brinell HB 30, HB 10, HB 5, HB 2.5: Break Nmm² Vickers (3 5 10 20 30 50 100 Kgf) 29.43 49.05 98.10 196.20 294.30 490.50 981 N only indentation
Digital reading	Rockwell - Brinell - Vickers - Resolution: 0.1 HR - 0.1HB - 0.1 HV (0.01 HR unit, at request)
Accuracy	Conformation standards EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18 / JIS
Operativity	it can work if not levelled, inclined or near to vibration area, without losing accuracy
Temperature range	+ 5° to + 50° C
Total height capacity	215 mm
Total depth capacity	190 mm
Max load of test piece	1000 Kg
Data output	RS 232 C
Power supply	220V 50÷60Hz - 200VA
Fields of application	For all metals: iron, steel, tempered steel, brass, aluminium and nitriding, cementation, hard facing
Net weight	75 Kg
Packing weight	90 Kg
Packing measurements	37x60x100 cm

## 206 MX / 206 MXS



Technical characteristics: 206 MX (code 1116)		206 MXS (code 1117)
Preload	(10 Kgf) 98.07 N	29.4N (3 Kgf)
Test Load	588-980-1471N Rockwell (60-100-150Kgf) 98.07-588N Vickers (10-60Kgf)	147-294-441N Superficial Rockwell (15-30-45Kgf) 29-147-294N Vickers (3-15-30Kgf)
Mode of operation	Motorized load application - Electronic control	Motorized load application - Electronic control
Feasible Tests	Rockwell: HRA; HRB; HRC; HRD; HRE; HRF; HRG; HRH; HRK Vickers: HV10; HV60; HV100 only indentation *Brinell (on request): HB 2.5/62.5; HB2.5/187.5; HB 5/125 HBT 2.5/62.5; HBT 2.5/187.5; HBT 5/125	Superficial Rockwell: HR15N; HR30N; HR45N; HR15T; HR30T; HR45T Vickers: HV3; HV15; Hv30 *Brinell (on request): HB 2.5/15.625; HB 2.5/31.25 HBT 2.5/15.625; HBT 2.5/31.25
Twin		
Reading resolution	0.1 HR - 0.1 HB	0.2 HR - 0.2 HB
Accuracy	Conformation standards EN-ISO 6508-2 / 6506-2 / JIS	
Operativity	it can work if not levelled, inclined or near to vibration area, without losing accuracy	
Temperature range	+ 5° to + 50° C	
Height capacity	215 mm	
Depth capacity	190 mm	
Diameter of anvil	60 mm	
Max load of test piece	1000 Kg	
Data output	RS 232 C optional	
Power supply	100÷240V 50÷60 Hz 12VA	
Fields of application	For all metals, steel, hard steel, cast iron, brass, aluminium over 0.6mm, plastics, soft and hard rubber	Nitriding, cementation, hard facing with depth less to 0.6 mm
Net weight	65 kg	
Packing weight	85 kg	
Packing measurements	37x60x102 cm	

## HARD TEST-I

Conform with standard DIN 50157

A new combined tester for Hardness and sigma break tests in one instrument: quick and accurate for production departments without requiring laboratory inspection.

**DIRECT DIGITAL READOUT ON 10 HARDNESS SCALES**

- HrA
- Hh
- Hrc
- Hrb
- Hr30t
- Hb5
- Hb30
- Hu
- r
- Hr15n



**QUICK:** in only 2 seconds the hardness and sigma are measured on large range of metallic products

**UNIVERSAL:** designed to check sheets, metal rolls, shaped parts, tubes, on aluminium, brass, copper and steel

**ACCURATE:** products and surfaces down to 0.08 mm thick can be checked. It works using the innovative Affri system which measures the real indentation depth applying constant incremental load rates through a minor and major load (as in laboratory machines).





HARD TEST-II

Conform with standard DIN 50157  
Cod. 23631 handwheel for Metaltester.  
Automatic clamping and testing cycle for metals parts.  
Capacity 30x30 mm.  
For fast accurate hardness on production department.



METALTESTER MKII

- Conform with standard DIN 50157
- For every kind of metal both very hard and soft
- Suitable for flat, round and irregular pieces
- No need to adjust it
- Accuracy  $\pm 0.5$  HRC
- For thin surfaces: up to 0.08 mm thickness and large parts

Technical characteristics		
Min. thickness measurable	Mod 2102= 0.08mm	Mod 2102/2=0.06 mm at 65HRC
Principle of operation	Load with electronic control	
Fields of application	for all metals	
Digital scale read out (other scales on request)	Rockwell HRA (20...92); HRB (26...100); HRC (0...80);	
	HR15N (69...93); HR30T (16...83)	
	Brinell HB5 (5...205); HB30 (66...884) Knoop (25...97)	
	Vickers (13...1865)	
	Tensile Module R (226...2898) HZA (0...250)	
	Webster B 0 – 20 (on request)	
	Barcol 0 – 100 (on request)	
Display resolution	0.1 Unit	
Repeatability	$\pm 0.5\%$ on reference test block HRC	
Memory of test results	500 tests	
Data transmission	RS 232 C	
Statistic of results	mean of results	
Display	L C D	
Printer (option)	20 column termic paper measures: (15 x 10 x 4 cm)	
Power supply	rechargeable battery 6V	
Operating time	1000 tests	
Automatic shut off	After a pause of 2 minutes. Restart by button	
Dimension of probe	body: $\varnothing$ 40 mm x 90 mm - base $\varnothing$ 20 mm.	
Dimension of electronic box	160 x 90 x 50h mm	
Weight	300 gr. probe - 980 gr. digital box - 2.5 Kg with case	
Dimension of case	30x20x15 cm	



Interchangeable test heads are designed for a wide range of metal applications and surfaces.

Test on small area

## METALTEST

Conform with standard DIN 50157

Portable hardness tester compact and easy to use in every position with immediate result on HRC, HRB, HRA, HB, HV, Nmm2, HR 15N units. No limit on thickness can be tested, thin materials as coating surface of 0.08 mm can be accurately measured.

- For every kind of metal both very hard and soft
- Suitable for flat, round and irregular pieces
- No need for adjustment if used inclined or inverted
- No affected by thickness of sample
- For thin surfaces: down to 0.08 mm thickness and large parts
- 10 different scales on the display
- Memory of the results 100 values (each scale)
- Average of the stored results.
- Repeatability + / - 0,5 HR on test block

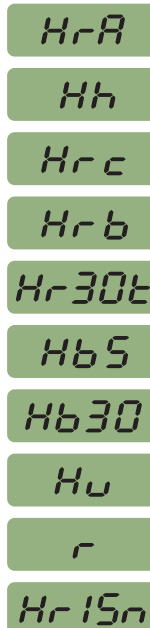
Applicable accessories for all portables models:



Optional: Art. 2316 V long base  
Easy test on long screws



Optional: Art. 2315  
For irregular surfaces  
Coils



## MICROTESTER

Conform with standard DIN 50157

### Applicable electronic processor:

Large LCD display and user friendly keypad make the microtester easy to operate



Bench instrument  
Cod. 2312 including anvils for 2102 is  
ideal for testing small samples



Advanced graphic LCD and  
software multifunctions

## EDA300

### Motorized stand for MKII



- Conform with standard DIN 50157
- Accurate rapid and reproduceable results from measurement of penetration depth and low constant force the most repeatable instrument in the world  $\pm 0,5$  HRC
- Direct result in 10 different hardness scales and N mm<sup>2</sup> sigma range to measure from 10 HRB to 1800 HV
- A single start input to activate without interruption phase: move down head indenter to take the contact with test surface, clamp sample and execute the test and goes back
- A test is performed in only 3 seconds independently from every distance of test sample

#### Technical characteristics

Total height capacity	from 0 to 170 mm
Minimum thickness measurable	0.08 mm 600 Vickers
Ø measurable	from 0.5 mm to 150 mm
Total depth capacity	75 mm

## HT-1000 / HT-2000



Portable rebound hardness tester with data output to send data to the printer for all metals.

Direct digital readout on crystal liquid display in the following scales: HV HRC HRB HB HL or HSD. It work on all metals, very rapid and easy to use with only a touch of the button.

### SPECIFICATION:

Display: 4 digit LCD with switch able backlight  
Calendar, data, hour programmable  
Inclination of probe programmable  
Statistic, visible on display and printable.

### MEASUREMENT RANGE:

Leeb: 50 to 1000 HL      Shore: 32.5 to 99.5HS  
Brinell 45 to 700HB      Vickers: 32 to 900HV  
Rockwell C: 20 to 68.8 HRC      Rockwell B : 4 to 100 HRB  
Power supply: AA 1.5V x 2 Batteries  
Weight: Approx 100g  
Operating temp: 10°C to 50°C  
Interface: Infrared for printer and computer



### HT-1000 PACKAGE INCLUDES:

- HT-1000 hardness Tester
- Standard Test Block
- Support Ring .79" (20 mm)
- Support Ring .53" (13 mm)
- Plastic Carrying Case
- Tube Cleaning Brush
- CR-2330 Lithium Batteries (2)
- Operating Manual

### HT-2000 PACKAGE INCLUDES:

- HT-2000 hardness Tester + printer infrared
- Standard Test Block
- Support Ring .79" (20 mm)
- Support Ring .53" (13 mm)
- HP 82240B Infrared Printer
- CR-2330 Lithium Batteries (2)
- 1.5V AA Alkaline Batteries (4)
- Plastic Carrying Case
- Tube Cleaning Brush
- Operating Manual

### OPTIONAL ACCESSORIES:

- extension probe Ø4 mm, L=50 mm
- set of rings for various surface round



### Caratteristiche tecniche:

Calendar, data, hour programmable (only for HT2000), Inclination of probe programmable, Statistic, visible on display and printable

Display	4 digit LCD with switchable backlight		
Measurement Range	Leeb: 50 to 1000 HL	Shore: 30 to 100 HS	Brinell: 75 to 700 HB
	Vickers: 75 to 1000 HV	Rockwell C: 20 to 70 HRC	Rockwell B: 35 to 100 HRB
Scales	HL, HV, HB, HRC, HSD, HRB		
Accuracy	+/- 4 HL		
Testing direction	Vertically / Down / 45° Down / Horizontal		
Materials	Low carbon steel, High alloy steel		
Operating Temperature	Operating: 10 °C to 40 °C      Storage: - 20 °C to 50 °C		
Power supply	AA 1.5V x 2 batteries		
Batteries	Tester: Two, 3V Lithium CR2330 batteries      Printer: Four, 1.5V Alkaline AA batteries		
Battery life	Tester: Work Life 40 hours continuous (2.500 test results) - Shelf Life 2 Year		
Printer	6.000 print lines infrared (only for HT2000)		
Data Storage	Automatic recording up to 200 test results including readings, conversions, average values, hardness scale, material, direction, date and time.		
Time and date	Real time and date with a 10 year calendar		
Interface	infrared for printer and computer (only for HT2000)		
Tester dimensions	165x28x28 mm		
Contact Dia.	20 and 13.5 mm		
Weight	120 gr		



## DM8

Very large colour touch screen with integrated functions.

