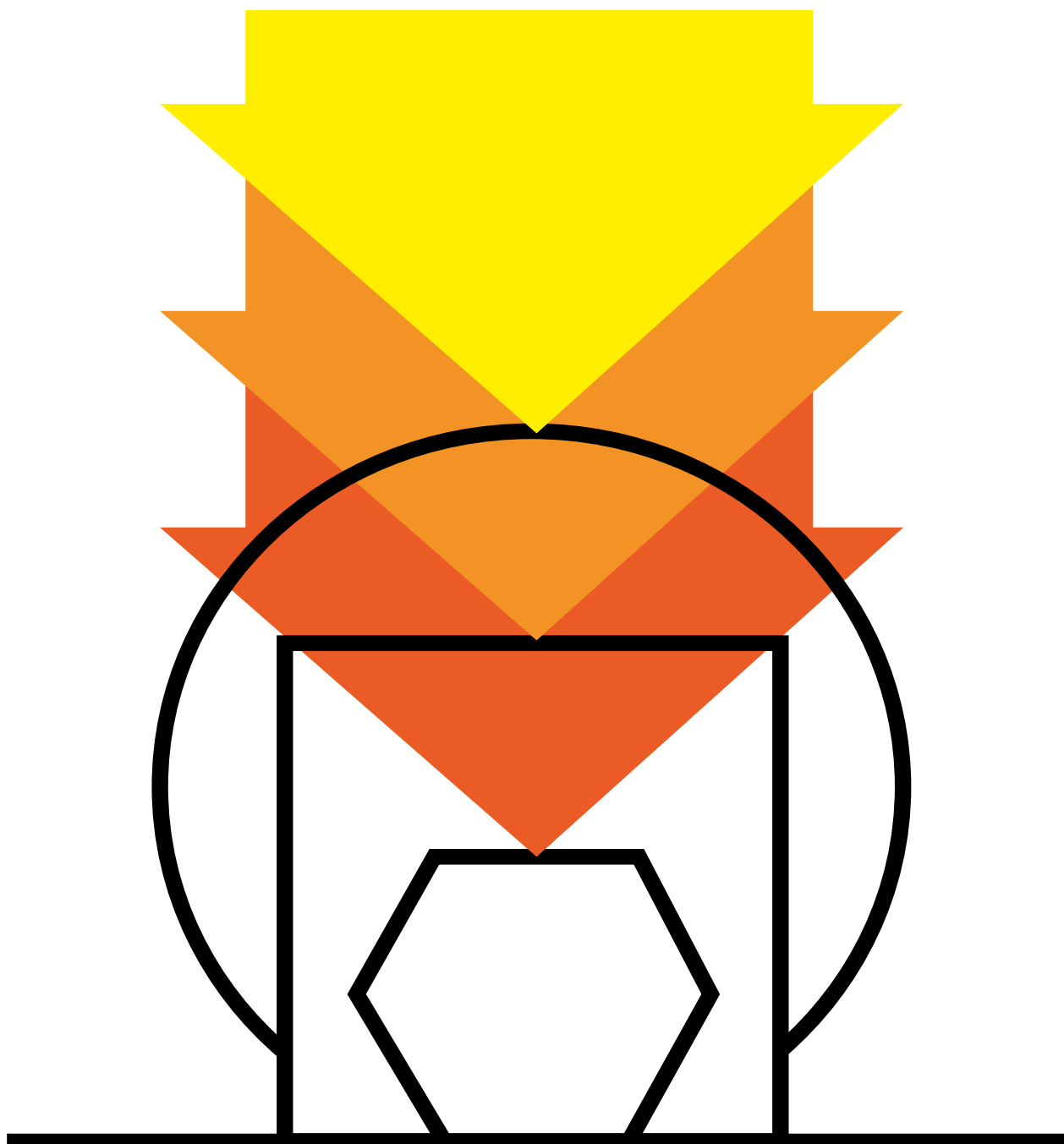




## PRODUCT RANGE





## AFFRI, FROM 1954 HARDNESS TESTERS PRODUCTION AND WORLD WIDE SUPPLY

Since 1954 AFFRI® is producing hardness testers combining test loads and innovative devices that make up the AFFRI SYSTEM®. The handling can be mechanical, electro-mechanical, hydro-mechanical or pneumo-mechanical.

The AFFRI SYSTEM® has long surpassed traditional philosophies using dead-weights and elevating screws that can still be used in conventional hardness testers.

The AFFRI SYSTEM® 's patterns are protected and registered and deposited.

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

A further improvement in performance was achieved when AFFRI® built the hardness tester truly automatic in the performance of Rockwell, Brinell and Vickers tests.

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



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

**ALL AFFRI® INSTRUMENTS ARE CONFORM TO INTERNATIONAL STANDARDS.  
FULLY CERTIFICABLE BY INTERNATIONAL CALIBRATION LABORATORIES.  
(WHERE APPLICABLE)**

## STEELS AND CAST IRON (HS)

TENSIL	TENSIL	N/mm²	Kg/mm²	VICKERS	HB30	FOR RAILS		SHORE	D	ROCKWELL C	D	ROCKWELL D	ROCKWELL A	45N	30N	15N
						68	77									
1540	157	480	450	1710	1710	106	67	76	85	75	84	72	81	70	80	91.5
1471	150	453	433	1663	1663	103	65	74.5	83.5	73	83	70	80	69	79	91
1432	146	440	423	1556	1556	101	64	74	84	71.5	81.5	67.5	78.5	66.5	77.5	90.5
1402	143	428	413	1476	1476	99	63	73	83	70	80.5	65.5	76.5	64	75.5	89.5
1373	140	416	405	1400	1400	97	62	72.5	82.5	69	79	69	79	69	79	91
1334	136	404	393	1323	1323	94	61	71.5	81.5	67.5	78.5	65.5	76.5	64	75.5	90.5
1304	133	392	387	1245	1245	92	60	71	81	66.5	77.5	64	75.5	63	74	89.5
1275	130	381	377	1160	1160	90	59	70	80.5	65.5	76.5	64	75.5	63	74	89.5
1245	127	370	368	1076	1076	87	58	69	80	64	75	63	74	62	74	89
1216	124	360	359	1004	1004	84	57	68.5	79.5	63	75	62	74	61	73	88
1177	120	350	349	940	940	81	56	67.5	79	62	74	61	73	60	72	87.5
1147	117	341	341	883	883	79	55	67	78.5	61	73	60	72	59	71	87
1118	114	332	332	828	828	77	54	66	78	60	72	59	71	58	70	87
1088	111	323	323	775	775	75	53	65.5	77.5	58.5	71	57.5	70.5	57	69.5	86.5
1059	108	314	314	724	724	74	52	64.5	77	57.5	70.5	56	69.5	56	68.5	86
1030	105	305	305	675	675	72	51	64	76.5	56	69.5	55	68.5	55	68.5	85.5
1000	102	298	298	628	628	70	50	63	76	55	68.5	54	67.5	54	67.5	85
971	99	290	290	583	583	69	49	62	75.5	54	67.5	53	66.5	53	66.5	84.5
951	97	283	283	540	540	68	48	61.5	74.4	52.5	66.5	52	65.5	52	65.5	84.5
922	94	276	276	500	500	67	47	60.5	74	51.5	66	51	65	51	66	84
892	92	269	269	462	462	65	46	60	73.5	50	65	50	65	50	65	83.5
873	89	262	262	428	428	64	45	59	72.5	49	64	49	64	49	64	83
853	87	256	256	397	397	63	44	58.5	72	48	63	48	63	48	63	82.5
833	85	250	250	368	368	61	43	57.5	72	46.5	62	46.5	62	46	62	82
824	84	244	244	341	341	60	42	57	71.5	45.5	61.5	45.5	61.5	45	61.5	81.5
804	82	239	239	316	316	59	41	56	71	44.5	60.5	44.5	60.5	44	60.5	81
784	80	234	234	293	293	58	40	55.5	70.5	43	59.5	43	59.5	43	59.5	80.5
765	77	228	228	272	272	57	39	55	70	42	58.5	42	58.5	42	58.5	80
725	74	216	216	254	254	55	38	54	69.5	41	57.5	41	57.5	41	57.5	79.5
706	72	210	210	238	238	54	37	53	69	39.5	56.5	39.5	56.5	39	56.5	79
686	70	205	205	223	223	53	36	52.5	68.5	38	56	38	56	37	55	78
667	68	200	200	209	209	52	35	52	68	37	55	37	55	36	54	77
657	67	195	195	196	196	51	34	51.5	67.5	36	54	36	54	35	53	76.5
637	65	190	190	183	183	50	33	50.5	67	35	53	35	53	35	53	76.5
618	63	185	185	171	171	49	32	49.5	66.5	33.5	52	33.5	52	33	52	76
598	61	180	180	160	160	48	31	48.5	66	32.5	51.5	32.5	51.5	32	51.5	75.5
588	60	176	176	150	150	47	30	47.5	65.5	31.5	50.5	31.5	50.5	31	50.5	75
578	59	172	172	140	140	46	29	47	65	30	49.5	30	49.5	30	49.5	74.5
559	57	169	169	130	130	45	28	46.5	64.5	29	48.5	29	48.5	29	48.5	74
549	56	165	165	121	121	44	27	46	64	28	47.5	28	47.5	28	47.5	73.5
539	55	162	162	113	113	43	26	45.5	63.5	27	47	27	47	27	47	72.5
529	54	159	159	106	106	42	25	44.5	63	26	46	26	46	26	46	72
519	53	156	156	100	100	41	24	44	62.5	25	45	25	45	25	45	71.5
510	52	153	153	94	94	40	23	43.5	62	24	44	24	44	24	44	71
500	51	150	150	89	89	39	22	43	61.5	23	43	23	43	23	43	70.5
490	50	146	146	84	84	38	21	42	61	22	42	22	42	22	42	70
470	48	144	144	80	80	37	20	41.5	60.5	21.5	41.5	21.5	41.5	21	41	69.5
450	46	141	141	76	76	36	20	41	60	21	41	21	41	21	41	69
430	44	139	139	72	72	35	19	40.5	59.5	20.5	40.5	20.5	40.5	20	40	68.5
410	42	137	137	68	68	34	18	40	59	20	40	20	40	20	40	68
390	40	135	135	64	64	33	17	39.5	58.5	19.5	39.5	19.5	39.5	19	39	67.5
370	38	133	133	61	61	32	16	39	58	19	39	19	39	19	39	67
350	36	131	131	58	58	31	15	38.5	57.5	18.5	38.5	18.5	38.5	18	38	66.5
330	34	129	129	55	55	30	14	38	57	18	38	18	38	18	38	66
310	32	127	127	52	52	29	13	37.5	56.5	17.5	37.5	17.5	37.5	17	37	65.5
290	30	125	125	49	49	28	12	37	56	17	37	17	37	17	37	65
270	28	123	123	46	46	27	11	36.5	55.5	16.5	36.5	16.5	36.5	16	36	64.5
250	26	121	121	43	43	26	10	36	55	16	36	16	36	16	36	64
230	24	119	119	40	40	25	9	35.5	54.5	15.5	35.5	15.5	35.5	15	35	63.5
210	22	117	117	37	37	24	8	35	54	15	35	15	35	15	35	63
190	20	115	115	34	34	23	7	34.5	53.5	14.5	34.5	14.5	34.5	14	34	62.5
170	18	113	113	31	31	22	6	34	53	14	34	14	34	14	34	62
150	16	111	111	28	28	21	5	33.5	52.5	13.5	33.5	13.5	33.5	13	33	61.5
130	14	109	109	25	25	20	4	33	52	13	33	13	33	13	33	61
110	12	107	107	22	22	19	3	32.5	51.5	12.5	32.5	12.5	32.5	12	32	60.5
90	10	105	105	19	19	18	2	32	51	12	32	12	32	12	32	60
70	8	103	103	16	16	17	1	31.5	50.5	11.5	31.5	11.5	31.5	11	31	59.5
50	6	101	101	13	13	16	0	31	50	11	31	11	31	11	31	59
30	4	99	99	10	10	15	-	30.5	49.5	10.5	30.5	10.5	30.5	10	30	58.5
10	2	97	97	7	7	14	-	30	49	10	30	10	30	10	30	58
-	-	95	95	4	4	13	-	29.5	48.5	9.5	29.5	9.5	29.5	9	29	57.5
-	-	93	93	1	1	12	-	29	48	9	29	9	29	9	29	57
-	-	91	91	-	-	11	-	28.5	47.5	8.5	28.5	8.5	28.5	8	28	56.5
-	-	89	89	-	-	10	-	28	47	8	28	8	28	8	28	56
-	-	87	87	-	-	9	-	27.5	46.5	7.5	27.5	7.5	27.5	7	27	55.5
-	-	85	85	-	-	8	-	27	46	7	27	7	27	7	27	55
-	-	83	83	-	-	7	-	26.5	45.5	6.5	26.5	6.5	26.5	6	26	54.5
-	-	81	81	-	-	6	-	26	45	6	26	6	26	6	26	54
-	-	79	79	-	-	5	-	25.5	44.5	5.5	25.5	5.5	25.5	5	25	53.5
-	-	77	77	-	-	4	-	25	44	5	25	5	25	5	25	53
-	-	75	75	-	-	3	-	24.5	43.5	4.5	24.5	4.5	24.5	4	24	52.5
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-	-	71	71	-	-	1	-	23.5	42.5	3.5	23.5	3.5	23.5	3	23	51.5
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-	-	67	67	-	-	-	-	22.5	41.5	2.5	22.5	2.5	22.5	2	22	50.5
-	-	65	65	-	-	-	-	22	41	2	22	2	22	2	22	50
-	-	63	63	-	-	-	-	21.5	40.5	1.5	21.5	1.				



SCALE	SYMBOL	INDENTER	MINOR LOAD N	MAJOR LOAD N	FIELD OF APPLICATION
ROCKWELL	HRA	CONE 120°	98.07	588.4	Hardened Metals, cementation layers, thin sheet (>0.4 mm)
	HRB	BALL 1/16"	98.07	980.7	Non-ferrous metals, construction steel
	HRC	CONE 120°	98.07	1471	Tempered, cemented, hardened and quenched steel
	HRD	CONE 120°	98.07	980.7	Cemented surface with a medium layer of cementation
	HRE	BALL 1/8"	98.07	980.7	Cast iron, alloy magnesium aluminum, anti-friction metals, plastic (ASTM D785-60T)
	HRF	BALL 1/16"	98.07	588.4	Alloy copper, sheet (> 0.6 mm)
	HRG	BALL 1/16"	98.07	1471	Phosphorous bronze, beryllium copper, medium hardness tempered cast iron
	HRH	BALL 1/8"	98.07	588.4	Aluminum, zinc, lead abrasive stone
	HRK	BALL 1/8"	98.07	1471	Anti-friction metals and reduced hardness metals
	HRL	BALL 1/4"	98.07	588.4	Like HRK, hard rubber (ASTM D 530-59 T) synthetic materials (ASTM D 785-60 T)
	HRM	BALL 1/4"	98.07	980.7	Like HRK and HRL, chipboard panels (ASTM D 805-52)
	HRP	BALL 1/4"	98.07	1471	Like HRK, HRL, HRM
	HRR	BALL 1/2"	98.07	588.4	Like HRK, HRL, HRM
	HRS	BALL 1/2"	98.07	980.7	Like HRK, HRL, HRM
	HRV	BALL 1/2"	98.07	1471	Like HRK, HRL, HRM, HRP, HRR, HRS
SUPERFICIAL ROCKWELL	HR15N			147.1	
	HR30N	CONE 120°	29.42	294.2	Like HRA, HRC, HRD but for layers or thin sheet (> 0.15 mm)
	HR45N			441.3	
	HR15T			147.1	
	HR30T	BALL 1/16"	29.42	294.2	Like HRB, HRF, HRG but for thin sheet (> 0.25 mm)
	HR45T			441.3	
	HR15W			147.1	
	HR30W	BALL 1/8"	29.42	294.2	Softer metals, in thin layers e.g. thin anti-friction metal covering
	HR45W			441.3	
	HR15X			147.1	
	HR30X	BALL 1/4"	29.42	294.2	Sinterized metals (ASTM B 347-59 T)
	HR45X			441.3	
	HR15Y			147.1	
VICKERS	HR30Y	BALL 1/2"	29.4	294.2	Like HRX
	HR45Y			441.3	
	HV3	PIRAMID 136°		29.42	
	HV10	PIRAMID 136°		98.07	All metals (hard and soft)
	HV15	PIRAMID 136°		147.1	All metals (hard and soft)
	HV30	PIRAMID 136°		294.2	All metals (hard and soft)
	HV50	PIRAMID 136°		490.3	All metals (hard and soft)
BRINELL	HV100	PIRAMID 136°		980.7	All metals (hard and soft)
	HBW 2.5/187.5			1839	Steel, cast iron
	HBWT 30 C			1839	Steel, cast iron (direct reading) above 500 HB, below 400 HB
	HBWT 30 S			1839	Steel, cast iron (direct reading) above 500 HB, below 400 HB
	HBW 2.5/62.5	2.5 Carbide ball		612.9	Aluminum
	HBT 10	2.5 Carbide ball		612.9	Aluminum
	HBW 5/125	5 Carbide ball		1226	Aluminum
	HBWT 5	5 Carbide ball		1226	Aluminum (direct reading) above 500 HB, below 400 HB
	HBW 1/10	1 Carbide ball		98.07	Cast iron, copper alloys

	page
<b>MASTER</b>	
MASTER A .....	8
MASTER B .....	8
MASTER C .....	8
<b>ROCKWELL</b>	
DAKOMASTER 300 .....	11
250 MRS .....	12
3332 MRS .....	12
3332 / 3302 MRSA .....	12
206 RSD/RS-SD .....	13
330 RSD/RS-SD .....	13
903 / 331 RSD/RS-SD .....	13
250 DRM .....	14
206 EX/EXS .....	14
206 RT/RTS .....	14
<b>BRINELL</b>	
INTEGRAL 1 .....	17
LD 3000 .....	18
MRS-JET 3000 .....	18
<b>VICKERS</b>	
WIKI JS .....	21
WIKI 30 .....	22
LD 3000 AF .....	23
DM2 .....	24
DM8 .....	24
<b>UNIVERSAL</b>	
INTEGRAL 2 - 3 - 5 .....	26
251 / 270 / 770 VRSA/VRSD/VRSTV .....	27
LD 250 .....	28
<b>PORTABLES</b>	
METALTEST .....	30
MKII .....	30
PIXEL .....	30
HARDTEST .....	31
MICROTESTER .....	31
EDA300 .....	31
RSDMAG .....	32
BRIMATIC .....	34
<b>PLASTIC</b>	
IRHD/MICRO IRHD .....	36
SHORE .....	37
ELECTRONIC SHORE .....	38
<b>TAILORED</b>	
MRS BOT .....	40
GAS BOTTLE .....	40
INTEGRAL PORTALE .....	41
MAXINTEGRAL .....	41
MATRIX .....	42
DKS .....	42
DAKO JOMINY .....	43
330 PRS/PRS-S .....	44
AUTO GM PRS .....	44
ARM .....	45
EXPLORER .....	45
BALTIMORA .....	46
MRS FRU .....	46
<b>TEST BLOCKS &amp; INDENTERS</b>	
INDENTERS .....	48
INDENTERS .....	49
TEST BLOCKS .....	50
<b>ACCESSORIES</b>	
VICKERS AUTOMATIC SYSTEM .....	52
MICROSCOPES .....	53
ANVILS .....	53

## HOW TO READ AFFRI'S CATALOGUE

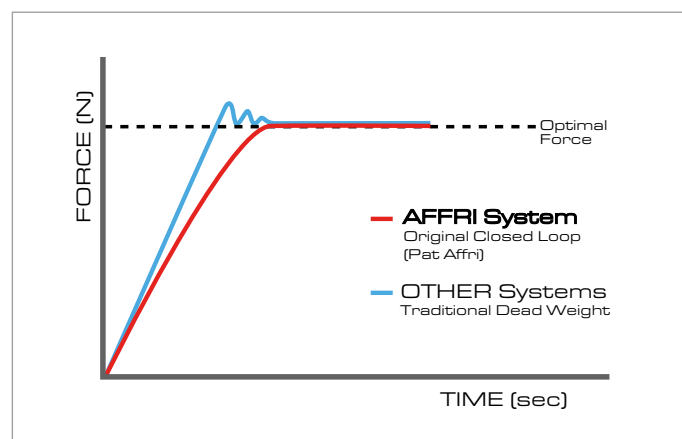
<b>P</b>	Motorized pneumatic action
<b>M</b>	Motorized electrical action
<b>RS</b>	Rockwell semiautomatic «AFFRI SYSTEM» inside
<b>S</b>	Superficial Rockwell
<b>D</b>	Digital
<b>RT</b>	Traditional Rockwell system (manual cycle)
<b>EX</b>	Economic Rockwell manual cycle
<b>MX</b>	Economic Rockwell motorized cycle
<b>V</b>	Vickers
<b>TV</b>	Vision trough camera
<b>VM</b>	Vickers Micro

## REFERENCE HARDNESS TESTER FOR CALIBRATION LABORATORIES

These highly accurate hardness testers are designed for laboratories and for calibrating Test Blocks. This kind of hardness tester includes AFFRI System Technology and a fully automatic system to perform calibration in accordance with the International Standards ASTM, EN ISO-JIS.

