

# CLAS Certificate Number 2003-05

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**From:** National Research Council Canada

**Company name**

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**Clients served**

- All interested parties
- On-site calibration services are available for the capabilities for which it is indicated in the remarks column.

**Fields of calibration**

- Dimensional
- Mechanical

**SCC accreditation (ISO/IEC 17025)**

- Accredited Laboratory N° 503
- First issued 2003-10-07
- Issue 8.0e 2018-07-06

**i** This scope of calibration capabilities is published by the CLAS program of the National Research Council of Canada (NRC) in close co-operation with the laboratory accreditation program of the Standards Council of Canada (SCC), Canada's accreditation body for calibration and testing laboratories. The SCC accredits the capability of the named laboratory for being able to perform the listed calibrations at the given Calibration Measurement Capability (see Supplementary **note C** and **note D**) with traceability to the International System of Units (SI) or to standards acceptable to the CLAS program.

Measured Quantity & Range or Instrument	Calibration and Measurement Capability expressed as an Uncertainty ( $\pm$ ) (See <u>supplementary notes</u> )	Type of Service	Remarks
Gauge block CLTM-7 See note <sup>1</sup>			
Steel, length			
Inch, up to 4 inches	( 1.6 + 0.8 L ) $\mu$ inch (L in inches) or 2 $\mu$ inch, whichever greater	I	Using automatic comparator

Measured Quantity & Range or Instrument	Calibration and Measurement Capability expressed as an Uncertainty ( $\pm$ ) (See <u>supplementary notes</u> )	Type of Service	Remarks
Metric, up to 100 mm	( 0.041+ 0.0008 L ) $\mu\text{m}$ (L in mm) or 0.05 $\mu\text{m}$ , whichever greater		Using automatic comparator
Inch, up to 1 inch	( 4 + 0.7 L ) $\mu\text{inch}$ (L in inches)		Using manual comparator; direct comparison
Metric, up to 25 mm	( 0.11+ 0.0007 L ) $\mu\text{m}$ (L in mm)		Using manual comparator; direct comparison
Inch, up to 1 inch	( 7+ 0.7 L ) $\mu\text{inch}$ (L in inches)		Using manual comparator; wide-range
Metric, up to 25 mm	( 0.18+ 0.0007 L ) $\mu\text{m}$ (L in mm)		Using manual comparator; wide-range

Measured Quantity & Range or Instrument	Calibration and Measurement Capability expressed as an Uncertainty ( $\pm$ ) (See <u>supplementary notes</u> )	Type of Service	Remarks
Inch, 1 to 10 inches	$( 5 + 5.5 L ) \mu\text{inch}$ (L in inches)		Using manual comparator; direct comparison
Metric, 25 to 250 mm	$( 0.13 + 0.0055 L ) \mu\text{m}$ (L in mm)		Using manual comparator; direct comparison
Inch, 12 to 20 inches	47 $\mu\text{inch}$		Using CMM
Metric, 300 to 500 mm	1.2 $\mu\text{m}$		Using CMM
Ceramic, length See note <sup>1</sup>	$( 1.6 + 0.7 L ) \mu\text{inch}$ (L in inches) or 2 $\mu\text{inch}$ , whichever greater	I	Using automatic comparator

Measured Quantity & Range or Instrument	Calibration and Measurement Capability expressed as an Uncertainty ( $\pm$ ) (See <u>supplementary notes</u> )	Type of Service	Remarks
Metric, up to 100 mm	( 0.04+ 0.0007 L ) $\mu$ m (L in mm) or 0.05 $\mu$ m, whichever greater		Using automatic comparator
Gauge Block See note <sup>2</sup>	1 $\mu$ inch or 0.025 $\mu$ m	I	Using automatic comparator
Variation in length (parallelism)	1 $\mu$ inch or 0.025 $\mu$ m	I	Using automatic comparator
Height gauge	( 51+ 2.0 L ) $\mu$ inch (L in inches)	II	See note <sup>3</sup>
Metric, up to 1000 mm	( 1.3+ 0.002 L ) $\mu$ m (L in mm)		
Micrometer Head			