The most complete system in the world. Multi objective and multi indenters.

Ideal for factory and laboratory use.

It indicates load force applied, load time, Diagonal 1 and Diagonal 2, hardness results, number of measurements stored, averages, statistics.

Self conversion data. HV and HK Knoop test can be calculated just by selecting switch and applying extra Knoop indenter.



Autoturret multi step 3 or 6 positions to install till to 4 objectives and + 2 indenters

### Technical characteristics (code 7101)

		DM-8 A and B											
Auto-turret		2 Indenters + 4 Objectives											
Max. height of specimen		120 mm											
Max. depth of specimen		160 mm											
Reading		Digital - Touch panel											
DM-8A	mN	49.03	98.07	245.2	490.3	980.7	1961	2942	4903	9807			
	(gf)	5	10	25	50	100	200	300	500	1000			
DM-8B	mN	9.807	29.42	49.03	98.07	245.2	490.3	980.7	1961	2942	4903	9807	19614
	(gf)	1	3	5	10	25	50	100	200	300	500	1000	2000
Measuring microscope		Max. measuring length								250 μm			
		Min. graduation								0.01 μm			
		Min. measuring unit								0.01 μm			
Loading mechanism		Automatic loading and releasing method											
Load applying speed		50 μm/sec											
Dwell time		5-60 sec											
LCD type touch panel		Yes											
256 data memory		Yes											
Hardness conversion		Possible in compliance with ASTM (E-140),JIS											
OK/NG criteria		Yes											
Data editing		Yes											
Data output		RS232C											
Accuracy		According to ASTM E-384, ISO 6507-2 and JIS B 7734											
Photographic device		Possible to mount at anytime (camera sleeve:optional)											
Dimensions		Main body only: W220xD400xH500											
Weight		28 kg											
Power supply		Single phase AC100-240V 50/60Hz available											

## DM2

CCD camera transmits the image to the computer and EASYDUR® Software for fast and automatic Vickers measurements it eliminates human errors, saves data, performs statistics, prints out results (optional).

Auto turret to select indenter and objective.

Control panel integrated with ergonomic touch key board. 2 digital large LED indicate load force applied, Load time, Diagonal 1 and Diagonal 2, Hardness results, number of measurements stored, average, statistics. HV and HK (Knoop test can be calculated just by selecting switch and applying extra Knoop indenter).

Software for quick or automatic Vickers measure (optional)

Case depth diagram

### STANDARD ACCESSORIES

- Manual X-Y table 100x100mm, range 25x25 mm div 0.01 mm
- Precision vice 15 mm
- Test block HV 700
- Test block HV 400
- Diamond indenter for HV
- Measuring microscope electronic type
- Measuring microscope mechanical type

- Object lens (Built in) x10
- Object lens (Built in) x40
- Level adjusting leg
- Light source bulb (12V 18W)
- Auxiliary tools
- Instruction manual
- Accessories box
- Automatic conversion: Vickers - Rockckwell

### OPTIONAL

- Knoop indenter
- Knoop test block
- Printer
- Motorized X-Y table
- Software Semi Auto for easy Vickers measure
- X-Y table motorized, programmable step
- Software AUTO for automatic Vickers measure
- Digital micrometer div 0.001 mm TESA

### Technical characteristics

		DM-2 A					DM-2 D				
Test load	( mN ) N	( 98.07	245.2	490.3	980.7	1961	2942	4903	9807	)	
	( gf ) Symbol	( 10	25	50	100	200	300	500	1000	)	
Dwell time		5~40sec.					5~60 sec				
Measuring microscope	Max. measuring length	250 μm					250 μm				
	Min. graduation	0.5 μm					0.1 μm				
	Min. measuring unit	0.1 HV					0.1 HV				
Read out		Analogic					Digital				
Data output		-					Centronics				
Magnification		100x - 400x									
Max. height of specimen		95 mm									
Max. depth of specimen		100 mm									
Dimensions main body only		W220xD400xH500 mm									
Weight		28 kg									
Load applying speed		50 μm/sec									
Auto-turret		Yes									
Loading mechanism		Automatic loading and releasing method									
Accuracy		According to JIS B 7734 and ASTM E-384 / JIS									
Photographic device		Possible to mount at anytime (camera sleeve:optional)									
Power supply		Single phase AC100~240V 50/60Hz available									



## DM2 AUTO DM8 AUTO



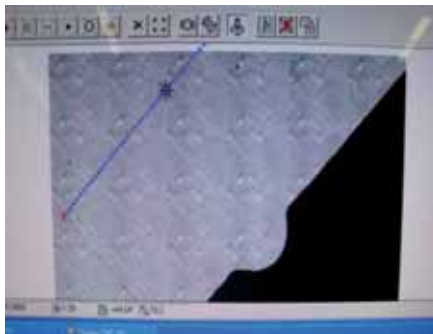
DM8 AUTO



Multi sample function



X-Y table action with joystick



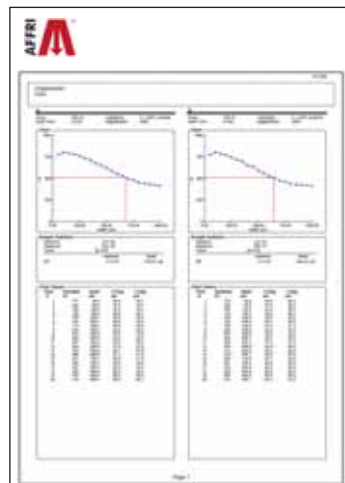
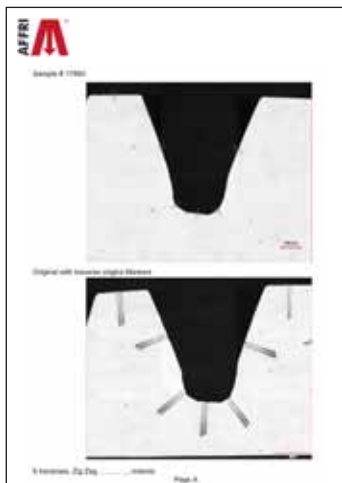
Example of scanning area

### Multiple Samples Holder

sample holders have unique design, allowing users to analyze mounted or un mounted samples. Holding multiple samples, some holders accommodate a test block, allowing users to validate the calibration of the micro hardness tester at any time without to remove the sample. The samples can be remove easily or inserted with a simple slide-in drawer system.

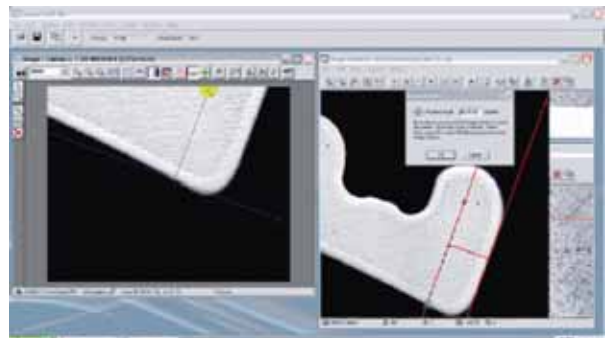


**DM8 AUTO - DM2 AUTO** includes: X-Y-Z axis auto focus fully motorized and camera, software to manage the cycle and auto-measure, table area 100x100mm or 200x90 mm, with excellent accuracy 1  $\mu$ m;



### Mosaic Feature

DM8 AUTO is the first hardness tester to offer a complete, high definition image of a sample, no matter its size. This innovative feature provides an "aerial view" of the sample, offering sharp close-ups as well as global views. The Mosaic Image makes it possible to position as many as 99 traverses – to within a few micron

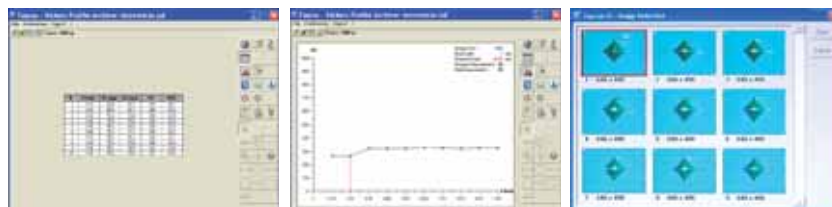


Traverse positioned in the middle of the branch and paralleled to the edge

## DM5



CCCD camera for vision of indentations and connection to PC and software for automatic Vickers measure



Software Taurus: Automatic Vickers measure, store data, create case depth diagram, test report  
Easy and simple action.

### STANDARD ACCESSORIES

- 136° Vickers indenter
- HV test block
- Anvil flat 50 mm
- V face anvil 50 mm
- Spare bulb
- Eyepiece 10x
- Objective 10x
- User's manual
- Cable cord
- Certificate of calibration

### OPTIONAL ACCESSORIES

- n. 1 Motorized turret for DM5A
- n. 1 Objective 20x (for DM5A only)
- n. 1 X - Y table 100 x 100 mm 25 x 25 mm travel 0.01 mm division
- n. 1 Software Taurus for automatic Vickers measure and case depth diagram
- n. 1 CCD camera adapter
- n. 1 Vice 25 mm capacity.