- AFFRI SYSTEM
- ABSOLUTE MEASUREMENT
- THE START BUTTON INITIATES AN UNINTERRUPTED TEST SEQUENCE COMPRISING:
  - APPROACH THE PIECE
  - CLAMPING
  - INDENTATION CYCLE OF REFERENCE SURFACE
  - COMPLETE MEASUREMENT CYCLE WITH CONSEQUENT RELEASE
- THE RESULTS ARE NOT INFLUENCED BY DEFLECTIONS DURING THE TEST CYCLE
- LARGE AND FIXED TABLE SUPPORTING TEST PIECES

The AFFRI system adopted by Master Testers is the same as per regular hardness tester.



**SEQUENCE OF AFFRI'S HARDNESS TESTERS**

**MASTER A**


Rockwell and Superficial Rockwell  
ISO 6508-3 / ASTM E-18

**MASTER B**

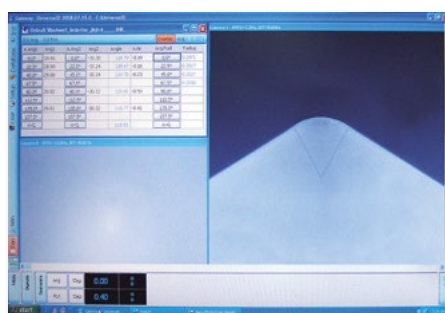

Vickers  
ISO 6507-3 / ASTM E-384

**MASTER C**

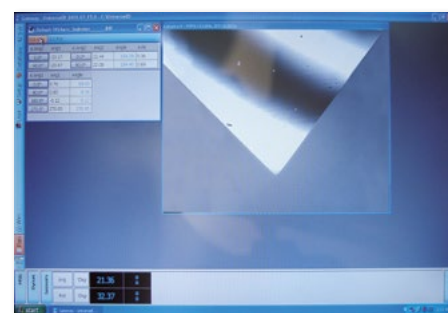

Brinell  
ISO 6506-3 / ASTM E-10

	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 Standard Deviation	26.21	<b>26.32</b>	44.27	<b>44.32</b>	65.07	<b>65.16</b>
	0.12	<b>0.19</b>	0.02	<b>0.01</b>	0.07	<b>0.03</b>

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

**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



### ONE-BUTTON ROCKWELL MEASUREMENT

The AFFRI® system can perform automatic contact with the test piece surface. It automatically moves the indenter and the hardness tester's head until contact is made blocking the piece; after this sequence the force is applied and indentation made.

The hardness tester can measure automatically in Rockwell and convert results into others scales.



# ROCKWELL



ALL OPERATIONS ARE MANAGED BY A SINGLE DRIVE INCLUDING AUTOMATIC CONTACT WITH THE TEST PIECE  
Fully motorized and automatic, the test is not affected by operator influences and can easily be used by operator of every level



1 Push the start button



2 The head moves down to make contact with the test surface from long distance and automatically starts the test cycle in automatic succession without breaching a phase.



3 The entire test cycle is complete and the results appear on a large display.

SECURE CONTACT WITH THE SPECIMEN IS ALWAYS MAINTAINED, EVEN IN THE UNLIKELY EVENT OF ANY SPECIMEN MOVEMENT



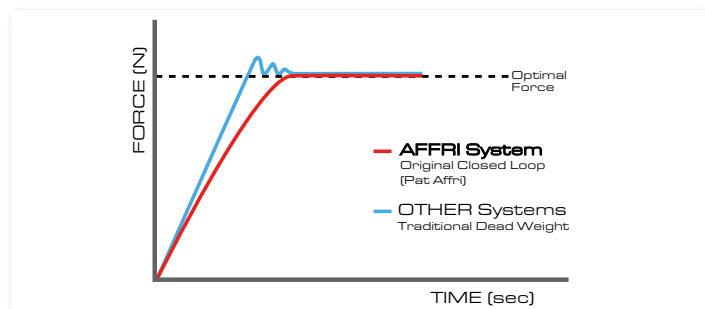
The clamping system assures perfect stability of any test piece throughout the cycle. No additional accessories are required, unlike old traditional hardness testers. The result is a reduction in costs! The top surface referencing design minimizes errors caused by anvil problems associated with dirt or scale. This reduces sample preparation time and increases both accuracy and speed.

THE FIRST RESULT IS CORRECT AND ABSOLUTE EVEN IN CASE OF STRUCTURAL DEFLECTION DURING THE TEST CYCLE



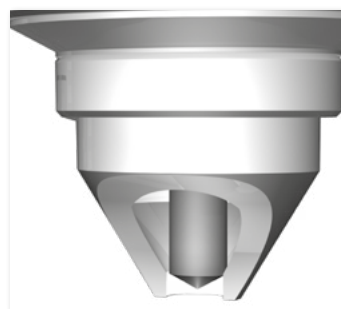
Accurate measurements, even on the first test, eliminate the need for multiple repeated tests. When testing unstable samples or defective parts, the AFFRI® System will follow the sample and not lose contact with its 2" stroke. The R & R data is at the top of its class and not surpassed by any other competitor under the same test conditions.

CLOSED LOOP AND LOAD CELL TECHNOLOGY (PAT. AFFRI)



The force by load cell and the closed loop AFFRI system assures absolute accuracy at all test conditions. The exclusive Affri latest generation of Closed Loop load cells control load forces, which are automatically programmed and controlled at each test assuring perfect linearity in every range eliminating the problems associated with dead weight systems on traditional testers. Results are not affected by any structural deflection, misalignment or vibration. The system can also operate in an inclined position.

INDENTER



The exclusive Affri diamond indenter has a life-span longer than any other indenter on the market. The indenter retracts and moves down just after the test piece is clamped thereby minimizing the risk to accidental shock.

ABSOLUTE BASE



A wide and stable work holder plate to support masses beyond 2000 kg eliminate the anvil instability problems and eliminate maintenance and adjustment. For large or very irregular test pieces which cannot be easily received by the regular bench hardness tester.

# DAKOMASTER 300



- Innovative measurement technology with vertical measure; original AFFRI system®
- DAKOMASTER 300 is equipped with a unique closed loop electronic force measuring system
- DAKOMASTER 300 AFFRI System achieves the highest level of measurement of depth accuracy and resolution available for a Hardness test
- Constant high repeatability and accuracy in every test condition
- A single start button to perform automatic test cycle
- Automatic clamping system for secure stability of every test piece
- Wide working area bearing 2000 kg test pieces
- Compact small size head to perform test on inside tube over 150 mm diameter
- DAKOMASTER 300 can indicate even the thickness of tested piece
- Remote control and touch screen
- No wire data transmission, WI-FI or BlueTooth
- Remote service via Internet for a quick diagnosis and software update

## ACTION

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

- 1** - Automatic contact with the specimen. **2** - Automatic clamping and activation of the reference surface point. **3** - Automatic preloading and loading.  
**4** - Automatic measure. **5** - Automatic return stroke at programmed distance. The entire test cycle is complete and the result appears on a large display.

## FORCE RANGE

Preload:	29.42 - 98.07N (3 - 10 kgf)
Rockwell:	588.4 - 980.7 - 1471 N (60 - 100 - 150 kgf)
Superficial Rockwell:	147.1 - 294.2 - 441.3 N (15 - 30 - 45 kgf)
Brinell:	9.807 - 49.03 - 61.29 - 98.07 - 153.2 - 245.2 - 294.2 - 306.5 - 612.9 - 1226 - 1839 N (as option 2452 N) (1 - 5 - 6.25 - 10 - 15.6 - 25 - 30 - 31.2 - 62.5 - 125 - 187.5 kgf - as option 250 kgf)
Vickers/Knoop:	9.807 - 29.42 - 49.03 - 98.07 - 147.1 - 196 - 294.2 - 490.35 - 980.7 N (1 - 3 - 5 - 10 - 15 - 20 - 30 - 50 - 100 kgf)
Optional tests:	49 - 132 - 358 - 961 N (for plastic and rubber as per EN-ISO 2039)

## FEASIBLE TESTS

Rockwell:	HRA - HRB - HRC - HRD - HRE - HRF - HRG - HRH - HRK - HRL - HRM - HRP - HRR - HRS - HRV
Superficial Rockwell:	HR15N - HR30N - HR45N - HR15T - HR30T - HR45T - HR15S - HR30S - HR45S - HR15W - HR30W - HR45W - HR15X - HR30X - HR45X - HR15Y - HR30Y - HR45Y
Brinell HBWT:	1/30 - 2.5/15.6 - 2.5/31.5 - 5/125(3) (Aluminum and its alloys) - 2.5/62.5(2) (Aluminum and its alloys) - 2.5/187.5(6) (Aluminum and its alloys) - 2.5/187.5(5) (Carbon steel) - 2.5/187.5(1) (Cast iron)
Vickers/Knoop:	Generate indentation
Temperature:	Measure test temperature range from - 40.0 to + 80.0 °C

## OPTIONAL TESTS

Brinell HBW:	HB1/10 - HB1/30 - HB2.5/6.25 - HB2.5/15.625 - HB2.5/31.25 - HB2.5/62.5 - HB2.5/187.5 - HB5/25 - HB5/125 - HB5/250
Vickers/Knoop:	HV1 - HV3 - HV5 - HV10 - HV15 - HV20 - HV30 - HV60 - HV100
Shore:	ISO 2039, Shore A and D hardness scales for plastic
CHD:	Automatic Case depth measure with non-destructive process HDT method tracing case depth curve. Range till 1.5 mm / 0.06"

## TECHNICAL DATA

Conformity Standards:	EN-ISO 6506-2 / EN-ISO 6507-2 / EN-ISO 6508-2 / EN-ISO 2039 / ISO 868 / ASTM-E10 / ASTM-E18 / ASTM-E103 / ASTM 2240 / ASTM-E384 / JIS
Load accuracy:	Better than 0.05 %
Readout Division:	0.01 HR - 0.1 HBWT
Height Capacity:	Motorized 300 mm / 12"
Depth Capacity:	130 mm / 5"
Working base dimension:	390 x 295 mm / 15 x 11.5"
Tolerable Weight:	2000kg
Temperature Range:	From 10 °C to 35 °C
Data Output:	RS 232 C (USB as option)
Power Supply:	110 or 220 V / 50÷60 Hz
Software:	Affri - OMAG
Principle of Operation:	Load Cell and Closed Loop (Affri patent)
Fields Of Use	For all metals: iron, steel, tempered steel, cast iron, brass, aluminum, copper and metal alloys. Heat treatment, hardening, nitriding, cementation and hardfacing. Hard and soft plastics.
Packing:	120 x 120 x 160 cm / 47 x 47 x 63"

## 250 MRS MRS PC



## 3332 MRS



## 3332 MRS 3302



### ACTION

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

- 1** - Automatic contact with the specimen. **2** - Automatic clamping and activation of the reference surface point. **3** - Automatic preloading and loading.
- 4** - Automatic measure. **5** - Automatic return stroke at programmed distance. The entire test cycle is complete and the result appears on a large display.

### FORCE RANGE

Preload:	29.42 - 98.07N (3 - 10 kgf)
Rockwell:	588.4 - 980.7 - 1471 N (60 - 100 - 150 kgf)
Superficial Rockwell:	147.1 - 294.2 - 441.3 N (15 - 30 - 45 kgf)
Brinell:	9.807 - 49.03 - 61.29 - 98.07 - 153.2 - 245.2 - 294.2 - 306.5 - 612.9 - 1226 - 1839 N (as option 2452 N) (1 - 5 - 6.25 - 10 - 15.6 - 25 - 30 - 31.2 - 62.5 - 125 - 187.5 kgf - as option 250 kgf)
Vickers/Knoop:	9.807 - 29.42 - 49.03 - 98.07 - 147.1 - 196 - 294.2 - 490.35 - 980.7 N (1 - 3 - 5 - 10 - 15 - 20 - 30 - 50 - 100 kgf)
Optional tests:	49 - 132 - 358 - 961 N (for plastic and rubber as per EN-ISO 2039)

### FEASIBLE TESTS

Rockwell:	HRA - HRB - HRC - HRD - HRE - HRF - HRG - HRH - HRK - HRL - HRM - HRP - HRR - HRS - HRV
Superficial Rockwell:	HR15N - HR30N - HR45N - HR15T - HR30T - HR45T - HR15S - HR30S - HR45S - HR15W - HR30W - HR45W - HR15X - HR30X - HR45X - HR15Y - HR30Y - HR45Y
Brinell HBWT:	1/30 - 2.5/15.6 - 2.5/31.5 - 5/125(3) (Aluminum and its alloys) - 2.5/62.5(2) (Aluminum and its alloys) - 2.5/187.5(6) (Aluminum and its alloys) - 2.5/187.5(5) (Carbon steel) - 2.5/187.5(1) (Cast iron)
Vickers/Knoop:	Generate indentation
Temperature:	Measure test temperature range from - 40.0 to + 80.0 °C

### OPTIONAL TESTS

Brinell HBW:	HB1/10 - HB1/30 - HB2.5/6.25 - HB2.5/15.625 - HB2.5/31.25 - HB2.5/62.5 - HB2.5/187.5 - HB5/25 - HB5/125 - HB5/250
Vickers/Knoop:	HV1 - HV3 - HV5 - HV10 - HV15 - HV20 - HV30 - HV60 - HV100
Shore:	ISO 2039, Shore A and D hardness scales for plastic
CHD:	Automatic Case depth measure with non-destructive process HDT method tracing case depth curve. Range till 1.5 mm / 0.06"

### TECHNICAL DATA

Conformity Standards:	EN-ISO 6506-2 / EN-ISO 6507-2 / EN-ISO 6508-2 / EN-ISO 2039 / ISO 868 / ASTM-E10 / ASTM-E18 / ASTM-E103 / ASTM 2240 / ASTM-E384 / JIS
Load accuracy:	Better than 0.1 % - MRS PC Better than 0.05 %
Readout Division:	0.1 HR / HBWT - MRS PC 0.01 HR
Indenter Stroke:	250MRS, 3332MRS and 3302MRS: Motorized 50mm / 2"
Height Capacity:	250MRS: 215 mm / 8.5" (As option 300 mm / 12") - 3332MRS: 380 mm / 15" - 3332MRS: Motorized 500 mm / 19.5" (As option up to 700 mm / 27.5")
Depth Capacity:	250MRS: 190 mm / 7.5" (As option 220 mm / 8.5") - 3332MRS and 3332MRS: 200 mm / 8"
Working table:	3332MRS, 3332MRS and 3302MRS: 390 x 330 mm / 15 x 13" (More on request)
Tolerable Weight:	2000kg
Temperature Range:	From 10 °C to 35 °C
Data Output:	RS 232 C (USB as option)
Power Supply:	110 or 220 V / 50÷60 Hz
Software:	Affri - OMAG
Principle of Operation:	Load Cell and Closed Loop (Affri patent)
Fields Of Use	For all metals: iron, steel, tempered steel, cast iron, brass, aluminum, copper and metal alloys. Heat treatment, hardening, nitriding, cementation and hardfacing. Hard and soft plastics.
Packing:	60 x 100 x h50 cm / 23 x 40 x h20" - 85kg

## 206 RSD RS-SD



## 330 RSD RS-SD



## 903 RSD RS-SD



331 RSD/RS-SD  
For ring shape samples

### ACTION

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

- 1 - Automatic contact with the specimen. 2 - Automatic clamping and activation of the reference surface point. 3 - Automatic preloading and loading.
- 4 - Automatic measure. 5 - Automatic return stroke when releasing the lever. The entire test cycle is complete and the result appears on a large display.

### FORCE RANGE

#### RS-SD

#### RSD

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

### FEASIBLE TESTS

#### RS-SD

#### RSD

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

### OPTIONAL TESTS

#### RS-SD

#### RSD

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

### TECHNICAL DATA

Conformity Standards:	EN-ISO 6506-2 / EN-ISO 6507-2 / EN-ISO 6508-2 / ASTM-E10 / ASTM-E18 / ASTM-E103 / ASTM-E384 / JIS
Load accuracy:	Better than 0.5 %
Readout Division:	0.1 HR / HBWT
Indenter Stroke:	50mm / 2"
Height Capacity:	206RSD: 215 mm / 8.5" - 330RSD: 330 mm / 12" - 903RSD: 500 mm / 19.5" (As option up to 700 mm / 27.5")
Depth Capacity:	190 mm / 7.5"
Working table:	330RSD and 903RSD: 390 x 330 mm / 15 x 13" (More on request. Available optional base for ring shape samples on request)
Tolerable Weight:	2000kg
Temperature Range:	From 10 °C to 35 °C
Data Output:	RS 232 C (USB as option)
Power Supply:	110 or 220 V / 50÷60 Hz
Software:	Affri - OMAG
Principle of Operation:	Dynamometric Load Cell
Fields Of Use	RSD: For all metals: iron, steel, tempered steel, cast iron, brass, aluminium, copper and metal alloys with more than 0.6 mm thickness. RS-SD: Heat treatment, hardening, nitriding, cementation and hardfacing with less than 0.6 mm depth.
Packing:	206RSD: 60 x 100 x h50 cm / 23 x 40 x h20" - 85kg. 330RSD: 90 x 80 x 115 / 35 x 32 x 45" - 100kg

## 250 DRM DRMC



## 206 EX EXS EX2



## 206 RT RTS



### FORCE RANGE

Preload:	29.42 - 98.07 N (3 - 10 kgf)
Rockwell & Superficial R.:	588.4 - 980.7 - 1471 N (60 - 100 - 150 kgf) / 147.1 - 294.2 - 441.3 N (15 - 30 - 45 kgf)
Brinell (DRMC only):	9.807 - 49.03 - 61.29 - 98.07 - 153.2 - 245.2 - 294.2 - 306.5 - 612.9 - 1226 - 1839 N (as option 2452 N) (1 - 5 - 6.25 - 10 - 15.6 - 25 - 30 - 31.2 - 62.5 - 125 - 187.5 kgf - as option 250 kgf)
Vickers/Knoop:	9.807 - 29.42 - 49.03 - 98.07 - 147.1 - 196 - 294.2 - 490.35 - 980.7 N (1 - 3 - 5 - 10 - 15 - 20 - 30 - 50 - 100 kgf)

### FEASIBLE TESTS

Rockwell & Superficial R.:	HRA - HRB - HRC - HRD - HRF - HRG - HRL - HRM - HRR / HR15N/T/W/X/Y - HR30N/T/W/X/Y - HR45N/T/W/X/Y
Brinell HBWT (DRMC only):	1/30 - 2.5/15.6 - 2.5/31.5 - 5/125(3) - 2.5/62.5(2) - 2.5/187.5(6) (Aluminum and its alloys) - 2.5/187.5(5) (Carbon steel) - 2.5/187.5(1) (Cast iron)
Temperature:	Measure test temperature range from - 40.0 to + 80.0 °C

### OPTIONAL TESTS

Brinell HBW (DRMC only):	HB1/10 - HB1/30 - HB2.5/6.25 - HB2.5/15.625 - HB2.5/31.25 - HB2.5/62.5 - HB2.5/187.5 - HB5/25 - HB5/125 - HB5/250
Vickers/Knoop:	HV1 - HV3 - HV5 - HV10 - HV15 - HV20 - HV30 - HV60 - HV100

### FORCE RANGE

#### RTS/EXS/EX2

#### RT/EX/EX2

Preload:	29.42 N (3 kgf)	98.07 N (10 kgf)
Rockwell or Superficial R.:	147.1 - 294.2 - 441.3 N (15 - 30 - 45 kgf)	588.4 - 980.7 - 1471 N (60 - 100 - 150 kgf)
Brinell:	153.2 - 294.2 - 306.5 N (15.625 - 30 - 31.25 kgf)	98.07 - 612.9 - 1226 - 1839 N - as option 2452 N (10 - 62.5 - 125 - 187.5 kgf - as option 250 kgf)
Vickers/Knoop:	29.42 - 147.1 - 294.2 N (3 - 15 - 30 kgf)	98.07 - 588.4 - 980.7 N (10 - 60 - 100 kgf)

### FEASIBLE TESTS

#### RTS/EXS/EX2

#### RT/EX/EX2

Rockwell or Superficial R.:	HR15N/T/W/X/Y - HR30N/T/W/X/Y - HR45N/T/W/X/Y	HRA - HRB - HRC - HRD - HRF - HRG - HRL - HRM - HRR
Brinell HBWT:	1/30 - 2.5/15.6 - 2.5/31.5	5/125 - 2.5/62.5 - 2.5/187.5
Temperature:	Measure test temperature range from - 40.0 to + 80.0 °C	Measure test temperature range from - 40.0 to + 80.0 °C

### OPTIONAL TESTS

#### RTS/EXS/EX2

#### RT/EX/EX2

Brinell HBW:	HB1/30 - HB2.5/15.625 - HB2.5/31.25	HB1/10 - HB2.5/6.25 - HB2.5/187.5 - HB5/125 - HB5/250
Vickers/Knoop:	HV3 - HV15 - HV30	HV10 - HV60 - HV100

### ACTION

**250DRM:** Spin the leveling screw handle and bring your sample to make contact with the indenter, activating the reference zero point. The Affri® system cycle starts automatically. Within seconds results appear.

