

# The Impressor

## The Impressor Hand-Held Portable Hardness Tester

- Aluminum
- Aluminum Alloys
- Soft Metals
- Plastics
- Fiberglass



### Introduction

#### Portable

The Impressor is a convenient tool for testing the hardness of aluminum, aluminum alloys, copper, brass and other materials including plastics and fiberglass. The instrument is designed for use on fabricated parts and assemblies as well as on raw stock.

#### Easy to Use

No experience required; can be used in any position and in any space that will allow for the operator's hand. The hardness reading is instantly indicated on the dial, which is divided into one hundred graduations. No waiting, pre-loading or separate measurements.

#### Lightweight

The impressor weighs only 1 lb. 2 oz. and comes complete with carrying case, adjusting wrench and two spare indenter points, 2 lb. 8oz.

### Applications

#### Three Models Available

GYZJ 934-1 for soft metals such as aluminum and its alloys, brass, copper, and some of the harder plastics and fiberglass. Approximate range 25 to 150 Brinell (10 mm ball 500 kg load). This unit meets American Society for Testing and Materials (ASTM) Standard D-2583.

GYZJ 935 for the softer plastics and very soft metals.

GYZJ 936 for extremely soft materials such as lead, linoleum and leather.

Barber-Colman engineers will be glad to recommend the most suitable model upon receipt of sample materials.

### Operating Information

The Impressor is best suited for testing homogeneous materials. Materials of granular, fibrous or coarse structure will produce a wide variation in hardness readings because of the small diameter of the indenter point.

For accurate readings, material should be at least 1/32" thick and large enough for a minimum distance of 1/8" in any direction from the indenter point to the edge of the specimen. The testing area should be smooth and free from mechanical damage.

Simply exert a light pressure against the instrument to drive the spring-loaded indenter point into the material. The indenter point must be perpendicular to the surface being tested.

On very soft metals, the highest reading should be used since cold flow permits the spring-loaded indenter point to continue penetration.

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## Operating Information (continued)

**Note:** Physical characteristics of very soft materials are such that uniform correlation between different hardness measuring systems cannot be established. For this reason, no conversion curves are offered for the 935 and 936 models. We recommend that impressor hardness limits for each material be established by test.

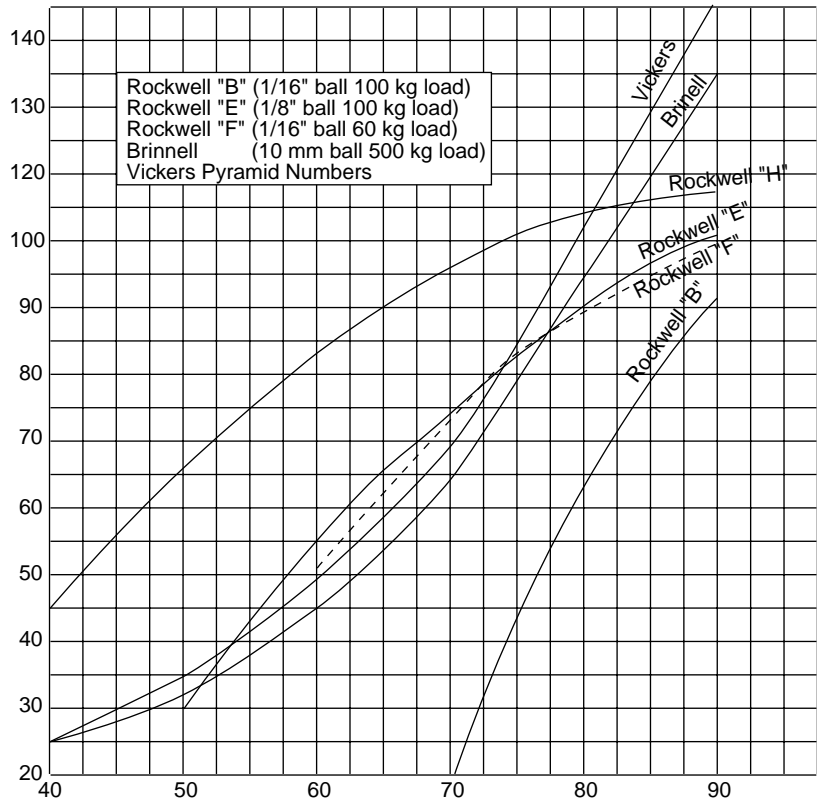
**Recommended Sample Sizes** To equalize the variance of the average (GYZJ 934-1)

