

Portable Hardness Tester



Table 1: measuring range of TIME Leeb hardness tester

Material	Hardness scale	Impace device					
		D/DC	D+15	C	G	E	DL
Steel and cast steel	HRC	17.9~68.5	19.3~67.9	20.0~69.5		22.4~70.7	20.6~68.2
	HRB	59.6~99.6			47.7~99.9		37.0~99.9
	HRA	59.1~85.8				61.7~88.0	
	HB	127~651	80~638	80~683	90~646	83~663	81~646
	HV	83~976	80~937	80~996		84~1042	80~950
	HS	32.2~99.5	33.3~99.3	31.8~102.1		35.8~102.6	30.6~96.8
Steel	HB	143~650					
CWT, ST	HRC	20.4~67.1	19.8~68.2	20.7~68.2		22.6~70.2	
	HV	80~898	80~935	100~941		82~1009	
Stainless steel	HRB	46.5~101.7					
	HB	85~655					
	HV	85~802					
GC, IRON	HRC						
	HB	93~334			92~326		
	HV						
NC, IRON	HRC						
	HB	131~387			127~364		
	HV						
C, ALUM	HB	19~164		23~210	32~168		
	HRB	23.8~84.6		22.7~85.0	23.8~85.5		
BRASS	HB	40~173					
	HRB	13.5~95.3					
BRONZE	HB	60~290					
COPPER	HB	45~315					

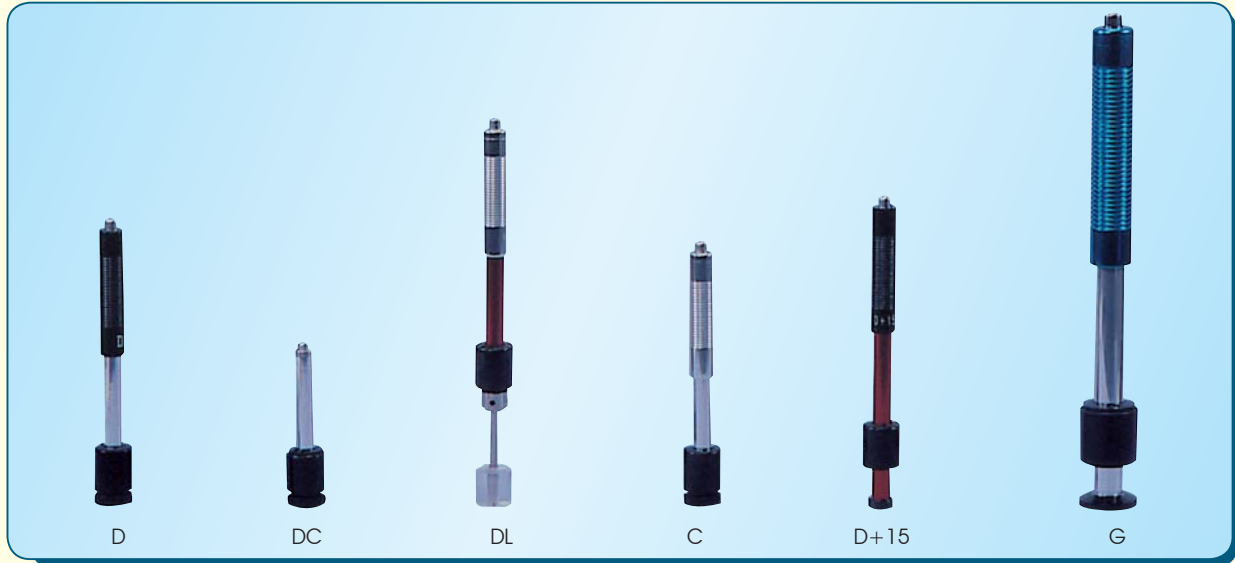
Table 2: Tolerance and repeatability

No.	Impact device	Standard test block values	Tolerance	Repeatability
1	D	760 ± 30HLD 530 ± 40HLD	± 6HLD ± 10HLD	6HLD 10HLD
2	DC	760 ± 30HLDC 530 ± 40HLDC	± 6HLDC ± 10HLDC	6HLDC 10HLDC
3	DL	878 ± 30HLDL 736 ± 40HLDL	± 12HLDL	12HLDL
4	D+15	766 ± 30HLD+15 544 ± 40HLD+15	± 12HLD+15	12HLD+15
5	G	590 ± 40HLG 500 ± 40HLG	± 12HLG	12HLG
6	C	822 ± 30HLC 590 ± 40HLC	± 12HLC	12HLC



