



The Dutch Accreditation Council RvA, by law appointed as the national accreditation body for The Netherlands, hereby declares that accreditation has been granted to:

**TRESCAL Hengelo B.V.  
Calibration Laboratory  
Hengelo**

The organisation has demonstrated to be able to generate technical valid results in a competent way and work according to a management system.

This accreditation is based on an assessment against the requirements as laid down in EN ISO/IEC 17025:2017.

The accreditation covers the activities as specified in the authorized annex bearing the registration number.

The accreditation is valid provided that the organisation continues to meet the requirements.

The accreditation with registration number:

**K 018**

is granted on 15 September 1980

This declaration is valid until  
**1 December 2020**

This declaration is prolonged until  
**1 April 2021**

The board of the Dutch Accreditation Council,  
on its behalf,

  
mr. J.A.W.M. de Haas

Annex to declaration of accreditation (scope of accreditation)  
 Normative document: EN ISO/IEC 17025:2017  
 Registration number: **K 018**

of **TRESCAL Hengelo B.V.**  
**Calibration Laboratory**

This annex is valid from: **05-06-2020 to 01-12-2020** Replaces annex dated: **23-10-2019**  
**Prolonged until 01-04-2021**

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

**Head Office**

Joseph Schumpeterstraat 10  
 7559 SG  
 Hengelo  
 The Netherlands

Location	Abbreviation/ location code
Joseph Schumpeterstraat 10 7559 SG Hengelo The Netherlands	HLO

HCS code	Measured quantity, Instrument, Measure	Range	CMC <sup>1</sup>	Remarks	Location
DM 0 0	DIMENSIONAL QUANTITIES				
DM 1 0	Gauge blocks				HLO
	Gauge blocks, steel	(0.5 - 100) mm (0.02 - 4) inch	0.06 μm + 1.2•10 <sup>-6</sup> •l	Central length, fixed sizes	
	Gauge blocks, tungsten carbide	(0.5 - 100) mm (0.02 - 4) inch	0.06 μm + 0.7•10 <sup>-6</sup> •l	Central length, fixed sizes	
	Gauge blocks, ceramic	(0.5 - 100) mm (0.02 - 4) inch	0.06 μm + 1.0•10 <sup>-6</sup> •l	Central length, fixed sizes	

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

J.A.W.M. de Haas

<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 "Expression of the Uncertainty of Measurement in Calibration".

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	Gauge blocks, steel / tungsten carbide / ceramic		$0.05 \mu\text{m} + 0.1 \cdot 10^{-6} \cdot l$	Length variation	
	Step gauge	up to 1000 mm	$1.2 \mu\text{m} + 6.0 \cdot 10^{-6} \cdot l$		
DM 1 0	Length gauges			Comparative measure	HLO
	Steel	(125 – 500) mm	$0.2 \mu\text{m} + 3 \cdot 10^{-6} \cdot l$		
DM 2 0	Line scales, distances				HLO
	Rulers (all models)	up to 300 mm	$0.8 \mu\text{m} + 4 \cdot 10^{-6} \cdot l$		
		up to 600 mm	$1.1 \mu\text{m} + 4 \cdot 10^{-6} \cdot l$		
		up to 3000 mm	$6 \mu\text{m} + 5 \cdot 10^{-6} \cdot l$		
		up to 100 m	$6 \mu\text{m} + 6 \cdot 10^{-6} \cdot l$		
DM 3 0	Length measuring instruments				HLO
	1D-measuring machines			Laser interferometer; machine equipped with	
		up to 20 m	$0.15 \mu\text{m} + 0.7 \cdot R + 1.0 \cdot 10^{-6} \cdot l$	Zerodur scales;(1)	
		up to 20 m	$0.15 \mu\text{m} + 0.7 \cdot R + 1.3 \cdot 10^{-6} \cdot l$	Glass scales;(1)	
		up to 20 m	$0.15 \mu\text{m} + 0.7 \cdot R + 1.6 \cdot 10^{-6} \cdot l$	Steel scales;(1)	
		up to 400 mm	$0.3 \mu\text{m} + 0.7 \cdot R + 3 \cdot 10^{-6} \cdot l$	Optical systems (1)	
		up to 700 mm	$0.05 \mu\text{m} + 0.5 \cdot 10^{-6} \cdot l + S$	Using special gauge blocks (1)	
	Handheld tools for external	(0 - 200) mm	$0.45 \mu\text{m} + 0.5 \cdot R + 25 \cdot 10^{-6} \cdot l$	e.g. vernier, micrometer, (1)	