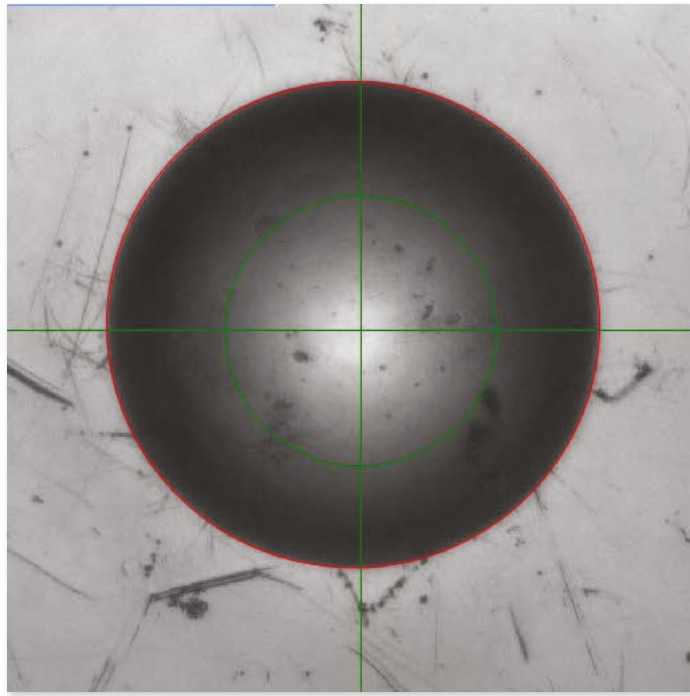
**206EX and 206RT:** Spin the leveling screw handle and bring your sample to make contact with the indenter, activating the reference zero point. Pull the START lever and within seconds results appear.

### TECHNICAL DATA

Conformity Standards:	EN-ISO 6506-2 / EN-ISO 6507-2 / EN-ISO 6508-2 / ASTM-E10 / ASTM-E18 / ASTM-E103 / ASTM-E384 / JIS
Load accuracy:	DRM: Better than 0.1 % - EX/EXS/EX2/RT/RTS: Better than 1 %
Readout Division:	DRM/EX/EXS/EX2: 0.1 HR / HBWT - 206RT: 0.5HR
Capacity:	Height capacity: 215 mm / 8.5" (250DRM As option 300 mm / 12") / Depth Capacity 190 mm / 7.5" (250DRM As option 220 mm / 8.5")
Tolerable Weight:	900kg
Temperature Range:	From 10 °C to 35 °C
Data Output:	DRM/EX/EXS/EX2: RS 232 C (USB as option)
Power Supply:	DRM/EX/EXS/EX2: 110 or 220 V / 50÷60 Hz
Software:	Affri - OMAG
Principle of Operation:	DRM: Load Cell - EX/EXS/EX2/RT/RTS: Dynamometric Load Cell
Fields Of Use	RT/EX/EX2/DRM: For all metals: iron, steel, tempered steel, cast iron, brass, aluminium, copper and metal alloys with more than 0.6 mm thickness. RTS/EXS/EX2/DRM: Heat treatment, hardening, nitriding, cementation and hardfacing with less than 0.6 mm depth.
Packing:	60 x 100 x h50 cm / 23 x 40 x h20" - 85kg



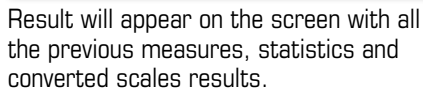
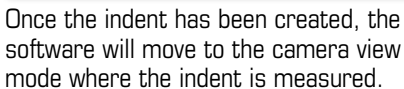
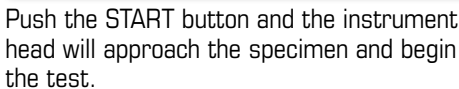
# BRINELL



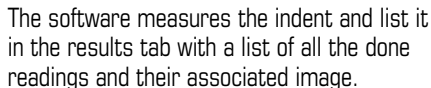
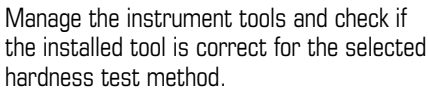
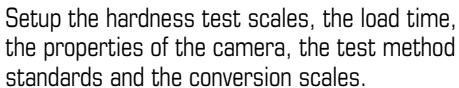
## ONE-BUTTON BRINELL MEASUREMENT

The AFFRI® system automatically moves the indenter and the hardness tester's head until contact is made blocking the piece; after this sequence the force is applied and indentation made. The software will move to the camera view mode and auto measures the indent. The hardness tester can measure automatically in Brinell and convert results into other scales.

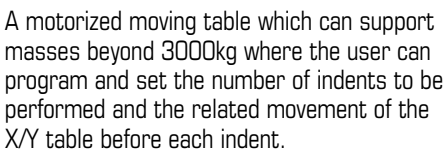




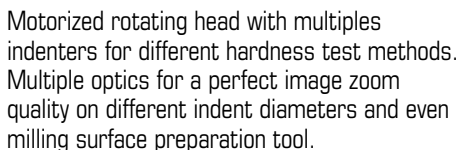
THE SOFTWARE CONTROLS THE WHOLE INSTRUMENT AVOIDING SETTINGS ERRORS OR OPERATORS MISTAKES



## X/Y AUTOMATIC SUPPORT PLANE



## 7 SLOTS ROTATING HEAD



## AUTOFOCUS

The Auto Focus performs an automatic focus adjustment for the selected optic with precise positioning at any magnification.

## CLOSED LOOP AND LOAD CELLS (PAT. AFFRI)

Closed loop load cells control load forces, assuring perfect linearity in every range. Please see pag.10

## CLAMPING SYSTEM

The clamping system assures perfect stability of any test piece throughout the test cycle. Please see pag.10

# INTEGRAL 1



- Brinell Hardness Tester
- Automatic Brinell measures through camera and image analysis
- Auto-focus
- Innovative measurement technology with vertical measure system: original AFFRI System Hardness Tester achieves the highest level of measurement accuracy and resolution available for a Hardness Test
- INTEGRAL 1 is equipped with a unique closed loop electronic force measuring system, an original Affri System
- High and constant accuracy of results in every test condition
- A single start button to make surface contact, test cycle and programmed return stroke
- Automatic clamping system at request
- Automatic and pneumatic turret for multi objectives and multi indenters up to 7 positions
- Wide working area bearing 3000 kg test pieces
- Remote control via Internet for service, quick diagnosis and software update
- As optional, milling surface preparation tool

## ACTION

Just one push of the start button activates the continuous 500mm stroke in one direction movement of the head generating:

**1** - Automatic contact with test piece. **2** - Automatic clamping, active and sliding. **3** - Automatic loading. **4** - Automatic switching to optic lens. **5** - Autofocus by image scanning brightness. **6** - Automatic measure. **7** - Automatic return stroke at programmed distance. The entire test cycle is complete and the result appears on a large display.

## FORCE RANGE

Brinell:	153.2 - 306.5 - 612.9 - 1226 - 1839 - 2451 - 4903 - 7355 - 9870 - 29421 N (15.6 - 31.2 - 62.5 - 125 - 187.5 - 250 - 500 - 750 - 1000 - 3000 kgf)
Vickers/Knoop:	98.07 - 588.4 - 980.7 N (10 - 60 - 100 kgf)
Optional loads:	9.807 - 24.52 - 49.03 - 61.29 - 98.07 N (1 - 2.5 - 5 - 6.25 - 10 kgf)

## FEASIBLE TESTS

Brinell HBW:	HBW1/30 - HBW2.5/15.625 - HBW2.5/31.25 - HBW2.5/62.5 - HBW2.5/187.5 - HBW5/25 - HRW5/62,5 - HBW5/125 - HBW5/250 - HBW5/750 - HBW10/100 - HBW10/250 - HBW10/500 - HBW10/1000 - HBW10/1500 - HBW10/3000
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## OPTIONAL TESTS

Brinell HBW:	HBW1/1 - HBW1/2.5 - HBW1/5 - HBW1/10 - HBW2.5/6.25
Vickers/Knoop:	HV10 - HV60 - HV100

## TECHNICAL DATA

Conformity Standards:	EN-ISO 6506-2 / ASTM-E10 / JIS
Load accuracy:	Better than 0.05 %
Readout Division:	0.1 HB
Head Stroke:	Fully motorized 500 mm / 20" (More as option)
Height Capacity:	500 mm / 20" (More as option)
Depth Capacity:	170 mm / 6.7" (More as option)
Working base dimension:	400 x 400 mm / 16 x 16" (More as option)
Tolerable Weight:	3000kg
Turret:	Motorized and pneumatic automatic turret. Self-switching 1 indenter + 1 objective (optional 5-7 steps)
Camera:	Firewire included
Lighting:	LED
Network:	Wire Ethernet connection for technical assistance, auto diagnosis and support
Temperature Range:	From 10 °C to 35 °C
Data Output:	USB / Ethernet
Power Supply:	110 or 220 V / 50÷60 Hz - Air compressed 5 ATM
Software:	Easydur
Principle of Operation:	Load Cell and Closed Loop (Affri patent)
Fields Of Use	For all metals: iron, steel, tempered steel, cast iron, brass, aluminum, copper and metal alloys.
Packing:	600kg - 160 x 130 x 230 cm / 62 x 51 x 90"

## LD3000



Standard  
microscope,  
Pag. 53

## LD3000A



## LD3000B



### ACTION

Brinell testing solutions from 1 to 3000 kgf.

**LD 3000** - Only indentation. Reading of indentation is made through standard microscope or through optional electronic microscope with auto-measure.

**LD 3000 A** - Automatic HBW. On-board LCD and portable camera probe. Real Brinell HBW in compliance with ASTM E10 and ISO 6506.

**LD 3000 B** - Automatic HBWT. Hardness depth measurement for Brinell HBWT and Rockwell in compliance with ASTM E18 and ISO 6508. On-board LCD.

### FORCE RANGE

Preload:	29.42 - 98.07N (3 - 10 kgf)
Rockwell:	588.4 - 980.7 - 1471 N (60 - 100 - 150 kgf)
Superficial Rockwell:	147.1 - 294.2 - 441.3 N (15 - 30 - 45 kgf)
Brinell:	9.807 - 49.03 - 61.29 - 98.07 - 147.1 - 294.2 - 306.5 - 612.9 - 1839 - 2452 - 4903 - 7355 - 9807 - 29421 N (1 - 5 - 6.25 - 10 - 15.6 - 30 - 31.2 - 62.5 - 187.5 - 250 - 500 - 750 - 1000 - 3000 kgf)
Vickers/Knoop:	9.807 - 29.42 - 49.03 - 98.07 - 147.1 - 196 - 294.2 - 490.35 - 980.7 N (1 - 3 - 5 - 10 - 15 - 20 - 30 - 50 - 100 kgf)

### LD3000 FEASIBLE TESTS

Brinell/Vickers:	Generate indentation
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### LD3000A FEASIBLE TESTS - Automatic indentation reading with onboard LCD and portable probe

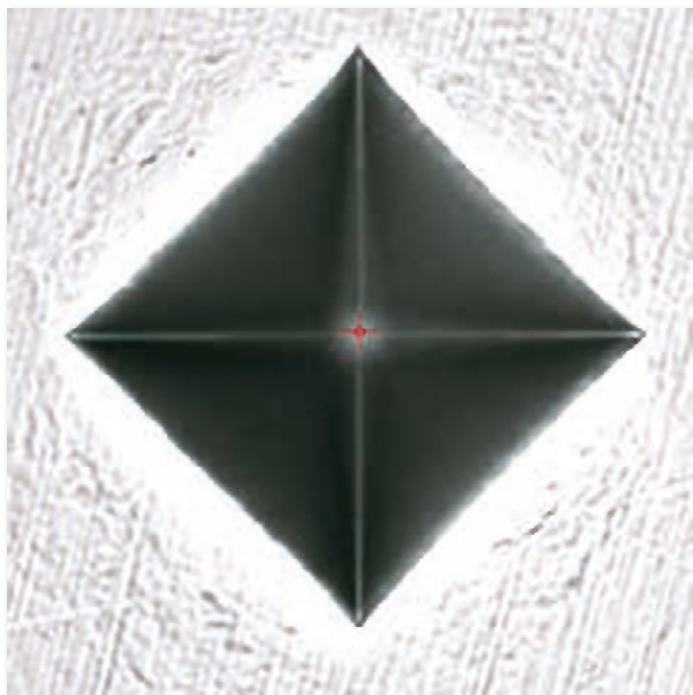
Brinell HBW:	HBW1/1 - HBW1/2.5 - HBW1/5 - HBW1/10 - HBW1/30 - HBW2.5/6.25 - HBW2.5/15.625 - HBW2.5/31.25 - HBW2.5/62.5 - HBW2.5/187.5 - HBW5/25 - HRW5/62.5 - HBW5/125 - HBW5/250 - HBW5/750 - HBW10/100 - HBW10/250 - HBW10/500 - HBW10/1000 - HBW10/1500 - HBW10/3000
Vickers:	HV1 - HV2.5 - HV 3 - HV 5 - HV 10 - HV 20 - HV 30 - HV 50 - HV 100

### LD3000B FEASIBLE TESTS - Automatic direct Brinell HBWT and Rockwell measurements

Rockwell:	HRA - HRB - HRC - HRD - HRF - HRG - HRL - HRM - HRR
Superficial Rockwell:	HR15N - HR30N - HR45N - HR15T - HR30T - HR45T - HR15S - HR30S - HR45S - HR15W - HR30W - HR45W - HR15X - HR30X - HR45X - HR15Y - HR30Y - HR45Y
Brinell HBWT:	2.5/62.5 - 2.5/187.5 - 5/125 - 5/250 - 5/750 - 10/500 - 10/1000 - 10/1500 - 10/3000
Brinell HBW / Vickers:	Generate indentation

### TECHNICAL DATA

Conformity Standards:	EN-ISO 6506-2 / EN-ISO 6507-2 / EN-ISO 6508-2 / ASTM-E10 / ASTM-E18 / ASTM-E103 / ASTM-E384 / JIS
Load accuracy:	LD3000 better than 0.5 % / LD3000A-B Better than 0.05 %
Readout Division:	LD 3000 A: 0.1 HB / HV - LD 3000 B: 0.01 HR / 0.1 HBWT
Indenter Stroke:	Motorized 30 mm / 1.2"
Height Capacity:	150 mm / 6" - Removing the elevating screw, the vertical capacity increase till 300 mm / 12"
Depth Capacity:	190 mm / 7.5"
Tolerable Weight:	2000kg. Removing the elevating screw, the tolerable weight can be increased to more than 3000kg.
Reading/Measuring:	LD 3000 - Indentation reading through standard microscope or through optional electronic microscope with auto-measure LD 3000 A - Automatic Brinell HBW with on-board LCD touchscreen and portable camera probe. LD 3000 B - Direct depth hardness measurement Brinell HBWT and Rockwell.
Dwell Time:	From 5 to 60 seconds programmable
Network:	Wire Ethernet connection for technical assistance, auto diagnosis and support
Temperature Range:	From 10 °C to 35 °C
Data Output:	USB / Ethernet
Power Supply:	110 or 220 V / 50÷60 Hz - Air compressed 5 ATM
Software:	OMAG / AFFRI
Principle of Operation:	Load Cell and Closed Loop (Affri patent)
Fields Of Use	For all metals: iron, steel, tempered steel, cast iron, brass, aluminum, copper and metal alloys. Heat treatment, hardening, nitriding, cementation and hardfacing
Packing:	350kg - 140 x 100 x 65 cm / 55 x 39 x 25"



### **ONE-BUTTON VICKERS MEASUREMENT**

The AFFRI® system automatically moves the indenter and the hardness tester's head until contact is made blocking the piece; after this sequence the force is applied and indentation made. The software will move to the camera view mode and auto measures the indent. The hardness tester can measure automatically in Vickers and convert results into other scales.



# VICKERS



JUST PRESS ONE BUTTON FOR ACCURATE MULTI CASE-DEPTH VICKERS TESTS



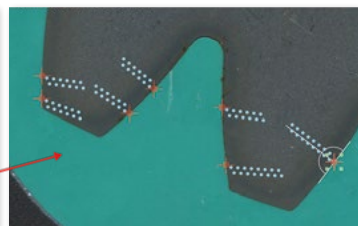
Push the START button and the instrument head will approach the specimen and begin the test, following every predefined patterns and performing each indentation, no matter the amount. Auto focusing, automatic measuring and reporting, allow this system to function unattended for hours without interruption, saving time and money, thus increasing throughput and productivity.

## ① SEE THE FULL AREA



Obtain a perfect, detailed, high resolution, and evenly illuminated view of the whole sample holder.

## ② SET UP PATTERNS



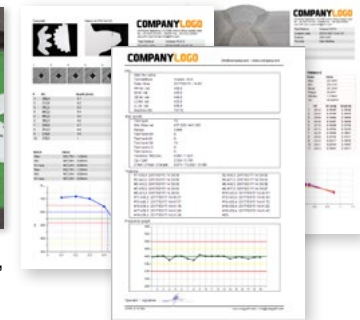
Copy and paste or create and save new patterns to predefined locations with a simple click.

## ③ PUSH START



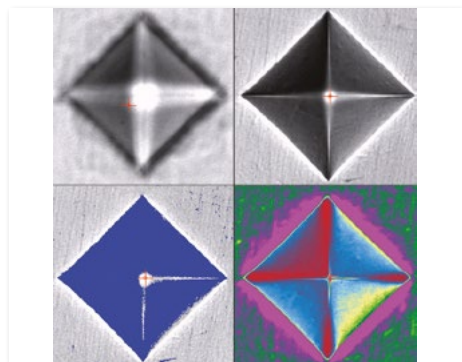
The software follows the patterns, indents the sample, measures, and generates data dynamically.

## ④ GET RESULTS



Obtain statistically relevant results. Review results in graphical and/or tabular format.

## AUTO-FOCUSING & AUTO-MEASUREMENTS



With software controlled focus, shading correction and DC regulated light source, reproducible results are obtained regardless of the number of indents measured even on rough sample surfaces.

## 6 SLOTS ROTATING HEAD



All optical microscope objectives can be pre-installed and combined with indenters for Vickers and Knoop scales. Optical objectives selection of 2.5x – 5x – 10x – 20x – 40x – 50x – 100x.

