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CAB number 2310, Calibration Laboratory Department
Rohova 1506/6, 716 00 Ostrava-Radvanice

CMC for the field of measured quantity: Length

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

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Ord. number[1]	Calibrated quantity / Subject of calibration	Nominal range min. unit		Nominal range max. unit	Parameter(s) of the measurand	Lowest stated expanded measurement uncertainty[2]	Calibration principle	Calibration procedure identification[3]	Work-place
	Micrometric heads	0 mm	to	50 mm		(3·L + 1.2) µm			
	Inside micrometers	0 mm	to	300 mm		(6·L + 1.5) µm	Comparison with measuring rings		
	Micrometer depth gauges	0 mm	to	300 mm		(8·L + 2) µm	Comparison with standard parallel gauge blocks		
7	Weld gauges	0 mm	to	100 mm		20 µm	Comparison with standard parallel gauge blocks	PP-11.12	
8	Feeler gauges	0 mm	to	10 mm		(20·L + 0.6) µm	Measurement on a length gauge	PP-11.13	
	Adjustable gauges for ultrasonic equipment	0 mm	to	250 mm		(8·L + 1) µm			
	Wedges for joints	0 mm	to	30 mm		15 µm	Measurement by a length sensor		
9	Dial indicators	0 mm	to	100 mm		(4·L + 0.5) µm	Measurement by a special measuring device	PP-11.14	
10	Calibration foils	0 mm	to	20 mm		(70·L + 0.5) µm	Measurement on a length gauge	PP-11.15	
11	Layer thickness measuring devices	0 mm	to	1.5 mm		1.3 µm	Comparison with layer thickness standards	PP-11.16	
12	Cylindrical, flat and slot gauges	0 mm	to	300 mm		(5·L + 0.7) µm	Measurement on a length gauge	PP-11.17	
	Sphere	0 mm	to	50 mm		(5·L + 0.7) µm			
	Rigid inside micrometers, check tubes	0 mm 1,000 mm	to to	1,000 mm 3,000 mm		(9·L + 1) µm (10·L + 1.5) µm			
	Measuring wires	0.17 mm	to	6.35 mm		0.5 µm			
	Cylindrical gauges	0 mm	to	20 mm		0.5 µm			
13	Film thickness standards	0 mm 0.5 mm	to to	0.5 mm 1.5 mm		(0.01·l + 2.3) µm 8.5 µm	Measurement by a layer thickness measuring instrument	PP-11.18	

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Ord. number[1]	Calibrated quantity / Subject of calibration	Nominal range min.	unit		max.	unit	Parameter(s) of the measurand	Lowest stated expanded measurement uncertainty[2]	Calibration principle	Calibration procedure identification[3]	Work-place
14	Pasameters	0 mm	to		200 mm			(3.5·L + 0.7) µm	Comparison with standard parallel gauge blocks	PP-11.19	
	Micropasameters	0 mm	to		200 mm			(6·L + 1) µm			
15	Thickness gauges with dial indicator	0 mm	to		100 mm			1.5 µm	Comparison with standard parallel gauge blocks	PP-11.22	
	Dial indicators with measuring arms for external measurement	0 mm	to		300 mm			(10·L + 1.5) µm			
	Dial indicators with measuring arms for internal measurement	0 mm	to		300 mm			(7·L + 1) µm	Comparison with measuring rings and standard parallel gauge blocks		
	Internal gauge with dial indicator	0 mm	to		300 mm			2 µm	Direct measurement by a special measuring device		
	Depth gauges with dial indicator	0 mm	to		150 mm			(8·L + 2) µm	Comparison with standard parallel gauge blocks		
16	Length sensors	0 mm	to		100 mm			(4·L + 0.45) µm	Measurement on a length gauge	PP-11.23	
17	Roller length gauges	0 m	to		250 m			(0.003·L + 0.13) m	Comparison with a standard scale	PP-11.29	
18	Limit and end measuring rings	1 mm	to		300 mm			(4·L + 0.7) µm	Measurement on a length gauge	PP-11.31	
	Snap gauges	1 mm	to		300 mm			(3·L + 0.6) µm	Measurement on a length gauge and comparison with standard parallel gauge blocks		
19	Ultrasonic thickness gauges	0 mm	to		200 mm			10 µm	Comparison with standard ultrasonic gauges	PP-11.32	
20	Thread gauges – male gauges, cylindrical and conical	0 mm	to		300 mm			(5.5·L + 3) µm	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·L + 3) µm	Comparison with a threaded wear gauge	PP-11.34	
		3.5 mm	to		300 mm			(2·L + 3.3) µm	Measurement on a length gauge		