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	measurements	(200 - 2000) mm	$4 \mu\text{m} + 0.5 \cdot R + 5 \cdot 10^{-6} \cdot l$		
	Handheld tools for internal measurements (2-point)	(0 - 200) mm	$0.7 \mu\text{m} + 0.5 \cdot R + 25 \cdot 10^{-6} \cdot l$	e.g. vernier, internal micrometer, (1)	
		(200 - 400) mm	$5 \mu\text{m} + 0.5 \cdot R + 4 \cdot 10^{-6} \cdot l$		
	Handheld tools for internal measurements (2- and 3-point)	(1 - 250) mm	$1.5 \mu\text{m} + 0.5 \cdot R + 25 \cdot 10^{-6} \cdot l$	e.g. internal micrometers (1)	
	Handheld tools for height- and depth measurements	(0 - 200) mm	$0.7 \mu\text{m} + 0.5 \cdot R + 25 \cdot 10^{-6} \cdot l$	e.g. (depth) vernier, (1)	
		(200 - 500) mm	$4 \mu\text{m} + 0.5 \cdot R + 5 \cdot 10^{-6} \cdot l$		
	Linear displacement sensor	up to 200 mm	$0.05 \mu\text{m} + 0.7 \cdot R + 2.5 \cdot 10^{-6} \cdot l + S$	e.g. dial gauge, ... (1)	
		(200 - 300) mm	$0.7 \mu\text{m} + 0.7 \cdot R + 3.5 \cdot 10^{-6} \cdot l$		
	Height gauge	up to 1500 mm	$0.8 \mu\text{m} + 0.7 \cdot R + 2.5 \cdot 10^{-6} \cdot l$	(1)	
	Inside micrometer	up to 300 mm	$0.7 \mu\text{m} + 0.7 \cdot R + 2.5 \cdot 10^{-6} \cdot l$	(1)	
		(300 - 1000) mm	$0.4 \mu\text{m} + 0.7 \cdot R + 2 \cdot 10^{-6} \cdot l$	(1)	
		(1000 - 3000) mm	$0.4 \mu\text{m} + 0.7 \cdot R + 2 \cdot 10^{-6} \cdot l$		
	Film thickness gauge	up to 25 mm	$0.6 \mu\text{m} + 0.7 \cdot R + 22 \cdot 10^{-6} \cdot l$		
	Laser distance meter	up to 25 m	$0.5 \text{ mm} + 40 \cdot 10^{-6} \cdot L + 0,6 \cdot R$		