<b>Measured Quantity &amp; Range or Instrument</b>	<b>Calibration and Measurement Capability expressed as an Uncertainty (<math>\pm</math>) (See <u>supplementary notes</u>)</b>	<b>Type of Service</b>	<b>Remarks</b>
<b>Inch, up to 2 inches</b>	30 $\mu$ inch	II	See note <sup>3</sup>
<b>Metric, up to 50 mm</b>	0.6 $\mu$ m		
<b>Outside</b>			
<b>Inch, up to 6 inches</b>	( 45 + 2 L ) $\mu$ inch (L in inches)	II	See note <sup>3</sup>
<b>Inch, &gt; 6 to 20 inches</b>	( 50 + 4.2 L ) $\mu$ inch (L in inches)		
<b>Metric, up to 500 mm</b>	( 1.0 + 0.0042 L ) $\mu$ m (L in mm)		
<b>Depth</b>			
<b>Inch, up to 6 inches</b>	( 45 + 2.2 L ) $\mu$ inch (L in inches)	II	See note <sup>3</sup>
<b>Inch, &gt; 6 to 12 inches</b>	( 55 + 3.8 L ) $\mu$ inch (L in inches)		
<b>Metric, up to 300 mm</b>	( 1.1 + 0.0036 L ) $\mu$ m (L in mm)		

<b>Measured Quantity &amp; Range or Instrument</b>	<b>Calibration and Measurement Capability expressed as an Uncertainty (<math>\pm</math>) (See <u>supplementary notes</u>)</b>	<b>Type of Service</b>	<b>Remarks</b>
<b>Tubular inside</b>			
<b>Inch, up to 2 inches</b>	$( 50 + 0.8 L ) \mu\text{inch}$ (L in inches)	II	See note <sup>3</sup>
<b>Inch, &gt; 2 to 24 inches</b>	$( 60 + 4.4 L ) \mu\text{inch}$ (L in inches)		
<b>Metric, up to 600 mm</b>	$( 1.0 + 0.005 L ) \mu\text{m}$ (L in mm)		
<b>Three point internal</b>			
<b>Inch, up to 7 inches</b>	$( 75 + 1.6 L ) \mu\text{inch}$ (L in inches)	II	See note <sup>3</sup>
<b>Metric, up to 175 mm</b>	$( 1.3 + 0.0032 L ) \mu\text{m}$ (L in mm)		
<b>Indicator tester</b>			
<b>Inch, up to 1 inch</b>	30 $\mu\text{inch}$	II	See note <sup>3</sup>
<b>Metric, up to 25 mm</b>	0.6 $\mu\text{m}$		

<b>Measured Quantity &amp; Range or Instrument</b>	<b>Calibration and Measurement Capability expressed as an Uncertainty (<math>\pm</math>) (See <u>supplementary notes</u>)</b>	<b>Type of Service</b>	<b>Remarks</b>
<b>Bore gauge (2 points)</b>			
<b>Inch, up to 4 inches</b>	$( 50 + 0.3 L ) \mu\text{inch}$ (L in inches)	II	See note <sup>3</sup>
<b>Metric, up to 100 mm</b>	$( 1.1 + 0.0006 L ) \mu\text{m}$ (L in mm)		
<b>Indicator</b>			
<b>Dial</b>			
<b>Inch, 0.00005 inch graduations</b>	14 $\mu\text{inch}$	II	Up to 4 inch travel
<b>Inch, 0.0001 inch graduations</b>	20 $\mu\text{inch}$		
<b>Metric, 0.001 mm graduations</b>	0.3 $\mu\text{m}$		Up to 100 mm travel



Measured Quantity & Range or Instrument	Calibration and Measurement Capability expressed as an Uncertainty ( $\pm$ ) (See <u>supplementary notes</u> )	Type of Service	Remarks
Metric, 0.002 mm graduations	0.4 $\mu$ m		
Metric, 0.02 mm graduations	3.0 $\mu$ m		
Digital			
Inch, 0.00005 inch resolution	30 $\mu$ inch	II	Up to 4 inch travel
Metric, 0.0005 mm resolution	0.4 $\mu$ m		Up to 100 mm travel
Metric, 0.001 mm resolution	0.7 $\mu$ m		
Metric, 0.01 mm resolution	5.8 $\mu$ m		

**Caliper**

**Outside, Inside and Depth**

**Inch**

<b>Measured Quantity &amp; Range or Instrument</b>	<b>Calibration and Measurement Capability expressed as an Uncertainty (<math>\pm</math>) (See <u>supplementary notes</u>)</b>	<b>Type of Service</b>	<b>Remarks</b>
<b>up to 24 inches</b>	$( 290 + 1.6 L ) \mu\text{inch}$ (L in inches)	II	See note <sup>1</sup>
<b>&gt; 24 to 40 inches</b>			
<b>0.0005 inch resolution</b>	$( 400 + 14 L ) \mu\text{inch}$ (L in inches)	II	See note <sup>1</sup>
<b>0.001 inch resolution</b>	$( 1000 + 10 L ) \mu\text{inch}$ (L in inches)		
<b>Metric</b>			
<b>up to 600 mm</b>	$( 5.8 + 0.002 L ) \mu\text{m}$ (L in mm)	II	See note <sup>1</sup>
<b>&gt; 600 to 1000 mm</b>			
<b>0.01 mm resolution</b>	$( 7.5 + 0.014 L ) \mu\text{m}$ (L in mm)	II	See note <sup>1</sup>
<b>0.02 mm resolution</b>	$( 20 + 0.010 L ) \mu\text{m}$ (L in mm)		

