

United States Department of Commerce
National Institute of Standards and Technology



Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 200311-0

United Testing Sys. Canada, Ltd.
CONCORD ONT L4K 1K7
CANADA

*is accredited by the National Voluntary Laboratory Accreditation Program for specific services,
listed on the Scope of Accreditation, for:*

CALIBRATION LABORATORIES

*This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005.
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality
management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).*

2014-04-01 through 2015-03-31

Effective dates



A handwritten signature in black ink, appearing to read "William R. Mudd".

For the National Institute of Standards and Technology



National Voluntary Laboratory Accreditation Program



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SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

United Testing Sys. Canada, Ltd. 225 Bradwick Drive, #21 Concord Ontario L4K 1K7 CANADA Mr. David Fleming Phone: 905-669-5327 Fax: 905-738-5051 E-mail: service@utscanada.com URL: http://www.utscanada.com	Parameter(s) of Accreditation Dimensional Mechanical This laboratory is compliant to ANSI/NCSL Z540-1-1994; Part 1. (20/A01)
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CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) Notes 1,2

Measured Parameter or Device Calibrated	Range	Uncertainty ($k=2$) Note 3, 5	Remarks
DIMENSIONAL			
LENGTH & DIAMETER; STEP GAGES (20/D05)			
Extensometer Linear Calibrator Field calibrations available Note 4	0 in to 1.0 in 0 mm to 25.4 mm	$15 \mu\text{in} + 35L \mu\text{in}$ Note 8 $0.37 \mu\text{m} + 0.035L \mu\text{m}$ Note 9	ASTM E83
Extensometer Gage Length Field calibrations available Note 4	0.5 in 1.0 in 2.0 in	19 μm 39 μm 77 μm	ASTM 83, Gage Blocks
	0 in to 4 in 0 mm to 102 mm	0.001 in 25 μm	ASTM E83, Caliper
	0 in to 12 in 0 mm to 305 mm	0.0015 in 38 μm	ASTM E83, Caliper
Crosshead / Actuator Travel / Position Transducer Field calibrations available Note 4	0 in to 24 in 0 mm to 601 mm	0.002 in 51 μm	ASTM E2309, Caliper
	0 in to 2 in 0 mm to 50.8 mm	0.00015 in 3.8 μm	ASTM E2309, Micrometer Head
	0 in to 12 in 0 mm to 305 mm	0.0015 in 38 μm	ASTM E2309, Caliper

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CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) ^{Notes 1,2}

Measured Parameter or Device Calibrated	Range	Uncertainty ($k=2$) ^{Note 3, 5}	Remarks
Crosshead Speed / Actuator Speed	0 in to 1 in	$15\text{ }\mu\text{in} + 35L\text{ }\mu\text{in}$ ^{Note 8}	ASTM E2309, Linear Calibrator
	0 mm to 25.4 mm	$0.37\text{ }\mu\text{m} + 0.35L\text{ }\mu\text{m}$ ^{Note 9}	
	0.010 in/min to 40 in/min	0.25 %	ASTM E2658
	0.10 mm/min to 1000 mm/min	0.25 %	
Time Component		200 ms	Comparison to digital stopwatch
ELECTROMAGNETICS – DC/LOW FREQUENCY			
DC RESISTANCE AND CURRENT (20/E05)			
DC Current – Measure	0.1 mA to 20 mA	0.028 %	
DC VOLTAGE (20/E06)			
DC mV/V Voltage Ratio – Measure	0.1mV/V to 5 mV/V 0.1 V to 20 V	0.01 % 0.01 %	
MECHANICAL			
FORCE (20/M06)			
Alignment	1.00 % to 100 % Bending	3.8 % Bending	ASTM E1012
Force	0.0022 lbf to 112 404 lbf	0.02 %	ASTM E74, ISO 376
	0.0022 lbf to 300 000 lbf	0.05 %	
Force – Tension/Compression Field calibrations available ^{Note 4}	0.022 lbf to 1 000 000 lbf	0.25 %	ASTM E4, ISO 7500-1
	0.022 lbf to 112 404 lbf	0.12 %	
HARDNESS (20/M13)			
Durometer – Indenter Tip Extension	0 mm to 6.35 mm 0 in to 0.25 in	0.66 mm 26 μm	ASTM 2240, Gage Blocks Durometer Scales A, B, C, D, E 0, 00, 000, 0005
Force	0.1 N to 45 N	0.25 %	