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DM 4 0	Diameter, length				HLO
	Setting rings and ring gauges	Ø (1 - 4) mm	$1.2 \mu\text{m} + 6 \cdot 10^{-6} \cdot l$		
		Ø (4 - 200) mm	$1.0 \mu\text{m} + 2 \cdot 10^{-6} \cdot l$		
		Ø (200 - 500) mm	$1.2 \mu\text{m} + 6 \cdot 10^{-6} \cdot l$		
	Pin gauge	up to Ø 300 mm	$0.8 \mu\text{m} + 2.5 \cdot 10^{-6} \cdot l$		
	Plug gauge	up to Ø 300 mm	$0.8 \mu\text{m} + 2.5 \cdot 10^{-6} \cdot l$		
	Thread wires	up to Ø 20 mm	$0.8 \mu\text{m} + 2.5 \cdot 10^{-6} \cdot l$		
	Other external diameters	up to Ø 100 mm	$0.5 \mu\text{m} + (1+6 \cdot \Delta T) \cdot 10^{-6} \cdot l$	(1)	
		up to Ø 300 mm	$0.8 \mu\text{m} + 2.5 \cdot 10^{-6} \cdot l$		
	Other internal diameters	Ø (1 - 4) mm	$1.2 \mu\text{m} + 6 \cdot 10^{-6} \cdot l$		
		Ø (4 - 200) mm	$1.0 \mu\text{m} + 2 \cdot 10^{-6} \cdot l$		
		Ø (200 - 500) mm	$1.2 \mu\text{m} + 6 \cdot 10^{-6} \cdot l$		
	Feeler gauges	up to 5 mm	$0.8 \mu\text{m} + 2.5 \cdot 10^{-6} \cdot l$		
	Setting gauges for micrometers	up to 300 mm	$0.8 \mu\text{m} + 2.5 \cdot 10^{-6} \cdot l$	(1)	
		(300 - 1000) mm	$0.4 \mu\text{m} + 2 \cdot 10^{-6} \cdot l$	(1)	
		(1000 - 3000) mm	$0.4 \mu\text{m} + 2 \cdot 10^{-6} \cdot l$		
	Other distances for parallel faces	up to 300 mm	$0.8 \mu\text{m} + 2.5 \cdot 10^{-6} \cdot l$	(1)	
		(300 - 1000) mm	$0.4 \mu\text{m} + 2 \cdot 10^{-6} \cdot l$	(1)	
		(1000 - 3000) mm	$0.4 \mu\text{m} + 2 \cdot 10^{-6} \cdot l$		
	Conical (taper) ring and pin	Ø (1 – 500) mm	$1.8 \mu\text{m} + 0.4 \cdot 10^{-6} \cdot l$	$h \leq 390 \text{ mm}$	
DM 5 0	Form error				HLO
	Roundness in- and externally	Ø (1 - 500 mm)	$0.05 \mu\text{m} + 0.01 \cdot A$	A=roundness deviation	

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	Roundness testers and other instruments for measuring roundness		$0.04 \mu\text{m} + 0.5 \cdot R$	(1)	
	Knife edge straight edge	up to 100 mm	$0.25 \mu\text{m}$	(1)	
		(100 - 300) mm	$0.6 \mu\text{m}$	(1)	
		(300 - 500) mm	$0.7 \mu\text{m}$	(1)	
	Straight edge	up to 10 m	$0.4 \mu\text{m} + 0.25 \cdot 10^{-6} \cdot l$	(1)	
	Surface plate	Up to $6 \times 10 \text{ m}^2$	$0.2 \mu\text{m} + 1.5 \cdot 10^{-6} \cdot l$	l = longest side of the surface plate (1)	
	Flick standard (roundness standard)		$0.15 \mu\text{m}$		
DM 6 0	Roughness				HLO
	Surface texture measuring instruments	Ra up to $5 \mu\text{m}$	$0.01 \mu\text{m} + 0.02 \cdot A + 0.5 \cdot R + S$	A = Ra-value of reference (1)	
		Rz up to $10 \mu\text{m}$	$0.01 \mu\text{m} + 0.05 \cdot A + 0.5 \cdot R + S$	A = Rz-value of reference (1)	
		Rt Rmax up to $10 \mu\text{m}$	$0.01 \mu\text{m} + 0.05 \cdot A + 0.5 \cdot R + S$	A = Rt Rmax-value of reference (1)	
	Roughness standards	Ra up to $10 \mu\text{m}$	$0.015 \mu\text{m} + 0.045 \cdot A$	A = measured Ra-value	
		Rz up to $15 \mu\text{m}$	$0.025 \mu\text{m} + 0.07 \cdot A$	A = measured Rz-value	
		Rt (Rmax) up to $15 \mu\text{m}$	$0.025 \mu\text{m} + 0.07 \cdot A$	A = measured Rt (Rmax)-value	
	Groove depth (-standaard)	up to 6 mm	$0.05 \mu\text{m} + 0.007 \cdot A$	A = measured profile height	