**Depth gauge**

**Dial Caliper Type**

<b>Measured Quantity &amp; Range or Instrument</b>	<b>Calibration and Measurement Capability expressed as an Uncertainty (<math>\pm</math>) (See <u>supplementary notes</u>)</b>	<b>Type of Service</b>	<b>Remarks</b>
<b>Inch, up to 12 inches</b>	0.0024 inch	II	See note <sup>3</sup>
<b>Metric, up to 300 mm</b>	60 $\mu\text{m}$		
<b>Dial Indicator Type</b>			
<b>Inch, up to 12 inches</b>	580 $\mu\text{inch}$	II	See note <sup>3</sup>
<b>Metric, up to 300 mm</b>	12 $\mu\text{m}$		
<b>Digital Caliper Type</b>			
<b>Inch, up to 12 inches</b>	290 $\mu\text{inch}$	II	See note <sup>3</sup>
<b>Metric, up to 300 mm</b>	6 $\mu\text{m}$		
<b>Digital Indicator Type</b>			
<b>Inch, up to 12 inches</b>	( 30 + 2 L ) $\mu\text{inch}$ (L in inches)	II	See note <sup>3</sup>

<b>Measured Quantity &amp; Range or Instrument</b>	<b>Calibration and Measurement Capability expressed as an Uncertainty (<math>\pm</math>) (See <u>supplementary notes</u>)</b>	<b>Type of Service</b>	<b>Remarks</b>
<b>Metric, up to 300 mm</b>	$(0.6 + 0.0025 L) \mu\text{m}$ (L in mm)		
<b>Vernier Caliper Type</b>			
<b>Inch, up to 12 inches</b>	1200 $\mu\text{inch}$	II	See note <sup>3</sup>
<b>Metric, up to 300 mm</b>	24 $\mu\text{m}$		
<b>External caliper gauge</b>			
<b>Inch, up to 4 inches</b>			
<b>0.0002 inch resolution</b>	120 $\mu\text{inch}$	II	See note <sup>1</sup>
<b>0.0005 inch resolution</b>	290 $\mu\text{inch}$		
<b>0.001 inch resolution</b>	580 $\mu\text{inch}$		
<b>0.002 inch resolution</b>	1200 $\mu\text{inch}$		

Measured Quantity & Range or Instrument	Calibration and Measurement Capability expressed as an Uncertainty ( $\pm$ ) (See <u>supplementary notes</u> )	Type of Service	Remarks
0.005 inch resolution	2900 $\mu$ inch		
<b>Metric, up to 100 mm</b>			
0.005 mm resolution	2.9 $\mu$ m	II	See note <sup>1</sup>
0.01 mm resolution	5.8 $\mu$ m		
0.02 mm resolution	12 $\mu$ m		
0.05 mm resolution	29 $\mu$ m		
0.1 mm resolution	58 $\mu$ m		
<b>Internal caliper gauge</b>			
<b>Inch, up to 4 inches</b>			
0.0002 inch resolution	120 $\mu$ inch	II	See note <sup>1</sup>

Measured Quantity & Range or Instrument	Calibration and Measurement Capability expressed as an Uncertainty ( $\pm$ ) (See <u>supplementary notes</u> )	Type of Service	Remarks
0.0005 inch resolution	290 $\mu$ inch		
0.001 inch resolution	580 $\mu$ inch		
<b>Metric, up to 100 mm</b>			
0.005 mm resolution	2.9 $\mu$ m	II	See note <sup>1</sup>
0.01 mm resolution	5.8 $\mu$ m		
0.02 mm resolution	12 $\mu$ m		
<b>Thickness gauge</b>			
Inch, up to 1 inch	290 $\mu$ inch	II	See note <sup>3</sup>
Metric, up to 25 mm	5.8 $\mu$ m		
<b>Profile projector</b>			