## MOTORIZED X/Y SUPPORT PLANE

With an accuracy of  $\pm 0.5 \mu\text{m}$  steps, reference points for patterns can be set exactly where they are needed

## CLOSED LOOP AND LOAD CELLS (PAT. AFFRI)

Closed loop load cells control load forces, assuring perfect linearity in every range. Please see pag.10

## UNEVELLED SAMPLE SURFACES

Reliable test even on unlevelled or misaligned surfaces.

## VERTICAL HEAD MOVEMENT

Electronically controlled. Collision protection for indenters and objectives.

## WIKI JS



- Collision protection for indenter and for objective
- Automatic focus and measure for single or multiple indentations
- Precise, and reliable test even on not leveled or misaligned surface
- One button to perform surface contact and test multi sample cycle
- The most advanced Automatic Vickers hardness tester with auto-measurement and auto-focus
- Possibility to create several patterns in only one cycle for one sample or even for several samples
- Automatic table with 0.5 micron/step division
- Total control on all the hardness tester using a joy-stick
- Automatic horizontal turret until 6 memory positions
- 2 indenters: Vickers and Knoop
- It can install a Rockwell indenter for superficial Rockwell test
- Panoramic large view field for easy identification of test area

## FORCE RANGE

Vickers/Knoop:	0.0098 - 0.0196 - 0.049 - 0.098 - 0.1471 - 0.1961 - 0.2452 - 0.4903 - 0.9807 - 1.961 - 2.942 - 4.903 - 9.807 - 19.61 - 29.42 - 49.03 - 98.07 - 196.1 - 294.2 - 490.3 - 980.7 N (0.001 - 0.002 - 0.005 - 0.01 - 0.015 - 0.02 - 0.025 - 0.05 - 0.1 - 0.2 - 0.3 - 0.5 - 1 - 2 - 3 - 5 - 10 - 20 - 30 - 50 - 100 kgf)
Brinell:	153.2 - 306.5 N (15.6 - 31.25 kgf)
Superficial Rockwell:	147.1 - 294.2 - 441.3N (15 - 30 - 45 kgf)

## WIKI 100/200 JS FEASIBLE TESTS - (10 gf ÷ 10 kgf)

Vickers:	HV0.01 - HV0.015 - HV0.02 - HV0.025 - HV0.05 - HV0.1 - HV0.2 - HV0.3 - HV0.5 - HV1 - HV2 - HV3 - HV5 - HV10
Knoop (Optional):	HK0.01 - HK0.015 - HK0.02 - HK0.025 - HK0.05 - HK0.1 - HK0.2 - HK0.3 - HK0.5 - HK1 - HK2

## WIKI 100/200 JS 3 FEASIBLE TESTS - (100 gf ÷ 30 kgf)

Vickers:	HV0.1 - HV0.2 - HV0.3 - HV0.5 - HV1 - HV2 - HV3 - HV5 - HV10 - HV20 - HV30
Knoop (Optional):	HK0.1 - HK0.2 - HK0.3 - HK0.5 - HK1 - HK2

## OPTIONAL TESTS (Depending on the models)

Vickers / Knoop:	HV0.001 - HV0.002 - HV0.005 - HV30 - HV50 - HV100 / HK0.001 - HK0.002 - HK0.005
Superficial Rockwell (JS3):	HR15N - HR30N - HR45N - HR15T - HR30T - HR45T - HR15S - HR30S - HR45S - HR15W - HR30W - HR45W - HR15X - HR30X - HR45X - HR15Y - HR30Y - HR45Y
Brinell HBW / HBWT (JS3):	2.5/15,6 - 2.5/31.25

## TECHNICAL DATA

Conformity Standards:	EN-ISO 6506 / EN-ISO 6507 / EN-ISO 6508 / EN-ISO 4545 / ASTM E10 / ASTM E08 / ASTM E103 / ASTM-E384 / ASTM-E92 / JIS
Load accuracy:	Better than 0.05 %
Readout Division:	0.1 HV / HK / HB - 0.01 HR
Height Capacity:	Motorized 240 mm / 9.4" (as optional 300 mm / 12" or 700 mm / 27.5")
Depth Capacity:	135 mm / 5.5"
Turret:	Automatic and motorized - 6 positions (4 objectives - 2 indenters)
Indenter:	Vickers - As option Knoop, Brinell and Rockwell
Objectives:	2.5x - 5x - 10x - 20x - 40x - 50x - 100x (Total magnification 25x - 50x - 100x - 200x - 400x - 500x - 1000x)
Camera:	1.3 MP USB2 B/W HD
Focus and Reading:	Automatic and manual
Lighting:	Energy Efficient Cool LED Light Source
Network:	Wire connection for technical assistance and auto-diagnosis
X-Y Table:	WIKI100JS: Manual 100 x 100 mm with 10 µm step WIKI200JS: Motorized with 0.5 µm steps 100 x 60 mm / 3.9 x 2.3" or 200 x 100 mm / 7.8 x 3.9"
Tolerable weight:	50 kg
Dwell Time:	From 5 to 60 seconds programmable
Temperature Range:	From 10 °C to 35 °C
Data Output:	USB / Ethernet
Power Supply:	110 or 220 V / 50÷60 Hz
Software:	Affri - OMAG
Principle of Operation:	Load Cell and Closed Loop (Affri patent)
Fields Of Use:	For micro and macro Vickers and case depth test on every metals: iron, steel, tempered steel, cast iron, brass, aluminium, copper and metal alloys. Heat treatment, hardening, nitriding, cementation and hardfacing. Knoop test on ceramic and glass materials.
Packaging:	120 x 120 x 160 cm / 47 x 47 x 65" - 160/200 kg

# WIKI 30



Base for flat or round pieces, suitable also for small pieces (see the photo on the left).



Double magnetic clamping base for big or small diameters.



Smaller optional carrying console with LCD touchscreen.

- A new milestone in the field of Portable Hardness Testing for micro and macro Vickers and also for Brinell
- WIKI 30 eliminates the need to cut sample and to perform test in laboratory
- Automatic instrument created for testing (simple and stitch) tubes with a diameter of 100mm up to almost 700mm (by using the hook/chain system)
- The hardness tester is portable and engineered to be light and resistant
- The particular shape of WIKI 30 allows to have both a plate supporting surface for testing details with parallel sides and a "V" plate for centering tubular details
- Designed for housing a hook-chain system, it allows to anchor it to large dimension tubes, thus giving precise tests under optimal stability conditions
- Thanks to the autofocus, once the measuring cycle is started, the instrument will perform the test, later analyse the indentation and display the hardness value, duly calculated, on the palmtop PC screen supplied with the instrument

## ACTION

Just press one button and the head moves down, applies the force, makes the indentation, reads the indent and moves back upward. Fully motorized with 90 mm of vertical stroke.

## FORCE RANGE

Vickers/Knoop:	0.9807 - 1.961 - 2.942 - 4.903 - 9.807 - 19.61 - 29.42 - 49.03 - 61.29 - 98.07 - 147.1 - 152.98 - 196.14 - 245.17 - 294.21 N (0.1 - 0.2 - 0.3 - 0.5 - 1 - 2 - 3 - 5 - 6.25 - 10 - 15 - 15.6 - 20 - 25 - 30 kgf)
Brinell:	9.807 - 24.52 - 49.03 - 61.29 - 98.07 - 153.2 - 245.2 - 294.2 N (1 - 2.5 - 5 - 6.25 - 10 - 15.6 - 25 - 30 kgf)

## FEASIBLE TESTS

Vickers:	HV0.1 - HV0.2 - HV0.3 - HV0.5 - HV1 - HV2 - HV3 - HV5 - HV10 - HV20 - HV30
Knoop (Optional):	HK0.1 - HK0.2 - HK0.3 - HK0.5 - HK1 - HK2
Brinell (Optional):	On Request

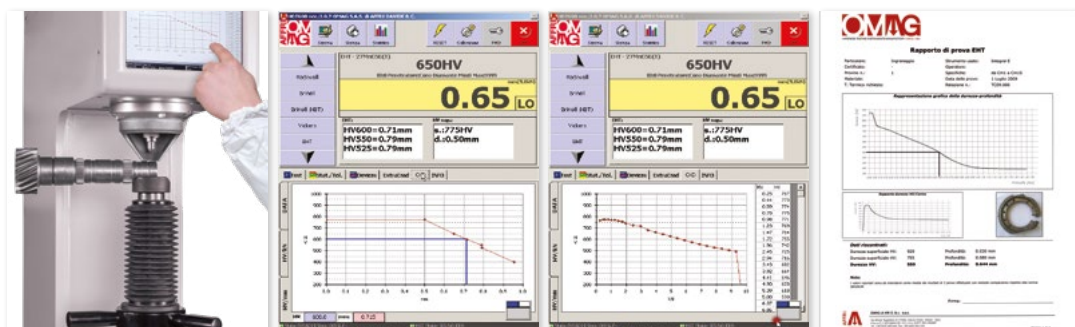
## TECHNICAL DATA

Conformity Standards:	EN-ISO 6507 / EN-ISO 4545 / ASTM-E384 / ASTM-E92 / JIS
Load accuracy:	Better than 0.05 %
Readout Division:	0.1 HV / HK
Vertical Stroke:	Motorized vertical stroke 90 mm / 3.5"
Horizontal Stroke:	Indenter horizontal stroke $\pm$ 5 mm (X axe)
Depth Capacity:	135 mm / 5.5"
Turret:	Automatic and motorized - 2 positions
Indenter:	Vickers - As option Knoop and Brinell
Objectives:	10x - 20x - 40x - 50x (Total magnification 100x - 200x - 400x - 500x)
Camera:	1.3 MP USB2 B/W HD
Focus and Reading:	Automatic and manual
Lighting:	Energy Efficient Cool LED Light Source
Network:	Wire connection for technical assistance and auto-diagnosis
Dwell Time:	From 5 to 60 seconds programmable
Temperature Range:	From 10 °C to 35 °C
Data Output:	USB / Ethernet
Power Supply:	110 or 220 V / 50÷60 Hz
Software:	Afri - OMAG
Principle of Operation:	Load Cell and Closed Loop (Affri patent)
Fields Of Use:	For micro and macro Vickers and case depth test on every metals: iron, steel, tempered steel, cast iron, brass, aluminium, copper and metal alloys. Heat treatment, hardening, nitriding, cementation and hardfacing. Knoop test on ceramic and glass materials.
Packaging:	100 x 100 x 60 cm / 40 x 40 x 23" - 60 kg

## LD 3000 AF



- The LD 3000 AF will determine (CHD) Case Hardness Depth without destroying the specimen, with great precision and minimal operator intervention. LD 3000 AF let you to realize Case Depth test from 0.01 mm to 1.8 mm
- Testing can be performed on a non-metallographic prepared specimen. The load force speeds are controlled to one thousandth of a second, and measures the indentation to the highest precision (0.01um), resulting in accurate Rockwell and Superficial Rockwell
- The system has a built touch screen with a user friendly interface. Standard and custom reports can be easily generated. HDTL software version, supplies the Hardness and hardness depth values at HV2 525 - 550 - 600 - 650
- The HDTL Plus version offers the complete report and graph, assisting in displaying the complete sample decarbonised zone
- LD 3000 AF conforms to **ISO-6508** and **ASTM E-18**
- Possibility to store the data or connecting to database networks, PC's and printers, to download data or for final custom reports
- Auto reading on Rockwell, Superficial Rockwell, Brinell and Vickers scales



## FORCE RANGE

Preload:	29.42 - 98.07N (3 - 10 kgf)
Rockwell:	588.4 - 980.7 - 1471 N (60 - 100 - 150 kgf)
Superficial Rockwell:	147.1 - 294.2 - 441.3 N (15 - 30 - 45 kgf)
Brinell:	9.807 - 49.03 - 61.29 - 98.07 - 147.1 - 294.2 - 306.5 - 612.9 - 1839 - 2452 - 4903 - 7355 - 9807 - 29421 N (1 - 5 - 6.25 - 10 - 15.6 - 30 - 31.2 - 62.5 - 187.5 - 250 - 500 - 750 - 1000 - 3000 kgf)
Vickers/Knoop:	9.807 - 29.42 - 49.03 - 98.07 - 147.1 - 196 - 294.2 - 490.35 - 980.7 N (1 - 3 - 5 - 10 - 15 - 20 - 30 - 50 - 100 kgf)

## FEASIBLE TESTS

HDTL:	CHD with non-destructive method. HV525 - HV550 - HV600 - HV650 (More on request)
Rockwell:	HRA - HRC - HRC - HRD - HRE - HRF - HRG - HRH - HRK - HRL - HRM - HRP - HRR - HRS - HRV
Superficial Rockwell:	HR15N - HR30N - HR45N - HR15T - HR30T - HR45T - HR15S - HR30S - HR45S - HR15W - HR30W - HR45W - HR15X - HR30X - HR45X - HR15Y - HR30Y - HR45Y
Brinell HBWT:	2.5/62.5 - 2.5/187.5 - 5/125 - 5/250 - 5/750 - 10/500 - 10/1000 - 10/1500 - 10/3000
Brinell HBW:	Generate Indentation: HBW1/1 - HBW1/2.5 - HBW1/5 - HBW1/10 - HBW1/30 - HBW2.5/6.25 - HBW2.5/15.625 - HBW2.5/31.25 - HBW2.5/62.5 - HBW2.5/187.5 - HBW5/25 - HBW5/62.5 - HBW5/125 - HBW5/250 - HBW5/750 - HBW10/100 - HBW10/250 - HBW10/500 - HBW10/1000 - HBW10/1500 - HBW10/3000
Vickers:	Generate indentation HV1 - HV2.5 - HV 3 - HV 5 - HV 10 - HV 20 - HV 30 - HV 50 - HV 100

## TECHNICAL DATA

Conformity Standards:	EN-ISO 6506-2 / EN-ISO 6507-2 / EN-ISO 6508-2 / EN-ISO 14577 / ASTM-E10 / ASTM-E18 / ASTM-E103 / ASTM-E384 / JIS
Load accuracy:	Better than 0.05 %
Readout Division:	HR / 0.1 HBWT
Indenter Stroke:	Motorized 30 mm / 1.2"
Height Capacity:	150 mm / 6" - Removing the elevating screw, the vertical capacity increase till 300 mm / 12"
Depth Capacity:	190 mm / 75"
Tolerable Weight:	3000kg. Removing the elevating screw, the tolerable weight can be increased to more than 3000kg.
Dwell Time:	From 5 to 60 seconds programmable
Network:	Wire Ethernet connection for technical assistance, auto diagnosis and support
Temperature Range:	From 10 °C to 35 °C
Data Output:	USB / Ethernet
Power Supply:	110 or 220 V / 50÷60 Hz - Air compressed 5 ATM
Software:	OMAG / AFFRI
Principle of Operation:	Load Cell and Closed Loop (Affri patent)
Fields Of Use	For hardness case depth test with non-destructive method on finished product and all metals: Iron, steel, tempered steel, cast iron, brass, aluminum, copper and metal alloys. Heat treatment, hardening, nitriding, cementation and hardfacing.
Packing:	350kg - 140 x 100 x 65 cm / 55 x 39 x 25"



## DM 8

## DM 2



- Traditional dead weight hardness tester for micro Vickers
- DM serie is able to perform Vickers and Knoop Test
- In the DM serie it is possible to install up to 4 objectives and 2 indenters on the motorized turret
- LED lighting source

### ACTION

**MANUAL** - Automatic turret and automatic loading.

**SEMI** - Same as Manual plus measurement by camera and software.

**AUTO** - Same as Semi plus auto focus and motorized X/Y table.

### FORCE RANGE

DM2 - Vickers/Knoop:	0.098 - 0.2452 - 0.4903 - 0.9807 - 1.9613 - 2.9419 - 4.9033 - 9.807 N (0.01 - 0.025 - 0.05 - 0.1 - 0.2 - 0.3 - 0.5 - 1 kgf)
DM8A - Vickers/Knoop:	0.049 - 0.098 - 0.2452 - 0.4903 - 0.9807 - 1.9613 - 2.9419 - 4.9033 - 9.807 N (0.005 - 0.01 - 0.025 - 0.05 - 0.1 - 0.2 - 0.3 - 0.5 - 1 kgf)
DM8B - Vickers/Knoop:	0.0098 - 0.0294 - 0.049 - 0.098 - 0.2452 - 0.4903 - 0.9807 - 1.9613 - 2.9419 - 4.9033 - 9.807 - 19.613 N (0.001 - 0.003 - 0.005 - 0.01 - 0.025 - 0.05 - 0.1 - 0.2 - 0.3 - 0.5 - 1 - 2 kgf)

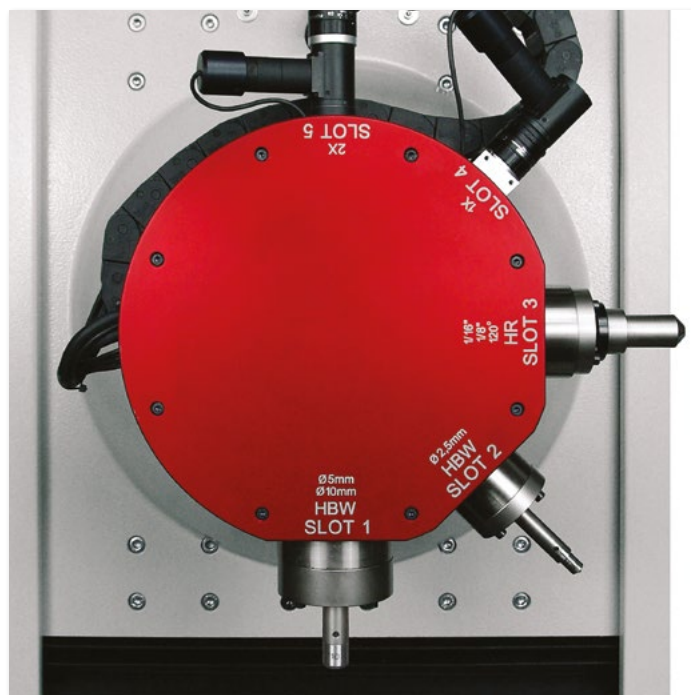
### FEASIBLE TESTS

DM2:	Vickers: HVO.01 - HVO.025 - HVO.05 - HVO.1 - HVO.2 - HVO.3 - HVO.5 - HV1 Knoop (Optional): HK0.01 - HK0.025 - HK0.05 - HK0.1 - HK0.2 - HK0.3 - HK0.5 - HK1
DM8A:	Vickers: HVO.005 - HVO.01 - HVO.025 - HVO.05 - HVO.1 - HVO.2 - HVO.3 - HVO.5 - HV1 Knoop (Optional): HK0.005 - HK0.01 - HK0.025 - HK0.05 - HK0.1 - HK0.2 - HK0.3 - HK0.5 - HK1
DM8B:	Vickers: HVO.001 - HVO.003 - HVO.005 - HVO.01 - HVO.025 - HVO.05 - HVO.1 - HVO.2 - HVO.3 - HVO.5 - HV1 - HV2 Knoop (Optional): HK0.001 - HK0.003 - HK0.005 - HK0.01 - HK0.025 - HK0.05 - HK0.1 - HK0.2 - HK0.3 - HK0.5 - HK1 - HK2

### TECHNICAL DATA

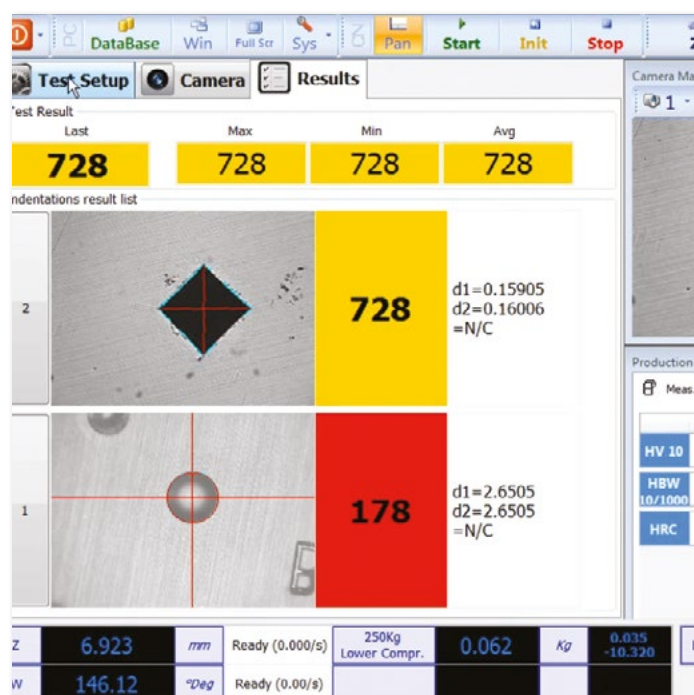
Conformity Standards:	EN-ISO 6507 / EN-ISO 4545 / ASTM-E384 / ASTM-E92 / JIS
Accuracy:	Better than 1 %
Readout Division:	0.1 HV / HK
Height Capacity:	DM2: 110 mm / 4.5" - DM8A/B: 120 mm / 5". Motorized stroke with AUTO version.
Depth Capacity:	DM2: 70 mm / 2.7" - DM8A/B: 160 mm / 6.3"
Turret:	DM2: Automatic and motorized 4 positions. DM8A/B: Automatic and motorized 6 positions
Indenter:	Vickers - As option Knoop
Objectives:	DM2: 10x - 40x (Total Magnification 100x - 400x) DM8A/B: 10x - 50x (Total Magnification 100x - 500x), As option 2.5x - 5x - 20x - 40x - 100x (Total magnification 25x - 50x - 200x - 400x - 1000x)
Camera:	1.3 MP USB2 B/W HD
Focus and Reading:	Manual: Manual focus and manual reading - Semi: Manual focus with auto reading - Auto: Automatic focus with auto reading
Lighting:	Energy Efficient Cool LED Light Source
X-Y Table:	Manual/Semi: Manual 100 x 100 mm with 10 µm step - Auto: Motorized with 0.5 µm steps 100 x 60 mm / 3.9 x 2.3" or 200 x 100 mm / 7.8 x 3.9"
Dwell Time:	From 5 to 60 seconds programmable
Network:	Wire connection for technical assistance and auto-diagnosis
Temperature Range:	From 10 °C to 35 °C
Data Output:	RS232 / USB (As option)
Power Supply:	110 or 220 V / 50÷60 Hz
Software:	Affri - OMAG
Principle of Operation:	Weights
Fields Of Use:	For micro and macro Vickers and case depth test on every metals: iron, steel, tempered steel, cast iron, brass, aluminium, copper and metal alloys. Heat treatment, hardening, nitriding, cementation and hardfacing. Knoop test on ceramic and glass materials.
Packaging:	60 x 60 x 80 cm / 24 x 24 x 33" - 40 kg





## ONE-BUTTON UNIVERSAL MEASUREMENT

The AFFRI® system automatically moves the hardness tester's head until contact is made blocking the piece. Depending on the scale selected, the force is applied and indentation made. The software will move to the camera view mode and auto measures the indent. The hardness tester can measure automatically in Rockwell, Brinell and Vickers.