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DM 7 0	Thread quantities external			e.g. screw plug gauge	HLO
	Pitch	up to 10 mm	2 µm		
	Profile angle	up to 180°	(0.2 + 9/L) arcmin		
	Single pitch diameter	∅(1 - 300) mm	α = 30°: ± (6.0 – 7.5) µm	According to Euramet/CG-10/V.02, method 1a or 1b	
		∅(1 - 300) mm	α = 55° 60°: ± (3.2 – 4.1) µm		
		∅(1 - 300) mm	α = 90°: ± (2.6 – 3.4) µm		
	Pitch diameter	∅(1 - 300) mm	α = 30°: ± (6.0 – 7.5) µm	According to Euramet/CG-10/V.02, method 2a, 2b or 3	
		∅(1 - 300) mm	α = 55° 60°: ± (3.2 – 4.1) µm		
		∅(1 - 300) mm	α = 90°: ± (2.6 – 3.4) µm		
DM 7 0	Thread quantities			Cylindrical thread	HLO
	Thread quantities measured with master scanner ( <i>Thread trapezium excluded</i> )			Method 4 according to TCGM – 04.05 d = nominal diameter α = flank angle P = pitch Cylindrical & Conical thread	
	Thread plug gauges (external thread) outside, core diameter pitch diameter	∅ (2 – 90) mm ∅ (2 – 90) mm	1.5 µm + 5 × 10 <sup>-6</sup> × l 2.5 µm + 10 × 10 <sup>-6</sup> × l 4.5 µm + 10 × 10 <sup>-6</sup> × l	α ≥ 27° α < 27°	
	Thread ring gauges (internal thread) outside, core diameter pitch diameter	∅ (3 – 100) mm ∅ (3 – 100) mm	1.5 µm + 10 × 10 <sup>-6</sup> × l 2.5 µm + 10 × 10 <sup>-6</sup> × l 4.5 µm + 10 × 10 <sup>-6</sup> × l	α ≥ 27° α < 27°	

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DM 7 0	Thread quantities internal			e.g. screw ring gauge	
	Pitch	up to 10 mm	2 µm		
	Profile angle	up to 180°	(0.2 + 9/L) arcmin	Measurement on cast	
	Simple pitch diameter	∅(4 - 200) mm	α = 30°: ± (9 – 14) µm	According to Euramet/CG-10/V.02, method 1a or 1b	
		∅(4 - 200) mm	α = 55° 60°: ± (3.6 – 7) µm		
		∅(4 - 200) mm	α = 90°: ± (3.1 – 6.2) µm		
	Pitch diameter	∅(4 - 200) mm	α = 30°: ± (9 – 14) µm	According to RvA-I-4.05, Euramet/CG-10/V.02, method 2a, 2b or 3	
		∅(4 - 200) mm	α = 55° 60°: ± (3.6 – 7) µm		
		∅(4 - 200) mm	α = 90°: ± (3.1 – 6.2) µm		
DM 8 0	Combined instruments				HLO
	1D-, 2D- en 3D-measuring machines	up to 20 m	0.15 µm + 0.7•R + 1.0•10 <sup>-6</sup> •l	Laser interferometer, Zerodur scales (1)	
		up to 20 m	0.15 µm + 0.7•R + 1.3•10 <sup>-6</sup> •l	Laser interferometer, glass scales (1)	
		up to 20 m	0.15 µm + 0.7•R + 1.6•10 <sup>-6</sup> •l	Laser interferometer, steel scales (1)	
		up to 400 mm	0.3 µm + 0.7•R + 2.3•10 <sup>-6</sup> •l	Optical systems (1)	
		up to 700 mm	0.05 µm + 0.5•10 <sup>-6</sup> •l + S	Using special gauge blocks (1)	
	Deviation of nominal displacement	up to 20 m	0.15 µm + 0.7•R + 1.0•10 <sup>-6</sup> •l	Laser interferometer, Zerodur scales (1)	
		up to 20 m	0.15 µm + 0.7•R + 1.3•10 <sup>-6</sup> •l	Laser interferometer, glass scales (1)	