Measured Quantity & Range or Instrument	Calibration and Measurement Capability expressed as an Uncertainty ( $\pm$ ) (See <u>supplementary notes</u> )	Type of Service	Remarks
Linearity of movement: Digital readout type	( 1.6 + 0.021 L ) $\mu\text{m}$ (L in mm)	III	See note <sup>3</sup> On-site calibration available.
Linearity of movement: Micrometer head type	( 1.6 + 0.017 L ) $\mu\text{m}$ (L in mm)		
Magnification error	( 13+0.017 L ) $\mu\text{m}$ (L in mm)		
Squareness of stage	0.7 $\mu\text{m}$		
Eccentricity of screen rotation	1.6 $\mu\text{m}$		
Parallelism of stage	1.7 $\mu\text{m}$		
Accuracy of edge finder	1.0 $\mu\text{m}$		
I-Checker			

<b>Measured Quantity &amp; Range or Instrument</b>	<b>Calibration and Measurement Capability expressed as an Uncertainty (<math>\pm</math>) (See <u>supplementary notes</u>)</b>	<b>Type of Service</b>	<b>Remarks</b>
<b>25 to 100 mm</b>	$(0.13 + .0027 L) \mu\text{m}$ , L is in mm	II	See note <sup>1</sup>
<b>1 to 4 inches</b>	$(5.1 + 2.7 L) \mu\text{inch}$ , L is in inch		

**Mu-checker: Graduation**

<b>0.1 <math>\mu\text{m}</math></b>	0.3 $\mu\text{m}$	II	See note <sup>1</sup>
<b>0.5 <math>\mu\text{m}</math></b>	0.3 $\mu\text{m}$		
<b>1 <math>\mu\text{m}</math></b>	0.4 $\mu\text{m}$		
<b>5 <math>\mu\text{m}</math></b>	1.5 $\mu\text{m}$		
<b>10 <math>\mu\text{m}</math></b>	2.9 $\mu\text{m}$		
<b>50 <math>\mu\text{m}</math></b>	15 $\mu\text{m}$		
<b>0.000005 inch</b>	10 $\mu\text{inch}$		
<b>0.00001 inch</b>	10 $\mu\text{inch}$		
<b>0.00005 inch</b>	17 $\mu\text{inch}$		
<b>0.0001 inch</b>	30 $\mu\text{inch}$		



<b>Measured Quantity &amp; Range or Instrument</b>	<b>Calibration and Measurement Capability expressed as an Uncertainty (<math>\pm</math>) (See <u>supplementary notes</u>)</b>	<b>Type of Service</b>	<b>Remarks</b>
<b>0.0005 inch</b>	150 $\mu$ inch		
<b>0.001 inch</b>	290 $\mu$ inch		
<b>Riser block</b>			
<b>150 to 600 mm</b>	( 0.4 + 0.002 L ) $\mu$ m , L is in mm	II	See note <sup>1</sup>
<b>6 to 24 inches</b>	( 16 + 2 L ) $\mu$ inch , L is in inch		
<b>Height masters</b>			
<b>Up to 300 mm</b>	( 0.5 + 0.002 L ) $\mu$ m , L is in mm	II	See note <sup>1</sup>
<b>Up to 12 inches</b>	( 20 + 2 L ) $\mu$ inch , L is in inch		
<b>Step gauge (checkmaster)</b>			
<b>Up to 1010 mm</b>	( 0.39 + 0.0014 L ) $\mu$ m where L is the length in mm	II	See note <sup>13</sup>

Measured Quantity & Range or Instrument	Calibration and Measurement Capability expressed as an Uncertainty ( $\pm$ ) (See <u>supplementary notes</u> )	Type of Service	Remarks
> 1010 up to 1710 mm	( 0.61 + 0.0018 L ) $\mu\text{m}$ where L is the length in mm		
Up to 40 inch	( 15.4 + 1.4 L ) $\mu\text{inch}$ where L is the length in inches		
> 40 Inch up to 70 Inch	( 24 + 1.8 L ) $\mu\text{inch}$ where L is the length in inches		
<b>Micrometer standard</b>			
5 to 500 mm	( 0.32 + 0.002 L ) $\mu\text{m}$ where L is the length in mm	II	See note <u>13</u>
> 500 up to 1000 mm	( 0.69 + 0.004 L ) $\mu\text{m}$ where L is the length in mm		

Measured Quantity & Range or Instrument	Calibration and Measurement Capability expressed as an Uncertainty ( $\pm$ ) (See <u>supplementary notes</u> )	Type of Service	Remarks
0.2 to 20 inches	( 12.6 + 2 L ) $\mu$ inch where L is the length in inches		
> 20 up to 40 inches	( 27.2 + 4 L ) $\mu$ inch where L is the length in inches		