	<u>Hardness Scale</u>	<u>Reading Variance</u>	<u>Number of Readings</u>	<u>Variance of Average</u>
<b>Homogeneous Material:</b>	20	2.47	9	0.27
	30	2.20	8	0.28
	40	1.93	7	0.27
	50	1.66	6	0.28
	60	1.39	5	0.28
	70	1.12	4	0.28
	80	0.85	3	0.28
	<b>Reinforced Plastics:</b>	30	22.4	29
40		17.2	22	0.78
50		12.0	16	0.75
60		7.8	10	0.78
70		3.6	5	0.75

## Typical Readings of Aluminum Alloys

Alloy and Temper:	<u>1100-0</u>	<u>3003-0</u>	<u>3003H14</u>	<u>2024-0</u>	<u>5052-0</u>	<u>5052H14</u>	<u>6061T6</u>	<u>2024T3</u>
GYZJ 934-1 reading:	35	42	56	60	62	75	80	85

## Approximate Conversion Curves for GYZJ 934-1



# The Impressor

## Operating Information (continued)

Approximate Conversion Chart for GYZJ 934-1

934-1	Brinnell	Vickers	Rockwell			
			B	E	F	H
35		23				32
36		23				33
37		24				37
38		24				40
39		25				43
40	25	25				45
41	26	26				47
42	26	27				49
43	27	27				52
44	27	28				54
45	27	20				56
46	28	30				58
47	29	32		24		61
48	30	33		25		63
49	31	34		28		64
50	32	35		30		66
51	33	36		33		68
52	34	38		36		70
53	35	39		39	29	72
54	37	41		42	33	73
55	38	42		44	38	75
56	39	44		46	40	76
57	40	45		48	43	78
58	42	47		51	47	80
59	44	48		53	49	81
60	45	49		55	51	83
61	47	51		57	54	84
62	48	53		59	56	86
63	50	55		62	58	88
64	52	57		64	61	89
64	54	58		65	63	90
66	55	60		67	65	91
67	58	62		69	67	92

934-1	Brinnell	Vickers	Rockwell			
			B	E	F	H
68	60	64		71	69	94
69	62	67		73	71	95
70	64	69	18	74	73	96
71	67	72	19	76	75	98
72	69	74	28	77	77	99
73	71	76	33	79	79	100
74	73	81	39	81	81	101
75	76	85	45	83	83	102
76	80	88	48	84	84	103
77	84	92	52	86	86	104
78	87	95	56	88	87	105
89	90	99	60	89	88	106
80	94	103	63	90	89	107
81	97	108	65	91	90	108
82	100	111	69	92	91	108
83	105	116	72	94	92	109
84	109	122	75	95	93	109
85	113	127	77	96	94	110
86	117	133	80	97	95	111
87	122	137	83	98	96	111
88	126	142	86	99	97	112
89	131	144	89	100	97	112
90	135		91	101	98	113
91	139			102	99	113
92	145			103	100	
93				103	101	
94				104	101	
95				104	102	
96				105	102	
97				106	103	
98				107		
99				108		
100				108		

Approximate Conversion Chart GYZJ-935 and GYZJ-936

GYZJ-935 & 936	Type D Durameter	
	GYZJ-935	GYZJ-936
4	64	52
6	65	
8		66
10	67	
12		68
14	69	
16		70
18	71	
20		72
22	73	
24		74
26	75	
28		76

GYZJ-935 & 936	Type D Durameter	
	GYZJ-935	GYZJ-936
30	70	60
32		
34	71	61
36		
38	72	63
40		
42	73	64
44		
46	74	65
48		75
50	76	
52		77
54	78	
56		79
	80	
		81
	82	
		83
	84	
		85
	86	
		87
	88	
		89
	90	
		91
	92	
		93
	94	
		95
	96	
		97
	98	
		99
	100	