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		up to 20 m	$0.15 \mu\text{m} + 0.7 \cdot R + 1.6 \cdot 10^{-6} \cdot l$	Laser interferometer, steel scales (1)	
		up to 400 mm	$0.3 \mu\text{m} + 0.7 \cdot R + 2.3 \cdot 10^{-6} \cdot l$	Optical systems (1)	
		up to 700 mm	$0.05 \mu\text{m} + 0.5 \cdot 10^{-6} \cdot l + S$	Using special gauge blocks (1)	
	Deviations transverse to the translation directions	up to 0,5 mm	$0.1 \mu\text{m} + 3 \cdot 10^{-6} \cdot l + 0.005 \cdot A$	A = measured deviation; measuring length up to 3000 mm (1)	
	Rotational deviations around the translation direction	up to 400 arcsec	$0.5 \text{ arcsec} + 0.0035 \cdot H$	H = measured angle; only horizontal translations (1)	
		up to 2000 $\mu\text{m}/\text{m}$	$2.5 \mu\text{m}/\text{m} + 0.0035 \cdot H$		
		up to 400 arcsec	$1.6 \text{ arcsec} + 0.007 \cdot H$	Up to 2000 mm translation; ceramic straight edge and 2 displacement sensors (1)	
		up to 2000 $\mu\text{m}/\text{m}$	$8 \mu\text{m}/\text{m} + 0.007 \cdot H$		
	Other rotational deviations	up to 7200 arcsec	$0.5 \text{ arcsec} + 0.0016 \cdot H$	H = measured angle, translation up to 20 m (1)	
	Translation deviation along a rotational axis		$0.025 \mu\text{m}$	(1)	
	Parallelism of a rotation and a translation	translation up to 500 mm	1arcsec	(1)	
	Squareness of 2 translations	up to 500 x 500 mm <sup>2</sup>	1arcsec	Ceramic square and displacement sensor (1)	
		up to 500 x 500 mm <sup>3</sup>	0.6 arcsec	Ceramic square and measurement system op measuring machine; reversal method (1)	
	Squareness of a rotation and a translation	translation up to 150 mm	$0.07 \mu\text{m}$	(1)	

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		translation up to 300 mm	0.7 µm	(1)	
DM 8 0	Coordinate Measuring Machines X, Y and Z axis			using calibration fixture (stepgauge) measuring (reference).	HLO
		max. 1000 mm	0.95 µm + 0.5·10 <sup>-6</sup> ·l	Measurement uncertainty steel reference and glass ruler. (1)	
		max. 2000 mm	1.0 µm + 0.8·10 <sup>-6</sup> ·l	Measurement uncertainty steel reference and glass ruler. (1)	
		max. 100 mm	0.6 µm	Measurement uncertainty steel reference and zerodur ruler. (1)	
		max. 500 mm	1.2 µm + 0.65·10 <sup>-6</sup> ·l	Measurement uncertainty steel reference and zerodur ruler. (1)	
DM 8 1	Tools, products				HLO
	Surface profiles	up to 6 x 120 mm <sup>2</sup>	0.05 µm + 0.007·A	A = measured profile height	
	Roughness	Ra: up to 10 µm	0.015 µm + 0.045·A	A = measured Ra-value	
		Rz: up to 15 µm	0.025 µm + 0.07·A	A = measured Rz-value	
		Rt, Rmax: up to 15 µm	0.025 µm + 0.07·A	A = measured Rt, Rmax-value	
	Straightness	up to 6 x 120 mm <sup>2</sup>	0.05 µm + 0.007·A	A = measured profile height	
		up to 100 mm	0.25 µm		
		(100 - 300) mm	0.6 µm		
		(300 - 500) mm	0.7 µm		
		up to 1000 mm	1.3 µm + 2·10 <sup>-6</sup> ·l		

