

STANDARD BLOCKS FOR RELIABLE HARDNESS TESTS

ทดสอบความแข็ง, แท่งทดสอบเครื่องวัดความแข็ง

Yamamoto®



Types and nominal Hardness Values

HR C	70, 67, 64, 62, 60, 57, 55, 50, 45, 40, 35, 30, 25, 20, 10
HR A	87, 85, 83, 81, 78, 75, 71, 65, 56
HR30N	83, 81, 78, 73, 67, 60, 55, 50, 41
HR15N(45N)	92, 90, 87, 85, 80, 75 (43)(23)
HRB W	100, 95, 90, 82, 72, 62, 52, 42, 32
HR30T W	78, 72, 62, 52, 42, 38, 32
HR15T W	87, 82, 78
HRE	90
HRM	107, 67
HRL	118, 92
HRR	123, 105
HRF	90
HRS	90
HMV(1,0.1)	1600
HMV(1,0.1,0.01)	900, 800, 700, 600, 500, 00, 300, 200, 10, 40
HMV(0.1,0.01,0.001)	30(Au)
HV(30,1)	1000, 900, 800, 700
HV(10,1)	600, 500, 400, 300, 200, 150, 100, 40
UMV(0.01,0.002)	900, 700, 500, 200 (Berkovich 9.8mN tested)
HN.W	Single crystal block for nanoindentation (430HV 0.0,0.001, Berkovich 9.8mN tested)
HS	100, 95, 90, 80, 70, 60, 50, 40, 30, 20, 7
HLE(Dia)	850, 800, 700, 600, 500
HLD(WC)	880, 830, 730, 630, 520
HBW(10/3000)	600, 550, 500, 450, 400, 350, 300, 250, 229, 200, 180, 150
HBW(10/500)	125, 100

Combinations for diamond indenter verification

HR C	55, 25
HR45N	45, 23
HR15N	90

Combinations for daily control

HR C	60, 50, 30
HS	90, 60, 30
HBW	229

ISO 9001 Quality System

Yamamoto's hardness blocks are ISO 9001 certified, complying with requirement of the ISO standards. The register certificate No. is JQA - 2078 ISO 9001 - 2000 / JIS Q 9001 : 2000

- Hardness uniformity meeting world's highest standards.
- Universal reference values on JIS/ISO standards for international acceptance.
- Highly stable and reliable hardness values.

Durability of Yamamoto Standard Block for Hardness

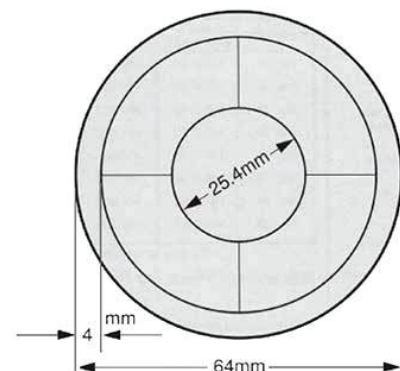
Secular changes of all Yamamoto's blocks are eliminated by a sufficient heat treatment process, regardless of the block type. Due to work hardening near and around the perimeters of indentations, the usable test areas is limited, as JIS prescribes it to be 4d (d = diameter of the indentations) as spaces between indentations.

To make the maximum use of a block, indentations should be made evenly over the test surface. For this purpose, it is recommended to divide the working surface. For the durable limits specified in table 1, reduce the number to half if the highest level of accuracy is required.

Table 1. The result of durability

Hardness	60HRC	30HRC	90HRB	60HRB
Durable Limit (approx.)	500	260	250	200

Fig. An example of the working surface divided into five (n=5)