Digital display of load, dwell time, Vickers result, number of test conversion result to Rockwell, Brinell scale



Fast selection of test load trough knob

Conform to the ISO 6507.2 , ASTM E 384 JISB 7734  
Automatic turret to select indenter and objective

### Technical data

	DM-5 A	DM-5 B
Test loads	0.3 0.5 1 3 5 10 20 30	1 2 3 5 10 20 30 50
Digital Display	Vickers, Brinell, Rockwell C	
Out data	RS32 C	
Objective	10x - 20x	10x
Magnifications	100x - 200x	100x
Field of vision	900µm (100x): 450 µm (200x)	900µm (100x)
Division	0.5µm (100x): 0.1 µm (200x)	0.5µm (100x)
Switch objective/indenter	manual turret (option motorized)	manual turret
Eyepiece	digital encoder 10x	
Table	X - Y 100x100 travel 25x25 division 0.01 mm	
Camera connection	special adaptor optional	
Height capacity	max 210 mm w. flat anvil	
Depth capacity	160 mm	
Digital display	of programmed load	
Digital display	dwell time 1 to 99 sec. programmable	
Digital display	No. of tests	
Light	adjustable by key board	
Power source	220 240 V single phase	
Weight	55 Kg	
Dimension	55 x 30 x 700H cm	



Turret to self switch in indenter objective  
(2 objectives for DM5A 1 objective for DM5B)



MOTORIZED X-Y TABLE connected with CNC computer for automatic tests

## INTEGRAL 6



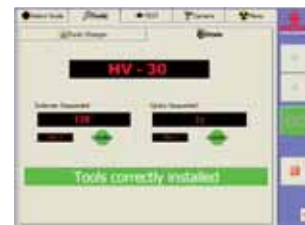
- Fully Automatic Universal Hardness Tester
- Automatic Rockwell, Brinell, Vickers, Knoop, ISO 2039, SHORE measures
- Thanks to the Affri system Closed loop technologies inside the Autofocus for Vickers and Brinell is easy and automatic
- Color touch screen TFT 17" inclinable 180°
- Large base for heavy parts 400 x 400 mm
- Sliding indenter stroke from 300 to 0 mm self touching surface
- Automatic clamping for Rockwell tests (Brinell at request)
- One single start input to activate without interruption: (self touch surface to be tested, self load -un-load self switching indenter, optic, self focus and self measure, self goes up to free sample)
- The first test is valid, non need to repeat. Absolute measure
- Insensible to external vibrations sources
- Insensible to deflections during test cycle
- Insensible to change of temperature ( 5 to + 50°C)
- It can be operative also if is not leveled or if inclined

### OPTION

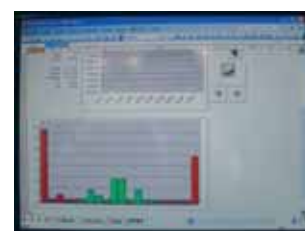
- Clamping system combinet to the high technology of Affri System assure perfect clamping also on unstable or flexible parts
- Rotating turret at 6 positions for automatic switch to several indenters and objectives ②
- Motorized X-Y axis table 200 x 100mm division 0.01 mm combined to automatic start test cycle for hardness case depth. The axis are independently or combined programmed ③.
- Large vision filed optic camera for automatic sample border or bar code recognizing
- Martens hardness cycle



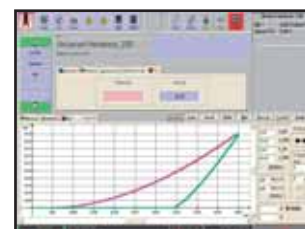
Automatic Vickers measure



Automatic check-up correct objective and indenter installed on



Complete statistic and test report on Excel® format



Martens hardness



② Motorized turret at 5 - 3 - 2 steps self switch indenter – objectives



③ Motorized X Y table for series of Vickers test and auto recognize zero point

### Available models Rockwell, Brinell, VICKERS, KnOop, ISO 2039, SHORE

#### - INTEGRAL 6 (loads from 0.3 to 30) Micro Vickers + Superficial Rockwell + Brinell

Micro Vickers - Knoop 0.3 0.5 1 2 5 10 20 30 kgf (2,94 4,9 9,81 19,6 49,05 98,1 196 294,3 N)  
Superficial Rockwell 15 30 45 kgf (147 294 441,45 N)  
Shore A B C D O 00

Brinell 1 5 10 30 31.2 kgf (9,81 49,05 98,1 294 306 N)  
ISO 2039  
Martens max 30 kgf (294 N)

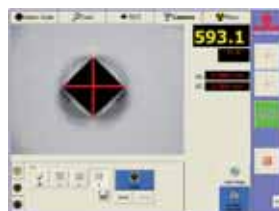
### Technical characteristics

Measures	Automatic Brinell - Vickers / Rockwell / Knoop / ISO 2039 / SHORE			
Focus	Automatic			
HDTL function	Permits checking the case depth of hardness treathment from 0.15 to 1.5 mm at 525 - 550 - 600 HV1			
Test height	max 300 min 0 mm self adjusting acting the Test start input			
Depth	170 mm (other on request)			
Action:	Only one start input moves down head and indenter to take test surface contact, self load -un-load self switching indenter, optic, self focus and self measure,self goes up to free sample			
Load forces	controlled by internal load cell and closed loop Affri system patent			
Automatic turret	self switching 1 indenter + 1 objective (optional 5 steps 3 indenters + 2 objectives)			
Resolution	0.1 HB / 0.1 HR / 0.1 HV / 0.1 HK / 0.1 SH			
Net work	wire connection for technical assistance auto diagnosis			
Accuracy: Conformation standards	Brinell EN-ISO 6506-2 Vickers EN-ISO 6507-2	Rockwell EN-ISO 6508-2 Plastic DIN EN 53456, EN-ISO 2039-2	Knoop ISO 4545 Shore A B C D O 00 ISO 7619 - ISO 868	JIS
Operativity	it can work if not levelled, inclined or near to vibration area, without loosing accuracy			
Temperature range	+ 5° to + 50° C			
Self aligning to test surface	from 0 to 300 mm			
Max. weight allowed for the specimen to be tested	2000 Kg			
Base	400x400 mm			
Fields of application	For all metals: iron, steel, tempered steel, brass, aluminium and nitriding, cementation, hard facing, plastic			
Size	600x400x800h			
Net weight	150 Kg			
Packing weight	200 Kg			
Power supply	220V 50÷60Hz - 200VA - Air compressed 5 ATM			





## INTEGRAL



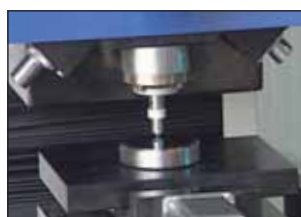
Automatic Vickers measure



Automatic check-up correct objective and indenter installed on



① Clamping system for long parts



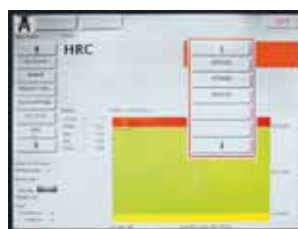
② Motorized turret at 5 - 3 - 2 steps self switch indenter - objectives



③ Motorized X-Y table for series of Vickers test and auto recognize zero point



Complete statistic and test report on Excel® format



④ Automatic case depth measurement without cut the sample HDTL principle

- Fully Automatic Universal Hardness Tester
- Automatic Brinell, Vickers, Rockwell measures
- Thanks to the Affri system Closed loop technologies inside the Autofocus for Vickers and Brinell is easy and automatic
- It can measures automatically the case depth surface of heat treatment from 0.15 to 1.5 mm thickness directly up the surface without cutting the sample (HDTL) cycle. It is not a destructive test.
- Color touch screen TFT 17" inclinable 180°
- Large base for heavy parts 400 x 400 mm
- Sliding indenter stroke from 500 to 0 mm self touching surface
- Automatic clamping for Rockwell tests (Brinell at request)
- One single start input to activate without interruption: (self touch surface to be tested, self load -unload self switching indenter, optic, self focus and self measure, self goes up to free sample)
- The first test is valid, non need to repeat. Absolute measure
- Insensible to external vibrations sources
- Insensible to deflections during test cycle
- Insensible to change of temperature (5 to + 50°C)
- It can be operative also if is not leveled or if inclined

### OPTION

- Clamping system combinet to the high technology of Affri System assure perfect clamping also on unstable or flexible parts ①
- Rotating turret at 6 positions for automatic switch to several indenters and objectives ②
- Motorized X-Y axis table 200 x 100mm division 0.01 mm combined to automatic start test cycle for hardness case depth. The axis are independently or combined programmed ③.
- Large vision filed optic camera for automatic sample border or bar code recognizing.
- HDTL for case depth ④.

### Available models

#### - INTEGRAL 1 (loads from 15.6 to 3000) Brinell

Brinell 15.6 31.2 62.5 125 187.5 250 500 750 1000 3000.

#### - INTEGRAL 2 (loads from 1 to 250) Rockwell+Brinell + Vickers + Shore

Brinell 1 5 10 15 15.6 30 31.2 62.5 125 187.5 250 .

Vickers 1 2 3 5 10 15 30 50 60 100

Rockwell 15N/T 30N/T 45N/T 60 100 150 HRC A D B F G L M R S T V X Z

ISO 2039 tests for plastic

#### - INTEGRAL 3 (loads from 3 to 1000) Brinell + Vickers + Rockwell + Superficial Rockwell + Case depth

Brinell: 3 5 10 15.5 31.2 62.5 125 187.5 250 500 1000; Vickers: 3 5 10 15 30 60 100 120

Rockwell: 60 100 150; Superficial Rockwell: 15 30 45

HDTL case depth automatic HV 525 - 550 - 600 (at request)

#### - INTEGRAL 4 (loads from 1 to 50) Brinell + Vickers + Shore

Brinell 1 5 10 30 31.2 50, Vickers 1 2 3 5 10 15 30 50, Rockwell 15N/T 30N/T 45N/T ISO 2039 tests for plastic

#### - INTEGRAL 5 (loads from 10 to 3000) Rockwell + Brinell + Vickers

Brinell 10 30 31.2 62.5 125 187.5 250 500 750 1000 3000.

Vickers 10 15 30 50 60 100 120

Rockwell 60 100 150 HRC A D B F G L M R S T V X Z

HDTL case depth test

#### - INTEGRAL 6 (loads from 0.3 to 30) Micro Vickers + Superficial Rockwell + Brinell

Micro Vickers 0.3 0.5 1 2 5 10 20 30, Brinell 1 5 10 30 31.2, Superficial Rockwell 15 30 45

### Technical characteristics

Measures	Automatic Brinell, Vickers, Rockwell and case depth treatment (depend to the models)		
Focus	Automatic		
HDTL function	Permits checking the case depth of hardness treatment from 0.15 to 1.5 mm at 525 - 550 - 600 HV1		
Test height	max 500 min 50 mm self adjusting acting the Test start input		
Depth	170 mm (other on request)		
Action:	Only one start input moves down head and indenter to reach test surface self touch surface to be tested, self load -un-load self switching indenter, optic, self focus and self measure, self goes up to free sample		
Load forces	controlled by internal load cell and closed loop Affri system patent		
Automatic turret	self switching 1 indenter + 1 objective (optional 5 steps 3 indenters + 2 objectives)		
Resolution	0.1 unit (0.01 mm case depth)		
Net work	wire connection for technical assistance auto diagnosis		
Accuracy: Conformation standards	Brinell EN-ISO 6506-2 Vickers EN-ISO 6507-2	Knoop Rockwell EN-ISO 6508-2	Plastic DIN EN 53456, EN-ISO 2039-2 JIS
Operativity	it can work if not levelled, inclined or near to vibration area, without loosing accuracy		
Temperature range	+ 5° to + 50° C		
Self aligning to test surface	from 0 to 500 mm		
Max. weight allowed for the specimen to be tested	2000 Kg		
Base	400x400 mm		
Fields of application	For all metals: iron, steel, tempered steel, brass, aluminium and nitriding, cementation, hard facing, plastic		
Size	600x1000x1800h		
Net weight	500 Kg		
Packing weight	600 Kg		
Power supply	220V 50÷60Hz - 200VA - Air compressed 5 ATM		