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Technical specification of impact devices



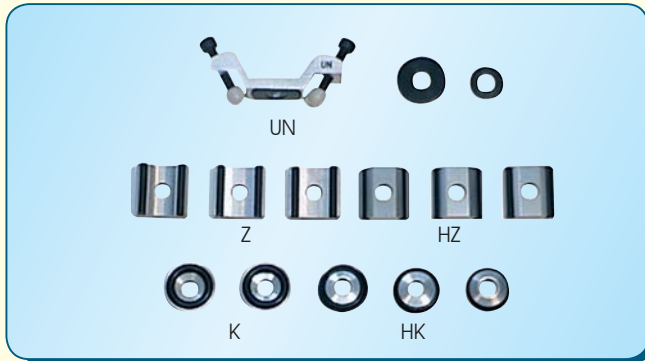
Technical specification

Impact device	D/DC/DL	D+15	C	G	
Impacting energy	11mJ	11mJ	2.7mJ	90mJ	
Mass of impact body	5.5g/5.5g/7.2g	7.8g	3.0g	20g	
Hardness of spherical test tip	1600HV	1600HV	1600HV	1600HV	
Diameter of spherical test tip	3mm	3mm	3mm	5mm	
Material of spherical test tip	Tungsten carbide	Tungsten carbide	Tungsten carbide	Tungsten carbide	
Diameter of impact device	20/20/6mm	20mm	20mm	30mm	
Length of impact device	147/86/202mm	162mm	141mm	255mm	
Weight of impact device	75/50/60g	80g	75g	250g	
Max. hardness of workpiece	940/940/950HV	940HV	1000HV	650HV	
Surface roughness of workpiece	$\leq 1.6\mu\text{m}$	$\leq 1.6\mu\text{m}$	$\leq 0.4\mu\text{m}$	$\leq 6.3\mu\text{m}$	
Min. Weight of workpiece					
Direct measurement	>5kg	>5kg	>1.5kg	>15kg	
Needing stable support	2~5kg	2~5kg	0.5~1.5kg	5~15kg	
Needing compact coupling	0.05~2kg	0.05~2kg	0.02~0.5kg	0.5~5kg	
Min. thickness of workpiece with compact coupling	5mm	5mm	1mm	10mm	
Min. thickness of hardened layer	0.8mm	0.8mm	0.2mm	1.2mm	
Size of impact indentation					
Hardness 300HV	Indentation diameter	0.54mm	0.54mm	0.38mm	1.03mm
	Indentation depth	24 μm	24 μm	12 μm	53 μm
Hardness 600HV	Indentation diameter	0.54mm	0.54mm	0.32mm	0.90mm
	Indentation depth	17 μm	17 μm	8 μm	41 μm
Hardness 800HV	Indentation diameter	0.35mm	0.35mm	0.35mm	-
	Indentation depth	10 μm	10 μm	7 μm	-
Application guide of impact devices	D type for general purpose, DC type for inner face of holes or small spaces, DL type for long and narrow channel or holes	D+15 type for grooves or concave	C type for small or light workpieces and surface hardener layer	G type for big and heavy workpieces with rough surface	



Optional Support Rings

Function: they are used for tested surface whose curvature radius is less than 30mm (D, DC, D+15, C impact devices) or less than 50mm (G impact device) .



Support Rings



No.	Type	Sketch of non-conventional supporting ring	Remarks
1	Z10-15		For testing cylindrical outside surface R10 ~ R15
2	Z14.5-30		For testing cylindrical outside surface R14.5 ~ R30
3	Z25-50		For testing cylindrical outside surface R25 ~ R50
4	HZ11-13		For testing cylindrical inside surface R11 ~ R13
5	HZ12.5-17		For testing cylindrical inside surface R12.5 ~ R17
6	HZ16.5-30		For testing cylindrical inside surface R16.5 ~ R30
7	K10-15		For testing spherical outside surface SR10 ~ SR15
8	K14.5-30		For testing spherical outside surface SR14.5 ~ SR30
9	HK11-13		For testing spherical inside surface SR11 ~ SR13
10	HK12.5-17		For testing spherical inside surface SR12.5 ~ SR17
11	HK16.5-30		For testing spherical inside surface SR16.5 ~ SR30
12	UN		For testing cylindrical outside surface, radius adjustable R10 ~