

Annex to declaration of accreditation (scope of accreditation)  
 Normative document: EN ISO/IEC 17025:2017  
 Registration number: **K 086**

of **Mitutoyo Nederland B.V.**  
**Service Department, Calibration Service and Technical Department**

This annex is valid from: **05-10-2022** to **01-10-2026**

Replaces annex dated: **28-09-2022**

**Location(s) where activities are performed under accreditation**

**Head Office**

Storkstraat 30  
 3905 KX  
 Veenendaal  
 The Netherlands

Location	Abbreviation/ location code
Mitutoyo Research Center Nederland B.V. Storkstraat 30 3905 KX Veenendaal The Netherlands	VE
On site	OS

HCS code	Measured quantity, Instrument, Measure	Range	CMC <sup>1</sup>	Remarks	Location
DM 0 0	DIMENTIONAL QUANTITIES				VE, OS
DM 1 0	Length gauges				VE
	Long rectangular gauge blocks				
	- steel and ceramic - zero-glass	(100 – 1510) mm (100 – 1510) mm	0,10 µm + 0,34·10 <sup>-6</sup> ./ 0,10 µm + 0,20·10 <sup>-6</sup> ./	laser interferometer + CMM laser interferometer + CMM	

<sup>1</sup> Calibration and Measurement Capability (CMC): Demonstrated measurement uncertainty, with coverage probability of 95%, in a given measurement point or measurement range. Measurement uncertainty, *U*, is calculated according to EA-4/02 "Evaluation of the Uncertainty of Measurement in Calibration".

This annex has been approved by the Board of the Dutch Accreditation Council, on its behalf,

J.A.W.M. de Haas

of **Mitutoyo Nederland B.V.**  
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	- variation in length	(100 – 1510) mm	0,22 µm	laser interferometer + CMM	
	Long square gauge blocks				
	- steel - hard metal (tungsten carbide)	(100 – 500) mm (100 – 500) mm	0,10 µm + 0,34·10 <sup>-6</sup> · <i>l</i> 0,10 µm + 0,40·10 <sup>-6</sup> · <i>l</i>	laser interferometer + CMM laser interferometer + CMM	
	- variation in length	(100 – 500) mm	0,14 µm	laser interferometer + CMM	
	Micrometer-standards				
	- length	till 1510 mm	0,10 µm + 0,50·10 <sup>-6</sup> · <i>l</i>	laser interferometer + CMM	
	- variation in length	till 1510 mm	0,04 µm	laser interferometer + CMM	
	Step gauges (check-masters)			<i>l<sub>s</sub></i> = measurement position (m) <i>l<sub>t</sub></i> = total length (m)	
	- length	till 1510 mm	0,12 µm + 0,34·10 <sup>-6</sup> · <i>l<sub>s</sub></i> + 0,12·10 <sup>-6</sup> · <i>l<sub>t</sub></i>	laser interferometer + CMM	
	- variation in length	till 1510 mm	0,06 µm	laser interferometer + CMM	
DM 2 0	Line standards, distances				VE, OS
	Deviations of translations			<i>r</i> = rotation, <i>t</i> = straightness deviation <i>l</i> = length of translation (m)	OS
	- linear displacements	till 20 m till 20 m	0,20 µm + 0,7·10 <sup>-6</sup> · <i>l</i> 0,20 µm + 2,3·10 <sup>-6</sup> · <i>l</i>	laser interferometer laser interferometer, with thermal compensation for the object	
	- straightness deviation	till 1,5 mm till 1,5 mm	0,8 µm + 0,8·10 <sup>-3</sup> · <i>t</i> + 0,4·10 <sup>-6</sup> · <i>l</i> 2,5 µm + 8,0·10 <sup>-3</sup> · <i>t</i> + 0,4·10 <sup>-6</sup> · <i>l</i>	laser with straightness optics <i>l</i> ≤ 3 m <i>l</i> ≤ 20 m	