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Measured Parameter or Device Calibrated	Range	Uncertainty (<i>k</i> =2) ^{Note 3, 5}	Remarks
Rockwell Hardness Testers Field calibrations available ^{Note 4}	1 Durometer Units to 100 Durometer Units	0.25 %	ASTM E4 Direct verification of Force is applicable to all Rockwell Testers. Direct verification of Depth is limited to United True Blue II model hardness testers.
Force	3 kgf to 150 kgf	0.25 %	
Depth	0 mm to 12 mm	0.0002 mm	
Rockwell Hardness Field calibrations available ^{Note 4}	Indirect Verification of Rockwell Hardness Testers and Rockwell Superficial Hardness		
Low Medium High	20 HRA to 60 HRA 60 HRA to 80 HRA 80 HRA to 100 HRA	0.42 HRA 0.19 HRA 0.20 HRA	ASTM E18, ISO 6508-2, ASTM E110
Low Medium High	20 HRBW to 50 HRBW 40 HRBW to 60 HRBW 60 HRBW to 70 HRBW	1.0 HRBW 0.73 HRBW 0.47 HRBW	
Low Medium High	20 HRC to 50 HRC 40 HRC to 60 HRC 60 HRC to 70 HRC	0.39 HRC 0.33 HRC 0.31 HRC	
Low Medium High	29.18 HRC 45.43 HRC 64.54 HRC	0.18 HRC 0.17 HRC 0.17 HRC	ASTM E18, ISO 6508-2, ASTM E110
Low Medium High	40 HRD to 55 HRD 55 HRD to 65 HRD 65 HRD to 77 HRD	0.12 HRD 0.10 HRD 0.09 HRD	
Low	50 HREW to 80 HREW	0.44 HREW	

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Measured Parameter or Device Calibrated	Range	Uncertainty ($k=2$) ^{Note 3, 5}	Remarks
Medium	80 HREW to 90 HREW	0.55 HREW	
High	90 HREW to 100 HREW	0.55 HREW	
Low	60 HRFW to 70 HRFW	0.54 HRFW	
Medium	70 HRFW to 85 HRFW	0.45 HRFW	
High	85 HRFW to 100 HRFW	0.45 HRFW	
Low	27 HRGW to 80 HRGW	0.68 HRGW	
Medium	80 HRGW to 94 HRGW	0.18 HRGW	
Low	80 HRHW to 95 HRHW	0.41 HRHW	
Medium	95 HRHW to 100 HRHW	0.38 HRHW	
High	100 HRHW to 105 HRHW	0.39 HRHW	
Low	40 HRKW to 60 HRKW	0.65 HRKW	
Medium	60 HRKW to 85 HRKW	0.63 HRKW	
High	85 HRKW to 100 HRKW	0.65 HRKW	
Low	100 HRLW to 120 HRLW	0.17 HRLW	
Medium	120 HRLW to 130 HRLW	0.12 HRLW	
Low	80 HRMW to 100 HRMW	0.53 HRMW	
Medium	100 HRMW to 110 HRMW	0.49 HRMW	
High	110 HRMW to 120 HRMW	0.41 HRMW	
Low	58 HRPW to 100 HRPW	0.56 HRPW	
Medium	100 HRPW to 112 HRPW	0.34 HRPW	
Low	100 HRRW to 115 HRRW	0.28 HRRW	
Medium	115 HRRW to 125 HRRW	0.32 HRRW	
High	100 HRRW to 130 HRRW	0.21 HRRW	
Low	100 HRSW to 120 HRSW	0.78 HRSW	
Medium	120 HRSW to 125 HRSW	0.25 HRSW	
Low	100 HRVW to 110 HRVW	0.24 HRVW	
Medium	110 HRVW to 121 HRVW	0.25 HRVW	

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CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) Notes 1,2

Measured Parameter or Device Calibrated	Range	Uncertainty ($k=2$) Note 3, 5	Remarks
Low	70 HR15N to 80 HR15N	0.46 HR15N	
Medium	70 HR15N to 90 HR15N	0.27 HR15N	
High	90 HR15N to 94 HR15N	0.22 HR15N	
Low	42 HR30N to 60 HR30N	0.39 HR30N	
Medium	60 HR30N to 77.5 HR30N	0.31 HR30N	
High	77.5 HR30N to 86 HR30N	0.27 HR30N	
Low	20 HR45N to 45 HR45N	0.45 HR45N	
Medium	45 HR45N to 66.5 HR45N	0.13 HR45N	
High	66.5 HR45N to 77 HR45N	0.16 HR45N	
Low	67 HR15TW to 75 HR15TW	0.42 HR15TW	
Medium	75 HR15TW to 85 HR15TW	0.37 HR15TW	
High	86 HR15TW to 93 HR15TW	0.35 HR15TW	
Low	25 HR30TW to 50 HR30TW	0.54 HR30TW	
Medium	50 HR30TW to 0 HR30TW	0.34 HR30TW	
High	70 HR30TW to 82 HR30TW	0.32 HR30TW	
Low	1 HR45TW to 30 HR45TW	0.47 HR45TW	
Medium	30 HR45TW to 50 HR45TW	0.61 HR45TW	
High	50 HR45TW to 75 HR45TW	0.41 HR45TW	
Low	70 HR15WW to 90 HR15WW	0.33 HR15WW	
Medium	90 HR15WW to 100 HR15WW	0.26 HR15WW	

