MHR-45A

Surface Rockwell Hardness Tester

- Professional manufacturer, best quality with competitive price
- Recommended by the world UT NDT inspection association for training and examination
- Core technology with independent intellectual property rights, certificate of CE, GOST and etc..

Overview

Mitech MHR-45A Surface Rockwell Hardness Tester, based on the mechanical principle of conical diamond or hard alloy indenter pressing into the sample surface to produce indentation, realizing the material hardness measurement by measuring the depth of the indentation. According to statistics, Rockwell hardness testing is the most widely used hardness testing method in metal processing industry, which utilization ratio is more than 70%. With stable performance, easy operation, dial reading intuitive and convenient, it is widely used in metal processing and manufacturing, various metal material's failure analysis and other fields like colleges and research institutions, and it is the sophisticated detection equipment to test the surface hardness of metal and other materials.

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Technical Parameters

Technical specifications	Technical Parameters
Preliminary testing force	29.4N , tolerance±2.0%
Testing force	147N、294N、441N , tolerance±1.0%
Measuring range	HR15N : 70-91、HR30N : 42-80、HR45N : 20-70、 HR15T : 73-93、HR30T : 43-82、HR45T : 12-72
Testing force application Mode	Manual operation
Indentor specification	Diamond cone Rockwell indenter, Φ1.5875mm steel ball indenter.
Display	Mechanical dial
Rockwell scale	HR15N 、HR30N 、HR45N 、HR15T 、HR30T 、HR45T
Maximum height of specimen	170mm
Distance of indenter to outer wall	165mm
Power supply	AC220V/50Hz
Dimensions	510*212*700mm
Main unit Weight	65kg

Indication Error

Scale	Standard Hardness Range	Allowed Tolerance	Allowed Repetitivea[a]
15N	70~77 HR 15N	±2 HRN	≤0.04(100 - H) Or 1.2 Rockwell [b]
	78~88 HR 15N		
	89~91 HR 15N		
30N	42~54 HR 30N		
	55~73 HR 30N		
	74~80 HR 30N		
45N	20~31 HR 45N		
	32~61 HR 45N		
	63~70 HR 45N		
15T	73~80 HR 15T	±3 HRT	≤0.06(100 - H) Or 1.2 Rockwell [b]
	81~87 HR 15T		
	88~93 HR 15T		
30T	43~56 HR 30T		
	57~69 HR 30T		
	70~82 HR 30T		
45T	12~33 HR 45T		
	34~54 HR 45T		
	55~72 HR 45T		

a : H is the average hardness value ; b : greater is standard.

Relationship Between Testing Force and Counterweights

Scale	Testing force (N)	Counterweights force (code)
HR15N HR15T	147	boom+counterweight3
HR30N HR30T	294	boom+counterweight3+counterweight2
HR45N HR45T	441	boom+counterweight3+counterweight2+counterweight1

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Features

- Widely used for surface Rockwell hardness test with a variety of metal and non-metallic materials;
- Using the classic design of mechanical device, data reading intuitive and convenient, easy operation;
- Fast test speed, small indentation of the workpiece after testing ;
- Option for various specifications of the indenter, support many types of Rockwell hardness scales testing ;
- Diamond indenter, durable wear and accurate measurement;
- Consistent with GB/T231 and other relevant standards at home and abroad.

The Scope of Application

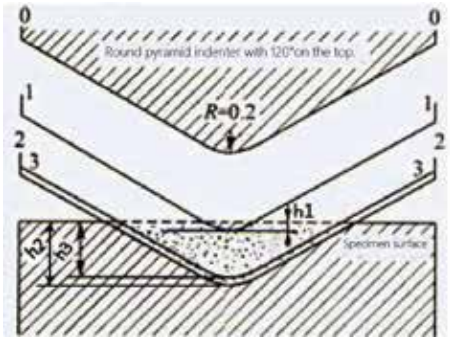
Different hardness test scale can measure different ranges of the sample materials and hardness.The commonly used rulers of the surface Rockwell hardness are N and T.It is mainly used to measure the Rockwell hardness value of the metal surface layer and metal thin surface.

scale	Indenter	Preliminary testing force	testing force	The scope of application
HR15N	diamond cone with 120°apex angle top spherical radius with 0.2mm	29.4 (N)	147.1(N)	Nitriding steel, various steel sheets, knives and other parts of the edge and the surface treatment part
HR30N			294.2(N)	
HR45N			441.3(N)	
HR15T	φ1.5875mm (1/16 inch steel ball)		147.1(N)	Soft steel, yellow steel, bronze, aluminum and other sheet
HR30T			294.2(N)	
HR45T			441.3(N)	

Working Principle

As is shown in the figure below, 0-0 is the position where the diamond indenter is not yet in contact with the specimen. 1-1 for the initial test force under the action of the indenter position, press the depth of h_1, the initial test is to eliminate the sample surface.It is not clean which is caused by the accuracy of the test results. In the figure, 2-2 is the position of the indenter under the total test force (initial test force and main test force), the pressing depth is h_2.3-3,and the position of the indenter after unloading the main test force, for metal elastic deformation will produce a certain recovery, so the actual pressure into the depth of h_3.The main test force caused by the plastic deformation of the indenter into the depth of h is h_3-h_1. Rockwell hardness value determined by the size of h, the greater the depth h, the lower the hardness; the other hand, and the higher the hardness. Each press 0.001mm is a surface Rockwell hardness unit. The hardness value obtained is called the surface Rockwell hardness value, denoted by the symbol HRN (T).

$$HRN\ (\ T\ )\ =\ 100\ -\ \frac{h}{0.001}$$



Rockwell hardness tester working principle Figure

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Working Conditions

- Operation Temperature：10～30℃；
- Relative Humidity：≤65%；
- The surrounding environment should avoid of vibration, strong magnetic field, corrosive medium and heavy dust.

Applications

- Used for quality control in metal processing manufacturing
- Used for failure analysis testing of metallic materials;
- Demonstration experiment for education and teaching in Colleges and Universities;
- Hardness testing of materials in scientific research institutions.

Configurations

	NO.	Name	QTY.	Remarks
	1	Main unit	1	
	2	Diamond Rockwell indenter	1	
	3	φ1.5875mm 1/16in ball indenter	1	
	4	Counterweights	3	
	5	Thermal printing paper	1	
	6	Small testing table	1	Diameter 40mm
Configuration	7	Large testing table	1	Diameter 150mm
instructions	8	V-shape testing table	1	Diameter 40mm,test cylindrical specimens
	9	Rockwell Standard Block HR15N	1	
	10	Surface Rockwell Standard Block HR30N	1	
	11	Surface Rockwell Standard Block HR30T	1	
	12	Plastic dust cover	1	
	13	Attached files	1	
	14	Instrument case	1	