**Flatness**

**for granite or steel surfaces requiring an accuracy of greater than 0.4  $\mu$ m**

1 x 1 mm to 900 x 1000 mm	( 0.34 + 0.002 L ) $\mu$ m where L is the maximum length in mm	II	See note <sup>15</sup>
0.04 x 0.04 inch to 35 x 40 inch	( 13 + 2 L ) $\mu$ inch where L is the maximum length in inches		

**Cylindrical ring gauge: Diameter**

<b>Measured Quantity &amp; Range or Instrument</b>	<b>Calibration and Measurement Capability expressed as an Uncertainty (<math>\pm</math>) (See <u>supplementary notes</u>)</b>	<b>Type of Service</b>	<b>Remarks</b>
<b>3 to 500 mm</b>	( $0.46 + 0.002D$ ) $\mu\text{m}$ where D is the diameter in mm	II	See note <sup>13</sup>
<b>0.12 to 20 inches</b>	( $18.1 + 2.0D$ ) $\mu\text{inch}$ where D is the diameter in inches		
<b>Cylindrical plug gauges: Diameter</b>			
<b>3 to 500 mm</b>	( $0.30 + 0.002D$ ) $\mu\text{m}$ where D is the diameter in mm	II	See note <sup>13</sup>
<b>0.12 to 20 inches</b>	( $11.8 + 2.0D$ ) $\mu\text{inch}$ where D is the diameter in inches		
<b>Test spheres</b>			
<b>Diameter</b>			
<b>8 to 50 mm</b>	0.4 $\mu\text{m}$	II	See note <sup>13</sup>
<b>0.3 to 2 inches</b>	16 $\mu\text{inch}$		
<b>Form</b>			

Measured Quantity & Range or Instrument	Calibration and Measurement Capability expressed as an Uncertainty ( $\pm$ ) (See <u>supplementary notes</u> )	Type of Service	Remarks
8 to 50 mm	( 0.05 + 0.007R ) $\mu\text{m}$ where R is the measured roundness in $\mu\text{m}$	II	See note <sup>14</sup>
0.3 to 2 inches	( 2.0 + 0.007R ) $\mu\text{inch}$ where R is the measured roundness in $\mu\text{inch}$		
<b>Roundness</b>			
Diameter of 2 to 200 mm	( 0.05 + 0.007R ) $\mu\text{m}$ where R is the measured roundness in $\mu\text{m}$	II	See note <sup>14</sup>
Diameter of 0.8 to 8 inches	( 2.0 + 0.007R ) $\mu\text{inch}$ where R is the measured roundness in $\mu\text{inch}$		
<b>Precision squares</b>			

<b>Measured Quantity &amp; Range or Instrument</b>	<b>Calibration and Measurement Capability expressed as an Uncertainty (<math>\pm</math>) (See <u>supplementary notes</u>)</b>	<b>Type of Service</b>	<b>Remarks</b>
<b>50 to 800 mm</b>	( 0.3 + 0.003 L ) $\mu\text{m}$ where L is the length in mm	II	See note <u>15</u>
<b>2 to 32 inch</b>	( 12 + 3 L ) $\mu\text{inch}$ where L is the length in inches		

**Parallels: Granite or steel**

**5 to 1000 mm**

<b>Parallelism</b>	( 0.33 + 0.002 L ) $\mu\text{m}$ where L is the length in mm	II	See note <u>13</u>
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<b>Width</b>	( 0.83 + 0.001 L ) $\mu\text{m}$ where L is the length in mm		
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**0.2 to 40 inches**

<b>Parallelism</b>	( 13.0 + 2 L ) $\mu\text{inch}$ where L is the length in inches	II	See note <u>13</u>
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Measured Quantity & Range or Instrument	Calibration and Measurement Capability expressed as an Uncertainty ( $\pm$ ) (See <u>supplementary notes</u> )	Type of Service	Remarks
Width	( 32.7 + 1.0 L ) $\mu$ inch where L is the length in inches		
<b>Mitutoyo contracer and form tracers</b>			
<b>Up to 200 mm Horizontal Axis:</b>			
Measurement of Stylus Radius	( 1.21 + 0.004D ) $\mu$ m where D is measured Radius length in mm	III	On-site services as per FSTM-11
Detector Accuracy	( 0.33 + 0.0007L ) $\mu$ m where L is the length in mm		
X and Y Axis	( 0.46 + 0.004L ) $\mu$ m where L is measurement length in mm		
Straightness	0.09 $\mu$ m		
Surface roughness	0.07 $\mu$ m		

