

Accredited entity according to ČSN EN ISO/IEC 17025:2018:

UNIMETRA, spol. s r.o.  
CAB number 2310, Calibration Laboratory Department  
Rohova 1506/6, 716 00 Ostrava-Radvanice

CMC for the field of measured quantity: Length

Ord. number <sup>1</sup>	Calibrated quantity / Subject of calibration	Nominal range		Parameter(s) of the measurand	Lowest stated expanded measurement uncertainty <sup>2</sup>	Calibration principle	Calibration procedure identification <sup>3</sup>	Work-place
		min. unit	max. unit					
1	Micrometer calliper gauges	0 mm	to 1,000 mm		$(9 \cdot L + 1.5) \mu\text{m}$	Comparison with standard parallel gauge blocks	PP-11.01	
2	Parallel gauge blocks	0.5 mm	to 100 mm		$(1.5 \cdot L + 0.15) \mu\text{m}$	Comparison with standard parallel gauge blocks	PP-11.02	
		100 mm	to 500 mm		$(2 \cdot L + 0.16) \mu\text{m}$			
3	Slide gauges	0 mm	to 1,000 mm		$(5 \cdot L + 12) \mu\text{m}$	Comparison with standard parallel gauge blocks	PP-11.05	
	Height gauges	0 mm	to 1,000 mm		$(8 \cdot L + 0.7) \mu\text{m}$			
4	Length gauges	0 mm	to 1,000 mm		$(15 \cdot L + 22) \mu\text{m}$	Comparison with a standard scale	PP-11.06	
		1,000 mm	to 5,000 mm		$(32 \cdot L + 22) \mu\text{m}$			
	Tapes for the measurement of circumference	0 mm	to 2,200 mm		$(55 \cdot L + 145) \mu\text{m}$			
	Tapes for the measurement of diameter	0 mm	to 700 mm					
	Measuring tapes	0 m	to 10 m		$(60 \cdot L + 145) \mu\text{m}$			
	Tape measures	0 m	to 5 m		$(50 \cdot L + 150) \mu\text{m}$			
		5 m	to 10 m		$(25 \cdot L + 200) \mu\text{m}$			
	Tape measures - digital	0 m	to 5 m		$(2 \cdot L + 120) \mu\text{m}$			
	Folding rules	0 m	to 5 m		$(50 \cdot L + 170) \mu\text{m}$			
Telescopic tubes	0 m	to 5 m		$(40 \cdot L + 270) \mu\text{m}$				
	Rules of portable microscopes	0 mm	to 20 mm		4 $\mu\text{m}$	Measurement on a 3D microscope		
5	Tape measures	0 m	to 50 m		$(30 \cdot L + 35) \mu\text{m}$	Comparison with a standard scale	PP-11.08	
6	Inside micrometer gauges, extension rods	0 mm	to 1,000 mm		$(9 \cdot L + 1.5) \mu\text{m}$	Measurement on a length gauge	PP-11.09	
		1,000 mm	to 3,000 mm		$(9.5 \cdot L + 2) \mu\text{m}$			

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	Micrometric heads	0 mm	to 50 mm		$(3 \cdot L + 1.2) \mu\text{m}$	Comparison with measuring rings		
	Inside micrometers	0 mm	to 300 mm		$(6 \cdot L + 1.5) \mu\text{m}$			
	Micrometer depth gauges	0 mm	to 300 mm		$(8 \cdot L + 2) \mu\text{m}$			
7	Weld gauges	0 mm	to 100 mm		20 $\mu\text{m}$	Comparison with standard parallel gauge blocks	PP-11.12	
8	Feeler gauges	0 mm	to 10 mm		$(20 \cdot L + 0.6) \mu\text{m}$	Measurement on a length gauge	PP-11.13	
	Adjustable gauges for ultrasonic equipment	0 mm	to 250 mm		$(8 \cdot L + 1) \mu\text{m}$			
	Wedges for joints	0 mm	to 30 mm		15 $\mu\text{m}$			
9	Dial indicators	0 mm	to 100 mm		$(4 \cdot L + 0.5) \mu\text{m}$	Measurement by a special measuring device	PP-11.14	
10	Calibration foils	0 mm	to 20 mm		$(70 \cdot L + 0.5) \mu\text{m}$	Measurement on a length gauge	PP-11.15	
11	Layer thickness measuring devices	0 mm	to 1.5 mm		1.3 $\mu\text{m}$	Comparison with layer thickness standards	PP-11.16	
12	Cylindrical, flat and slot gauges	0 mm	to 300 mm		$(5 \cdot L + 0.7) \mu\text{m}$	Measurement on a length gauge	PP-11.17	
	Sphere	0 mm	to 50 mm		$(5 \cdot L + 0.7) \mu\text{m}$			
	Rigid inside micrometers, check tubes	0 mm	to 1,000 mm		$(9 \cdot L + 1) \mu\text{m}$			
		1,000 mm	to 3,000 mm		$(10 \cdot L + 1.5) \mu\text{m}$			
	Measuring wires	0.17 mm	to 6.35 mm		0.5 $\mu\text{m}$			
	Cylindrical gauges	0 mm	to 20 mm		0.5 $\mu\text{m}$			
13	Film thickness standards	0 mm	to 0.5 mm		$(0.01 \cdot l + 2.3) \mu\text{m}$	Measurement by a layer thickness measuring instrument	PP-11.18	
		0.5 mm	to 1.5 mm		8.5 $\mu\text{m}$			