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ASSORTMENT	HARDNESS VALUE	TOLERANCE	CALIBRATION NUMBER (N)	VARIATION (R=MAX-MIN)	MATERIALS (JIS NOTATION)	DIMENSION (MM)	FINISHED SURFACE	STANDARD BASED
HMV (1, 0.1)	1600	±10%	4(2x2)	2%(HV1)	Si ₃ N ₄	Ø10x5	Super Finish	JIS B 7735
HMV (1, 0.1, 0.01)	900, 800, 700, 600, 500	±15	6(3x2)	5%(HV0.1)	SK85	Ø25x6	Super Finish	JIS B 7735
"	400, 300, 200(Be Copper)	±15	"	"	C1720P	Ø25x6 (2)	Super Finish	"
"	100(C2600P), 40(C1020P)	±10	"	7(100HV0.1), 4(40HV0.1)	←	Ø25x5, Ø25x6	Super Finish	"
HMV (0.1, 0.01, 0.001)	30(Au)	±10	"	4(HV0.1)	Au	Ø25x5 (0.8)	Super Finish	"
UMV (0.01, 0.002)	900, 700 (Berkovich 9.8mN tested)	±20%	6(3x2)	10%(HV0.01)	SK85	Ø25x6	Super Finish (Fine)	JIS B 7735
" (0.01, 0.002)	500, 200 (")	"	"	"	SK85, C1720P	Ø25x6 (2)	Super Finish (Fine)	"
★Nano Indentation Hardness Blocks		APPROX340	6(3x2 HV, Nano)		Single Crystal	Ø25x6	Super Finish (Fine)	JIS B 7735
HN-W	(HV0.01, 0.001 Berkovich 9.8mN tested)	HV0.001			Tungsten	(W:Ø9x6)		
HV (30, 1)	1000(SK120), 900, 800, 700	±15	10(5x2)/HV30,10	1.5%	SKS3	Ø64x15	Buffing	JIS B 7735
HV (10, 1)	600, 500, 400, 300, 200(SK85), 150(S45C)	"	6(3x2)/HV1	"	←	"	Buffing	"
"	100(C2600P), 40(C1020P)	±10	"	(150HV and below 2.2%)	←	Ø64x10	Buffing	"
HS	100(SK120), 95, 90, 80, 70, 60, 50, 40, 30	±2	HV10(5x2)	VHS≤1.5(70HS and below 1.2)	SK85	Ø64x15	Buffing	JIS B 7731
"	20(S20C), 7(C1020PØ64x10)	"	HS10(5x2)	ΔHS(HS-VHS)≤0.5	←	"	Buffing	"
HL	HLE(Dia)850, 800, 700, 600, 500	±15	(HV Calibration)		SK85	Ø115x33	Buffing	JIS B 7731
"	HLD(WC)880, 830, 730, 630, 520	"			"	"	Buffing	Related
HR C	70(SK120), 67, 64, 62, 60	±1	10(5x2)	0.2	SKS3	Ø64x15	Buffing	JIS B 7730
"	57, 55, 50, 45, 40, 35, 30, 25, 20, 10	"	"	(40HRC and below 0.3)	SK85	"	Buffing	"
HR A	87, 85, 83, 81, 78, 75, 71, 65, 56	"	"	0.3	Same as HRC	"	Buffing	"
HR30N	83, 81, 78, 73, 67, 60, 55, 50, 41	"	"	0.6	"	"	Buffing	"
HR15N (45N)	92, 90, 87, 85, 80, 75 (43) (23)	"	"	"	"	"	Buffing	"
HRB S	100, 95, 90	±2	10(5x2)	0.8	SK85	Ø64x10	Plate Lapping	JIS B 7730
"	82, 72, 62, 52, 42, 32	"	"	(50HRB and below 0.1)	C2600P	"	Plate Lapping	"
HR30T S	78, 72, 62, 52, 42, 38, 32	"	"	1.0	Same as HRB	"	Buffing	"
HR15T S	87, 82, 78	"	"	"	"	"	Buffing	"
HR (E•M•L•R•F•S)	HRE90 HRM107 HRL118 HRR123 HRF90	"	"	"	(100HV)	"	Buffing	JIS K 7202
"	HRM67 HRL92 HRR105 HRS90	"	"	"	(40HV)	"	Buffing	"
HBW (10/3000)	600, 550, 500, 450, 400, 350	±15	6(3x2)	1.5%	SK85	Ø115x18	Fine Grinding	JIS B 7736
"	300, 250, 229(d=4mm), 200, 180	"	"	"	"	"	Fine Grinding	"
"	HBW(10/3000) 150, HBW(10/500) 125	"	"	2.5%	S45C	"	Fine Grinding	"
"	HBW(10/500) 100	"	"	3%	S10C	"	Fine Grinding	"
HRC	67, 64, 62, 60	±1	6(3x2)			Ø50.8x6.4		(ASTM E-18)
HRC	55, 50, 45, 40, 35, 30, 25, 20					(Ø2x1/4)		