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	- rotation around horizontal axis with translation (pitch, roll)	-100" to 100" -100" to 100"	0,2" + 2,0·10 <sup>-2</sup> ·r + 3,5·10 <sup>-2</sup> ·(l/m)" 1,5" + 2,0·10 <sup>-2</sup> ·r	laser with rotation optics, l ≤ 20 m electronic levels	
	- rotation around vertical axis with translation (yaw)	-100" to 100"	0,2" + 2,0·10 <sup>-2</sup> ·r + 3,5·10 <sup>-2</sup> ·(l/m)"	laser with rotation optics, l ≤ 20 m	
	Deviations of combined displacements				OS
	- squareness of guides	-300" to 300"	1,2" (≈ 6 μm/m)	laser with squareness optics, with length per guide ≤ 20 m	
	Line standards				VE
	- zero-glas - normal glas	till 650 mm	0,08 μm + 0,50·10 <sup>-6</sup> ·l 0,08 μm + 1,0·10 <sup>-6</sup> ·l	laser interferometer + Vision system	
	Line scales				VE
	- normal glas	till 650 mm	0,40 μm + 1,0·10 <sup>-6</sup> ·l	laser interferometer + Vision system	
	Calibration charts				VE
	- normal glas	till 10 mm	0,24 μm	laser interferometer + Vision system	
	Motic calibration slide	(0 – 1,5) mm	10 μm	Vision system	VE
	Distance standard	(0 – 400) mm	0,24 μm + 2,0·10 <sup>-6</sup> ·l	laser interferometer + Vision system	VE

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	2-D Grids (zero-glass)				VE
	- distance between 2 points	till 200 x 200 mm	0,8 µm + 0,5·10 <sup>-6</sup> ·l	laser interferometer + Vision system	
	- linearity		0,2 µm + 0,5·10 <sup>-6</sup> ·l		
	- straightness		0,2 µm		
	- squareness		0,2"		
	- rotation		0,4"		
DM 3 0	Length measuring instruments			l = measured length (m) d = measured diameter (m)	OS
	Dial indicator, Calibration tester				
	- i-Checker	(0 – 100) mm	0,10 µm + 2,2·10 <sup>-6</sup> ·l 0,06 µm + 0,8·10 <sup>-6</sup> ·l	digital (gauge blocks) digital (laser interferometer)	
	- tester 521-105	(0 – 5) mm	0,3 µm 0,9 µm	analog (gauge blocks) analog (laser interferometer)	
	- tester 521-103	(0 – 1) mm	0,3 µm 4,5 µm	analog (gauge blocks) analog (laser interferometer)	
	Low-force height gauges			Performance verification by using Gauge Blocks	
	- VL-50 / -50A/ Elecont	(0 – 50) mm	0,06 µm + 2,2·10 <sup>-6</sup> ·l		
	- VL-50S/-50AS	(0 – 50) mm	0,64 µm + 0,40·10 <sup>-6</sup> ·l		

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	Linear heights				
	- linear displacements	(0 – 1000) mm	0,8 µm + 3,8·10 <sup>-6</sup> ./ 0,2 µm + 2,3·10 <sup>-6</sup> ./	steel step gauge  steel step gauge or laser interferometer and both with thermal compensation for the object. See DM 2 0  In combination with calibration of granite surface plate.	
	- squareness		7,0 µm	precision square	
	- straightness		1,6 µm	longest leg of precision square	
	Profile projectors	<u>PJ / PV / PH-type</u> (0 – 50) mm (0 – 300) mm	1,5 µm + 2,4·10 <sup>-6</sup> ./ 1,4 µm + 6,6·10 <sup>-6</sup> ./		
		Magnification error	0,02%		
	Measurement microscopes	<u>TM-type</u> (0 – 50) mm	2,0 µm + 3,2·10 <sup>-6</sup> ./		
		<u>MF-type</u> (0 – 50) mm (0 – 300) mm	0,9 µm + 3,6·10 <sup>-6</sup> ./ 0,9 µm + 7,9·10 <sup>-6</sup> ./		
	Vision systems				
	3-D ( <u>QV-type</u> ): glass With automatic thermal compensation	(0 – 200) mm (0 – 400) mm (0 – 1000) mm	0,2 µm + 0,8·10 <sup>-6</sup> ./ 0,2 µm + 1,2·10 <sup>-6</sup> ./ 0,2 µm + 1,3·10 <sup>-6</sup> ./	X- and Y-axis, 2D en 3D X- and Y-axis, 2D en 3D X- and Y-axis, 2D en 3D	
		(0 – 100) mm (0 – 250) mm	0,5 µm + 1,0·10 <sup>-6</sup> ./ 0,5 µm + 1,6·10 <sup>-6</sup> ./	Z-axis Z-axis	
	3- D ( <u>QV-type</u> ): glass With manual handmatige thermal compensation	(0 – 200) mm (0 – 400) mm (0 – 1000) mm	0,2 µm + 2,0·10 <sup>-6</sup> ./ 0,2 µm + 2,5·10 <sup>-6</sup> ./ 0,2 µm + 2,7·10 <sup>-6</sup> ./	X- and Y-axis, 2D en 3D X- and Y-axis, 2D en 3D X- and Y-axis, 2D en 3D	
		(0 – 100) mm (0 – 250) mm	0,5 µm + 1,8·10 <sup>-6</sup> ./ 0,5 µm + 2,5·10 <sup>-6</sup> ./	Z-axis Z-axis	