Measured Quantity & Range or Instrument	Calibration and Measurement Capability expressed as an Uncertainty ( $\pm$ ) (See <u>supplementary notes</u> )	Type of Service	Remarks
<b>Coordinate measuring machines (CMM)</b>			
<b>Acceptance and reverification tests for CMM - CMMs used for measuring size</b>			On-site services as per ISO 10360-2 2009 edition and 2001 edition.
See note <sup>9</sup>			
<b>Error of Indication</b>			
<b>0 to 1.5 m</b>	( 0.12 + 0.00004 L ) $\mu\text{m}$ where L is the length in mm	III	See note <sup>10</sup>
<b>0 to 40 m</b>	( 0.16 + 0.0006 L ) $\mu\text{m}$ where L is the length in mm		See note <sup>11</sup>
<b>Probing Error</b>			



Measured Quantity & Range or Instrument	Calibration and Measurement Capability expressed as an Uncertainty ( $\pm$ ) (See <u>supplementary notes</u> )	Type of Service	Remarks
10 to 50 mm in sphere diameter	0.14 $\mu\text{m}$	III	See note <u>12</u>

### Mitutoyo optic coordinate measuring machines

#### Up to 600 mm

Length Measurement Error: $E_{UXY}$	$(0.25 + 0.39 \times L/1000)$ $\mu\text{m}$ at $k=2$ where L is measured Length in mm	III	On-site services according to ISO 10360-7: 2011 and FSTM-8 See note <u>17</u> See note <u>18</u>
Length Measurement Error: $E_{UZ}$	$(0.27 + 0.60 \times L/1000)$ $\mu\text{m}$ at $k=2$ where L is measured Length in mm		
Squareness Error: $E_{SQ}$	$(1.79 + 0.003L)$ $\mu\text{m}$ at $k=2$ where L is measured Length in mm		
Probing Error: $P_{F2D}$	0.13 $\mu\text{m}$		

<b>Measured Quantity &amp; Range or Instrument</b>	<b>Calibration and Measurement Capability expressed as an Uncertainty (<math>\pm</math>) (See <u>supplementary notes</u>)</b>	<b>Type of Service</b>	<b>Remarks</b>
<b>Probing Error: P<sub>FV2D</sub></b>	0.13 $\mu\text{m}$		
<b>Surface roughness</b>			
<b>R<sub>a</sub> up to 4.1 <math>\mu\text{m}</math></b>			
R <sub>a</sub>	0.07 $\mu\text{m}$	II	See note <u>16</u>
R <sub>max</sub> , R <sub>y</sub>	0.29 $\mu\text{m}$		
<b>R<sub>a</sub> up to 160 <math>\mu\text{inches}</math></b>			
R <sub>a</sub>	3 $\mu\text{inches}$	II	See note <u>16</u>
R <sub>max</sub> , R <sub>y</sub>	11 $\mu\text{inches}$		
<b>Hardness</b>			
<b>Indirect verification of Rockwell hardness testers</b>			
<b>HRA</b>	Governed by the uncertainty of the standardized test block used to perform the indirect verification	III	ASTM E18
<b>HRB</b>			Standardized
<b>HRC</b>			Test Blocks per ASTM E18
<b>HRD</b>			See notes <u>4</u> , <u>7</u> and <u>8</u> .

Measured Quantity & Range or Instrument	Calibration and Measurement Capability expressed as an Uncertainty ( $\pm$ ) (See <u>supplementary notes</u> )	Type of Service	Remarks
HRE			On-site calibration available.
<b>Indirect verification of Rockwell Superficial hardness testers</b>			
HR15T	Governed by the uncertainty of the standardized test block used to perform the indirect verification	III	ASTM E18
HR30T			Standardized Test Blocks per
HR15N			ASTM E18
HR30N			See notes <sup>4</sup> , <sup>7</sup> and <sup>8</sup> .
<b>Indirect verification of Vickers and Knoop micro-indentation hardness testers</b>			
HV	Governed by the uncertainty of the standardized test block used to perform the indirect verification	III	ASTM E384
HK			Standardized Test Blocks per
<b>Indirect verification of Vickers hardness testers</b>			ASTM E384
			See notes <sup>5</sup> , <sup>7</sup> and <sup>8</sup> .
			On-site calibration available.

Measured Quantity & Range or Instrument	Calibration and Measurement Capability expressed as an Uncertainty ( $\pm$ ) (See <u>supplementary notes</u> )	Type of Service	Remarks
HV	Governed by the uncertainty of the standardized test block used to perform the indirect verification	III	ASTM E92 Standardized Test Blocks per ASTM E92 See notes <sup>6</sup> , <sup>7</sup> and <sup>8</sup> . On-site calibration available.