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		min.	unit	max.	unit					
14	Pasameters	0 mm	to	200 mm		$(3.5 \cdot L + 0.7) \mu\text{m}$	Comparison with standard parallel gauge blocks	PP-11.19		
	Micropasameters	0 mm	to	200 mm		$(6 \cdot L + 1) \mu\text{m}$				
15	Thickness gauges with dial indicator	0 mm	to	100 mm		$1.5 \mu\text{m}$	Comparison with standard parallel gauge blocks	PP-11.22		
	Dial indicators with measuring arms for external measurement	0 mm	to	300 mm		$(10 \cdot L + 1.5) \mu\text{m}$				
	Dial indicators with measuring arms for internal measurement	0 mm	to	300 mm		$(7 \cdot L + 1) \mu\text{m}$	Comparison with measuring rings and standard parallel gauge blocks			
	Internal gauge with dial indicator	0 mm	to	300 mm		$2 \mu\text{m}$	Direct measurement by a special measuring device			
	Depth gauges with dial indicator	0 mm	to	150 mm		$(8 \cdot L + 2) \mu\text{m}$	Comparison with standard parallel gauge blocks			
16	Length sensors	0 mm	to	100 mm		$(4 \cdot L + 0.45) \mu\text{m}$	Measurement on a length gauge	PP-11.23		
17	Roller length gauges	0 m	to	250 m		$(0.003 \cdot L + 0.13) \text{m}$	Comparison with a standard scale	PP-11.29		
18	Limit and end measuring rings	1 mm	to	300 mm		$(4 \cdot L + 0.7) \mu\text{m}$	Measurement on a length gauge	PP-11.31		
	Snap gauges	1 mm	to	300 mm		$(3 \cdot L + 0.6) \mu\text{m}$	Measurement on a length gauge and comparison with standard parallel gauge blocks			
19	Ultrasonic thickness gauges	0 mm	to	200 mm		$10 \mu\text{m}$	Comparison with standard ultrasonic gauges	PP-11.32		
20	Thread gauges – male gauges, cylindrical and conical	0 mm	to	300 mm		$(5.5 \cdot L + 3) \mu\text{m}$	Measurement on a length gauge, microscope and height gauge	PP-11.33		
21	Thread gauges – rings, cylindrical and conical	2 mm	to	16 mm		$(5.5 \cdot L + 3) \mu\text{m}$	Comparison with a threaded wear gauge	PP-11.34		
		3.5 mm	to	300 mm		$(2 \cdot L + 3.3) \mu\text{m}$	Measurement on a length gauge			

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		min.	unit	max.	unit					
22	Rules	0 mm	to	1,000 mm		(3·L + 3.5) μm (6·L + 5) μm	Comparison with standard parallel gauge blocks from the standard plane	PP-11.45		
		1,000 mm	to	2,000 mm						
	Check bars	0 mm	to	4,000 mm		40 μm				
23*	Measuring microscopes, profile projectors	0 mm	to	250 mm		2 μm	Comparison with a standard scale	PP-11.48		
24	Length measuring instruments	0 mm	to	500 mm		(3·L + 0.15) μm	Comparison with standard parallel gauge blocks	PP-11.58		
25	Templates, measuring wedges, scales, special gauges, special measuring instruments and fixtures	0 mm	to	160 mm		(5·L + 4.5) μm	Measurement on a 3D microscope	PP-11.59		
26*	Length gauges, measuring microscopes and profile projectors, measuring systems, coordinate measuring machines	0 mm	to	40 m		(1·L + 0.1) μm	Measurement by a laser interferometer	PP-11.50		
	Surface rules and blocks, surface plates	0 mm	to	15 m		(1.6·M + 0.1) μm		PP-11.50		
27*	Instruments for the calibration of parallel gauge blocks (comparators)	0 mm	to	100 mm		0.04 μm	Comparison with standard parallel gauge blocks	PP-11.57		
28	Knife, flat and trying angles	0 mm	to	630 mm		(10·H + 5)/H μm/H 35 μm/H 75 μm/H	Comparison with standard parallel gauge blocks and perpendicularity standard	PP-11.04		
		630 mm	to	1,000 mm						
		1,000 mm	to	2,000 mm						

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		min.	unit	max.	unit					
29	Angle standards, perpendicularity cylinders, sine rulers, prismatic blocks, templates, special gauges, special meters and fixtures, male gauges, rings, calipers, surface plates, rulers	0 mm		to	1500 mm		$(4.3 \cdot L + 1) \mu\text{m}$	Measurement on a 3D coordinate measuring machine	PP-11.52	
30*	Contact roughness measuring instruments – roughness gauges	0.1 $\mu\text{m}$		to	800 $\mu\text{m}$		3,6 %	Measurement using roughness reference plates	PP-11.49	
	Roughness standards and templates	0.1 $\mu\text{m}$		to	800 $\mu\text{m}$		0.07 $\mu\text{m}$	Contact measurement with roughness gauge		