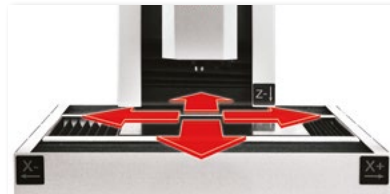


# UNIVERSAL

# INTEGRAL 2-3-5



- Universal hardness tester: Rockwell, Superficial Rockwell, Brinell, Vickers, Knoop, Shore
- Automatic and pneumatic turret for multi objectives and multi indenters up to 7 positions
- Wide working area bearing 3000 kg test pieces
- 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
- Large vision filed optic camera for automatic sample border or bar code recognizing.
- HDTL for case depth
- Remote control via Internet for service, quick diagnosis and software update



Motorized X-Y Table 3000 kg



Rotating turret 7 slots



Automatic milling tool

## ACTION

Just one push of the start button activates the continuous 500mm stroke in one direction movement of the head generating:

**1** - Automatic contact with test piece. **2** - Automatic clamping, active and sliding. **3** - Automatic loading. **4** - Automatic switching to optic lens. **5** - Autofocus by image scanning brightness. **6** - Automatic measure. **7** - Automatic return stroke at programmed distance. The entire test cycle is complete and the result appears on a large display.

**FORCE RANGE - INTEGRAL5** from 10 to 3000 Kgf (As option can be extended from 0.3 kg) - **INTEGRAL3** from 3 to 1000 kgf - **INTEGRAL2** from 1 to 250kgf

Preload:	29.42 - 98.07 N (3 - 10 kgf)
Rockwell/Superficial R.:	588.4 - 980.7 - 1471 N (60 - 100 - 150 kgf) / 147.1 - 294.2 - 441.3 N (15 - 30 - 45 kgf)
Brinell:	9.807 - 29.42 - 49.03 - 61.29 - 98.07 - 147.1 - 153.2 - 294.2 - 306.5 - 612.9 - 1226 - 1839 - 2452 - 4903 - 7335 - 9807 - 29421 N (1 - 3 - 5 - 6.25 - 10 - 15 - 15.6 - 30 - 31.2 - 62.5 - 125 - 187.5 - 250 - 500 - 750 - 1000 - 3000 kgf)
Vickers/Knoop:	2.942 - 4.903 - 9.807 - 29.42 - 49.03 - 98.07 - 147.1 - 196 - 294.2 - 490.35 - 980.7 N (0.3 - 0.5 - 1 - 3 - 5 - 10 - 15 - 20 - 30 - 50 - 100 kgf)
Optional tests:	49 - 132 - 358 - 961 N (for plastic and rubber as per EN-ISO 2039)

## FEASIBLE TESTS

Rockwell:	HRA - HRB - HRC - HRD - HRE - HRF - HRG - HRH - HRK - HRL - HRM - HRP - HRR - HRS - HRV
Superficial Rockwell:	HR15N - HR30N - HR45N - HR15T - HR30T - HR45T - HR15S - HR30S - HR45S - HR15W - HR30W - HR45W - HR15X - HR30X - HR45X - HR15Y - HR30Y - HR45Y
Brinell HBW:	HBW1/1 - HBW1/2.5 - HBW1/5 - HBW1/10 - HBW1/30 - HBW2.5/6.25 - HBW2.5/15.625 - HBW2.5/31.25 - HBW2.5/62.5 - HBW2.5/187.5 - HBW5/25 - HRW5/62.5 - HBW5/125 - HBW5/250 - HBW5/750 - HBW10/100 - HBW10/250 - HBW10/500 - HBW10/1000 - HBW10/1500 - HBW10/3000
Brinell HBWT:	2.5/62.5 - 2.5/187.5 - 5/125 - 5/250 - 5/750 - 10/500 - 10/1000 - 10/1500 - 10/3000
Vickers/Knoop:	HV0.3 - HV0.5 - HV1 - HV3 - HV5 - HV10 - HV20 - HV30 - HV50 - HV100 - HV120 / HK0.3 - HK0.5 - HK1 - HK2
Temperature:	Measure test temperature range from - 40.0 to + 80.0 °C
Optional Tests:	Test loads 49 - 132 - 358 - 961 <b>N</b> for Shore A - B - C - D (ISO 2039) INTEGRAL3/5: Automatic Case depth measure with non-destructive process HDT method tracing case depth curve. Range till 1.5 mm / 0.06"

## TECHNICAL DATA

Conformity Standards:	ISO 6506 / ISO 6507 / ISO 6508 / ISO 4545 / ISO 2039 / ISO 7619 / ISO 868 / ASTM E 18 / ASTM E10 / ASTM E103 / ASTM E384 / ASTM E92
Load accuracy:	Better than 0.05 %
Readout Division:	0.1 HV / HB / HBWT - 0.01 HR
Head Stroke:	Fully motorized 500 mm / 20" (More as option)
Capacity:	Height Capacity: 500 mm / 20" (More as option) - Depth Capacity: 170 mm / 6.7" (More as option)
Working base dimension:	400 x 400 mm / 16 x 16" (More as option)
Tolerable Weight:	3000kg
Turret:	Motorized and pneumatic automatic turret. Self-switching 1 indenter + 1 objective (optional 7 position or more)
Indenters/objective:	Available indenters: Diamond 120°, Ball W/S 1/16" - 1/8" - 1/4" - 1/2", Ball W/S 1 - 2.5 - 5 - 10 mm, Diamond Vickers, Diamond Knoop Available objectives: 1x - 2x - 5x - 10x - 20x - 40x - 50x - 100x (Total magnification: 10x - 20x - 50x - 100x - 200x - 400x - 500x - 1000x)
Camera/Lighting:	Firewire included / LED
Focus and Reading:	Automatic and Manual
Network:	Wire Ethernet connection for technical assistance, auto diagnosis and support
Temperature Range:	From 10 °C to 35 °C
Data Output:	USB / Ethernet
Power Supply:	110 or 220 V / 50÷60 Hz - Air compressed 5 ATM
Software:	Easydur
Principle of Operation:	Load Cell and Closed Loop (Affri patent)
Fields Of Use	Universal use for all metals: iron, steel, tempered steel, cast iron, brass, aluminium, copper and metal alloys. Heat treatment, hardening, nitriding, cementation and hardfacing. Hard and soft plastics.
Packing:	600kg - 160 x 130 x 230 cm / 62 x 51 x 90"

## 251 VRS



Optional PC combined with camera and software for quick Vickers and Brinell for semi-auto or auto measurements



## 270 VRS 770



Sliding table and large V face anvil



Clamping base for big or unstable pieces

### ACTION

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

**1** - Automatic contact with the specimen. **2** - Automatic clamping and activation of the reference surface point. **3** - Automatic preloading and loading.

**4** - Automatic measure. **5** - Automatic return stroke at programmed distance. The entire test cycle is complete and the result appears on a large display.

### FORCE RANGE

Preload:	29.42 - 98.07 N (3 - 10 kgf)
Rockwell/Superficial R:	588.4 - 980.7 - 1471 N (60 - 100 - 150 kgf) / 147.1 - 294.2 - 441.3 N (15 - 30 - 45 kgf)
Brinell:	9.807 - 49.03 - 61.29 - 98.07 - 153.2 - 245.2 - 294.2 - 306.5 - 612.9 - 1226 - 1839 N (as option 2452 N) (1 - 5 - 6.25 - 10 - 15.6 - 25 - 30 - 31.2 - 62.5 - 125 - 187.5 kgf - as option 250 kgf)
Vickers/Knoop:	9.807 - 19.60 - 29.42 - 49.03 - 98.07 - 147.1 - 196 - 294.2 - 490.35 - 980.7 N (1 - 2 - 3 - 5 - 10 - 15 - 20 - 30 - 50 - 100 kgf)
Optional tests:	49 - 132 - 358 - 961 N (for plastic and rubber as per EN-ISO 2039)

### FEASIBLE TESTS

Rockwell:	HRA - HRB - HRC - HRD - HRE - HRF - HRG - HRH - HRK - HRL - HRM - HRP - HRR - HRS - HRV
Superficial Rockwell:	HR15N - HR30N - HR45N - HR15T - HR30T - HR45T - HR15S - HR30S - HR45S - HR15W - HR30W - HR45W - HR15X - HR30X - HR45X - HR15Y - HR30Y - HR45Y
Brinell HBW:	HBW1/1 - HBW1/2.5 - HBW1/5 - HBW1/10 - HBW1/30 - HBW2.5/6.25 - HBW2.5/15.625 - HBW2.5/31.25 - HBW2.5/62.5 - HBW2.5/187.5 - HBW5/25 - HBW5/62.5 - HBW5/125 - HBW10/100 (As option HB5/250 - HB10/250)
Brinell HBWT:	1/30 - 2.5/15.6 - 2.5/31.5 - 5/125(3) (Aluminum and its alloys) - 2.5/62.5(2) (Aluminum and its alloys) - 2.5/187.5(6) (Aluminum and its alloys) - 2.5/187.5(5) (Carbon steel) - 2.5/187.5(1) (Cast iron) - (As option HB5/250)
Vickers/Knoop:	HV1 - HV3 - HV5 - HV10 - HV15 - HV20 - HV30 - HV60 - HV100 / HK1 - HK2
Temperature:	Measure test temperature range from - 40.0 to + 80.0 °C
Shore (Optional):	ISO 2039, Shore A and D hardness scales for plastic
CHD (Optional):	Automatic CHD with multi-indentation. Automatic Case depth measure with non-destructive process (Range till 1.5 mm / 0.06")

### TECHNICAL DATA

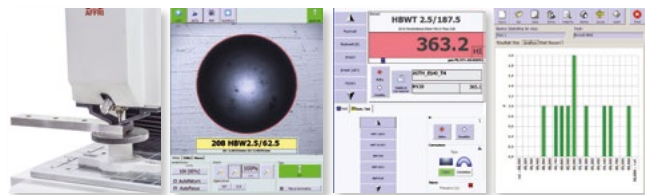
Conformity Standards:	EN-ISO 6506-2 / EN-ISO 6507-2 / EN-ISO 6508-2 / EN-ISO 2039 / ISO 868 / ASTM-E10 / ASTM-E18 / ASTM-E103 / ASTM 2240 / ASTM-E384 / JIS
Load accuracy:	Better than 0.5 %
Readout Division:	VRSD: 0.1 HR / HB / HV - VRSTV: 0.1 HB / HV - 0.01 HR
Indenter Stroke:	Motorized 50mm / 2"
Height Capacity:	251VRS: 215 mm / 8.5" - 270VRS: 380 mm / 15" - 770VRS: 700 mm / 27.5"
Depth Capacity:	190 mm / 7.5"
Working table:	270/770VRS: 390 x 330 mm / 15 x 13" (More on request)
Tolerable Weight:	2000kg
Objectives:	75X (Optional: 150X - 225X - 300X)
Reading:	VRSTV: Automatic and semi-automatic through CCD camera and software (Computer as optional) VRSD: Semi-automatic with encoder VRSA: Semi-automatic with drum scale
Temperature Range:	From 10 °C to 35 °C
Data Output:	RS 232 C (USB as option)
Power Supply:	110 or 220 V / 50÷60 Hz
Software:	Affri - OMAG
Principle of Operation:	Load Cell and Closed Loop (Affri patent)
Fields Of Use	For all metals: iron, steel, tempered steel, cast iron, brass, aluminum, copper and metal alloys. Heat treatment, hardening, nitriding, cementation and hardfacing. Hard and soft plastics.
Packing:	251VRS: 50x60x100cm / 20x23x40" - 85kg. 270VRS: 80x80x150cm / 32x32x59" - 120kg. 770VRS: 120x120x160 mm / 47x47x63" - 145kg.

LD 750  
LD 250

LD 3000 AX



- Universal hardness testers: Rockwell, Superficial Rockwell, Vickers, Knoop, Brinell
- Constant high repeatability and accuracy in every test condition
- Multifunctional touch screen
- Automatic Vickers and Brinell measurement with camera, autofocus and software
- Clamping system of the piece to reduce the measurement's errors
- Automatic turret for multi objectives and indenter selection
- Self levelling indenter equipped with an automatic stroke of 30 mm to make contact with test surface
- Remote control via Internet for service, quick diagnosis and software update



## ACTION

Just one push of the start button activates the continuous direction movement of the head generating:

**1** - Automatic contact with test piece. **2** - Automatic clamping, active and sliding. **3** - Automatic loading. **4** - Automatic switching to optic lens. **5** - Autofocus by image scanning brightness. **6** - Automatic measure. **7** - Automatic return stroke at programmed distance. The entire test cycle is complete and the result appears on a large display.

**FORCE RANGE** - LD750 - LD3000AX from 3 to 3000 Kgf - LD250 from 1 to 250kgf

Preload:	29.42 - 98.07 N (3 - 10 kgf)
Rockwell:	588.4 - 980.7 - 1471 N (60 - 100 - 150 kgf)
Superficial Rockwell:	147.1 - 294.2 - 441.3 N (15 - 30 - 45 kgf)
Brinell:	9.807 - 24.52 - 49.03 - 61.29 - 98.07 - 153.2 - 245.2 - 294.2 - 306.5 - 612.9 - 1226 - 1839 - 2452 <b>N</b> (1 - 2.5 - 5 - 6.25 - 10 - 15.6 - 25 - 30 - 31.2 - 62.5 - 125 - 187.5 - 250 - 500 - 750 - 1000 - 3000 <b>kgf</b> )
Vickers/Knoop:	9.807 - 19.60 - 29.42 - 49.03 - 98.07 - 196.14 - 294.2 - 490.3 - 980.7 <b>N</b> (1 - 2 - 3 - 5 - 10 - 20 - 30 - 50 - 100 <b>kgf</b> )
Optional tests:	49 - 132 - 358 - 961 N (for plastic and rubber as per EN-ISO 2039)

## FEASIBLE TESTS

Rockwell:	HRA - HRC - HRC - HRD - HRE - HRF - HRG - HRH - HRL - HRM - HRP - HRR - HRS - HRV
Superficial Rockwell:	HR15N - HR30N - HR45N - HR15T - HR30T - HR45T - HR15S - HR30S - HR45S - HR15W - HR30W - HR45W - HR15X - HR30X - HR45X - HR15Y - HR30Y - HR45Y
Brinell HBW:	1/5 - 1/10 - 1/30 - 2.5/6.25 - 2.5/15.625 - 2.5/31.25 - 2.5/62.5 - 2.5/187.5 - 5/25 - 5/31.25 - 5/62.5 - 5/125 - 5/250 - 10/100 - 10/125 - 10/250 - 10/500 - 10/1000 - 10/1500 - 10/3000
Brinell HBWT:	1/30 - 2.5/15.6 - 2.5/31.5 - 5/125(3) (Aluminum and alloys) - 2.5/62.5(2) (Aluminum and alloys) - 2.5/187.5(6) (Aluminum and alloys) - 2.5/187.5(5) (Carbon steel) - 2.5/187.5(1) (Cast iron) - 5/125 - 5/250 - 5/750 - 10/500 - 10/1000 - 10/1500 - 10/3000
Vickers/Knoop:	HV 1 - HV 2 - HV 3 - HV 5 - HV 10 - HV 20 - HV 30 - HV 50 - HV 100
Shore (As Option):	ISO 2039, Shore A and D hardness scales for plastic
CHD (As Option):	Automatic Case Hardness Depth tests with automatic graph

## TECHNICAL DATA

Conformity Standards:	EN-ISO 6506-2 / EN-ISO 6507-2 / EN-ISO 6508-2 / EN-ISO 2039 / ISO 868 / ASTM-E10 / ASTM-E18 / ASTM-E103 / ASTM 2240 / ASTM-E384 / JIS
Load accuracy:	Better than 0.05 %
Readout Division:	0.1 HBW / HBWT / HV - 0.01 HR
Lighting and Turret	LED - Motorized automatic turret self-switching 1 indenter + 1 objective
Indenters/objective:	Available indenters: Diamond 120°, Ball W/S 1/16" - 1/8" - 1/4" - 1/2", Ball W/S 1 - 2.5 - 5 - 10 mm, Diamond Vickers, Diamond Knoop Available objectives: 1x - 2x - 5x - 10x - 20x - 40x - 50x - 100x (Total magnification: 10x - 20x - 50x - 100x - 200x - 400x - 500x - 1000x)
Focus and Reading	Automatic and Manual
Dwell Time	From 1 to 99 seconds
Indenter Stroke:	LD750: Motorized 50mm / 2" - LD250: Motorized 30mm / 1.2" - LD3000AX: Motorized 50mm / 2"
Height Capacity:	LD750: Fully motorized 720 mm / 28" - LD250: Fully motorized 390 mm / 15" - LD3000AX: 280mm / 11" (More as optional)
Depth Capacity:	LD750: 265 mm / 10.5" - LD250: 190 mm / 7.5" (As option 290 mm / 11.5") - LD3000AX: 200 mm / 7.8"
X-Y Table	LD750: 480 x 675 mm / 19 x 26" (Larger as optional) - LD250: 330 x 390 mm / 13 x 15.5" (Larger as optional)
Tolerable Weight:	2000kg
Temperature Range:	From 10 °C to 35 °C
Data Output:	USB (RS 232C, LAN, wireless upon request)
Power Supply:	110 or 220 V / 50÷60 Hz
Software:	Affri - OMAG
Principle of Operation:	Load Cell and Closed Loop (Affri patent)
Fields Of Use	For all metals: iron, steel, tempered steel, cast iron, brass, aluminum, copper and metal alloys. Heat treatment, hardening, nitriding, cementation and hardfacing. Hard and soft plastics.
Packing:	LD750: 700 kg , 140 x 110 x 185 cm / 55 x 44 x 73" - LD250: 300 kg, 120 x 120 x 160 cm / 50 x 50 x 63"





### ONE HARDNESS TESTER, MANY SOLUTIONS

AFFRI® portable hardness testers can be used as a conventional bench top hardness tester or as a portable system for on-site testing when test pieces are too large or too heavy for a bench hardness tester. The AFFRI vertical movement permits a fully automatic test cycle. Real Rockwell and Brinell conform to any ASTM or ISO standard.