**Indirect verification of Rockwell and Vickers portable hardness testers**

HRC	Governed by the uncertainty of the standardized test block used to perform the indirect verification	III	ASTM E18 and E92 Standardized Test Blocks per ASTM E18 & E92 See notes <sup>4</sup> , <sup>6</sup> , <sup>7</sup> and <sup>8</sup> . On-site calibration available.
HV			

- 1 The Calibration Measurement Capability (CMC) listed can be achieved only if the standards being calibrated are suitable for such a measurement. The uncertainty stated on a calibration report will reflect the uncertainty contribution of the standards that were calibrated.
- 2 This measured quantity is commonly known as parallelism of gauge blocks.
- 3 The Calibration Measurement Capability listed is based on the calibration of an instrument with a resolution of 0.001 mm. The uncertainty stated on the calibration report will reflect the uncertainty contribution of the specific instrument that was calibrated.
- 4 The Indirect Verification of Rockwell Hardness Testers and Rockwell Superficial Hardness Testers is performed according to the requirements of ASTM E18.
- 5 The Indirect Verification of Knoop and Vickers Micro Hardness Testers is performed according to the requirements of ASTM E384.
- 6 The Indirect Verification of Vickers Hardness Testers is performed according to the requirements of ASTM E92.
- 7 ASTM E18, E384 and E92 are published by the ASTM International (ASTM).
- 8 The uncertainty of the hardness tester being calibrated is calculated for each specific test point and is dependant on the uncertainty of the specific hardness test block used and on the performance characteristics of the hardness tester itself.

- 9 The conformance to specification of the CMM is made in accordance with ISO 14253-1 taking into account all test measurement uncertainties.
- 10 This CMC is obtained using a low expansion artefact being at least 66% of the longest spatial diagonal of the measuring volume of the CMM, and the shortest size being less than 30 mm, over a temperature ranging from 19.5 to 20.5°C.
- 11 This CMC is obtained using a laser interferometer measuring technique, over a temperature ranging from 19.5 to 20.5°C.
- 12 The reference sphere supplied with the CMM will not be used for this test.
- 13 Calibrated in comparison with traceable standards using a Legex CMM.
- 14 Calibrated in comparison with traceable standards using a roundness tester.
- 15 Calibrated using a Legex CMM.
- 16 ASME B46.1
- 17 For imaging probe CMM capable of 3D and 2D measurements, using the component approach.
- 18 Limited to unidirectional measurements.

**Date modified:**

2019-10-30





Standards Council of Canada  
Conseil canadien des normes

Program for Accreditation of Laboratories – Canada  
Programme d'accréditation des laboratoires – Canada



National Research  
Council Canada

Conseil national  
de recherches Canada

Calibration Laboratory Assessment Service  
Service d'évaluation de laboratoires d'étalonnage

## CERTIFICATE OF ACCREDITATION

## CERTIFICAT D'ACCREDITATION

Mitutoyo Canada Inc.  
Calibration Laboratory  
2121 Meadowvale Boulevard, Mississauga, ON L5N 5N1

having been assessed by the National Research Council of Canada (NRC), under the authority of the Standards Council of Canada (SCC), and found to conform with the requirements of ISO/IEC 17025:2017 and conditions established by SCC, and the NRC Calibration Laboratory Assessment Service (CLAS), and having demonstrated the capability of calibrating measurement instruments and standards and providing verified traceability to the national measurement standards of Canada, in specified fields and specified uncertainty limits, is hereby recognized as an

ayant fait l'objet d'une évaluation par le Conseil national de recherches du Canada (CNRC), sous l'autorité du Conseil canadien des normes (CCN) et ayant été trouvé conforme aux exigences d'ISO/IEC 17025:2017, ainsi qu'aux conditions établies par le CCN et le Service d'évaluation de laboratoires d'étalonnage (CLAS) du CNRC, et ayant prouvé ses compétences en matière d'étalonnage des instruments de mesure et des étalons, et de raccordement aux étalons nationaux du Canada, dans des domaines précis et des limites établies d'incertitude, est de ce fait reconnu comme étant un

ACCREDITED CALIBRATION LABORATORY  
For specific measurement capabilities which are hereby CERTIFIED  
by CLAS



