

## Rockwell and Superficial Rockwell Hardness tester Calibration Report

Model: HR-1 Serial No.: 17046 Ambient Temperature: 20<sup>o</sup>C  
 Standard: ISO6508 ASTM E18 Date: 2019.9.27

**Calibrating Device:**

Standardized Rockwell hardness blocks.

*Note: The above-mentioned standard hardness blocks are verified by the standard Rockwell hardness testers Type HRBS-150, the standard blocks of which are traceable.*

**Visual Check:**

1. No scratch. No bubbling or cracking on coatings.
2. No scratch on the polished surface of the magnifier, and no inclined graduated lines.
3. The indicator glass has good transparency. No scratch.
4. Name plate and serial numbers are provided.

**Performance of Parts:**

1. The hand wheel and the test force loading assembly perform stable and smooth.
2. Wheel dial and the sleeve are assembled in a proper tightness without move.
3. The indicator hand runs neatly without block or abnormal skip.

**Hardness Values Inspection:**

Test block: <u>26.7 HRC</u>	Test block: <u>61 HRC</u>	Test block: <u>95.5 HRB</u>
Actual Reading: <u>27</u>	Actual Reading: <u>61</u>	Actual Reading: <u>95.5</u>
<u>27</u>	<u>61</u>	<u>95.5</u>
<u>27.5</u>	<u>61</u>	<u>95.5</u>
<u>27.5</u>	<u>61</u>	<u>96</u>
<u>27.5</u>	<u>61.5</u>	<u>96</u>
Average: <u>27.3</u>	Average: <u>61.1</u>	Average: <u>95.7</u>

Test block: _____	Test block: _____	Test block: _____
Actual Reading: _____	Actual Reading: _____	Actual Reading: _____
_____	_____	_____
_____	_____	_____
Average: _____	Average: _____	Average: _____

Inspector: 10.2.e \_\_\_\_\_  
 Supervisor: 10.2.e \_\_\_\_\_

### Appendix A: Technical Conditions for Rockwell, Superficial Rockwell Hardness Scales

Rockwell Hardness Scales / Initial Test Force: 10kg (98.07N)

Rockwell Hardness Scale	Hardness Symbol	Indenter Type	Total Test Force kg(N)	Applicable Range
A	HRA	Diamond cone	60kg (588.4N)	20~88HRA
B	HRB	Steel ball $\Phi$ 1.588mm	100kg (980.7N)	20~100HRB
C	HRC	Diamond cone	150kg (1471N)	20~70HRC
D	HRD	Diamond cone	100kg (980.7N)	40~77HRD
E	HRE	Steel ball $\Phi$ 3.175mm	100kg (980.7N)	70~100HRE
F	HRF	Steel ball $\Phi$ 1.588mm	60kg (588.4N)	60~100HRF
G	HRG	Steel ball $\Phi$ 1.588mm	150kg (1471N)	30~94HRG
H	HRH	Steel ball $\Phi$ 3.175mm	60kg (588.4N)	80~100HRH
K	HRK	Steel ball $\Phi$ 3.175mm	150kg (1471N)	40~100HRK

In accordance with International Standard: ISO6508-1999 Note: 9.8N=1kg

Superficial Rockwell Hardness Scales / Initial Test Force: 3kg (29.4N)

Superficial Rockwell Hardness Scales	Hardness Symbol	Indenter Type	Total Test Force kg(N)	Applicable Range
15N	HR15N		15kg (147.1)	70~94HR15N
30N	HR30N	Diamond cone	30kg (294.2)	42~86HR30N
45N	HR45N		45kg (441.3)	20~77HR45N
15T	HR15T	Steel ball	15kg (147.1)	67~93HR15T
30T	HR30T	Steel ball $\Phi$ 1.588mm	30kg (294.2)	29~82HR30T
45T	HR45T		45kg (441.3)	10~72HR45T

In accordance with International Standard: ISO6508-1999 Note: 9.8N=1kg

### Appendix B: Allowable Error and Repeatability of Rockwell Hardness Tester

Rockwell Hardness Scale	Hardness Range of Standard Block	Allowable Error for Rockwell Hardness Unit	Allowable Repeatability
A	20HRA~ $\leq$ 75HRA >75HRA~ $\leq$ 88HRA	$\pm$ 2HRA $\pm$ 1.5HRA	$\leq$ 0.02 (100- $\bar{H}$ ) or 0.8 Rockwell unit <sup>b</sup>
B	20HRB~ $\leq$ 45HRB >45HRB~ $\leq$ 80HRB >80HRB~ $\leq$ 100HRB	$\pm$ 4HRB $\pm$ 3HRB $\pm$ 2HRB	$\leq$ 0.04 (130- $\bar{H}$ ) or 1.2 Rockwell unit <sup>b</sup>
C	20HRC~ $\leq$ 70HRC	$\pm$ 1.5HRC	$\leq$ 0.02 (100- $\bar{H}$ ) or 0.8 Rockwell unit <sup>b</sup>
D	40HRD~ $\leq$ 70HRD >70HRD~ $\leq$ 77HRD	$\pm$ 2HRD $\pm$ 1.5HRD	$\leq$ 0.02 (100- $\bar{H}$ ) or 0.8 Rockwell unit <sup>b</sup>
E	70HRE~ $\leq$ 90HRE >90HRE~ $\leq$ 100HRE	$\pm$ 2.5HRE $\pm$ 2HRE	$\leq$ 0.04 (130- $\bar{H}$ ) or 1.2 Rockwell unit <sup>b</sup>
F	60HRF~ $\leq$ 90HRF >90HRF~ $\leq$ 100HRF	$\pm$ 3HRF $\pm$ 2HRF	$\leq$ 0.04 (130- $\bar{H}$ ) or 1.2 Rockwell unit <sup>b</sup>
G	30HRG~ $\leq$ 50HRG >50HRG~ $\leq$ 75HRG >75HRG~ $\leq$ 94HRG	$\pm$ 6HRG $\pm$ 4.5HRG $\pm$ 3HRG	$\leq$ 0.04 (130- $\bar{H}$ ) or 1.2 Rockwell unit <sup>b</sup>
H	80HRH~ $\leq$ 100HRH	$\pm$ 2HRH	$\leq$ 0.04 (130- $\bar{H}$ ) or 1.2 Rockwell unit <sup>b</sup>
K	40HRK~ $\leq$ 60HRK >60HRK~ $\leq$ 80HRK >80HRK~ $\leq$ 100HRK	$\pm$ 4HRK $\pm$ 3HRK $\pm$ 2HRK	$\leq$ 0.04 (130- $\bar{H}$ ) or 1.2 Rockwell unit <sup>b</sup>
N		$\pm$ 2HRN	$\leq$ 0.04 (100- $\bar{H}$ ) or 1.2 Rockwell unit <sup>b</sup>
T		$\pm$ 3HRT	$\leq$ 0.06 (100- $\bar{H}$ ) or 2.4 Rockwell unit <sup>b</sup>

a: " $\bar{H}$ " is the average hardness value. b: The greater value is valid.

In accordance with International Standard: ISO6508-1999