GYZJ-935 & 936	Type D Durameter	
	GYZJ-935	GYZJ-936
58	78	72
60	79	73
62		74
64	80	75
66	81	76
68	82	77
70		78
72	83	79
74	84	80
76	85	81
78		83
80	86	84
82	87	85
84	88	86
86	89	87
88	n/a	89

# The Impressor

## Ordering Information

### Hardness Tester

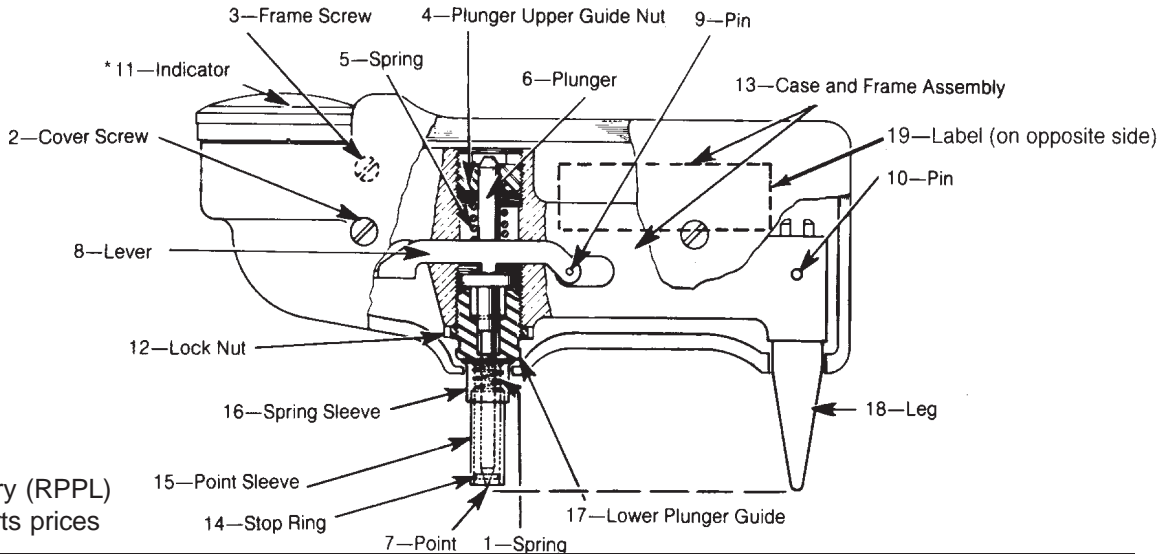
Schedule: SF	Model	Range
	GYZJ-934-1	25 to 50 Brinell (10 mm ball 500 kg load)
	GYZJ-935	For softer plastic and very soft metals
	GYZJ-936	For extremely soft material

### Certified Test Disks

Schedule: Y	Part No.	Use with Model	Barber-Colman Scale
	GYZJ-069-100	Set of 5 GYZJ-935	87 – 89
	GYZJ-070-100	Set of 5 GYZJ-936	48 – 50
	GYZJ-078-100	Set of 5 GYZJ-934-1	43 – 48
	GYZJ-250-100	Set of 5 GYZJ-934-1	87/89
<b>Non-certified Test Disks</b>	GYZJ-069	Each GYZJ-935	87 – 89
	GYZJ-070	Each GYZJ-936	48 – 50
	GYZJ-078	Each GYZJ-934-1	43 – 48
	GYZJ-250	Each GYZJ-934-1	87/89