LABORATOIRE D'ÉTALONNAGE ACCRÉDITÉ  
CERTIFIÉ par le CLAS pour des capacités précises de mesure

as listed in the Directory of the Canadian Calibration Network maintained by NRC and approved by SCC. The national measurement standards of Canada are realized, maintained and disseminated by NRC under the authority of the National Research Council Act and the Weights and Measurements Act. Bilateral agreements recognizing the equivalence of national measurement standards exist between NRC and other national metrology institutes. Copies of these agreements are available from NRC.

indiquées dans le Répertoire du réseau canadien d'étalonnage établi par le CNRC et approuvé par le CCN. Les étalons nationaux du Canada sont établis, maintenus et émis par le CNRC en vertu de la Loi sur le Conseil national de recherches et de la Loi sur les poids et mesures. Il existe entre le CNRC et d'autres instituts nationaux de métrologie des accords bilatéraux qui reconnaissent l'équivalence des étalons nationaux de mesure. Le CNRC tient à la disposition du public des exemplaires de ces accords.



*[Signature]*

Chief Metrologist (NRC) / Métrologue en chef (CNRC)

*[Signature]*

Vice-President – Accreditation Services / Vice-président – Services d'accréditation

Issued on: / Délivré le : 2020-04-05

Accredited laboratory number: / Numéro de laboratoire accrédité : 503

SCC file number: / Dossier du CCN n° : 15587

NRC CLAS Certificate No. / Numéro du certificat CNRC CLAS : 2003-05

Initial accreditation date: / Date de la première accréditation : 2003-10-07

The validity of this certificate, including the date of last re-accreditation and its expiry can be confirmed by the accompanying Scope of Accreditation document in the Directory of Accredited Laboratories on the SCC website at [www.scc.ca](http://www.scc.ca). This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. The 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).

Pour vérifier la validité du présent certificat, y compris la date de la dernière réaccréditation et la date d'expiration du certificat, consulter la portée d'accréditation qui se trouve dans le répertoire des laboratoires accrédités dans le site Web du CCN au [www.ccn.ca](http://www.ccn.ca). Ce laboratoire est accrédité conformément à la Norme internationale reconnue ISO/IEC 17025:2017. Cette accréditation démontre la compétence technique d'un organisme pour une portée définie et l'exploitation d'un système de management de la qualité de laboratoire (cf. communiqué conjoint ISO-ILAC-IAF date de avril 2017).

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**TESTING AND CALIBRATION LABORATORY ACCREDITATION  
PROGRAM (LAP)**

**Scope of Accreditation**

Accredited Laboratory No. 503

**Legal Name of Accredited Laboratory:** **Mitutoyo Canada Inc.**  
**Location Name or Operating as (if applicable):** Calibration Laboratory  
**Contact Name:** Fritz Jordaan  
**Address:** 2121 Meadowvale Boulevard  
Mississauga, ON L5N 5N1  
**Telephone:** +1 905 821 1261  
**Fax:** +1 905 821 4968  
**Website:** [www.mitutoyo.ca](http://www.mitutoyo.ca)  
**Email:** [Fritz.Jordaan@mitutoyo.ca](mailto:Fritz.Jordaan@mitutoyo.ca)

<b>SCC File Number:</b>	15587
<b>Provider:</b>	NRC-CLAS
<b>Provider File Number:</b>	461
<b>Accreditation Standards:</b>	ISO/IEC 17025:2017
<b>Clients Served:</b>	All interested parties On-site calibration services are available for some capabilities
<b>Field of Calibration:</b>	Dimensional Hardness
<b>Program Specialty Area:</b>	Calibration
<b>Initial Accreditation:</b>	2003-10-07
<b>Most Recent Accreditation:</b>	2020-04-05
<b>Accreditation Valid to:</b>	2023-10-07

*Remarque: La présente portée d'accréditation existe également en français, sous la forme d'un document distinct.  
Note: This scope of accreditation is also available in French as a separately issued document.*



**Standards Council of Canada**  
**Conseil canadien des normes**

#### **CALIBRATION OF MEASURING AND TEST EQUIPMENT**

For calibration measurement capability, please refer to the Canadian Calibration Network web page at the National Research Council of Canada. This laboratory is accredited by the Standards Council of Canada as part of the Calibration Laboratory Assessment Service (CLAS) program and is listed at [nrc.canada.ca](http://nrc.canada.ca).

This document forms part of the Certificate of Accreditation issued by the Standards Council of Canada (SCC). The original version is available in the Directory of Accredited Laboratories on the SCC website at [www.scc.ca](http://www.scc.ca).

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Elias Rafoul  
Vice-President, Accreditation Services  
Publication on: 2020-04-09