## INTEGRAL - E



Automatic Vickers measure



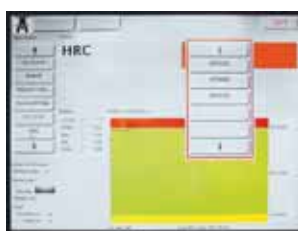
Automatic check-up correct objective and indenter installed on



② Motorized turret at 5 - 3 - 2 steps self switch indenter – objectives



Complete statistic and test report on Excel® format



① Automatic case depth measurement without cut the sample HDTL principle

- Fully Automatic Universal Hardness Tester
- It can measure automatically the case depth surface of heat treatment from 0.15 to 1.5 mm thickness directly up the surface without cutting sample (HDTL) cycle. It is not a destructive test.
- Automatic Brinell, Vickers, Rockwell measures
- Thanks to the Affri system Closed loop technologies inside the Autofocus for Vickers and Brinell is easy and automatic
- Color touch screen TFT 17"
- Elevating screw columns base for fast adjustments
- Sliding indenter stroke from 50 to 0 mm self touching surface
- Automatic clamping for Rockwell tests (Brinell at request)
- One single start input to activate without interruption: (self touch surface to be tested, self load -un-load self switching indenter, optic, self focus and self measure, self goes up to free sample)
- The first test is valid, non need to repeat. Absolute measure
- Insensible to external vibrations sources
- Insensible to change of temperature (5 to + 50°C)
- Insensible to deflections during test cycle
- It can be operative also if it is not leveled or if inclined

### Exemple of test report for case depth:

TEST REPORT	
AFFRI - HDTL	
Hardness Depth Treatment Loads	
Product Code	.....
Operator	.....
Date of test	.....
Vickers	depth measured
HV 525	0.27 mm
HV 550	0.31 mm
HV 600	0.34 mm
Superficial Hardness detected	HRC 54.46

Test report for case depth HDTL measurement

### OPTION

- Clamping system combinet to the high technology of Affri System assure perfect clamping also on unstable or flexible parts ①
- Rotating turret at 6 positions for automatic switch to several indenters and objectives ②
- Motorized X-Y axis table 200 x 100mm division 0.01 mm combined to automatic start test cycle for hardness case depth. The axis are independently or combined programmed ③.
- Large vision filed optic camera for automatic sample border or bar code recognizing.
- HDTL for case depth ④.

### Available models

- **INTEGRAL - E 1 (loads from 15.6 to 3000) Brinell**  
Brinell 15.6 31.2 62.5 125 187.5 250 500 750 1000 3000.
- **INTEGRAL - E 2 (loads from 1 to 250) Rockwell+Brinell + Vickers + Shore**  
Brinell 1 5 10 15 15.6 30 31.2 62.5 125 187.5 250 .  
Vickers 1 2 3 5 10 15 30 50 60 100  
Rockwell 15N/T 30N/T 45N/T 60 100 150 HRC A D B F G L M R S T V X Z  
ISO 2039 tests for plastic
- **INTEGRAL - E 3 (loads from 3 to 1000) Brinell + Vickers + Rockwell + Superficial Rockwell + Case depth**  
Brinell: 3 5 10 15.5 31.2 62.5 125 187.5 250 500 1000; Vickers: 3 5 10 15 30 60 100 120  
Rockwell: 60 100 150; Superficial Rockwell: 15 30 45  
HDTL case depth automatic HV 525 - 550 - 600 (at request)
- **INTEGRAL - E 4 (loads from 1 to 50) Brinell + Vickers + Shore**  
Brinell 1 5 10 30 31.2 50, Vickers 1 2 3 5 10 15 30 50, Rockwell 15N/T 30N/T 45N/T  
ISO 2039 tests for plastic
- **INTEGRAL - E 5 (loads from 10 to 3000) Rockwell + Brinell + Vickers**  
Brinell 10 30 31.2 62.5 125 187.5 250 500 750 1000 3000.  
Vickers 10 15 30 50 60 100 120  
Rockwell 60 100 150 HRC A D B F G L M R S T V X Z  
HDTL case depth test
- **INTEGRAL - E 6 (loads from 0.3 to 30) Micro Vickers+Superficial Rockwell+Brinell**  
Micro Vickers 0.3 0.5 1 2 5 10 20 30  
Brinell 1 5 10 30 31.2  
Superficial Rockwell 15 30 45

### Technical characteristics

Measures	Automatic Brinell, Vickers, Rockwell and case depth treatment (depend to the models)		
Resolution	0.1 HR 0.01 mm case depth		
HDTL function	Permits checking the case depth of hardness from 0.15 to 1.5 mm range at 525 - 550 - 600 HV1		
Load force	Controlled in closed loop load cell inside Affri patent		
Test height	max 400 min 0 mm self adjusting in step of 50 mm acting the Test start input and Handwheel for long stroke		
Depth	200 mm (others on request)		
Action:	Only one start input moves down head and indenter to reach test surface self touch surface to be tested, self load -un-load self switching indenter, optic, self focus and self measure, self goes up to free sample		
Automatic turret	self switching 1 indenter + 1 objective (optional 5 steps 3 indenters + 2 objectives)		
Net work	wire connection for technical assistance auto diagnosis		
Operativity	it can work if not levelled, inclined or near to vibration area, without losing accuracy		
Temperature range	+ 5° to + 50° C		
Self aligning to test surface	from 0 to 50 mm		
Compensation of deflection	From 0 to 50 mm range		
Accuracy: Conformation standards	Brinell EN-ISO 6506-2 Vickers EN-ISO 6507-2	Knoop Rockwell EN-ISO 6508-2	Plastic DIN EN 53456, EN-ISO 2039-2 JIS
Max. weight allowed for the specimen to be tested	200 Kg		
Base	Anvils set applicables		
Fields of application	For all metals: iron, steel, tempered steel, brass, aluminium and nitriding, cementation, hard facing, plastic		
Size	400x600x1700h		
Net weight	380 Kg		
Packing weight	450 Kg		
Power supply	220V 50-60Hz - 200VA - Air compressed 5 ATM		

## 270 VRSD 270 VRSA



VRSA  
Digital reading  
through data  
entering



## 770 VRSD

Fully motorized up/down head  
from 0 to 700 mm

## 270 VRSTV

Optional screen combined  
with camera and software  
Semi auto or auto measure



### ALL OPERATIONS ARE MANAGED BY A SINGLE DRIVE INCLUDING AUTOMATIC RESEARCH OF TEST PIECE

- Pushing the Start button, head moves down to reach the test surface from distance multiples of 50 mm and automatically starts the hardness test cycle in automatic succession without breaking a phase:
  - approach to the piece;
  - clamping of the piece;
  - activation of reference surface;
  - entire test cycle performance and release of piece.



Sledding table (optional)  
cod. 13601 large anvil V face



Clamping base for big or  
unstable pieces (optional)

### Technical characteristics

	270 VRSD VM VICKERS (code 6111)	270 VRSA VM VICKERS (code 6110)	270 VRSTV VM VICKERS (code 6112)
Vickers force	(0.3 0.5 1 2 2.5 3 5 10 15 20 30 50 Kgf)	2.94 4.9 9.81 19.6 24.5 29.43 49.05 98.1 147.15 196 294.3 490 N	
Super Rockwell force	15 30 45 HRN - HRT		
	270 VRSD (code 6101)	270 VRSA (code 6100)	270 VRSTV (code 6102)
Vickers Knoop loads	(1 2 2.5 3 5 10 15 20 30 60 100 Kgf)	9.81 19.6 24.5 29.43 49.05 98.1 147.15 196 294.3 588.6 981 N	
Rockwell loads	(10 60 100 150 Kgf)	98.10 588.60 981 1471.50 N	
SuperRockwell loads	(3 15 30 45 Kgf)	29.43 147.15 294.30 441.45 N	
Brinell loads	(5 6.25 10 15.6 25 30 31.2 62.5 125 187.5 Kgf - on request extra 250 Kgf)	49.05 61.3 98.1 153.23 245 294.43 306.5 613 1226 1839 N (on request 2452)	
Optional test loads	49 132 358 961 N (for plastic, rubber as per EN-ISO 2039 std) (250 Kgf) 2452.5 N Brinell		
Shore	A - B - C - D		
Operativity	it can work if not levelled, inclined or near to vibration area, without loosing accuracy		
Temperature range	+ 5° to + 50° C		
Self aligning to test surface	from 0 to 400 mm		
Clamping	Fix cup optional		
Action:	only one start input moves down head to reach and clamp the test surface from distance multiple of 50 mm and automatically starts the hardness cycle in automatic succession without breaking a phase		
Mobile Indenter	from 0 to 50 mm multiple till 400 mm		
Mobile clamping	from 0 to 50 mm multiple till 400 mm		
Magnification	75x 150x 225x 300x		
Automatic compensation of deflection piece	from 0 to 50 mm		
Reading resolution	0.1 HR-HB-HV ( 0.01 HR unit, at request) - (0.1 micron mm) Vickers Brinell		
Reading	Digital encoder for Brinell - Vickers	Drum scale + digital readout	CCD camera + computer
Total depth capacity	190 mm		
Working table	270x330 mm		
Working height	375 mm (700 mm for model 770 VRSD fully motorized)		
Max. weight allowed for the specimen to be tested:	2000 Kg		
Data output	RS 232 C		
Power supply	220V 50÷60Hz - 200VA		
Net weight	95 Kg (150 Kg for 770 VRSD)		
Packing weight	120 Kg (190 Kg for 770 VRSD)		
Packing measure	80x80x150 cm		
CCD camera	High resolution, Vickers semi auto / Auto measure		



## 251 VRSD / 251 VRSA



## 251 VRSTV



Optional screen combined  
with camera and software

Software and camera for quick  
Vickers and Brinell measures  
Auto measurements (optional)

Clamping base for big or  
unstable pieces (optional)



### ALL OPERATIONS ARE MANAGED BY A SINGLE DRIVE INCLUDING AUTOMATIC RESEARCH OF TEST PIECE

Pushing the Start button, head moves down to reach the test surface from distance multiples of 50 mm and automatically starts the hardness test cycle in automatic succession without breaking a phase:

- approach to the piece; - activation of reference surface; - clamping of the piece; - entire test cycle performance and release of piece.