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Measured Parameter or Device Calibrated	Range	Uncertainty ($k=2$) ^{Note 3, 5}	Remarks
Low	60 HR30WW to 80 HR30WW	0.40 HR30WW	
Medium	80 HR30WW to 95 HR30WW	0.40 HR30WW	
Low	25 HR45WW to 60 HR45WW	0.75 HR45WW	
Medium	60 HR45WW to 95 HR45WW	0.37 HR45WW	
Low	80 HR15XW to 90 HR15XW	0.38 HR15XW	
Medium	90 HR15XW to 100 HR15XW	0.09 HR15XW	
Low	65 HR30XW to 85 HR30XW	0.83 HR30XW	
Medium	85 HR30XW to 100 HR30XW	0.12 HR30XW	
Low	50 HR45XW to 85 HR45XW	0.54 HR45XW	
Medium	85 HR45XW to 95 HR45XW	0.11 HR45XW	
Low	85 HR15YW to 91 HR15YW	0.97 HR15YW	
Medium	91 HR15YW to 96 HR15YW	0.46 HR15YW	
High	96 HR15YW to 100 HR15YW	0.46 HR16YW	
Low	75 HR30YW to 90 HR30YW	0.18 HR30YW	
Medium	90 HR30YW to 100 HR30YW	0.22 HR30YW	

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Measured Parameter or Device Calibrated	Range	Uncertainty ($k=2$) Note 3, 5	Remarks
Low	65 HR45YW to 85 HR45YW	0.45 HR45YW	
Medium	85 HR45YW to 100 HR45YW	0.25 HR45YW	
Vickers Hardness Scale Field calibrations available Note 4			
Machine Parameter			
Indentation	0 mm to 7 mm 0.1 mm to 5 mm	0.8 μm 0.1 μm	Stage Micrometer ASTM E384
Force	10 gf to 120,000 gf	0.25 %	ASTM E74
Time		200 ms	Comparison to digital stopwatch
Vickers Hardness Testers at specified load			ASTM E92, ISO 6507-2, ASTM E384
1 kgf	278 HV	4.3 HV	
1 kgf	565 HV	11 HV	
2.5 kgf	253 HV	7.2 HV	
2.5 kgf	474 HV	5.5 HV	
2.5 kgf	760 HV	10 HV	
5 kgf	263 HV	6.3 HV	
5 kgf	457 HV	10 HV	
5 kgf	717 HV	11 HV	
10 kgf	264 HV	4.8 HV	
10 kgf	443 HV	5.5 HV	
10 kgf	713 HV	11 HV	
15 kgf	251 HV	3.0 HV	
15 kgf	466 HV	5.4 HV	
15 kgf	752 HV	11 HV	

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Measured Parameter or Device Calibrated	Range	Uncertainty ($k=2$) ^{Note 3, 5}	Remarks
30 kgf	253 HV	3.7 HV	ASTM E384, ISO 4545
30 kgf	470 HV	4 HV	
30 kgf	749 HV	14 HV	
50 kgf	174 HV	1.6 HV	
50 kgf	482 HV	4.7 HV	
50 kgf	774 HV	5.6 HV	
Knoop Hardness Scale Field calibrations available ^{Note 4}			
Knoop Micro Hardness Testers at specified load			
25 gf	233 HK	13 HK	
50 gf	231 HK	12 HK	
100 gf	193 HK	10 HK	
100 gf	318 HK	11 HK	
200 gf	311 HK	14 HK	
200 gf	703 HK	27 HK	
300 gf	219 HK	10 HK	
300 gf	570 HK	17 HK	
500 gf	217 HK	8.7 HK	
500 gf	559 HK	17 HK	
1000 gf	215 HK	7.5 HK	ASTM 384, ISO 6507-2
1000 gf	528 HK	9.6 HK	
Vickers Hardness Scale Field calibrations available ^{Note 4}			
Vickers Micro Hardness Testers at specified load			
25 gf	110 HV	6.5 HV	