## The Impressor Repair Parts

Schedule: Y



Contact factory (RPPL)  
for repair parts prices

Item	GYZJ-934-1	GYZJ-935	GYZJ-936	Description	Qty
1	AYRS-62	AYRS-62	AYRS-62	Spring	1
2	BYRF-3114	BYRF-3114	BYRF-3114	Cover Screw	2
3	BYRF-250	BYRF-250	BYRF-250	Frame Screw	1
4	GYZJ-2	GYZJ-2	GYZJ-2	Plunger Upper Guide Nut	1
5	GYZJ-3	AYRS-146-1	AYRS-146-1	Spring†	1
6	GYZJ-4-1	GYZJ-4-1	GYZJ-4-1	Plunger	1
7	GYZJ-6-5	GYZJ-6-5	GYZJ-67	Indenter Point†	1
8	GYZJ-7	GYZJ-7	GYZJ-7	Lever	1
9	GYZJ-8	GYZJ-8	GYZJ-8	Pin	1
10	DYRA-218	DYRA-218	DYRA-218	Pin	1
11	GYZJ-15-2	GYZJ-15-2	GYZJ-15-2	Indicator (not field servicable)	1
12	GYZJ-16	GYZJ-16	GYZJ-16	Lock Nut	1
-	GYZJ-17-1	GYZJ-17-1	GYZJ-17-1	Wrench	1
-	GYZJ-19-2	GYZJ-19-2	GYZJ-19-2	Carrying Case	1
13	GYZJ-23-1	GYZJ-23-1	GYZJ-23-1	Case & Frame Assembly	1
-	GYZJ-250*	GYZJ-69***	GYZJ-70****	Test Disc†	1
-	GYZJ-78**	None	None	Test Disc†	1
14	GYZJ-61	GYZJ-61	GYZJ-61	Stop Ring	1
15	GYZJ-62	GYZJ-62	GYZJ-62	Point Sleeve	1
16	GYZJ-63	GYZJ-63	GYZJ-63	Spring Sleeve	1
17	GYZJ-64	GYZJ-64	GYZJ-71	Lower Plunger Guide†	1
18	GYZJ-65	GYZJ-65	GYZJ-65	Leg	1
19	GYZJ-79-1	GYZJ-79-2	GYZJ-79-3	Label†	1

† Parts required to convert between models. \* Marked "87/89" \*\* Marked "43-48" \*\*\* Marked "87-89" \*\*\*\* Marked "48-50"

## Typical Sample Readings from Barcol Impressor

Readings at 20C-68F

Sample Material	Impressor GYZJ-934-1	Impressor GYZJ-935	Impressor GYZJ-936	Durometer Shore D
Melamine (Mold)	75.2			
Urea Resin (Mold)	68.6			
Polyester (Injection)	45.5	85.3	87.6	88.1
Phenol	60.0			
Polycarbonate (Colored)	10.9	69.0	75.5	82.2
Polycarbonate (Non-Colored)	10.7	69.1	75.3	82.9
Acrylic Plastic	49.1	87.8	89.5	89.4
Polystyrene	22.3	74.0	79.9	84.7
Deruline	11.3	72.3	81.5	84.4
Hard Vinyl Chloride (Non-Colored)	18.4	76.6	81.7	84.1
Hard Vinyl Chloride	13.4	75.0	81.1	83.2
Hard Vinyl Chloride (Gray)	7.6	73.8	80.1	82.7
Nylon 66	10.4	73.5	80.7	84.5
Nylon 6	4.3	70.2	78.3	82.5
Nylon 610		67.1	76.5	81.3
Polypropylene (1)		54.8	67.5	77.1
ABS		56.2	69.5	77.1
Hard Polyethylene (1)		25.9	50.7	68.9
PVC (DOP 30)		22.8	44.4	65.5
Polypropylene (2)		48.3	63.5	73.6
Hard Polyethylene (2)		25.9	52.3	69.4
Soft Polyethylene			7.0	52.5
Low Pressure Polyethylene		22.5	50.2	67.9
High Pressure Polyethylene			19.2	56.4
Teflon			33.6	60.7
Polypropylene (3)		52.4	66.1	76.5
PVC Tile		45.2	60.1	70.8

## **ASTM Standard Tests Using the Barcol Impressor**

### **D2583-95(2001)e1 Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor**

#### **1. Scope**

1.1 This test method covers the determination of indentation hardness of both reinforced and nonreinforced rigid plastics using a Barcol Impressor, Model No. 934-1 and Model No. 935.

1.2 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

Note 1—There is currently no ISO standard that duplicates this test method.

### **B648-78(2000) Standard Test Method for Indentation Hardness of Aluminum Alloys by Means of a Barcol Impressor**

#### **1. Scope**

1.1 This test method covers the determination of indentation hardness of aluminum alloys using a Barcol Impressor, Model No. 934-1.

1.2 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

Note 1--Another model, No. 935, is for use on plastics but is not included in this test method and should not be used for aluminum alloys.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*