#### Technical characteristics

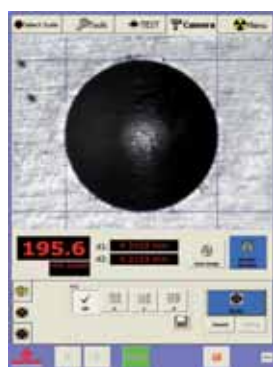
	251 VRSD VM VICKERS (code 6212)	251 VRSA VM VICKERS (code 6211)	251 VRSTV VM VICKERS (code 6213)
Vickers force	(0.3 0.5 1 2 2.5 3 5 10 15 20 30 50 Kgf)	2.94 4.9 9.81 19.6 24.5 29.43 49.05 98.1 147.15 196 294.3 490 N	
Super Rockwell force	15 30 45 HRN - HRT		
	251 VRSD (code 6202)	251 VRSA (code 6201)	251 VRSTV (code 6203)
Vickers Knoop loads	(1 2 2.5 3 5 10 15 20 30 60 100 Kgf)	9.81 19.6 24.5 29.43 49.05 98.1 147.15 196 294.3 588.6 981 N	
Rockwell loads	(10 60 100 150 Kgf)	98.10 588.60 981 1471.50 N	
SuperRockwell loads	(3 15 30 45 Kgf)	29.43 147.15 294.30 441.45 N	
Brinell loads	(5 6.25 10 15.6 25 30 31.2 62.5 125 187.5 Kgf - on request extra 250 Kgf) 49.05 61.3 98.1 153.23 245 294.43 306.5 613 1226 1839 N (on request 2452)		
Optional test loads	49 132 358 961 N (for plastic, rubber as per EN-ISO 2039 std)	(250 Kgf) 2452.5 N Brinell	
Shore	A - B - C - D		
Operativity	it can work if not levelled, inclined or near to vibration area, without loosing accuracy		
Temperature range	+ 5° to + 50° C		
Self aligning to test surface from 0 to 50 mm			
Clamping	Fix cup optional		
Action:	only one start input moves down head to reach and clamp the test surface from distance multiple of 50 mm and automatically starts the hardness cycle in automatic succession without breaking a phase		
Mobile Indenter	from 0 to 50 mm		
Mobile clamping	from 0 to 50 mm		
Magnification	75x 150x 220x 300x		
Automatic compensation of deflection piece from 0 to 50 mm			
Reading resolution	0.1 HR-HB-HV (0.01 HR unit, at request) - 0.1 micron mm		
Reading	Digital encoder for Brinell - Vickers	Drum scale + digital readout	CCD camera + computer
Total depth capacity	190 mm		
Working height	200 mm		
Data output	RS 232 C		
Power supply	220V 50÷60Hz - 200VA		
Net weight	75 Kg		
Packing weight	95 Kg		
Packing measurements	50x50x100 cms		
CCD camera	High resolution, Vickers semi auto / Auto measure		

## LD 250

- A single initiation runs the automatic test cycle and presents the result.
- The LD 250 is a very practical and robust instrument designed to perform Vickers, Brinell, Rockwell, Super Rockwell and Knoop Hardness tests conforming to the ISO 6506, 6507, 6508 and ISO 2039 standards
- Over the load range from 9.81N to 2452 N. The patented internal Affri system assures high performance automatic load tests and automatic measurement on every scale
- Automatic selection of test load, indenter and objective plus automatic measurement cycle.
- Self start test load self switch indenter to objective self measure.
- High resolution video image via camera with auto adjustment of the iris to match the surface reflection and assure perfect results on Vickers and Brinell measurements even if the surfaces are not highly polished.
- The test force is closed loop load control using an electronic load cell connected to the indenter eliminating friction and error under all conditions.
- The ABSOLUTE control of loads assures infinite precision even in poor environments near sources of mechanical vibration, or if the machine is not levelled or inclined and even if the test piece is not stable during the test.
- The first test is valid, non need to repeat. Absolute measure
- Automatic switching of indenter and objective
- One single start input to activate without interruption: (self touch surface to be tested, self load -un-load self switching indenter, optic, self focus and self measure, self goes up to free sample)
- Touch screen colour TFT and full Windows system for easy use of the machine with information on a single screen

### Technical data

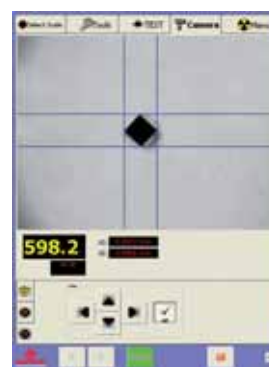
Hardness scale	Vickers, Brinell, Rockwell, SuperRockwell, Knoop
Standard	Vickers ISO 6507, ASTM E 384, Rockwell ISO 6508, ASTM E 18, Knoop ISO 4545 Brinell ISO 6506, ASTM E 18, Rockwell for plastic ISO 2039, Shore ISO 7619 - ISO 868
Vickers loads	1 2 3 5 10 20 30 50 60 100 120 (9.81 19.6 29.43 49.05 98.1 196 294.3 490.5 588.6 981 1177.2 N)
Brinell loads	1 2.5 5 6.25 10 15 15.6 25 30 31.25 62.5 125 187.5 250 (9.81 24.5 49.05 61.3 98.1 147.15 153.23 245 294.3 306.5 613 1226 1839 2452 N)
Super Rockwell loads	15 30 45 (147.15 294.3 441.45 N)
Rockwell loads	60 100 150 (588.60 981 1471.50 N)
Automatic Brinell	HBT 2,5 / 62,5 - 5 / 125 - 2,5/187,5
Optics: real objective with predefined magnification. Pre-calibrated and combined with camera and video measurement software	
Precision of the loads	0.1 %
Division on video measurements: 0.1 HB HV HRC HRN HK	
Light source	Self adjusting with self iris
Indenter: Diamond Rockwell 120°, diamond Vicker 136°, diamond knoop 172°, ball 1/16", 1/8", 1/2" Rockwell, 1- 2,5 - 5 -10 mm W Brinell	
Dwell time selectable	(0,1 to 99,9 seconds) for minor and major load independently
Data transmission	USB (RS 232C, LAN, wireless upon request)
Max capacity	300 mm (other on request)
Max depth	160 mm (other on request)
Max weight of test piece	2000 KG
Power supply	220 240 V 50 60 Hz
Weight	500 KG



Automatic Brinell measure



Automatic Vickers measure



Manual Brinell, Vickers and Knoop measures



Complete statistic and test report on Excel® format



Automatic check-up correct objective and indenter installed on



Scrolling menu on touch screen fast and easy use

## LD 3000

The LD 3000 hardness tester is a very practical and strong instrument designed to perform Brinell hardness tests at 3000 kg and other loads starting from 10Kg and also to perform Vickers tests. The integral AFFRI system assures high performance using automatic selection and application of loads through a simple touch panel. Digital readout of load force and dwell time help the operator during the test. The test force is closed loop controlled through an electronic load cell connected to the indenter. All errors linked to weight systems are eliminated, the test is fast and there is an absolute increase in accuracy in every condition. It includes a clamping cap for secure stability of large parts. The indenter moves through 30 mm into auto contact with the sample. The operator is required only to push the twin start buttons to initiate the complete test sequence: auto contact with the test surface, clamping, application of the test loads, release of sample. At the end of the cycle, the operator can easily measure the indentation in different systems:

### Four different measurement systems

- **Through the microscope** we supply, in order to obtain Brinell Vickers values (standard).
- **AUTOSCAN**, which is the electronic microscope for automatic measure (option).
- **Integrated automatic measure**, without a microscope for fast and serial tests HBT system (option)
- **Integrated optical direct readout** through camera system and automatic Brinell (option).

It can be operated in areas subject to vibration.

No need to level.

It can work even if inclined.

It can be operated at different temperature ranges from 0 to 50°C.

### Technical data (code 4206)

Programmed test force through touch panel and closed loop and load cell inside:

BRINELL loads:	98.1 - 147 - 294 - 306 - 613 - 1226 - 1839 - 2452 - 4905 - 7357 - 9810 - 29430 N (10 - 15 - 30 - 31.2 - 62.5 - 187.5 - 250 - 500 - 750 - 1000 - 3000 Kg)
VICKERS loads:	98.1 - 147 - 294 - 490.5 - 981 N Vickers (10 - 15 - 30 - 50 - 100 Kg)
Rockwell (option)	60 100 150 (588 981 1471N)
Dwell Time forces	from 5 to 60 seconds programmable
Digital display	of the selected force, selected test time
Cycle	only one single start input including travel of indenter and self loading
Clamping	movable cup and adjustable clamping force till 4000N
Measure	Through the microscope: Easy Brinell; Integrated automatic measure; Integrated optical direct readout
Field of use	all metals from 10 to 600 HB 10 to 2600 HV
Test height / Test width	300 mm / 160 mm
Dimensions / Weight	45 x 70 x 90 h cm / 350 Kg
Alimentazione	220 240 V 50 60 Hz

### Standard Equipment included in the price

Instruction manual, calibration certificate, dust cover, conversion table, warrantee certificate, electrical connection cable 220V50/60Hz. 0.01 mm high resolution microscope with 6 mm drum scale for Vickers Brinell indentations



Optional accessory: Clamping base for large or unstable pieces



Optional: Automatic Brinell measure, for fast test on production department, it doesn't need any microscope



Optional: **Easy Brinell**  
(Automatic Optical measure through autoscan Probe)

### Extra accessories

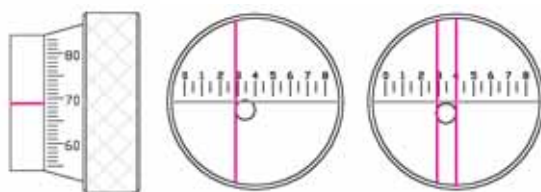
- Clamping base for secure lock samples
- Big flat anvil 150 mm
- Large square table 400 x 300
- Indenter 10 mm
- Indenter 5 mm
- Indenter 2.5 mm
- HRC indenter
- HRB Indenter
- Flat anvil 60 mm diameter for medium pieces
- "V" anvil 60 mm diameter for round pieces
- Test block HB W - 3000 Kg
- Test block HB W - 750 Kg
- Test block HB W - 187.5 Kg
- HRC test block
- HRB Test block
- Vickers 136° Indenter
- Vickers Test block HV 30
- Automeasure
- Automatic HBT Brinell measure
- Easy Brinell
- Integrated screen automeasure
- Autofocus
- Integrated screen and automatic Brinell measure
- Through camera and software to measure in fast and automatic procedure the brinell and Vickers indentations
- Objective 20x for load 187.5 - 250
- Obiettivo 44x for load 30 - 187.5
- Obiettivo 70x for loads 10 - 30

## ACCESSORIES FOR MISURE BRINELL - VICKERS



### 1216 MICROSCOPE

- *Portable handy microscope*
- *The most accurate!!*
- *0.01 mm division - 20x magnification*
- *External scale for easy measure*
- *Not stressing on the eyes*
- *Scale 6 mm division 0.01 mm*



## EASY BRINELL

Electronic microscope for automatic Brinell indentation measurement.

Easy:

Put the probe on tested piece and press button.

Brinell result will appear automatically.

