Equotip® 550 Leeb

- A956 / A370
- 16859
- 50156
- 17394
- 9378
- E140

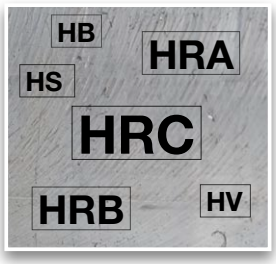
ASME CRTD-91

DGZfP Guideline MC 1

VDI / VDE Guideline 2616 Paper 1

Nordtest Technical Reports
99.12, 99.13, 99.36

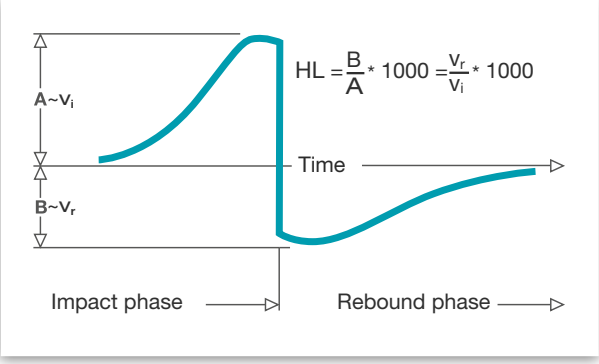
The global industry standard



Equotip Test Blocks Flyer

Leeb hardness principle is based on the dynamic (rebound) method. An impact body with a hard metal test tip is propelled by spring force against the surface of the test piece. Surface deformation takes place when the impact body hits the test surface, which results in loss of kinetic energy. This energy loss is detected by a comparison of velocities v_i and v_r when the impact body is at a precise distance from the surface for both the impact and rebound phase of the test, respectively.

Velocities are measured using a permanent magnet in the impact body that generates an induction voltage in the coil which is precisely positioned in the impact device. The detected voltage is proportional to the velocity of the impact body. Signal processing is then providing the hardness reading.



Equotip® Leeb Impact Devices

			D/DC	DL	S	E	G	C
Impact energy			11 Nmm	11 Nmm	11 Nmm	11 Nmm	90 Nmm	3 Nmm
Indenter			Tungsten carbide 3 mm	Tungsten carbide 2.8 mm	Ceramics 3 mm	Polycrystalline diamond 3 mm	Tungsten carbide 5 mm	Tungsten carbide 3 mm
Scope			Most commonly used probe. For the majority of applications.	Narrow indenter (probe) tip for measurement on hard reach areas or spaces with limited access.	For measurements in extreme hardness ranges. Tool steels with a high carbide content.	For measurements in extreme hardness ranges. Tool steels with high carbide content.	Large and heavy components, e.g. casts and forged parts.	For surface hardened components, coatings, thin or impact-sensitive parts.
Test blocks			<500 HLD ~600 HLD ~775 HLD	<710 HLDL ~780 HLDL ~890 HLDL	<815 HLS ~875 HLS	~740 HLE ~810 HLE	~450 HLG ~570 HLG	~565 HLC ~665 HLC ~835 HLC
Measuring Range								
Steel and cast steel	Vickers Brinell Rockwell Shore Rm N/mm²	HV HB HRB HRC HRA HS σ1 σ2 σ3	81-955 81-654 38-100 20-68 30-99 275-2194 616-1480 449-847	80-950 81-646 37-100 21-68 31-97 275-2297 614-1485 449-849	101-964 101-640 22-70 61-88 28-104 340-2194 615-1480 450-846	84-1211 83-686 20-72 61-88 29-103 283-2195 616-1479 448-849	 90-646 48-100 305-2194 618-1478 450-847	81-1012 81-694 20-70 30-102 275-2194 615-1479 450-846
Cold work tool steel	Vickers Rockwell	HV HRC	80-900 21-67	80-905 21-67	104-924 22-68	82-1009 23-70	*	98-942 20-67
Stainless steel	Vickers Brinell Rockwell	HV HB HRB HRC	85-802 85-655 46-102 20-62	*	119-934 105-656 70-104 21-64	88-668 87-661 49-102 20-64	*	*
Cast iron lamellar graphite GG	Brinell Vickers Rockwell	HB HV HRC	90-664 90-698 21-59	*	*	*	92-326	*
Cast iron, nodular graphite GGG	Brinell Vickers Rockwell	HB HV HRC	95-686 96-724 21-60	*	*	*	127-364 19-37	*
Cast aluminium alloys	Brinell Vickers Rockwell	HB HV HRB	19-164 22-193 24-85	20-187 21-191	20-184 22-196	23-176 22-198	19-168 24-86	21-167 23-85
Copper/zinc alloys (brass)	Brinell Rockwell	HB HRB	40-173 14-95	*	*	*	*	*
CuAl/CuSn-alloys (bronze)	Brinell	HB	60-290	*	*	*	*	*
Wrought copper alloys, low alloyed	Brinell	HB	45-315	*	*	*	*	*
Test Piece Requirements								
Surface preparation	Roughness grade class ISO 1302		N7				N9	N5
	Max. roughness depth R_t (µm / µinch)		10 / 400				30 / 1200	2.5 / 100
	Average roughness R_a (µm / µinch)		2 / 80				7 / 275	0.4 / 16
Minimum sample mass	Of compact shape (kg / lbs)		5 / 11				15 / 33	1.5 / 3.3
	On solid support (kg / lbs)		2 / 4.5				5 / 11	0.5 / 1.1
	Coupled on plate (kg / lbs)		0.05 / 0.2				0.5 / 1.1	0.02 / 0.045
Minimum sample thickness	Uncoupled (mm / inch)		25 / 0.98				70 / 2.73	15 / 0.59
	Coupled (mm / inch)		3 / 0.12				10 / 0.4	1 / 0.04
	Surface layer thickness (mm / inch)		0.8 / 0.03					0.2 / 0.008
Indentation size on test surface	With 300 HV, 30 HRC	Diameter (mm / inch)	0.54 / 0.021				1.03 / 0.04	0.38 / 0.015
		Depth (µm / µinch)	24 / 960				53 / 2120	12 / 480
	With 600 HV, 55 HRC	Diameter (mm / inch)	0.45 / 0.017				0.9 / 0.035	0.32 / 0.012
		Depth (µm / µinch)	17 / 680				41 / 1640	8 / 2560
	With 800 HV, 63 HRC	Diameter (mm / inch)	0.35 / 0.013					0.30 / 0.011
		Depth (µm / µinch)	10 / 400					7 / 280

*Custom conversion curve / correlation