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	3- D (QV-type): glass Without thermal compensation	(0 – 200) mm (0 – 400) mm (0 – 1000) mm	0,2 µm + 2,5·10 <sup>-6</sup> ./ 0,2 µm + 2,9·10 <sup>-6</sup> ./ 0,2 µm + 3,2·10 <sup>-6</sup> ./	X- and Y-axis, 2D en 3D X- and Y-axis, 2D en 3D X- and Y-axis, 2D en 3D	
		(0 – 100) mm (0 – 250) mm	0,5 µm + 2,4·10 <sup>-6</sup> ./ 0,5 µm + 3,3·10 <sup>-6</sup> ./	Z-axis Z-axis	
	3- D (QV-type): zero-glass With automatic thermal compensation	(0 – 400) mm (0 – 1000) mm	0,2 µm + 0,4·10 <sup>-6</sup> ./ 0,2 µm + 1,3·10 <sup>-6</sup> ./	X- and Y-axis, 2D en 3D X- and Y-axis, 2D en 3D	
		(0 – 100) mm (0 – 250) mm	0,1 µm + 2,8·10 <sup>-6</sup> ./ 0,2 µm + 2,4·10 <sup>-6</sup> ./	Z-axis Z-axis	
	3- D (QV-type): zero-glas With manual thermal compensation	(0 – 400) mm (0 – 1000) mm	0,2 µm + 0,4·10 <sup>-6</sup> ./ 0,2 µm + 1,3·10 <sup>-6</sup> ./	X- and Y-axis, 2D en 3D X- and Y-axis, 2D en 3D	
		(0 – 100) mm (0 – 250) mm	0,1 µm + 3,4·10 <sup>-6</sup> ./ 0,2 µm + 3,1·10 <sup>-6</sup> ./	Z-axis Z-axis	
	3- D (QV-type): zero-glas Without thermal compensation	(0 – 400) mm (0 – 1000) mm	0,2 µm + 0,4·10 <sup>-6</sup> ./ 0,2 µm + 9,7·10 <sup>-6</sup> ./	X- and Y-axis, 2D en 3D X- and Y-axis, 2D en 3D, met normal glass scale	
		(0 – 100) mm (0 – 250) mm	0,1 µm + 12·10 <sup>-6</sup> ./ 0,2 µm + 13·10 <sup>-6</sup> ./	Z-axis Z-axis	
	- squareness		15 µm	block square	
	- probing error	(0 – 1) µm	44 nm	ISO 10360-7:2011	
	2-D & 3-D (QS-type):	(0 – 200) mm (0 – 400) mm	0,7 µm + 7,5·10 <sup>-6</sup> ./ 0,7 µm + 8,6·10 <sup>-6</sup> ./	X- and Y-axis X- and Y-axis	
		(0 – 100) mm (0 – 250) mm	1,4 µm + 2,6·10 <sup>-6</sup> ./ 1,4 µm + 2,0·10 <sup>-6</sup> ./	Z-axis Z-axis	
	2-D (QI-type):	(0 – 200) mm (0 – 400) mm	0,7 µm + 7,5·10 <sup>-6</sup> ./ 0,7 µm + 8,5·10 <sup>-6</sup> ./	X- and Y-axis X- and Y-axis	
	Roundness instruments				
	- radial spindle	(0 – 100) nm	10 nm + 2 %· <i>RONt</i>	Hemisphere with reversal method, straight master, square master, optical flat, gauge blocks, Cylinder gauge, piëzo and laser, scale	
	- axial spindle	(0 – 100) nm	12 nm		
	- straightness column	(0 – 10) µm	38 nm + 3,5 %· <i>Z</i>	In case probe linearity ≤ 1%	