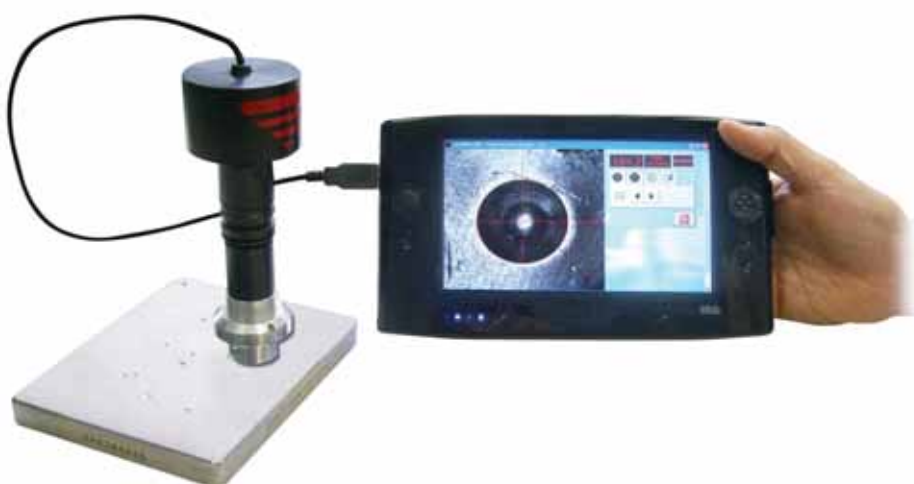
Adapt for all type of hardness testers.

Accurate +/- 0.5%

Auto light

Magnetic foot

Can be installed on every PC



### Technical characteristics

Programmable for ball	2.5 - 5 - 10 mm diameters loads 62.5 ÷ 3000 Kg
Division of readout	0.1 HB unit
Repetability	depends on surface roughness +/- 0.5%
Computer	minimum configuration Pentium 4, Windows XP, 4 giga HD, 128 mega Ram
Conversion table	inside
Weight of probe	0.5 Kg
Cable	2 meters



## CK3000

### ALL OPERATIONS ARE MANAGED BY A SINGLE DRIVE INCLUDING AUTOMATIC RESEARCH OF TEST PIECE

- By activating the single Start input button, CK3000 head moves to reach the test surface and automatically starts the hardness test cycle in automatic succession without breacking a phase:
  - approach to the piece;
  - activation of reference surface;
  - clamping of the piece;
  - entire test cycle performance and piece releasing.
- It does not require elevating screws
- It meets all laboratory requirements
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments.

### AUTOMATIC BRINELL HARDNESS TESTER

- Performs the HBT measure

### ABSOLUTE MEASURE

- The measurement is accurate at the first test and does not require a second test to confirm the result
- No difference of accuracy between stable and unstable test pieces
- Adapts to test forging, cast iron and large components
- Its does not require polished surface
- Its does not require optical reading

### Technical characteristics (code 4207)

Digital read-out	HBWT-500 - HBWT-750 - HBWT-1000 - HBWT-3000
Test loads	4905 7357 9810 29430N
Total height capacity	500 mm - Other on request
Depth	250 mm - Other on request
Base	400 x 400 mm
Accuracy	Conformation standards EN-ISO 6506 / JIS
Power supply	220V 50÷60Hz - 200VA
Measures	80x100x200 cm
Weight	500 Kg



## AUTO3000

- Automatic Brinell tester
- Digital Brinell read-out
- Test load automatically programmable (4900-7350-9800-29400 N)
- Ball indenter 5-10 mm
- The head rotates 360°, slides to easily clamp the test piece and automatically executes Brinell test (HBT)





## 330 PRS

- **High speed hardness tester** for fast tests in production departments. Just one start input and it self executes a complete hardness test including automatically clamping the piece. Up to 1000 tests per hour can be performed.
- Direct readout in Rockwell or Brinell hardness scales programmable in our factory before shipping the machine (others on request)
- Programmable tolerance and electrical data output for fast tested Piece selection in 3 classes Ok - Hi - Lo
- **Very easy to integrate into a conveyor line.** The full research of test sample and automatic cycle including long stroke head and automatic clamping of the AFFRI® system permits easy connection of the 330 PRS to an existing conveyor line. In addition, a full conveyor line and automatic selector line can be also studied and created by our company based on customer's specifications.

### VERY HIGH PERFORMANCE

- Unaltered operation even in extreme conditions.

### ALL OPERATIONS ARE MANAGED BY A SINGLE DRIVE INCLUDING AUTOMATIC RESEARCH OF TEST PIECE ①

- Pushing the Start button, 330 PRS head moves down to reach the test surface from distance multiples of 50 mm and automatically starts the hardness test cycle in automatic succession without breaching a phase:
  - approach to the piece;
  - clamping of the piece;
  - activation of reference surface;
  - entire test cycle performance and release of piece.

### Applicable accessories

#### Rockwell

- Rockwell C indenter
- Rockwell B indenter
- Rockwell test blocks C-B

#### Brinell

- Ball penetrator 2.5 - 5 mm
- Brinell test block for ball 2.5 - 5 mm

### Technical characteristics (code 1301)

Preload	(10 Kgf) 98.07 N
Test loads on request	(60 100 150 Kgf) Rockwell 588-980-1471 N (62.5-125-187.5 Kgf) Brinell 612-1225-1839 N
Feasible tests	Rockwell HRC A D B F G L M R Brinell HB 30, HB 10, HB 5, R Kgmm <sup>2</sup>
Mode of operation	automatic
Digital reading	Rockwell+Brinell
Reading resolution	0.1 HRC
Accuracy:	Conformation standards EN-ISO 6506 / 6507 / 6508 / ASTM-E18 / JIS
Floating head	50 mm motorized
Total height capacity	from 0 to 400 mm
Total depth capacity	200 mm
Dimension of base	330x390 mm
Max load of test piece	2000 Kg
Clamping pressure of piece	from 20 to 500 Kgf (from 196 to 4905) N
Clamping of piece	included
Data output	RS 232 C
Piece selection	Hard + Soft + Ok
Power supply	220V 50÷60Hz - 200VA / Pneumatic 4 bar
Fields of application	For all metals: iron, steel, tempered steel, bronze, aluminium. Thickness over 0.6 mm
Net weight	110 Kg
Packing weight	125 Kg
Packing measurements	72x72xH190 cm



## MATRIX

This hardness tester is endowed with movement on 3 independent axis and rotation of 360° to allow an easy location of the testing point.

**Perfect and effective measurements even at the first test.**

### SLIM INDENTER

Only one control to operate the movement for test preparing and for the entire test cycle performance, including the piece clamping phase. It follows that every result is correct even the first test result is accurate and reliable, so this increases the repeatability of the machine that offers test accuracy and reading reliability.

With this instrument you can perform tests directly during the manufacturing process, so that the annealing oven staff can be informed about the test result in real time.

The output qualitative level can be increased without any added cost.

The interesting price of the entire instrument permits a very quick write off in one year of work.

### AUTOMATIC RESEARCH OF TEST PIECE

- If you press Start button, MATRIX moves to reach the test surface and automatically starts the hardness test cycle in automatic succession without breaching a phase.
- It does not require elevating screws
- It meets all laboratory requirements
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments.

### MODULAR STRUCTURE

The machine is made with a modular structure so that it can easily fit different test pieces sizes.

### EASY DISPLACEMENTS

All movements are on guides with recirculating screws to grant accurate and easy movement of the test head that accurately places itself in the different testing points both on crankshaft in supporting diameters and on connecting rods and camshafts.

### AUTOCENTERING

The location of the precise testing point through centering is carried out automatically by moving head-supporting carriage that centres itself in a precise and reliable way thanks to an exclusive system.



### Technical characteristics

Reading scales	HRC or HRN or HV Vickers
Reading division	0.1 HRC 0.1 HRN 0.1 HV
Reading	Digital, with memory
Data output	RS 232 C for connection to printer or computer
Setting	min. and max. tolerance limits
Test loads	kg 150 for HRC; kg 30 for HRN; kg 30 for HV
Accuracy	Conformation standards EN-ISO 6508 / JIS
Test time	5 second (adjustable)
Working Depth	1000 mm (different on request)
Working Height	400 mm (different on request)
Machine weight	800 kg ~
Power supply	220V 50÷60Hz - 200VA
Pneumatic power	4 BAR

## AUTO BRINELL- ROCKWELL

Automatic Brinell-Rockwell tester for tubes, bottles including: grinding of test area, indentation, automatic measure and automatic selection of tested piece.



## AUTO GM

Automatic system for high speed test for car components "steering pars" to G.M.  
On Rockwell Scale, automatic loader, automatic test, automatic sorter: GO - high - low.  
1500 pcs per hour.





## AUTO PRS

Automatic in-line testing system for SKF bearing test.  
HRC scale, automatic loader, automatic test, automatic sorter: GO - high - low.  
1000 pcs per hour.



Option: light signal for fast selection go-no go

## AUTOMATIC BOLTS

Automatic high speed hardness tester for nuts, bolts, Rockwell C scale, automatic loader, automatic test, automatic sorter: GO - high - low.  
1000 pcs per hour.



## HB TWIN

Twin Brinell test: measure with two different positions simultaneously with auto alignment HB 10.3000



## GAS BOTTLE

Fully automatic system including grinding – Brinell indentation and automatic optic measurement and movement of gas bottle. Programmable cycle and step.



## **HB AUTO TUBE**

Fully automatic system with grinding test surface and Brinell automatic hardness test on cylinders, tubes and bottle, at high temperatures till 350°. Load 2.5-187.5 / 10-3000 or Rockwell HRC. Automatic selection go/no go



## **AUTOMATIC BRINELL "RADIAL"**

Load cell and Closed Loop Affri system 1839 – 29430N  
Capacity 1500 x 1500 mm fully motorized  
Table 1500 x 1000 mm  
Touch screen 17"



## HB OPTI

Brinell test on casting parts, optical and digital Brinell read-out  
10/3000 - 5/750 - 5/250



## METALTESTER F1

Vickers tests on crankshaft for Formula 1 (F1)



## 3302 R

Equipped with sliding table on x-y axes and 360° rotation for test on crankshafts of scale HRC – HRN.

## SERIE SHORE



### HARDNESS TESTER

In compliance with ASTM 2240, ISO R.868, ISO 7619, DIN 53505, JIS K7215 specifications. For rubber, plastic, medical components, paper, sponges using Shore A, B, C, D, O, OO, E, M, 000, 000-S scales.

With slim nose to ensure exact measurement even on small components.

For laboratory use connect it with bench stand 13.