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Ord. number[1]	Calibrated quantity / Subject of calibration	Nominal range min. unit	Nominal range max. unit	Parameter(s) of the measurand	Lowest stated expanded measurement uncertainty[2]	Calibration principle	Calibration procedure identification[3]	Work-place
22	Rules	0 mm to	1,000 mm		(3·L + 3.5) µm	Comparison with standard parallel gauge blocks from the standard plane	PP-11.45	
		1,000 mm to	2,000 mm		(6·L + 5) µm			
	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	Comparison with standard parallel gauge blocks and perpendicularity standard	PP-11.04	
		630 mm to	1,000 mm		35 µm/H			
		1,000 mm to	2,000 mm		75 µm/H			

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Ord. number[1]	Calibrated quantity / Subject of calibration	Nominal range min. unit	Nominal range max. unit	Parameter(s) of the measurand	Lowest stated expanded measurement uncertainty[2]	Calibration principle	Calibration procedure identification[3]	Work-place
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	1500 mm		(4.3·L + 1) µm	Measurement on a 3D coordinate measuring machine	PP-11.52	
30*	Contact roughness measuring instruments – roughness gauges	0.1 µm	800 µm		3,6 %	Measurement using roughness reference plates	PP-11.49	
	Roughness standards and templates	0.1 µm	800 µm		0.07 µm	Contact measurement with roughness gauge		

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[2] 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.

[3] If the document identifying the calibration procedure is dated, only these specific procedures are used. If the document identifying the calibration procedure is not dated, the latest edition of the specified procedure is used (including any changes).

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

Ord. number[1]	Calibrated quantity / Subject of calibration	Nominal range min. unit		Nominal range max. unit	Parameter(s) of the measurand	Lowest stated expanded measurement uncertainty[2]	Calibration principle	Calibration procedure identification[3]	Work-place
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 -20 mm/m	to to	2 mm/m 20 mm/m		4 µm/m 8 µm/m	Measurement on a level gauge or comparison with standard parallel gauge blocks and sine bar	PP-11.37	
	Clinometers	-90°	to	90°		9′′			
	Builder's level up to 2m	-2 mm/m	to	2 mm/m		0.18 mm/m	Microscope measurements in relation to the horizontal plane		
	Builder's level with angle gauge or clinometer	-180°	to	180°		0.2°	Comparison with angle gauges		

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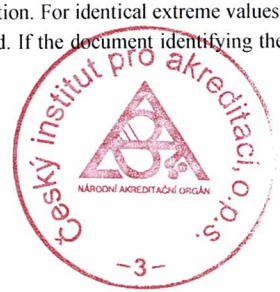

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CMC for the field of measured quantity: Mass

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

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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[1]	Calibrated quantity / Subject of calibration	Nominal range				Parameter(s) of the measurand	Lowest stated expanded measurement uncertainty[2]	Calibration principle	Calibration procedure identification[3]	Work-place
		min.	unit	max.	unit					
1	Torque wrenches and screwdrivers	0.1 Nm 0.5 Nm	to to	0.5 Nm 1,500 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 [1]	Calibrated quantity / Subject of calibration	Nominal range				Parameter(s) of the measurand	Lowest stated expanded measurement uncertainty[2]	Calibration principle	Calibration procedure identification[3]	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 [1]	Calibrated quantity / Subject of calibration	Nominal range				Parameter(s) of the measurand	Lowest stated expanded measurement uncertainty[2]	Calibration principle	Calibration procedure identification[3]	Work-place
		min.	unit	max.	unit					
1	Hygrometers, measuring chains for measuring relative humidity, data loggers for measuring relative humidity	10 % RH 50 % RH 70 % RH	to to to	50 % RH 70 % RH 90 % RH			1.5 % 2.0 % 2.5 %	Comparison with a standard hygrometer in a climatic chamber	PP-11.95	

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RH –Relative Humidity

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