# PORTABLES

## METALTEST



Wireless and pocket tester's version with embedded display and commands

## MKII



Tester version with wired support console

## PIXEL



Wireless tester's version with embedded display and bluetooth support console.

- Portable Hardness testers conform to standards DIN 50157
- Easy to use: push and read, 5 second only for one test cycle
- Hardness testers equipped with an advanced calibrated dynamometric load cell. Load application as bench top hardness testers.
- Accurate measurements on very thin metal thickness sheets > 0.06 mm and on coating chromium surface, rolled steel, profiles etc.
- Diamond indenter protected for long measurement cycle tests
- MKII and PIXEL: LCD graphic display for multi scale vision, simultaneous conversion on many scales, tolerance setting, statistic, depth indentation thickness, complete statistic, histogram, temperature value. Large hard disk for data and test sessions storage.
- MKII: RS 232 C Output for printer (as option USB 2 is available)



Absolute and accurate measurements in every conditions, even on flexible surfaces, without requiring special settings. It works in any position, even upside down, and could be supplied with several accessories for easy tests on round or irregular pieces like long screws, coils, bottles or tubes.

### ACTION

Simply choose the desired hardness scale, put the test probe on the surface and apply a light pressure to start the entire test cycle.

### FORCE RANGE

Preload: 9.807 N (1 kgf)

METALTEST / PIXEL: 54.92 N (5.6 kgf)

MKII: 19.614 or 54.92 N (2 or 5.6 kgf)

### FEASIBLE TESTS

Rockwell HRA (20...92); HRB (26...100); HRC (0...80); HR15N (69...93); HR30T (16...83)

Brinell HB5 (5...205); HB30 (66...884)

Vickers (13...1865)

Knoop (25...97)

### OPTIONAL TESTS

Tensile Module R (226...2898); HZA (0...250)

Webster B 0 / 20 (on request)

Barcol 0 / 100 (on request)

Leeb unit (on request)

### TECHNICAL DATA

Conformity Standards: DIN 50157

Load accuracy: Better than 0.5 %

Readout Division: 0.1

Min thickness measurable: 0,06 mm at 2 kgf / 0,08 mm at 5,6 kgf

Temperature Range: From 10 °C to 35 °C

Data Output: MKII / PIXEL: RS 232 C (USB as option)

Power Supply: METALTEST: Battery 9v - MKII / PIXEL: Rechargeable battery 6V

Software: Affri - OMAG

Principle of Operation: Dynamometric load cell

Fields Of Use: Tests in laboratory or in loco on tubes, profiles, valves bulky or small pieces. For all metals: iron, steel, tempered steel, cast iron, brass, aluminium, copper and metal alloys. Heat treatment, hardening, nitriding, cementation and hardfacing. Hard and soft plastics. Ceramic and glass materials.

Packing: METALTEST: 6kg, 20 x 30 x 20 cm - MKII / PIXEL: 5kg, 50 x 40 x 20 cm

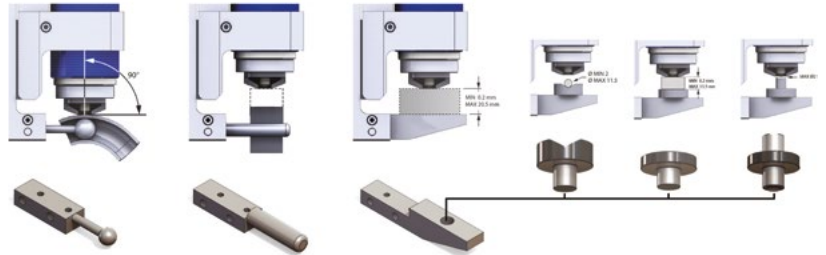


## ACCESSORIES FOR METALTEST AND MKII

## HARDTEST II HARDTEST I



Very useful instrument especially for hard-to-test items or for items with odd shapes (i.e. tests on spring wires). HARDTEST locks the testing piece and allows steady measurements avoiding sample movements. Easy and safe with a testing capacity of 30 x 30 mm.



## MICROTESTER

MKII stand support for manual measurements.  
Height capacity 110 mm  
Depth capacity 60 mm



## EDA300

MKII motorized stand support for automatic measurements.  
Height capacity 170 mm  
Depth capacity 75 mm



## FIELDS OF APPLICATION FOR AFFRI® PORTABLE TESTERS

	Soft		Hard		
HRA - Rockwell A	20	92		For hard steel, nitriding, cementation, roller, steel for tools, soft and hard materials	
HK - Knoop	25		97	For soft steel, non ferrous metals	
HRC - Rockwell C		0	80	For hard steel, nitriding, cementation, roller, steel for tools	
HRB - Rockwell B	26		100	For soft steel, non ferrous metals	
HR30T - Rockwell 30T	16		83	For soft steel, non ferrous metals	
HB5 - Brinell 5	5		205	For aluminum, soft aluminum alloy cast iron, bronze, brass	
HB30 - Brinell 30		66		884	For heat treated steel, annealed steel, drawn products, deep-drawn strip
HV - Vickers	13			1865	For all material
R - Tensile module N/mm²		226		2898	For heat treated steel, annealed steel, drawn products, deep-drawn strip
HR15N - Rockwell HR15N			69	93	For hard steel, nitriding, cementation, roller, steel for tools

RSDMAG

## FROM PORTABLE .....



- The first real standardized portable hardness tester conform to the Rockwell and Brinell standards **ASTM E-18, ASMT E-10** and **ISO 6508, ISO 6506**
- Achieves the highest level of measurement of depth accuracy and resolution available for a Hardness test
- Constant high repeatability and accuracy in every test condition
- RSD MAG is equipped with an advanced calibrated load cell static system for multi load force
- The AFFRI RSD MAG has no limits on samples geometry and largeness
- It is completely uninfluenced by direction so that it is operative up to 360° positioning and is not affected by any external source of vibration
- Self-aligning on round and flat surfaces
- Secure stability on every test piece
- LCD graphic display for multi scale vision, simultaneous conversion on many scales, tolerance setting, statistic, temperature measure, depth indentation thickness, complete statistic, histogram, memory data
- RS 232 C Output for printer (as option USB 2 is available)
- Are available indenters of various length to test every test area and different clamping system



Pulling one single start lever the result will appear in few seconds. It can be used by any operator without any particular preparation:



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

## ..... TO BENCH-TOP



Easy and safe measurements on samples with difficult geometry



50 mm vertical stroke for measuring head and indenter

Combine the RSD MAG tester with two different size of stand support in order to have a regular bench top tester based on your needs.

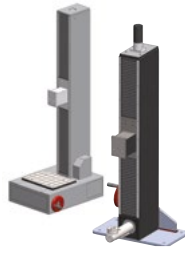
	670H	460L
Height Capacity:	390 mm	180 mm
Depth Capacity:	232 mm	204 mm

**670H / 460L**


Stand support for magnet  
670H High stand / stroke 390 mm  
460L Regular stand / stroke 180 mm

**206RSD / 330RSD**


Stand support for RSDMAG head  
206RSD Elevating scrow / stroke 215 mm  
330RSD Big base / stroke 300 mm

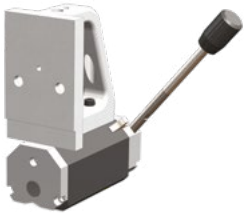
**903RSD / 331RSD**


Stand support for RSDMAG head  
903RSD Big base / stroke 700mm  
330RSD Base for rings / stroke 700 mm

**RSDMAG D2** - 588,4 to 1471 N  
(60 to 187.5 kgf)

**RSDMAG D4** - 147,1 to 441,3 N  
(15 to 45 kgf)

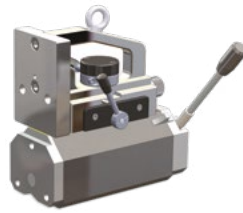
Combine the RSDMAG head with the base that better fit with the shape's geometry of your test sample.


**SMX30**


300mm / 11.8" magnetic base  
for HR/HB measures up to  
20mm / 0.8" sample's thickness

**SMX50**


500mm / 19.7" magnetic base  
for HR/HB measures less than  
20mm / 0.8" sample's thickness

**SMX55**


Magnetic base with 10mm / 0.4"  
horizontal stroke sliding head  
for multi indentation

**SMX70**


Double magnetic clamping  
base for big or small diameters  
round shape samples

**SMX80**


Chain clamping base for non  
ferrous samples

**RSDMAG D2/30 - D4/30**

**RSDMAG D2/50 - D4/50**

**RSDMAG D2/55 - D4/55**

**RSDMAG D2/70 - D4/70**

**RSDMAG D2/80 - D4/80**

**FORCE RANGE**
**RSDMAG D4**
**RSDMAG D2**

Preload:	29.42 N (3 kgf)	98.07N (10 kgf)
Rockwell:	---	588.4 - 980.7 - 1471 N (60 - 100 - 150 kgf)
Superficial Rockwell:	147.1 - 294.2 - 441.3 N (15 - 30 - 45 kgf)	---
Brinell:	153.2 - 294.2 - 306.5 N (15.625 - 30 - 31.25 kgf)	98.07 - 612.9 - 1226 - 1839 N - as option 2452 N (10 - 62.5 - 125 - 187.5 kgf - as option 250 kgf)
Vickers/Knoop:	29.42 - 147.1 - 294.2 N (3 - 15 - 30 kgf)	98.07 - 588.4 - 980.7 N (10 - 60 - 100 kgf)

**FEASIBLE TESTS**
**RSDMAG D4**
**RSDMAG D2**

Rockwell:	---	HRA - HRB - HRC - HRD - HRF - HRG - HRL - HRM - HRR
Superficial Rockwell:	HR15N - HR30N - HR45N - HR15T - HR30T - HR45T - HR15W - HR30W - HR45W - HR15X - HR30X - HR45X - HR15Y - HR30Y - HR45Y	---
Brinell HBWT:	1/30 - 2.5/15.6 - 2.5/31.5	5/125(3), 2.5/62.5(2) and 2.5/187.5(6) (Aluminum and its alloys) - 2.5/187.5(5) (Carbon steel) - 2.5/187.5(1) (Cast iron)
Vickers/Knoop:	Generate indentation HV3 - HV15 - HV30	Generate indentation HV10 - HV60 - HV100
Temperature:	Measure test temperature range from - 40.0 to + 80.0 °C	Measure test temperature range from - 40.0 to + 80.0 °C

**TECHNICAL DATA**

Conformity Standards:	EN-ISO 6506-2 / EN-ISO 6507-2 / EN-ISO 6508-2 / ASTM-E10 / ASTM-E18 / ASTM-E103 / ASTM-E384 / ASTM E110 / JIS
Load accuracy:	Better than 0.5 %
Readout Division:	0.1 HR / HBWT
Indenter Stroke:	50mm / 2"
Temperature Range:	From 10 °C to 35 °C
Power Supply - Data Output:	RS 232 C (USB as option) - Battery 6 V + Charger
Software:	Afri - OMAG
Principle of Operation:	Dynamometric Load Cell
Fields Of Use	Tests in laboratory or in loco on tubes, profiles, valves bulky or small pieces. For all metals: iron, steel, tempered steel, cast iron, brass, aluminium, copper and metal alloys with a more than 0.6 mm thickness. Heat treatment, hardening, nitriding, cementation and hardfacing with less than 0.6 mm depth (RSD MAG D4).
Packing:	50 x 40 x 60 cm / 20 x 18 x 23" - 35kg



# EASYBRINELL



- Electronic microscope for automatic Brinell indentation measurement with a ball of Ø 2.5 or 5 or 10 mm
- User friendly and compact
- Brinell results will appear with automatically or manually measure
- Accuracy and repeatability of measurement +/- 1%
- Auto light adjustment
- Magnetic foot (on request)
- It can be installed on Windows® PC
- Additional software for metallographic analysis as optional



## AVAILABLE PROBES:

Probe A:	Objective 20X - Automatic Brinell reader for indentation of Ø 5 - 10 mm
Probe B (Optional):	Objective 40X - Automatic Brinell reader for indentation of Ø 2.5 mm

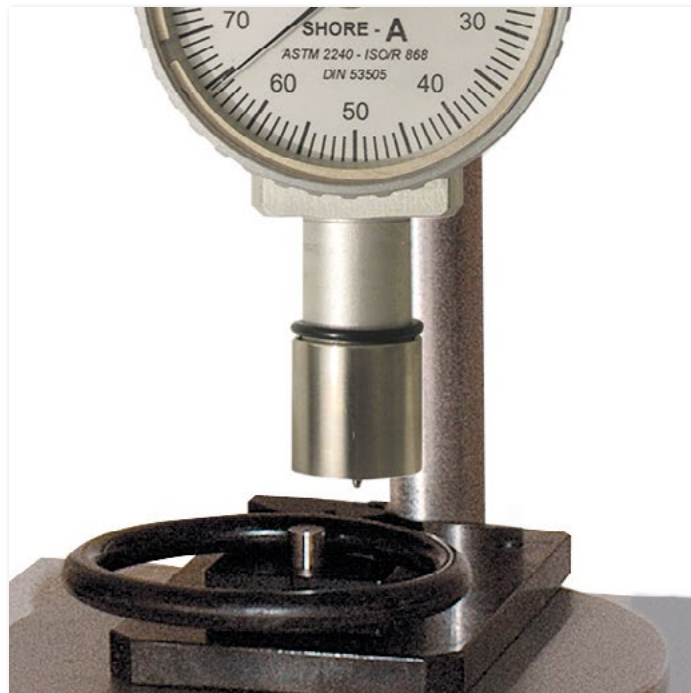
## TECHNICAL DATA

Conformity Standards:	EN-ISO 6506/ ASTM-E10
Accuracy:	Better than 1 %
Readout Division:	0.1 HB / HV / HK
Temperature Range:	From 10 °C to 35 °C
Power Supply:	Rechargeable battery 6V
Data Output:	USB
Focus and Reading:	Automatic
Lighting:	LED
Software:	Affri - OMAG
Fields Of Use:	Microscope for indentation digital reading and hardness testing measurements
Packing:	50 x 40 x 20 cm / 20 x 18 x 8" - 5kg



## PLASTIC MEASUREMENTS

All AFFRI® Plastic Hardness Testers are designed to meet high standards. For Shore and IRHD tests, certified for ASTM, ISO and DIN standards. With a slight pressure applied manually on the body of the hardness tester the result is shown immediately on the analog dial. If combined with their accessories, testers can be converted in bench-top.

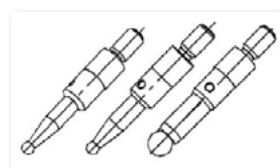
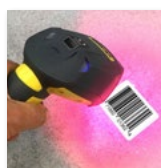




## IRHD MICRO IRHD



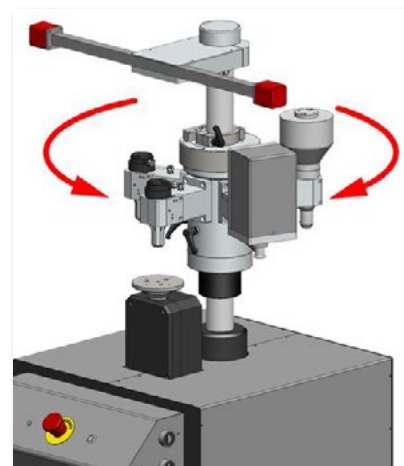
- Hardness tester for laboratory to measure plastic and synthetic fibers conform to Micro IRHD or IRHD test available cycle
- Interchangeable Multi-probe for a large field of application
- Automatic Shore measure
- Automatic load control in closed loop with multi load-cells
- A single start button to perform motorized test cycle including surface contact and test piece clamping from any distance from the test piece
- Mobile clamping piece with tracking of the piece
- Automatic compensation of any structural deflection or bending during the cycle



## MICRODAKO



- MICRODAKO is a fully motorized hardness tester which determinates the hardness of any plastic and rubber material, in accordance with standardized methods IRHD and Shore. (High-definition of 0.01 IRHD).
- Thanks to the motorized turret, the motorized Z axis, the automatic loading and the control by PC, the only manual intervention by the operator is the load of the sample on the working base of the hardness tester.



### IRHD - MICRO IRHD (ISO 48 / ASTM 1415) - HARDNESS TESTING ON THERMOPLASTIC, RUBBER AND VULCANIZED RUBBER

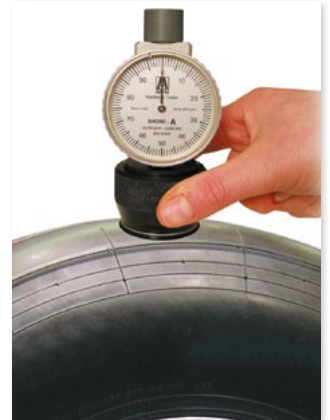
Test	Diameter (mm) and Application	Contact Force (N)	Loads Force (N)	Total Force (N)	Force at foot (N)
Method N (Standard)	Indenter ball $2.50 \pm 0.01$ / Clamping $20 \pm 0.01$ / Hole $6 \pm 0.01$ Thickness $\geq 4$ mm / Range: 35 - 85 IRHD or 30 - 95 IRHD	$0.30 \pm 0.02$	$5.40 \pm 0.01$	$5.70 \pm 0.03$	$8.3 \pm 1.5$
Method H (High hardness)	Indenter ball $1.00 \pm 0.01$ / Clamping $20 \pm 1$ / Hole $6 \pm 1$ Thickness $\geq 4$ mm / Range: 85 - 100 IRHD	$0.30 \pm 0.02$	$5.40 \pm 0.01$	$5.70 \pm 0.03$	$8.3 \pm 1.5$
Method L (Low hardness)	Indenter ball $2.50 \pm 0.01$ / Clamping $22 \pm 1$ / Hole $10 \pm 1$ Thickness $\geq 6$ mm / Range: 10 - 35 IRHD	$0.30 \pm 0.02$	$5.40 \pm 0.01$	$5.70 \pm 0.03$	$8.3 \pm 1.5$
Method M (Microtest)	Indenter ball $0.395 \pm 0.005$ / Clamping $3.35 \pm 0.15$ / Hole $1.00 \pm 0.15$ Thickness $< 4$ mm / Range: 35 - 85 IRHD or 30 - 95 IRHD	$8.3 \pm 0.5$	$145 \pm 0.5$ (mN)	$153.3 \pm 1.0$ (mN)	$235 \pm 30$ (mN)

SHORE

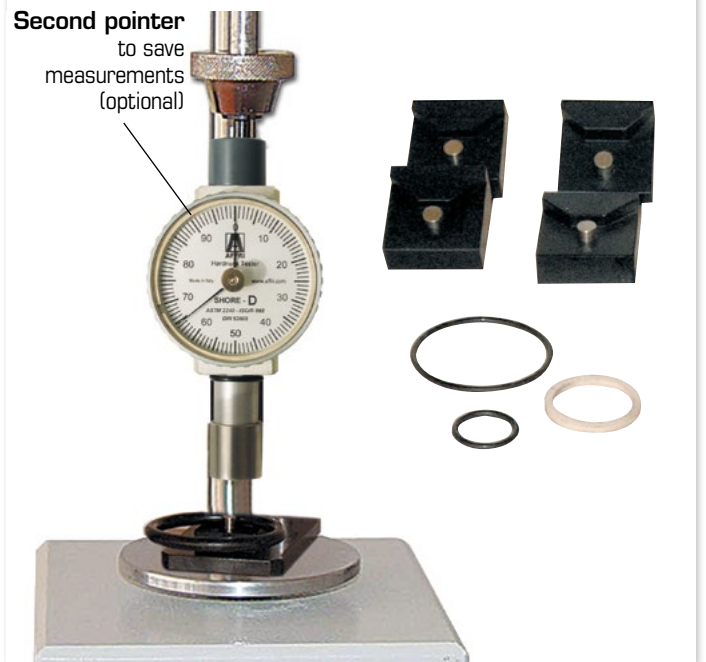
5 YEARS WARRANTY



- 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, OO, DO, O, E, M, OOO, OOO-S1 scales.
- 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 tires, adapt to test tires, roll.
- Highly accurate and durable hardness tester
- Easy measure on plastic and rubber
- R&R high performance
- Robust and resistant in every test condition
- Special hard indenter covered by 5 years warranty



Second pointer  
to save  
measurements  
(optional)



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. Supplementary weight for Shore C-D-DO models

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

#### FEASIBLE TESTS

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

## ELECTRONIC SHORE



- Highly accurate and durable hardness tester
- Easy measurement on plastic and rubber materials
- Automatic measurement with timer
- Applicable on motorized support
- O-Ring measures (when its combined with the bench support)
- Remote control with PLC system
- R&R high performance for high level laboratory
- Strong and accurate in every test condition
- Special hard indenter covered by 5 year warranty

DMG 03  
Motorized Bench  
support Height  
capacity 75 mm



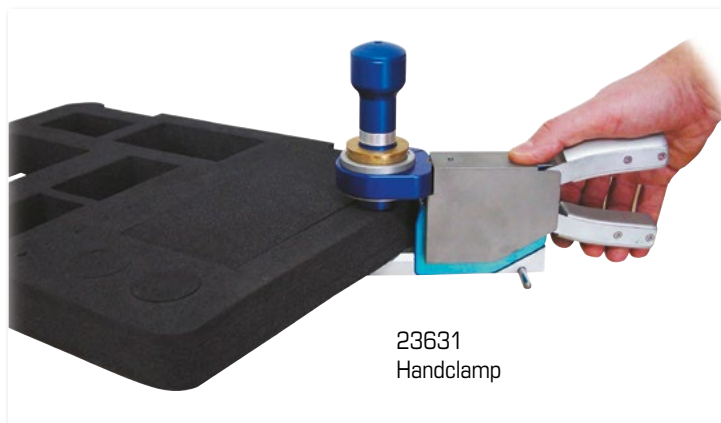
ART. 16  
For test on  
O-ring



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



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



23631  
Handclamp





## CUSTOMIZED SOLUTIONS

AFFRI® produces customized hardness tester in accordance with the request of the customers, and also engineers system of production in which the hardness tester is integrated.