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Measured Parameter or Device Calibrated	Range	Uncertainty ($k=2$) ^{Note 3, 5}	Remarks
50 gf	106 HV	4.9 HV	
100 gf	194 HV	9.1 HV	
100 gf	261 HV	11 HV	
200 gf	260 HV	11 HV	
200 gf	516 HV	15 HV	
300 gf	913 HV	5.2 HV	
300 gf	510 HV	13 HV	
500 gf	193 HV	4.0 HV	
500 gf	507 HV	11 HV	
1000 gf	194 HV	4.3 HV	
1000 gf	514 HV	11 HV	
Brinell Hardness Machine Parameters Field calibrations available ^{Note 4}			
Force	1.0 Kgf to 3000 Kgf	0.25 %	ASTM E4, ISO 7500-1
Indentation	0 mm to 7 mm	0.8 μ m	Stage Micrometer
Brinell Hardness Scale Field calibrations available ^{Note 4}			
Brinell Hardness Testers at specified load			
500 kgf	15 HBW to 100 HBW	1.2 HBW	ASTM E10, ISO 6506-2 ASTM E10, ISO 6506-2, ASTM E110
500 kgf	100 HBW to 158 HBW	4.8 HBW	
3000 kgf	200 HBW to 400 HBW	1.9 HBW	
300 kgf	400 HBW to 600 HBW	5.0 HBW	
LEEB Hardness	783 HLD	17 HLD	ASTM A956

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CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) Notes 1,2

Measured Parameter or Device Calibrated	Range	Uncertainty ($k=2$) Note 3, 5	Remarks
TORQUE (20/M15)			
Torque – Clockwise/Counter Clockwise	0.1 N-m to 5000 N-m 0.5 lbf-in to 50 000 lbf-in	0.05 % 0.05%	DIN 51309 / ASTM 2428 / ASME B107.14
Torque – Clockwise/Counter Clockwise Field calibrations available Note 4	0.1 N-m to 5000 N-m	0.25 %	DIN 51309
END			

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Notes

Note 1: A Calibration and Measurement Capability (CMC) is a description of the best result of a calibration or measurement (result with the smallest uncertainty of measurement) that is available to the laboratory's customers under normal conditions, when performing more or less routine calibrations of nearly ideal measurement standards or instruments. The CMC is described in the laboratory's scope of accreditation by: the measurement parameter/device being calibrated, the measurement range, the uncertainty associated with that range (see note 3), and remarks on additional parameters, if applicable.

Note 2: Calibration and Measurement Capabilities are traceable to the national measurement standards of the U.S. or to the national measurement standards of other countries and are thus traceable to the internationally accepted representation of the appropriate SI (Système International) unit.

Note 3: The uncertainty associated with a measurement in a CMC is an expanded uncertainty using a coverage factor, $k = 2$, with a level of confidence of approximately 95 %. Units for the measurand and its uncertainty are to match. Exceptions to this occur when marketplace practice employs mixed units, such as when the artifact to be measured is labeled in non-SI units and the uncertainty is given in SI units (Example: 5 lb weight with uncertainty given in mg).

Note 3a: The uncertainty of a specific calibration by the laboratory may be greater than the uncertainty in the CMC due to the condition and behavior of the customer's device and specific circumstances of the calibration. The uncertainties quoted do not include possible effects on the calibrated device of transportation, long term stability, or intended use.

Note 3b: As the CMC represents the best measurement results achievable under normal conditions, the accredited calibration laboratory shall not report smaller uncertainty of measurement than that given in a CMC for calibrations or measurements covered by that CMC.

Note 3c: As described in Note 1, CMCs cover calibrations and measurements that are available to the laboratory's customers under *normal conditions*. However, the laboratory may have the capability to offer special tests, employing special conditions, which yield calibration or measurement results with lower uncertainties. Such special tests are not covered by the CMCs and are outside the laboratory's scope of accreditation. In this case, NVLAP requirements for the labeling, on calibration reports, of results outside the laboratory's scope of accreditation apply. These requirements are set out in Annex A.1.h. of NIST Handbook 150, Procedures and General Requirements.

Note 4: Uncertainties associated with field service calibration may be greater as they incorporate on-site environmental contributions, transportation effects, or other factors that affect the measurements. (This note applies only if marked in the body of the scope.)

Note 5: Values listed with percent (%) are percent of reading or generated value unless otherwise noted.

Note 6: NVLAP accreditation is the formal recognition of specific calibration capabilities. Neither NVLAP nor NIST guarantee the accuracy of individual calibrations made by accredited laboratories.

Note 7: See NIST Handbook 150 for further explanation of these notes.

Note 8: Where L is the length in inches of device under test.

Note 9: Where L is the length in mm of device under test.

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