Type	Fields of application
3001 - Shore A	- For soft, flexible rubber, plastic, PVC, polyester, neoprene, leather, thiokol, nitril rubbers, tyres, etc.
3011 - Shore B	- As A scale for high values
3004 - Shore C	- As D scale for low values
3002 - Shore D	- Scale for hard and rigid surfaces synthetic materials, acrylics, plexiglass, printing rolls, cellulose, acetates, densified wood, nylon, derling
3010 - Shore DO	- As B and C
3009 - Shore O	- As A scale for low values
3008 - Shore OO	- For sponges, natural rubber and silicon
3013 - Shore E	- ASTM D 2240 - 02 a
3014 - Shore M	- ASTM D 2240 - 02 a
3015 - Shore 000	- ASTM D 2240 - 02 a
3016 - Shore 000-S	- ASTM D 2240 - 02 a



### HARDNESS TESTER

In compliance with ASTM 2240, ISO R.868, ISO 7619, DIN 53505, JIS K7215 specifications. For rubber, plastic, medical components, paper, sponges using Shore A scale.

Easy to use, supplied with clamping system to apply a constant and centered pressure on any sample, even on curved surfaces, assuring accurate results similar to those obtained through the test with bench support. Suitable for testing tyres, adapt to test tyres, roll.

Type	Fields of application
3003 - Shore A	- For soft, flexible rubber, plastic, PVC, polyester, neoprene, leather, thiokol, nitril rubbers, tyres, etc.

### Accessories

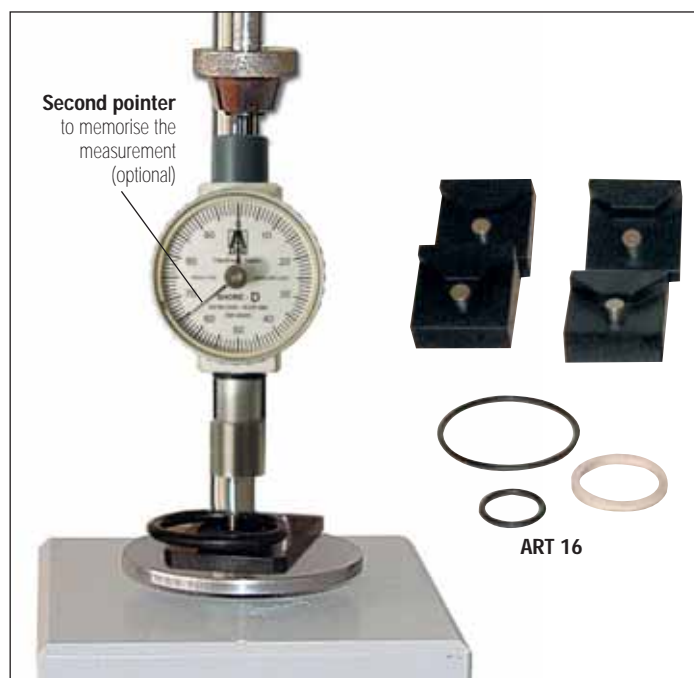


#### ART 13

Bench stand for use with analog or digital portable units, it ensures exact and centered use of the unit on test samples and with a constant pressure.

#### ART 14

Supplementary weight for Shore C - D - DO models.



#### ART 16

Set of clamping holders for bench connection in compliance with ASTM 1414 for precise O-Ring testing (section Ø 1.72 - 2.54 - 3.43 - 5.21 - 6.83 mm)

## ELECTRONIC HARDNESS TESTER



Till 6 probes can be connected and auto calibration  
RS232C or USB output data

### Technical characteristics (code 3104)

Hardness Scales each probe	Shore A, D, B, C, O, OO, E, M, OOO, OOO-S, Micro
Standards	DIN 53505 – ISO 868 – 7619 – NFT 51109 – ASTM D 2240 – BS 903 Part. A26
Dimensions	Electronic processor: 112 x 180 x 70 mm Probe diameter 40 foot diameter 16mm Height 108 mm + Cable
Data transmission	RS 232 C
Resolution	0.1 unit
Power source	6 V CC 250 mA
Fields of applications	all products tested through Shore system (plastic, rubber, paper, Silicon, PVC, ABS NYLON ...)
Weight	0.5 Kg probe - 1.4 Kg all complete with processor
Packing weight	4 Kg
Packing measurements	470 x 400 x 150 mm in a portable bag



Art. A078.A1.080  
MICRO PROBE A SCALE  
Test on tyres



Art. A078.A1.080  
MICRO PROBE A SCALE  
for easy inside test  
Min 45 mm Ø



23631  
Clamping handwheel



DMG 03  
Motorized Bench support  
Height capacity 75 mm

ART. 16  
For test on O-ring



Complete Kit bag Including printer



## IRHD



### Technical characteristics (code 3401)

Working	motorized trough load cell closed loop managed by computer 17" Colour LCD display
Conformation to the Standards	ISO 48 / 7318 / ASTM 1415
Stroke	50 self research surface sample and max 200 mm
Depth	170 mm
Base for sample	60 mm interchangeable
Dimension of machine	60 x 30 x 80h cm
Weight	60 Kg
Output data	USB
Power	220 /240 V 15V upon request
Packing measures	100x 100 x 100h cm
G.W.	90 Kg

Hardness tester for all plastics and rubbers  
composit products in accordance to IRHD

## PJ 0-100



PJ for roll paper

- **Portable tester for PJ tests for paper, roll paper, paperboard in accordance to P.J. procedure**
- **Ball indenter included**
- **Easy and immediate measure on digital display**
- **Can be utilised directly on roll paper thanks to the self aligning foot or on flat surfaces**

### Technical characteristics (code 3200)

The hardness tester is composed by:

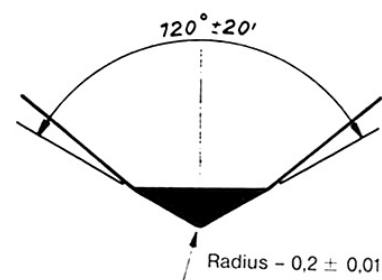
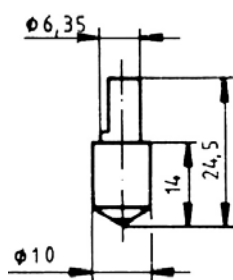
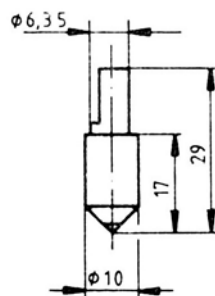
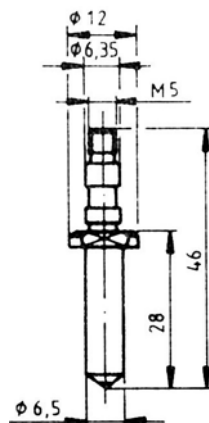
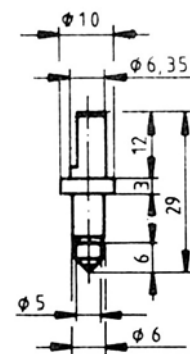
- Structure with metal base provided with inlet to place the sample to test, column to support the probe which is adjustable in highness to accept samples of different sizes;
- Electric probe with digital indication of read-out division 0.01 mm., provided with electronic data output for connection to a printer.
- The base to support the sample has adjustable feet and optic level for the levelling of the instrument; to execute test on cylinders of different diameter especially on gummed rolls.
- Handle to transport the instrument to execute tests of hardness directly on big pieces such as gummed rolls.



# DIAMOND INDENTERS FOR EVERY TYPE OF HARDNESS TESTERS

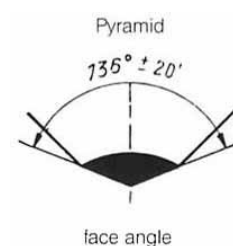
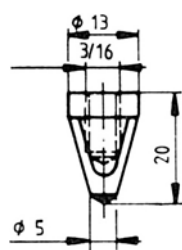
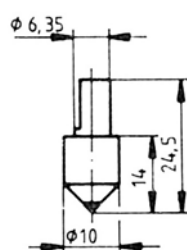
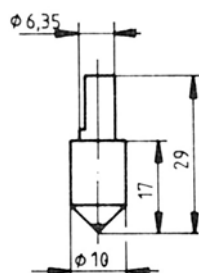
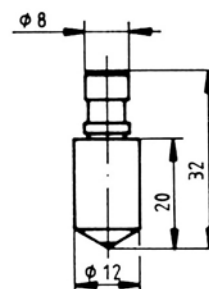
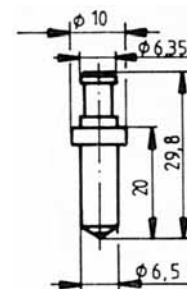
## Hardness Test Diamonds according to Rockwell (Rc)

Nr.	Type	Testing appliance
11	Origin. Rockwell 120°	z.B. Frank
12	Testor 120°	Wolpert - Wilson - Time - Mitutoyo
13	Briro UVN 120°	Reicherter
14	Testor-Automat 120°	Wolpert


**Nr. 11**

**Nr. 12**

**Nr. 13**

**Nr. 14**


## Hardness Test Diamonds according to Vickers

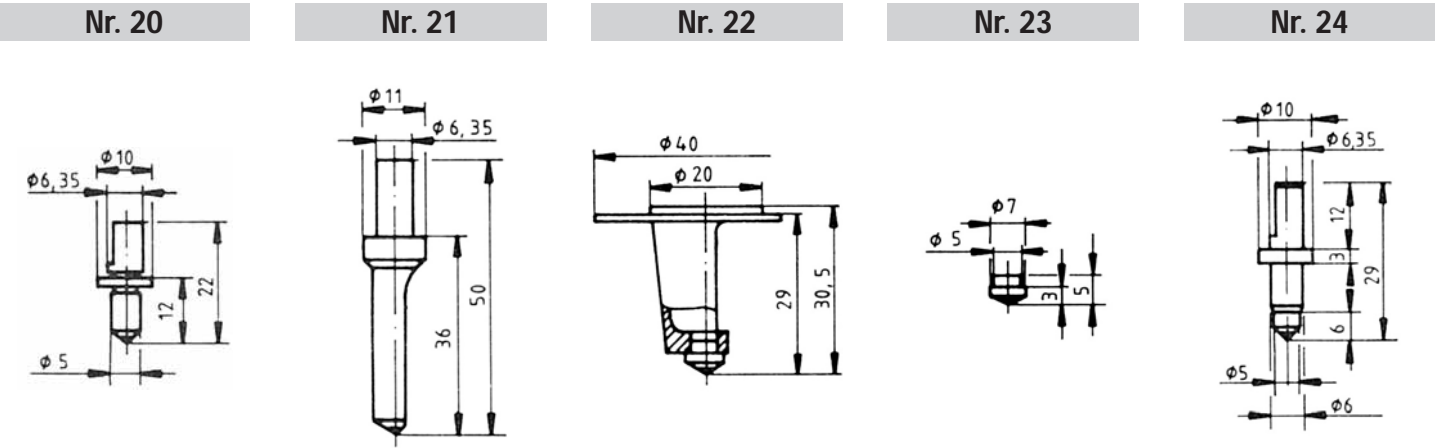
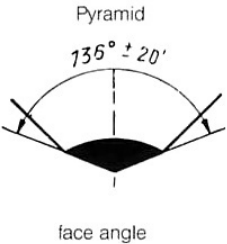
Nr.	Type	Testing appliance
15	Origin. Vickers 136°	Vickers - Tukon
16	Vickers 136°	Frank
17	Dia-Testor 136°	Wolpert - Wilson - Time - Mitutoyo
18	Brivisor 3000H 136°	Reicherter
19	VHT 5 136°	Reicherter