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	- straightness x-axis	(0 – 10) µm	0,14 µm + 1,2 %-z		
	- squareness rotating axis/x-axis	(0 – 10) µm	0,14 µm + 1,2 %-z		
	- parallelism rotating axis/column	(0 – 100) µm	0,28 µm + 1,2 %-z		
	- detector linearity	(0 – 100) µm	20 nm + 0,2 %-z		
	- detector force	(0 – 150) mN	2 mN		
	Roughness instruments			In accordance with ISO 12179:2000	
	- inclined optical flat		0,14 µm	Optical flat, Type A1, Type C1, Type D1 standards according to ISO 5436-1:2000 (high-end: with piëzo and laer).	
	- Linearity X-axis		0,06 %-RSm		
	- Vertical profile		12 nm+ 2 %-d		
	- roughness type D	(0 – 800) µm			
	Ra-value		4,2 nm + 4,2 %-Ra		
	Rz-value		42 nm + 2,8 %-Rz		
	- detector		20 nm + 0,2 %-z		
	Contour meters			Conform factory standard	
	- Linearity X1-axis / Y-axis Z2-axis	(0 – 200) mm (0 – 600) mm	0,09 µm + 0,29·10 <sup>-6</sup> ·/ 0,11 µm + 0,28·10 <sup>-6</sup> ·/	With laser interferometer	
	- X1-axis measurement accuracy	(0 – 50) mm	0,24 µm + 0,80·10 <sup>-6</sup> ·/	With X-axis master object	
	- X1-axis straightness	(0 – 200) mm	0,12 µm	With optical flat or straight edge	

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	- Z1-axis measurement accuracy	(-30 – 30) mm	0,30 µm + 0,40·10 <sup>-6</sup> ·l	With gauge blocks and optical flat	
	- Z2-axis measurement accuracy	(0 – 600) mm	1,0 µm + 2,4·10 <sup>-6</sup> ·l	With steel step gauge	
	LSM Laser scan micrometers			Performance verification by using: - Pins / Disks	
	- Linearity LSM - Repeatability LSM - Positioning error	(0 – 160) mm	0,37 µm + 25·10 <sup>-6</sup> ·l 0,02 µm 1,1 µm		
DM 4 0	Diameter			d = measured diameter (m)	VE
	Ring gauges				
	- diameter	(4 – 50) mm	0,2 µm	laser interferometer + CMM	
	Spheres (master ball)				
	- diameter	(0 – 30) mm	0,2 µm	laser interferometer + CMM	
DM 5 0	Form error				VE
	Measurement equipment for form				
	- straightness of straight edges	(0 – 2) mm	1,5 µm	With CMM: Straight edges till 1000 mm	
	- straightness of straight edges	(0 – 10) µm	38 nm + 3,5 %·z	With Roundness machine Straight edges till 280 mm	
	- straightness of straight edges	(0 – 50) µm	36 nm + 0,12·10 <sup>-6</sup> ·L	With autocollimator + CMM: Straight edges till 700 mm (evt till 2000 mm)	