All test operations are managed through a single start command to reduce operator fatigue and to increase test repeatability and accuracy.



# TAILORED

## MRS BOT



- Brinell automatic hardness tester programmable by PLC
- It is possible to include a milling system unit for surface preparation
- MRS-BOT can be included into loading and unloading system
- Multiple measurements on different steps
- Wide working area bearing 1000 kg test pieces
- Remote start command
- Remote control via Internet for service, additional operator training, quick diagnosis and software updates

### FEASIBLE TESTS

Version 1:	From 29.42 N to 9807 N (3 kgf to 1000 kgf)
Version 2:	From 98.07 N to 29421 N (10 kgf to 3000 kgf)
Feasible tests:	Brinell HBWT, Rockwell, Superficial Rockwell

### TECHNICAL DATA

Conformity Standards:	ISO 6506 / ISO 6508 / ASTM E10 / ASTM E18 / ASTM E103
Load accuracy:	Better than 0.05 %
Indenter stroke:	Motorized up to 700mm / 30" with automatic contact
PLC:	Programmable: vertical stroke, distance of multiple indentations
Depth Capacity:	300 mm / 12"
Data Output:	USB / RS 232 C / Ethernet
Principle of Operation:	Load Cell and Closed Loop (Affri patent)

## MRS-JET 3000



- Automatic Brinell HBWT for high speed cycles.
- Wide working area bearing 1000 kg test pieces.
- Remote control and PLC system for conveyor line inter action.
- It is able to measure even on rough surface or not clear surface.
- Remote control via Internet for service, quick diagnosis and software update.

### FEASIBLE TESTS

Test Loads:	From 98.07 N to 29421 N (10 kgf to 3000 kgf)
Feasible tests:	Brinell HBWT, Rockwell, Superficial Rockwell

### TECHNICAL DATA

Conformity Standards:	ISO 6506 / ISO 6508 / ASTM E10 / ASTM E18 / ASTM E103
Load accuracy:	Better than 0.05 %
Indenter stroke:	Motorized up to 700mm / 30" with automatic contact
PLC:	Programmable: vertical stroke, distance of multiple indentations
Depth Capacity:	240 mm / 9.5"
Data Output:	USB / RS 232 C / Ethernet
Principle of Operation:	Load Cell and Closed Loop (Affri patent)

## GAS BOTTLE



- Complete system including surface preparation and hardness test cycle to be included in a conveyor line for an automatic hardness test cycle
- It is possible to program the surface preparation by milling cold procedure and the distance between multiple indentations
- It is a real Brinell automatic optic system including auto-measurement with auto-focus
- Programmable multi-positioning
- The size of the machine is customized

### FEASIBLE TESTS

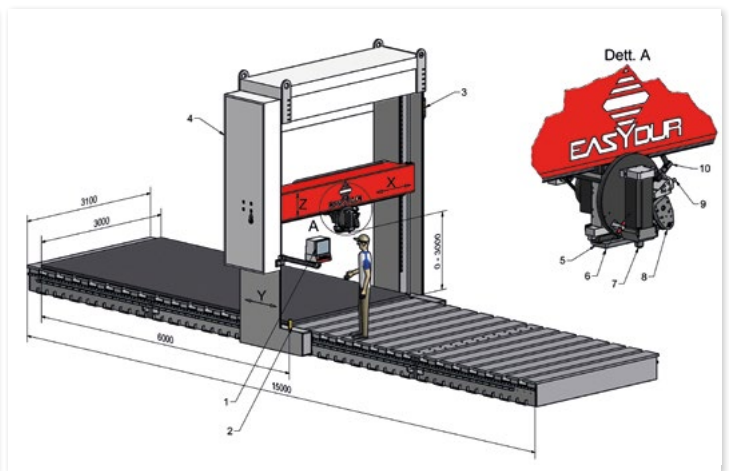
Test Loads:	From 98.07 N to 29421 N (10 kgf to 3000 kgf)
Feasible tests:	Brinell HBW, Brinell HBWT, Rockwell, Superficial Rockwell, Vickers



## INTEGRAL PORTALE



- Milling work station
- Table fix 6000 mm long portale frame rigid and movable head by means of linear bearing guide motorized head on X-Y-Z and rotating direction
- X: 6000 mm long travel head motorized movement
- Y: 2000 mm height capacity motorized movement
- Z: 2000 mm depth capacity fully motorized movement
- Rotating turret multi positioning and multi functions includes milling unit programmable with depth accuracy 0.002 mm and programmable roughness and over 20.000 test assured without need to replace the tool Brinell 187.5 - 750 - 1000 - 3000 kgf
- Multi indenter 2.5 - 5 - 10 mm W ball
- Multiple optic 20x - 40x
- The system includes rotating turret multi positioning and self combining
- Remote assistance and remote data transmission



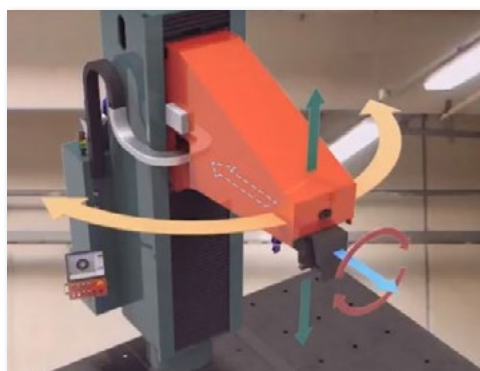
## EASYFLAG



Brinell - Vickers - Rockwell - 0,1 to 3000 kgf  
ASTM E10 / E384 / E18, ISO 6506 / 6507 / 6508

EASYFLAG 3000 is composed of a solid steel structure (not cast iron), welded and milled, entirely designed and made by us, since radial drill structures are not suitable neither to bear loads of 3000 kg plus the forces for blocking the pieces, nor to support the vibrations created by milling.

EASYFLAG 3000 is able to perform fully automatic hardness test cycles, thanks to the special motorized rotating turret and the in-house developed software. It is equipped with a 2MPX camera with autofocus, for the automatic recognition of the indentations. REPEATABILITY 0.1 HB. Load cell and Closed Loop technology (Pat. AFFRI).



## MATRIX



- Made with a modular structure so that it can easily fit different test pieces sizes
- Equipped 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.
- With this instrument it is possible to perform tests directly during the manufacturing process, so that the annealing oven staff can be informed in real time about the test results.
- The location of the precise testing point through centering is carried out automatically by moving head-supporting carriage that centers itself in a precise and reliable way thanks to an exclusive system
- Step-by-step assistive technology shows to the operator where to perform the test and notice when the right spot is reached. The program save every result associated to a specific specimen position and generates dynamic reports for each piece cycle with statistics.



### ACTION

Automatic hardness tests on crankshafts and camshafts with step-by-step computer assistance

### FORCE RANGE

Preload:	29.42 - 98.07 N (3 - 10 kgf)
Rockwell:	588.4 - 980.7 - 1471 N (60 - 100 - 150 kgf)
Superficial Rockwell:	147.1 - 294.2 - 441.3 N (15 - 30 - 45 kgf)

### FEASIBLE TESTS

Rockwell:	HRA - HRB - HRC - HRD - HRE - HRF - HRG - HRH - HRK - HRL - HRM - HRP - HRR - HRS - HRV
Superficial Rockwell:	HR15N - HR30N - HR45N - HR15T - HR30T - HR45T - HR15S - HR30S - HR45S - HR15W - HR30W - HR45W - HR15X - HR30X - HR45X - HR15Y - HR30Y - HR45Y

### TECHNICAL DATA

Conformity Standards:	EN-ISO 6508-2 / ASTM E18
Load accuracy:	Better than 0.05 %
Readout Division:	0.1 HR
Indenter Stroke:	Motorized 50mm / 2"
Max/Min specimen ø:	Max 95 mm / Min 47 mm (More on request)
Temperature Range:	From 10 °C to 35 °C
Data Output - Power Supply:	USB - 110 or 220 V / 50÷60 Hz
Software:	Afri - OMAG
Principle of Operation:	Load Cell and Closed Loop (Affri patent)
Packing:	190 x 220 x 120 cm / 75 x 87 x 47 " - 1000kg

## DKS



### Rockwell C - A - D - B - F - G - N - T

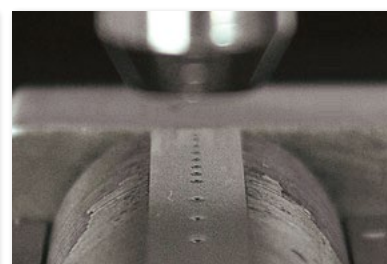
- Beyond the regular dimension
- Fully motorized vertical head movement from 0 to 700 mm
- Depth capacity 170 mm
- Rotating turret 2000 mm diameter 360°
- Automatic start contact with test piece and hardness test cycle
- Suitable to test power for aerospace engine



# DAKO JOMINY



- Automatic Jominy Hardness Tester
- Designed for multiple specimen testing and double sized surface testing
- Single or multiple sample test pieces, can be tested automatically, conforming to ASTM E-18 specification
- Optical imaging system.
- Panoramic camera with a 5X objective, for a clear sample pattern starting origin. Independent for each sample
- Self automatic calibration cycle, conforming to ASTM E-18- ISO 6508 on three test blocks ( Hard, Medium & Soft) ranges
- Standardized test patterns are stored, in the on board database, for ease of instrument operation
- A customized test cycle can be created at anytime
- Optimize your test block surface area, time saving instrument validation as well as using the complete test block surface.



## ACTION

One button for automatic jominy hardness test on multiple samples.

## FORCE RANGE

Preload:	29.42 - 98.07 N (3 - 10 kgf)
Rockwell:	588.4 - 980.7 - 1471 N (60 - 100 - 150 kgf)
Superficial Rockwell:	147.1 - 294.2 - 441.3 N (15 - 30 - 45 kgf)
Brinell:	9.807 - 49.03 - 61.29 - 98.07 - 153.2 - 245.2 - 294.2 - 306.5 - 612.9 - 1226 - 1839 N (as option 2452 N) (1 - 5 - 6.25 - 10 - 15.6 - 25 - 30 - 31.2 - 62.5 - 125 - 187.5 kgf - as option 250 kgf)
Vickers/Knoop:	9.807 - 29.42 - 49.03 - 98.07 - 147.1 - 196 - 294.2 - 490.35 - 980.7 N (1 - 3 - 5 - 10 - 15 - 20 - 30 - 50 - 100 kgf)
Optional tests:	49 - 132 - 358 - 961 N (for plastic and rubber as per EN-ISO 2039)

## FEASIBLE TESTS

Rockwell:	HRA - HRB - HRC - HRD - HRE - HRF - HRG - HRH - HRK - HRL - HRM - HRP - HRR - HRS - HRV
Superficial Rockwell:	HR15N - HR30N - HR45N - HR15T - HR30T - HR45T - HR15S - HR30S - HR45S - HR15W - HR30W - HR45W - HR15X - HR30X - HR45X - HR15Y - HR30Y - HR45Y
Brinell HBWT:	1/30 - 2.5/15.6 - 2.5/31.5 - 5/125(3) (Aluminum and its alloys) - 2.5/62.5(2) (Aluminum and its alloys) - 2.5/187.5(6) (Aluminum and its alloys) - 2.5/187.5(5) (Carbon steel) - 2.5/187.5(1) (Cast iron)
Vickers/Knoop:	Generate indentation
Temperature:	Measure test temperature range from - 40.0 to + 80.0 °C

## TECHNICAL DATA

Conformity Standards:	EN-ISO 6506-2 / EN-ISO 6507-2 / EN-ISO 6508-2 / EN-ISO 2039 / ISO 868 / ASTM-E10 / ASTM-E18 / ASTM-E103 / ASTM 2240 / ASTM-E384 / JIS
Load accuracy:	Better than 0.05 %
Readout Division:	0.1 HR / HBWT - MRS PC 0.01 HR
Auto calibration:	Automatic cycle on 3 blocks as ASTM E18. Memory of each indent position
Test samples:	Multiples up to 4 samples with 1, 2 or 4 faces
Patterns:	Standardized conform to Jominy standard or customized
Camera:	1.3 MP
Indenter Stroke:	Motorized 50mm / 2"
Capacity:	Height Capacity: Motorized 200 mm / 8" (More as option) - Depth Capacity: 190 mm / 7.5" (More as option)
Security cover:	4 transparent walls including security door and security stop
X/Y table:	Motorized 400 X 200 mm / 15 x 8" with 0.5 µm step
Temperature Range:	From 10 °C to 35 °C
Data Output - Power Supply:	RS 232 C (USB as option) - 110 or 220 V / 50÷60 Hz
Software:	Affri - OMAG
Principle of Operation:	Load Cell and Closed Loop (Affri patent)
Fields Of Use	For automatic Jominy tests in accordance to standards. For all metals: iron, steel, tempered steel, cast iron, brass, aluminum, copper and metal alloys. Heat treatment, hardening, nitriding, cementation and hardfacing. Hard and soft plastics.
Packing:	150 x 100 x 170 cm / 60 x 40 x 66" - 380kg



## 330 PRS / PRS-S



Details of single head for independent use

- High speed hardness tester for fast tests in production departments
- High volume tests, up to 1500 tests per hour
- On Rockwell Scale, automatic loader, automatic test, automatic sorter
- Very easy to integrate into a conveyor line
- Direct readout in Rockwell or Brinell scales

## AUTO GM PRS



### ACTION

Head developed to perform high number of tests in continuous cycle. The head moves down, the sample is clamped and the reference surface activated

### FORCE RANGE

Preload:	29.42 - 98.07 N (3 - 10 kgf)
Rockwell / Superficial R.:	588.4 - 980.7 - 1471 N (60 - 100 - 150 kgf) / PRS-S: 147.1 - 294.2 - 441.3 N (15 - 30 - 45 kgf)
Brinell:	612.9 - 1839 N (62.5 - 187.5 kgf)

### FEASIBLE TESTS

Rockwell:	HRA - HRB - HRC - HRD - HRE - HRF - HRG - HRH - HRK - HRL - HRM - HRP - HRR - HRS - HRV
Superficial Rockwell (PRS-S):	HR15N - HR30N - HR45N - HR15T - HR30T - HR45T - HR15S - HR30S - HR45S - HR15W - HR30W - HR45W - HR15X - HR30X - HR45X - HR15Y - HR30Y - HR45Y
Brinell HBWT:	2.5/62.5(2) (Aluminum and alloys) - 2.5/187.5(6) (Aluminum and alloys) - 2.5/187.5(5) (Carbon steel) - 2.5/187.5(1) (Cast iron)

### TECHNICAL DATA

Conformity Standards:	EN-ISO 6506-2 / EN-ISO 6508-2 / ASTM E10 / ASTM E18 / ASTM E103
Load accuracy:	Better than 0.5 %
Indenter Stroke:	50mm / 2"
Temperature Range:	From 10 °C to 35 °C
Data Output:	RS 232 C (USB as option)
Power Supply:	110 or 220 V / 50÷60 Hz - Pneumatic 4 bar
Software:	Affri - OMAG
Principle of Operation:	Load Cell and Closed Loop (Affri patent)
Fields Of Use:	For all metals: iron, steel, tempered steel, bronze, aluminum. Thickness over 0.6 mm

## ARM



- It represents the maximum automation applied to a hardness tester
- The tester anchored to a robotic arm allows an extreme mobility
- Excellent even for measuring series of camshafts or particular profiles that are normally difficult to measure. motorized system for the rotation of the shafts that make possible to carry out tests distributed over 360 °
- The robotic arm is characterized by six axis rotation which allow to perform measurements in absolute precision in each area of the piece, decreasing the time required for testing and increasing the precision thanks to the specific software used for the management of the robot



## EXPLORER



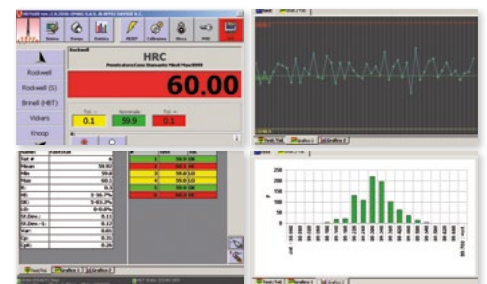
- Automatic hardness tester head integrable and connectable with a CNC machine for inside test cycle
- Designed for being assembled on any machine-tool thanks to the use of the standard coupling cone (ISO e DIN)
- Reliable and precise hardness tester, with a new design and user friendly.
- It allows to make quick and precise measurements.
- Explorer transfers the data concerning the test just carried out thanks to Bluetooth connectivity. This allows to place the support PC even far from the instrument for better ergonomics of the working place.



### SOFTWARE FOR ARM AND EXPLORER:

After applying the instrument to the machine tool, it will be enough to switch on the support pc and activate the instrument to start testing.

All data are transferred to the wireless PC via Bluetooth. Beyond the quick setting of all testing parameters, a complete set is supplied for analysing the data received from the instrument. Possibility of graphic analyses, quick choice of testing scales, quick conversions and the chance to save real time statistic sessions allow a quick and functional analysis of the tests carried out.