**Nr. 15**

**Nr. 16**

**Nr. 17**

**Nr. 18**

**Nr. 19**




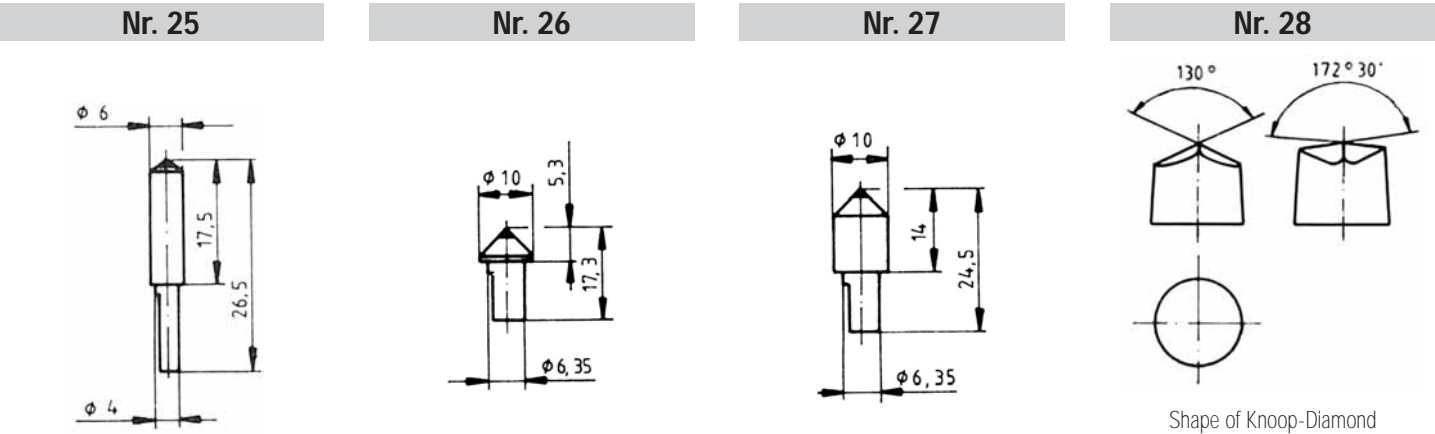
Hardness Test Diamonds according to Vickers

Nr.	Type	Testing appliance
20	Zwick 1 136°	Zwick
21	Zwick 2 136°	Zwick
22	Briviskop 187.5 136°	Reicherter
23	Spare indenter for item 22	Reicherter
24	Testor-Automat 136°	Wolpert



Diamonds for Micro hardness Test

Nr.	Type	Testing appliance
25	Mikro 136°	Leitz
26	Mikro-Testor 136°	Wolpert
27	Vickers 136°	Frank
28	Knoop	*



\* Knoop-Diamond for all Testing Appliances

## STANDARD TEST BLOCKS

### STANDARD TEST BLOCKS WITH UKAS - DKD CERTIFICATE FOR CALIBRATING HARDNESS TESTERS



TYPE	SCALE	NOMINAL VALUE												DIMENSION mm	SURFACE
Rockwell	HRC	20	25	30	35	40	45	50	55	60	63	65	67	Ø 64 x 15	Mirror
	HRB	30	40	50	60	70	80	85	90	95	100			Ø 64 x 15	Mirror
	HRA	26	31	35	40	45	50	53	55	59	62			Ø 64 x 15	Mirror
	HRA	60	63	65	68	70	73	76	78	81	83	84	85	Ø 64 x 15	Mirror
Available Rockwell HRD HRE HRF HRG HRH HRK HRL HRM HRP HRR HRS HRV scale															
Rockwell superf	HR15N	69	72	75	78	81	83	85	88	90	91	92	93	Ø 64 x 15	Mirror
	HR30N	41	46	50	55	59	64	68	73	77	80	82	83	Ø 64 x 15	Mirror
	HR45N	19	25	31	37	43	49	55	61	66	70	72	74	Ø 64 x 15	Mirror
	HR15T	70	73	77	80	83	86	88	90	91	93			Ø 64 x 15	Mirror
	HR30T	36	43	49	56	63	69	73	76	80	83			Ø 64 x 15	Mirror
	HR45T	2	12	22	32	43	53	58	63	68	73			Ø 64 x 15	Mirror
Available Rockwell HR15W HR30W HR45W HR15X HT30X HR45X HR15Y HR30Y HR45Y scale															
Vickers	HV10	50	100	200	300	350	400	450	500					Ø 64 x 15	Mirror
		550	600	650	700	750	800	850	900						
	HV30	50	100	200	300	350	400	450	500					Ø 64 x 15	Mirror
		550	600	650	700	750	800	850	900						
At demand: HV1 HV2 HV3 HV5 HV20 HV50 HV100															
Micro Vickers	HMV 0,1	50	100	200	300	350	400	450	500					Ø 30 x 10	Mirror
		550	600	650	700	750	800	850	900						
	HMV 1	50	100	200	300	350	400	450	500					Ø 30 x 10	Mirror
		550	600	650	700	750	800	850	900						
At demand: HMV 0,010 HMV 0,025 HMV 0,050 HMV 0,2 HMV 0,3 HMV 0,5															
Micro Knoop	HMK 0,1	50	100	200	300	350	400	450	500					Ø 30 x 10	Mirror
		550	600	650	700	750	800	850	900						
	HMK 1	50	100	200	300	350	400	450	500					Ø 30 x 10	Mirror
		550	600	650	700	750	800	850	900						
At demand: HMK 0,010 HMK 0,025 HMK 0,050 HMK 0,2 HMK 0,3 HMK 0,5															
Brinell	HB <sub>2,5-62,5</sub>	100	125	(Aluminium soft alloy)									Ø 64 x 15	Polished	
	HB <sub>2,5-187,5</sub>	200	300	400	500	600	(Steel)						Ø 64 x 15	Polished	
	HB <sub>10-3000</sub>	100	150	(Aluminium soft alloy)									150 x 120 x 15	Polished	
	HB <sub>10-3000</sub>	200	300	400	500	600	(Steel)						150 x 120 x 15	Polished	
At demand special loads															

A certificate UKAS or DKD is included.

### AFFRI CERTIFIED TEST BLOCK TRACEABLE TO UKAS - DKD - SIT

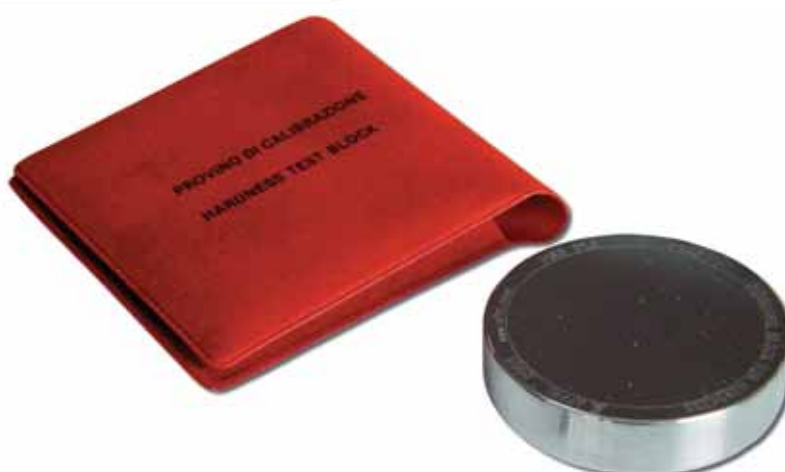
TYPE	SCALE	NOMINAL VALUE	DIMENSION mm	SURFACE
<b>Rockwell</b>	HRC	40 60	Ø 64 x 15	Mirror
	HRB	90	Ø 64 x 15	Mirror
	HRA	70 83	Ø 64 x 15	Mirror
<b>Rockwell superf</b>	HR15N	91	Ø 64 x 15	Mirror
	HR30N	80	Ø 64 x 15	Mirror
	HR45N	70	Ø 64 x 15	Mirror
	HR15T	90	Ø 64 x 15	Mirror
	HR30T	73	Ø 64 x 15	Mirror
	HR45T	63	Ø 64 x 15	Mirror
<b>Vickers</b>	HV10	200 700	Ø 64 x 15	Mirror
	HV30	200 700	Ø 64 x 15	Mirror
<b>Brinell</b>	HB <sub>2,5-62,5</sub>	100 125	Ø 64 x 15	Polished
	HB <sub>2,5-187,5</sub>	200	Ø 64 x 15	Polished



Western European Calibration Cooperation

## COOPERATING SERVICES

	<b>UNITED KINGDOM</b> British Calibration Service (NAMAS), 1968		<b>BELGIUM</b> Belgische Kalibratie Organisatie (BKO)/ Organization Belge d'Etalonnage (OBE), 1986
	<b>IRELAND</b> Irish Laboratory Accreditation Board (ILAB), 1985		<b>SWITZERLAND</b> Swiss Calibration Service (SCS), 1986
	<b>ITALY</b> Servizio di Taratura in Italia (SIT), 1979		<b>FEDERAL REPUBLIC OF GERMANY</b> Deutscher Kalibrierdienst (DKD), 1977
	<b>NETHERLANDS</b> Netherlands Calibration Service (NKO), 1975		<b>DENMARK</b> The national Testing Board of Denmark (STP), 1973
	<b>NORWAY</b> Norwegian Calibration Service (NKT), 1987		<b>SPAIN</b> Sistema de Calibración Industrial (SCI), 1983
	<b>PORTUGAL</b> Portuguese Institute for Quality (IPQ)		<b>FINLAND</b> Finnish Measurement Service (MSF), 1980
	<b>SWEDEN</b> Swedish Board for Technical Accreditation (SWEDAC), 1975		<b>FRANCE</b> Système des Chaines d'étalonnage (BNM), 1971
	<b>AUSTRIA</b> Österreichischer Kalibrierdienst ÖVE-ÖIAV (ÖKD), 1968		<b>GREECE</b> Ministry of Commerce Metrology Department, 1991
	<b>ICELAND</b> National Accreditation Scheme, 1991		



### NOTES:

The information and technical data present in this catalogue are subject to changes. **AFFRI®** has the right to modify the current data, at any time, in function of the evolution of raw material and new technology.

The installation of the products must be executed following the international standards. **AFFRI®** and its representatives will not accept any responsibility due to incorrect use, connections or installation. Respect of standards, laws and environments where the products are to be used are under the full responsibility of the installer.

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