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<sup>2</sup> The expanded measurement uncertainty is in accordance with ILAC-P14 and EA-4/02 M a part of CMC and it is the lowest value of the respective uncertainty. If not stated otherwise, its coverage probability is approx. 95 %. If not stated otherwise, the uncertainty values stated without a unit are relative to the measured value. The uncertainty value stated herein is based on the best conditions achievable by the laboratory; the uncertainty value of a specific calibration may be higher depending on the conditions of such a calibration. For identical extreme values of adjacent ranges, the lower uncertainty value always applies.

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L- measured length [m], l – measured thickness [m], M – largest length dimension [m], H – arm length [m]

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CMC for the field of measured quantity: Plane angle

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		min.	unit	max.	unit					
1	Universal angle gauges	0°		to	360°		2′	Comparison with standard angle gauges	PP-11.07	
	Locksmith's angle gauges and protractors	0°		to	180°		0.17°			
2	Liquid and electronic levels	-2 mm/m		to	2 mm/m		4 μm/m	Measurement on a level gauge or comparison with standard parallel gauge blocks and sine bar	PP-11.37	
		-20 mm/m		to	20 mm/m		8 μm/m			
	Clinometers	-90°		to	90°		9″			
	Builder's level up to 2m	-2 mm/m		to	2 mm/m		0.18 mm/m			
	Builder's level with angle gauge or clinometer	-180°		to	180°		0.2°			

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**CMC for the field of measured quantity: Mass**

Ord. number <sup>1</sup>	Calibrated quantity / Subject of calibration	Nominal range		Parameter(s) of the measurand	Lowest stated expanded measurement uncertainty <sup>2</sup>	Calibration principle	Calibration procedure identification <sup>3</sup>	Work-place
		min. unit	max. unit					
1*	Electronic and mechanical scales with non-automatic operation	1 mg	to 20 kg	Weight E2, F1	5·10 <sup>-6</sup>	Comparative measurement with standard weights	PP-11.75	
		20 kg	to 100 kg	F1, M1	5·10 <sup>-5</sup>			

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The lowest expanded measurement uncertainty is stated without accounting for the effect of the calibrated meter.

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**CMC for the field of measured quantity: Torque**

Ord. number <sup>1</sup>	Calibrated quantity / Subject of calibration	Nominal range				Parameter(s) of the measurand	Lowest stated expanded measurement uncertainty <sup>2</sup>	Calibration principle	Calibration procedure identification <sup>3</sup>	Work-place
		min.	unit	max.	unit					
1	Torque wrenches and screwdrivers	0.1 Nm		0.5 Nm			1 % 0.5 %	Comparison with a standard torque sensor	PP-11.70	

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CMC for the field of measured quantity: Temperature

Ord. number <sup>1</sup>	Calibrated quantity / Subject of calibration	Nominal range				Parameter(s) of the measurand	Lowest stated expanded measurement uncertainty <sup>2</sup>	Calibration principle	Calibration procedure identification <sup>3</sup>	Work-place
		min.	unit	max.	unit					
1	Direct indication electronic thermometers	-30 °C		to	100 °C		0.10 °C	Comparison with a standard thermometer in a dry block	PP-11.90	
		100 °C		to	300 °C		0.20 °C			
		300 °C		to	500 °C		0.40 °C			
		500 °C		to	650 °C		0.60 °C			
2	Direct indication electronic non-contact thermometers	-30 °C		to	100 °C		2 °C			
		100 °C		to	200 °C		3 °C			
		200 °C		to	300 °C		5 °C			
		300 °C		to	500 °C		6 °C			
3	Thermometers for air temperature measurement, data loggers, outdoor thermometers	-10 °C		to	100 °C		0.3 °C	Comparison with a standard thermometer in a climatic chamber	PP-11.91	
4	Non-contact thermometers	35 °C		to	100 °C		1.3 °C	Comparison with black body	PP-11.92	
		100 °C		to	300 °C		2.2 °C			
		300 °C		to	500 °C		3.3 °C			

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**CMC for the field of measured quantity: Humidity**

Ord. number <sub>1</sub>	Calibrated quantity / Subject of calibration	Nominal range				Parameter(s) of the measurand	Lowest stated expanded measurement uncertainty <sup>2</sup>	Calibration principle	Calibration procedure identification <sup>3</sup>	Work-place
		min.	unit	max.	unit					
1	Hygrometers, measuring chains for measuring relative humidity, data loggers for measuring relative humidity	10 % RH	to	50 % RH		1.5 %	Comparison with a standard hygrometer in a climatic chamber	PP-11.95		
		50 % RH	to	70 % RH		2.0 %				
		70 % RH	to	90 % RH		2.5 %				

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RH –Relative Humidity