



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

WILLIAMS HARDNESS TESTER
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 Cleveland, OH 44143
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CALIBRATION

Valid To: June 30, 2021

Certificate Number: 2286.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations¹:

I. Mechanical

Parameter/Equipment	Range	CMC ² (±)	Comments	
Indirect Verification of Rockwell Hardness and Rockwell Superficial Hardness Testers ³	HRA:		ASTM E18 w/ Wilson traceable reference blocks	
	(20 to 65) HRA	0.20 HRA		
	(70 to 78) HRA	0.24 HRA		
	(80 to 84) HRA	0.20 HRA		
	HRBW:			
	(38 to 59) HRBW	0.29 HRBW		
	(60 to 79) HRBW	0.23 HRBW		
	(80 to 100) HRBW	0.26 HRBW		
	HRC:			NIST traceable reference blocks
	(20 to 30) HRC	0.19 HRC		
(35 to 55) HRC	0.19 HRC			
(60 to 65) HRC	0.19 HRC			

Parameter/Equipment	Range	CMC ² (±)	Comments
Indirect Verification of Rockwell Hardness and Rockwell Superficial Hardness Testers ³ (cont)	<p>HR15N: (70 to 77) HR15N (78 to 88) HR15N (90 to 92) HR15N</p> <p>HR30N: (42 to 50) HR30N (55 to 73) HR30N (77 to 82) HR30N</p> <p>HR15TW: (73 to 80) HR15TW (81 to 86) HR15TW (87 to 93) HR15TW</p> <p>HR30TW: (40 to 56) HR30TW (57 to 69) HR30TW (70 to 83) HR30TW</p>	<p>0.25 HR15N 0.24 HR15N 0.19 HR15N</p> <p>0.25 HR30N 0.20 HR30N 0.20 HR30N</p> <p>0.20 HR15TW 0.38 HR15TW 0.38 HR15TW</p> <p>0.22 HR30TW 0.20 HR30TW 0.23 HR30TW</p>	ASTM E18 w/ Wilson traceable reference blocks
Indirect Verification of Microindentation Hardness Testers ³ (Knoop and Vickers)	<p>Repeatability under forces P (gf):</p> <p>$1 \leq P < 500$</p> <p>$250 < HK \leq 650$ $240 < HV \leq 600$</p> <p>$HK > 650$ $HV > 600$</p> <p>$500 \leq P \leq 1000$</p> <p>$100 \leq HK \leq 250$ $100 \leq HV \leq 240$</p> <p>$250 < HK \leq 650$ $240 < HV \leq 600$</p> <p>$HK > 650$ $HV > 600$</p>	<p>0.39 HK 0.22 HK</p> <p>0.28 HK 0.38 HV</p> <p>1.2 % of reading 0.26 HV</p> <p>0.28 HK 0.22 HK</p> <p>0.25 HK 0.24 HV</p>	<p>ASTM E384 w/ Wilson traceable reference blocks</p> <p>CMC is stated as the repeatability as defined in E384</p>

Parameter/Equipment	Range	CMC ² (±)	Comments
Direct Verification of Brinell Hardness Testers ³ –			ASTM E10
Verification of the Test Force	(3000, 1500, 500) kgf	0.25 % of reading	Verification of the test force is by proving ring per the method of ASTM E10
Verification of the Mean Diameter of the Indenter	(1, 2, 2.5, 5, 10) mm	0.07 µm	By mechanical comparison
Verification of the Device for Measuring Indentation Diameters	Type B Devices 5 mm 10 mm	0.01 mm 0.02 mm	ASTM E10 A1.4.6.2

¹ This laboratory offers commercial calibration service and field calibration service. The majority of the laboratory's services are performed in the field; however, portable hardness testers can be calibrated at the laboratory.

² Calibration and Measurement Capability Uncertainty (CMC) is the smallest uncertainty of measurement that a laboratory can achieve within its scope of accreditation when performing more or less routine calibrations of nearly ideal measurement standards or nearly ideal measuring equipment. CMCs represent expanded uncertainties expressed at approximately the 95 % level of confidence, usually using a coverage factor of $k = 2$. The actual measurement uncertainty of a specific calibration performed by the laboratory may be greater than the CMC due to the behavior of the customer's device and to influences from the circumstances of the specific calibration.

³ Field calibration service is available for this calibration and this laboratory meets A2LA R104 – *General Requirements: Accreditation of Field Testing and Field Calibration Laboratories* for these calibrations. Please note the actual measurement uncertainties achievable on a customer's site can normally be expected to be larger than the CMC found on the A2LA Scope. Allowance must be made for aspects such as the environment at the place of calibration and for other possible adverse effects such as those caused by transportation of the calibration equipment. The usual allowance for the actual uncertainty introduced by the item being calibrated, (e.g. resolution) must also be considered and this, on its own, could result in the actual measurement uncertainty achievable on a customer's site being larger than the CMC.



Accredited Laboratory

A2LA has accredited

WILLIAMS HARDNESS TESTER

Cleveland, OH

for technical competence in the field of

Calibration

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This laboratory also meets R205 – Specific Requirements: Calibration Laboratory Accreditation Program. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system *(refer to joint ISO-ILAC-IAF Communiqué dated April 2017)*.



Presented this 24th day of May 2019.

A blue ink signature of the Vice President of Accreditation Services.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 2286.01
Valid to June 30, 2021

For the calibrations to which this accreditation applies, please refer to the laboratory's Calibration Scope of Accreditation.