### FORCE RANGE

Preload:	9.807 N (1 kgf)
Main Load:	54.92 N (5.6 kgf)
Feasible Tests:	Rockwell - Superficial Rockwell - Micro Rockwell - Brinell - Vickers

### TECHNICAL DATA

Conformity Standards:	EN-ISO 6506-2 / EN-ISO 6508-2 / ASTM E10 / ASTM E18 / ASTM E103 / ASTM B 724 / DIN 50157
Load accuracy:	Better than 0.5 %
Temperature Range:	From 10 °C to 35 °C
Data Output:	Bluetooth and RS 232 C (USB as option)
Power Supply:	ARM: 118 o 220 V / 50-60 Hz EXPLORER: Internal Rechargeable ni-Mh Batteries 10 hours autonomy
Software:	Afri - OMAG
Principle of Operation:	Load Cell and Closed Loop (Affri patent)
Fields Of Use:	For all metals: iron, steel, tempered steel, bronze, aluminum. Thickness over 0.6 mm



## BALTIMORA



- BALTIMORA includes a compact head to achieve inside of tube from 170 mm diameter
- Wide working area bearing 1000 kg test pieces

### FORCE RANGE

Preload:	29.42 - 98.07 N (3 - 10 kgf)
Rockwell / Superficial R.:	588.4 - 980.7 - 1471 N (60 - 100 - 150 kgf) / 147.1 - 294.2 - 441.3 N (15 - 30 - 45 kgf)
Brinell:	9.807 - 49.03 - 61.29 - 98.07 - 153.2 - 245.2 - 294.2 - 306.5 - 612.9 - 1226 - 1839 N (as option 2452 N) (1 - 5 - 6.25 - 10 - 15.6 - 25 - 30 - 31.2 - 62.5 - 125 - 187.5 kgf - as option 250 kgf)
Vickers/Knoop:	9.807 - 29.42 - 49.03 - 98.07 - 147.1 - 196 - 294.2 - 490.35 - 980.7 N (1 - 3 - 5 - 10 - 15 - 20 - 30 - 50 - 100 kgf)

### FEASIBLE TESTS

Rockwell:	HRA - HRB - HRC - HRD - HRE - HRF - HRG - HRH - HRL - HRM - HRP - HRR - HRS - HRV
Superficial Rockwell:	HR15N - HR30N - HR45N - HR15T - HR30T - HR45T - HR15S - HR30S - HR45S - HR15W - HR30W - HR45W - HR15X - HR30X - HR45X - HR15Y - HR30Y - HR45Y
Brinell HBWT:	1/30 - 2.5/15.6 - 2.5/31.5 - 5/125(3) (Aluminum and its alloys) - 2.5/62.5(2) (Aluminum and its alloys) - 2.5/187.5(6) (Aluminum and its alloys) - 2.5/187.5(5) (Carbon steel) - 2.5/187.5(1) (Cast iron)
Temperature:	Measure test temperature range from - 40.0 to + 80.0 °C

### TECHNICAL DATA

Conformity Standards:	EN-ISO 6506-2 / EN-ISO 6507-2 / EN-ISO 6508-2 / EN-ISO 2039 / ISO 868 / ASTM-E10 / ASTM-E18 / ASTM-E103 / ASTM 2240 / ASTM-E384 / JIS
Load accuracy:	Better than 0.05 %
Readout Division:	0.01 HR / HBWT
Indenter Stroke:	Motorized 500mm / 20" (More on request)
Depth Capacity:	200 mm / 8" (More on request)
Working table:	390 x 330 mm / 15 x 13" (More on request) - Tolerable weight: 2000kg
Temperature Range:	From 10 °C to 35 °C
Data Output - Power Supply:	RS 232 C (USB or Ethernet as option) - 110 or 220 V / 50÷60 Hz
Software:	Affri - OMAG
Principle of Operation:	Load Cell and Closed Loop (Affri patent)

## MRS-FRU



- Testing instrument to measure force and displacement simultaneously
- MRS-FRU traces the load displacement diagram to calculate the breaking point.
- Real testing machine for compression and traction; fully motorized with load cell and software
- Auto start cycle by key boards and touch screen adapt to receive different clamping accessories for tensile, compression, breaking test.
- It is possible to draw a customized test diagram of force or displacement



### FORCE RANGE

Loads:	A: From 0 to 196.2 N (0 to 20 kgf) B: From 0 to 490.5 N (0 to 50 kgf) C: From 0 to 981.0 N (0 to 100 kgf)
Feasible Tests:	Compression and traction diagram (Force displacement)

### TECHNICAL DATA

Load accuracy:	Better than 0.5 %
Readout Division:	0.01 HR / HBWT
Indenter Stroke:	Motorized 50mm / 2" (More on request)
Height Capacity:	215 mm / 8.5"
Depth Capacity:	190 mm / 7.4"
Temperature Range:	From 10 °C to 35 °C
Data Output - Power Supply:	RS 232 C (USB as option) - 110 or 220 V / 50÷60 Hz
Software:	Affri - OMAG
Principle of Operation:	Load Cell and Closed Loop (Affri patent)
Fields Of Use:	For food, vegetable, packing to measure force and displacement

# INDENTERS & BLOCKS



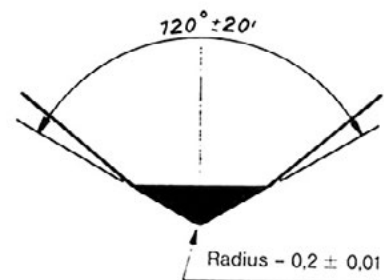
## HIGH QUALITY & LIFE LONG RELIABILITY

AFFRI® provides high quality indenters. Ball or cone types according to Rockwell, Vickers, Brinell, Knoop and Shore for each type of hardness tester. AFFRI® has a wide variety of test blocks for every scale certified UKAS/ACCREDIA or with AFFRI'S test blocks amenable to primary institute.

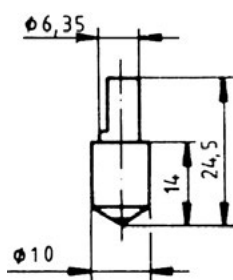


## HIGH QUALITY DIAMOND INDENTERS FOR EVERY TYPE OF HARDNESS TESTERS

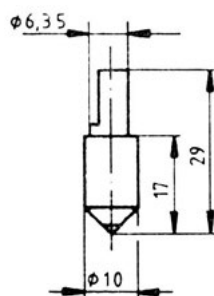
Nr.	Type	Testing appliance
11	Origin. Rockwell 120°	z.B. Frank
12	Testor 120°	Wolpert - Wilson - Time - Mitutoyo
13	Briro UVN 120°	Reicherter
14	Testor-Automat 120°	Wolpert



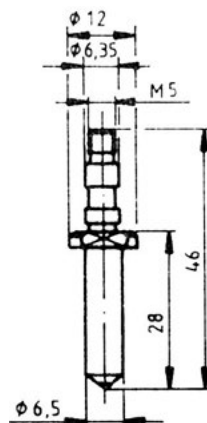
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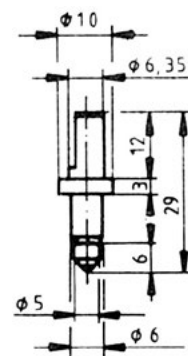
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**Nr. 13**

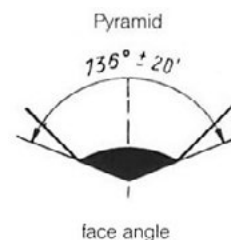


**Nr. 14**

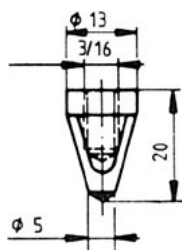


### HARDNESS TEST DIAMONDS ACCORDING TO VICKERS

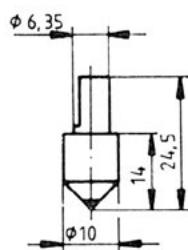
Nr.	Type	Testing appliance
15	Origin. Vickers 136°	Vickers - Tukon
16	Vickers 136°	Frank
17	Dia-Testor 136°	Wolpert - Wilson - Time - Mitutoyo
18	Brivisor 3000H 136°	Reicherter
19	VHT 5 136°	Reicherter



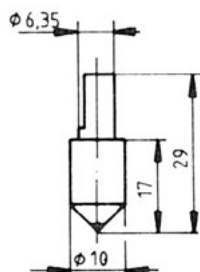
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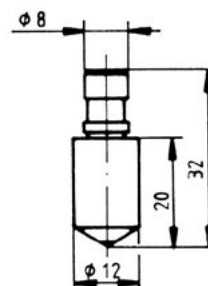
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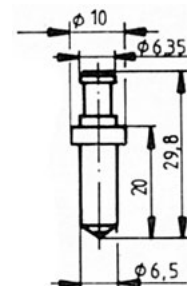
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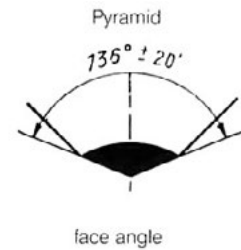
**Nr. 18**



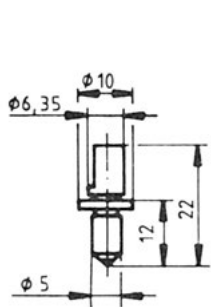
**Nr. 19**



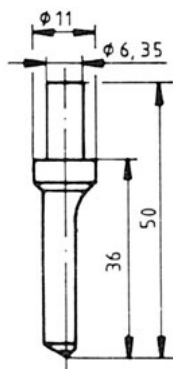
Nr.	Type	Testing appliance
20	Zwick 1 136°	Zwick
21	Zwick 2 136°	Zwick
22	Briviskop 187.5 136°	Reicherter
23	Spare indenter for item 22	Reicherter
24	Testor-Automat 136°	Wolpert



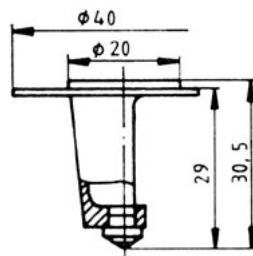
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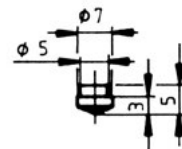
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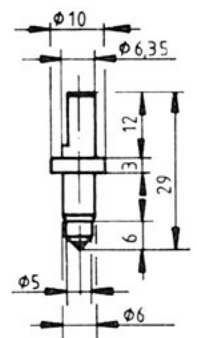
**Nr. 22**



**Nr. 23**



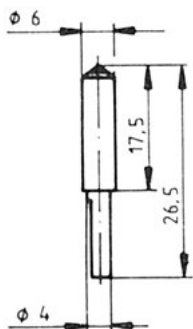
**Nr. 24**



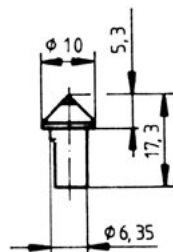
## DIAMONDS FOR MICRO HARDNESS TEST

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

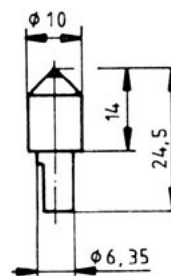
**Nr. 25**



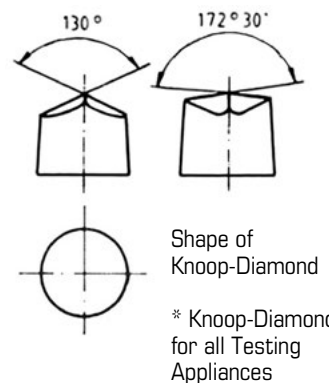
**Nr. 26**



**Nr. 27**



**Nr. 28**



## STANDARD BLOCKS WITH OFFICIAL CERTIFICATE CONFORM TO ASTM-ISO STANDARDS FOR PRIMARY CERTIFICATION OF THE HARDNESS TESTER



TYPE	SCALE	NOMINAL VALUE	DIMENSION mm	SURFACE
<b>Rockwell</b>	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				
<b>Rockwell superf</b>	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				
<b>Vickers</b>	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				
<b>Micro Vickers</b>	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				
<b>Micro Knoop</b>	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				
<b>Brinell</b>	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 is included.



## STANDARD BLOCKS WITH CERTIFICATE TRACEABLE AND CONFORM TO ASTM-ISO STANDARDS FOR JOURNAL CALIBRATION

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







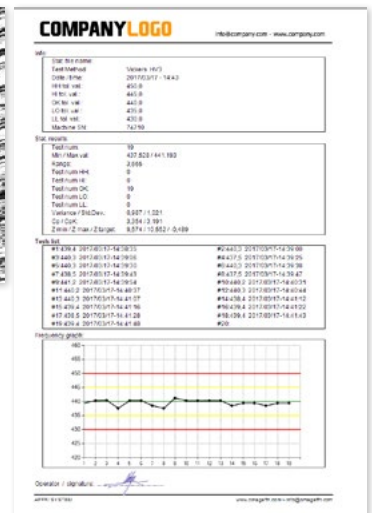
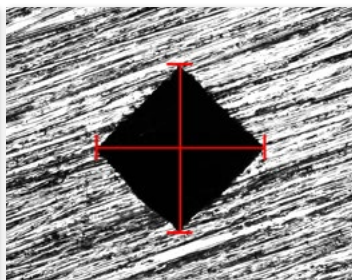
## ACCESSORIES AND AUTOMATIC SYSTEMS

AFFRI® provides X-Y tables (motorized or manual), tightening vices, prisms, multi sample box and several accessories to fix the piece on the hardness tester. AFFRI® is also able to meet the needs of the customers, building special tools for specific hardness tests on bulky, irregular and uncommon samples.





A112.0.008  
COLOUR CAMERA CMOS 1/2"  
1280X1024 USB2

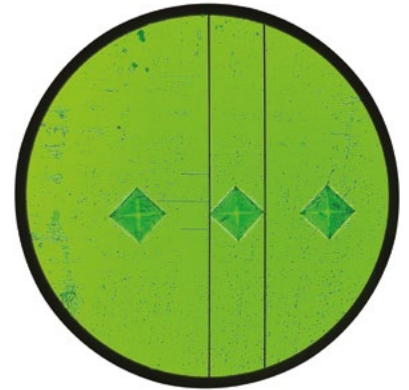
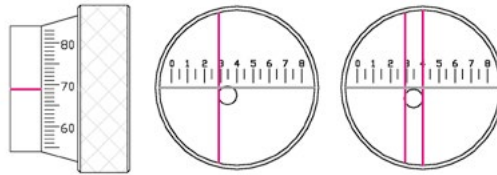


## ACCESSORIES FOR BRINELL, ROCKWELL AND VICKERS MEASURES

### 431216 MICROSCOPE



- Portable handly microscope equipped with foot base  $\varnothing 16$  mm and light source
- 0.01 mm division - 20x magnification (As option: division 0.001mm)
- External scale for easy measure
- Not stressing on the eyes
- Scale 6 mm
- Available with magnetic base (option)



### A4014.0.001 ANVILS



A series of different anvils is available to test every size of test piece:

- |            |   |
|------------|---|
| A014.0.001 | Flat anvil $\varnothing 60$ mm with flat surface  |
| A014.0.003 | V face anvil $\varnothing 60$ mm for diameters from 8 to 220 mm                               |
| A014.0.004 | Double Spot anvil $\varnothing 60$ flat + V $\varnothing 25$ mm for diameters from 5 to 30 mm |
| A014.0.002 | Flat anvil $\varnothing 150$ mm   |

## STANDARD ACCESSORIES INCLUDED ON THE PRICE LIST

For RT RTD EX MX DRM RS RSD series:

- 1 HRC indenter
- 1 HRB Indenter
- 1 HRC test block w. traceable certificate
- 1 HRB test block w. traceable certificate
- 1 Flat anvil
- 1 V face anvil
- 1 spot v+ Flat face anvil
- Manual instruction
- Conversion table
- Warrantee certificate
- Power cable

For all other bench-top models:

- 1 HRC indenter
- 1 HRC test block w. traceable certificate
- 1 Flat anvil
- 1 ( objective for optical machines)
- Manual instruction
- Conversion table
- Warrantee certificate
- Power cable

### WARRANTEE:

Affri warrantees the instrument for 12 months from date of shipment.

The warranty covers repair or replacement of the defective parts due to defect of construction or design.

The decision to repair or replace will be made by an Affri Engineer only.

The warranty work is performed at Affri Company.

The warranty excludes shipment costs, consumable parts, and commercial items.

Affri is not responsible for consequential damages.

Other warranties are excluded.

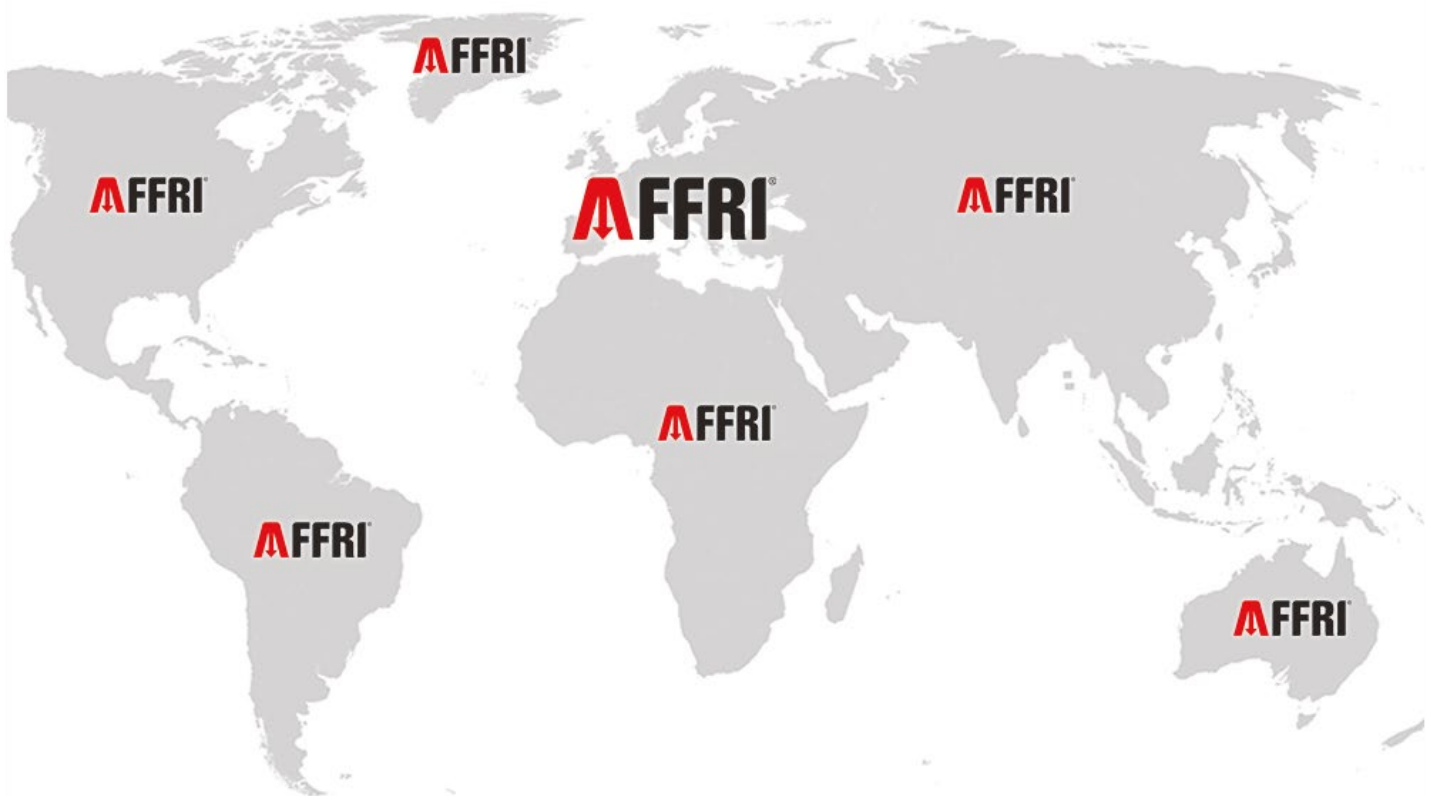
### ON-SITE SUPPORT:

Our highly qualified service technicians provide on-site support, maintenance and inspection to ensure your equipment is operating at peak performance.

The services includes tester calibration, operator training, software version updates and the diagnose of any technical issues.

### REAL TIME SUPPORT:

The remote control connects AFFRI's testers from anywhere in the world with AFFRI's engineers. Our experts can remotely diagnose any technical issues, provide additional operator training and update software version.





## 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.

AFFRI® and its representatives will not accept any responsibility for direct or indirect damage caused to people or things by the products or by consequences of their use.



▲ **Made by:**  
**OMAG di AFFRI D. S.r.l.**

Via M. Tagliaferro, 8  
I-21056 INDUNO OLONA - CEE (VA) - ITALY  
Tel. +39 0332 200546  
Fax +39 0332 203704  
info@omagaffri.com

▲ **Europe/Asia:**  
**AFFRI®**

Via M. Tagliaferro, 8  
I-21056 INDUNO OLONA - CEE - (VA) - ITALY  
Tel. +39 0332 201533  
Fax +39 0332 203621  
info@affri.com - www.affri.com

▲ **America:**  
**AFFRI Inc.**

850 Dillon Dr.  
Wood Dale, 60191 IL - USA  
Tel. 224 374 0931 - 630 303 1588  
sales@affriusa.com  
www.affri.com

Authorized distributor: