



Accreditation# 93289

Calibration Report #: 5142018-1.4M  
Purchase Order Number:  
Calibration Date: 5/14/2018  
Calibration Due Date: 5/14/2019  
Temperature: 68° F

# Certificate of Calibration

This is to certify that the following described Rockwell Hardness Tester has been calibrated using the indirect verification method within a range show below and has been found to be within tolerance and is in good working condition.

Customer:

Make: WilsonModel: 4 JR

Serial:

Indenter Serial A & C: 43772Indenter Serial B: 61426

## BEFORE CALIBRATION READINGS

Average Machine Reading	Test Block Serial No.	Test Block Reading	Error	Repeatability
AS FOUND DATA				
25.86	3742930	HRC 25.75 +/-1.0	+0.11 (Pass)	0.1
63.84	3738783	HRC 64.15 +/-0.5	-0.31 (Pass)	0.1
42.58	1773064	HRBW 42.89 +/- 1.5	-0.31 (Pass)	0.2
85.92	1541363	HRBW 86.33 +/- 1.0	-0.41 (Pass)	0.1
62.74	3739178	HRA 62.86 +/- 1.0	-0.12 (Pass)	0.4
82.86	3739742	HRA 83.37 +/- 0.5	-0.51 (Fail)	0.1

## AFTER CALIBRATION READINGS

Average Machine Reading	Test Block Serial No.	Test Block Reading	Error	Repeatability
AS FOUND DATA				
25.70	3742930	HRC 25.75 +/-1.0	-0.05 (Pass)	0.0
45.36	3742296	HRC 45.44 +/-1.0	-0.08 (Pass)	0.2
63.94	3738783	HRC 64.15 +/-0.5	-0.21 (Pass)	0.1
42.90	1773064	HRBW 42.89 +/- 1.5	+0.01 (Pass)	0.0
62.28	1773372	HRBW 62.12 +/- 1.0	+0.16 (Pass)	0.2
86.50	1541363	HRBW 86.33 +/- 1.0	+0.17 (Pass)	0.3
62.82	3739178	HRA 62.86 +/- 1.0	-0.04 (Pass)	0.1
72.96	3739458	HRA 73.22 +/- 1.0	-0.26 (Pass)	0.1
83.02	3739742	HRA 83.37 +/- 0.5	-0.35 (Pass)	0.1

**BEFORE CALIBRATION READINGS**

Test Block S/N 3742930	Test Block S/N 3738783
HRC 25.75 +/-1.0	HRC 64.15 +/-0.5
D1=25.8	D1=63.8
D2=25.8	D2=63.8
D3=25.9	D3=63.8
D4=25.9	D4=63.9
D5=25.9	D5=63.9
D=25.86	D=63.84
0.1 Repeatability	0.1 Repeatability

Test Block S/N 1773064	Test Block S/N 1541363
HRBW 42.89 +/- 1.5	HRBW 86.33 +/- 1.0
D1=42.5	D1=85.9
D2=42.5	D2=85.9
D3=42.5	D3=85.9
D4=42.7	D4=85.9
D5=42.7	D5=86.0
D=42.58	D=85.92
0.2 Repeatability	0.1 Repeatability

Test Block S/N 3739178	Test Block S/N 3739742
HRA 62.86 +/- 1.0	HRA 83.37 +/- 0.5
D1=62.5	<b>D1=82.8</b>
D2=62.5	<b>D2=82.8</b>
D3=62.9	<b>D3=82.9</b>
D4=62.9	<b>D4=82.9</b>
D5=62.9	<b>D5=82.9</b>
D=62.74	<b>D=82.86</b>
0.4 Repeatability	<b>0.1 Repeatability</b>



**AFTER CALIBRATION READINGS**

Test Block S/N 3742930	Test Block S/N 3742296	Test Block S/N 3738783
HRC 25.75 +/-1.0	HRC 45.44 +/-1.0	HRC 64.15 +/-0.5
D1=25.7	D1=45.2	D1=63.9
D2=25.7	D2=45.4	D2=63.9
D3=25.7	D3=45.4	D3=63.9
D4=25.7	D4=45.4	D4=64.0
D5=25.7	D5=45.4	D5=64.0
D=25.70	D=45.36	D=63.94
0.0 Repeatability	0.2 Repeatability	0.1 Repeatability

Test Block S/N 1773064	Test Block S/N 1773372	Test Block S/N 1541363
HRBW 42.89 +/- 1.5	HRBW 62.12 +/- 1.0	HRBW 86.33 +/- 1.0
D1=42.9	D1=62.2	D1=86.4
D2=42.9	D2=62.2	D2=86.4
D3=42.9	D3=62.2	D3=86.5
D4=42.9	D4=62.4	D4=86.5
D5=42.9	D5=62.4	D5=86.7
D=42.90	D=62.28	D=86.50
0.0 Repeatability	0.2 Repeatability	0.3 Repeatability

Test Block S/N 3739178	Test Block S/N 3739458	Test Block S/N 3739742
HRA 62.86 +/- 1.0	HRA 73.22 +/- 1.0	HRA 83.37 +/- 0.5
D1=62.8	D1=72.9	D1=83.0
D2=62.8	D2=72.9	D2=83.0
D3=62.8	D3=73.0	D3=83.0
D4=62.8	D4=73.0	D4=83.0
D5=62.9	D5=73.0	D5=83.1
D=62.82	D=72.96	D=83.02
0.1 Repeatability	0.1 Repeatability	0.1 Repeatability

Measurement Uncertainty: .04d

The above machine was serviced and all tests were made in strict conformity with A.S.T.M Designation E-18-16: Standard Test methods for Rockwell Hardness of Metallic Materials, Indirect verification method. Method of calibration is in accordance with ISO/IEC 17025: 2005 and ANSI/NC SL Z540.3-2006. All test blocks are manufactured and calibrate by David Ellis Company in accordance with ASTM-E-18. Our representative took 8 tests on test blocks calibrated to ASTM-E-18 standards. The average of these tests were within the limits as specified on the blocks. This report shall not be reproduced except in full. Results relate only to the items calibrated. The material covered by this certification has been calibrated or compared with master reference standards traceable to the National Institute of Standards Technology, Washington, DC.

Willrich Precision Instruments

By \_\_\_\_\_  
Quality Manager