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	- straightness of knife edge straight edges	(0 – 2) mm	1,5 µm	With CMM: Straight edges till 1000 mm	
	Roundness	<i>d</i> till 300 mm		With Roundness machine conform ISO 12181:2011 guideline	
		<i>RONt</i> :			
	- in- & outside ring	(0 – 12) µm	40 nm + 2 %· <i>RONt</i>	- at middle	
	- sphere (master ball)	(0 – 12) µm	40 nm + 2 %· <i>RONt</i>	- at equator	
	- roundness standard (hemisphere)	(0 – 1) µm	10 nm + 2 %· <i>RONt</i>	- at equator and reversal method or multi step method	
	- Flick standaard	2 µm < <i>RONt</i> < 100 µm	150 nm + 2 %· <i>RONt</i>	Met rondheidsmeetmachine	
	- Test circles for ISO 10360-7:2011 (calibration chart)	<i>RONt</i> : (0 – 1) µm	40 nm	Vision system with multi step method	
	Contour				
	x-axis standard	(0 – 200) mm	0,24 µm + 0,16·10 <sup>-6</sup> · <i>l</i>	Formtracer SV-C4500	
DM 6 0	Roughness				VE
	Surface Roughness			With roughness tester conform ISO 4287:1997	
	Groove depth step height	(0 – 20) µm		Formtracer SV-C4500	
	<i>d</i>		10 nm + 2%· <i>d</i>		
	<i>Pt</i>		10 nm + 2%· <i>Pt</i>		
	<i>Ra</i>	(0 – 20) µm	3 nm + 3%· <i>Ra</i>	Formtracer SV-C4500	
	<i>Rz</i>	(0 – 80) µm	30 nm + 2%· <i>Rz</i>	Formtracer SV-C4500	

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	<i>Rt</i>	(0 – 80) µm	40 nm + 3%· <i>Rt</i>	Formtracer SV-C4500	
	<i>RSm</i>	10 µm – 250 µm	0,1%· <i>RSm</i>	Formtracer SV-C4500	
	<i>RSm</i>	10 µm – 250 µm	0,01%· <i>RSm</i>	laser interferometer + vision system	
DM 8 0	Co-ordinate Measuring Machines			Performance verification	OS
	Probing Error			In accordance with ISO 10360-5, by using	
	Single stylus errors: P <sub>Form.Sph.1x25:SS:Tact</sub> P <sub>Size.Sph.1x25:SS:Tact</sub>	(0 – 51) mm	0,11 µm 0,21 µm	Master ball	
	Scanning errors: P <sub>Form.Sph.Scan:PP:Tact</sub> P <sub>Size.Sph.Scan:PP:Tact</sub>	(0 – 51) mm	0,11 µm 0,21 µm	Master ball	
	High-end CMM's: P <sub>Size.Sph.1x25:SS:Tact</sub> P <sub>Size.Sph.Scan:PP:Tact</sub>	(0 – 51) mm	0,10 µm 0,10 µm	High-end Master ball	
	Test of Size			In accordance with ISO 10360-2, by using	
	Length measuring error $E_L$ ( $E_0$ and $E_{150}$ )	(0 – 1) m (0 – 1,5) m (0 – 0,15) m	0,24 µm + 0,57·10 <sup>-6</sup> ·/ 0,30 µm + 0,53·10 <sup>-6</sup> ·/ 0,14 µm + 0,43·10 <sup>-6</sup> ·/	Steel stepgauges	
		(0 – 6) m	0,08 µm + 0,54·10 <sup>-6</sup> ·/	Laserinterferometer + 25 mm gauge block	
		(0 – 1) m	0,02 µm + 0,29·10 <sup>-6</sup> ·/	Low expansion Zero-Cera Gauge Blocks	

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DM 9 0	Angle			With CMM: / = distance on longest leg (m) L = length shortest leg (m)	VE
	Angle gauges Blade type squares 90° (stock support squares)				
	- angle deviation	± 0,5°	(0,5·m/L)" (≈ 2,4 μm/L)	length of legs till (700 x 1000) mm	
	- straightness	(0 – 2) mm	1,5 μm	length of legs till 700 mm	
	- form deviation of longest leg	± 1 mm	(1,5 + 1,0·l/L) μm	length of legs till (700 x 1000) mm	
TE 0 0	Temperature				VE
TE 4 1	Self indicating thermometers	(5 – 40) °C	0,03 °C	Temperature bath (1)	

Remarks:

The ambient temperature during the calibration within the laboratory is nominal 20 °C.  
 The "variation in length (v)" is defined conform the standard ISO 3650:1998.

(1) Secondary calibrations related to primary dimensional calibrations (DM)