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		up to 10 m	$0.5 \mu\text{m} + 0.5 \cdot 10^{-6} \cdot l$	(1)	
	Roundness external	up to Ø500 mm	$0.05 \mu\text{m} + 0.01 \cdot A$	A = measured roundness	
	Roundness internal	Ø(0,7 - 500) mm	$0.05 \mu\text{m} + 0.01 \cdot A$	A = measured roundness	
	Cylindricity	up to Ø500 and up to height 100 mm	$0.5 \mu\text{m} + 1.1 \cdot 10^{-6} \cdot H + 0.01 \cdot A$	A = measured cylindricity H = height cylinder	
		up to Ø500 and up to height 500 mm	$1.1 \mu\text{m} + 2 \cdot 10^{-6} \cdot H + 0.01 \cdot A$		
	Coaxiality and concentricity	up to Ø500 and up to height 500 mm	$0.1 \mu\text{m} + 0.02 \cdot A$	A = measured coaxiality / concentricity	
	Flatness	up to Ø60 mm	$0.04 \mu\text{m}$		
		up to Ø145 mm	$0.06 \mu\text{m}$		
		up to Ø300 mm	$0.6 \mu\text{m}$		
		up to 6 x 10 m <sup>2</sup>	$0.2 \mu\text{m} + 1.5 \cdot 10^{-6} \cdot l$	(1)	
	Angles between sides or planes	up to 180°	$(0.2 + 9/A) \text{ arcmin}$	A = leg length; leg length up to 200 mm	
	Diameter external	up to Ø 300 mm	$0.8 \mu\text{m} + 2.5 \cdot 10^{-6} \cdot l$		
		up to Ø 100 mm	$0.5 \mu\text{m} + (1+6 \cdot \Delta T) \cdot 10^{-6} \cdot l$	(1)	
		Ø(300 - 500) mm	$1.2 \mu\text{m} + 6 \cdot 10^{-6} \cdot l$		
	Diameter internal	Ø(1 - 4) mm	$1.2 \mu\text{m} + 6 \cdot 10^{-6} \cdot l$		
		Ø(4 - 200) mm	$1.0 \mu\text{m} + 2 \cdot 10^{-6} \cdot l$		
		Ø(200 - 500) mm	$1.2 \mu\text{m} + 6 \cdot 10^{-6} \cdot l$		
DM 8 1	Tools, products	Distance of 2 parallel planes			HLO
	External	up to 300 mm	$0.8 \mu\text{m} + 2.5 \cdot 10^{-6} \cdot l$		
		up to 100 mm	$0.5 \mu\text{m} + (1+6 \cdot \Delta T) \cdot 10^{-6} \cdot l$	(1)	

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		(300 - 3000)mm	0.4 μm + 2•10 <sup>-6</sup> •l		
	Internal	Ø(1 - 4) mm	1.2 μm + 6•10 <sup>-6</sup> •l		
		Ø(4 - 200) mm	1.0 μm + 2•10 <sup>-6</sup> •l		
		Ø(200 - 500) mm	1.2 μm + 6•10 <sup>-6</sup> •l		
DM 8 1	Tools, products	Thread external			HLO
	Pitch	up to 10 mm	2 μm		
	Profile angle	up to 180°	(0.2 + 9/L) arcmin		
	Simple pitch diameter	Ø(1 - 300) mm	α = 30°: ± (6.0 – 7.5) μm	According to Euramet/CG-10 V 2.0, method 1a or 1b	
		Ø(1 - 300) mm	α = 55° 60°: ± (3.2 – 4.1) μm		
		Ø(1 - 300) mm	α = 90°: ± (2.6 – 3.4) μm		
	Pitch diameter	Ø(1 - 300) mm	α = 30°: ± (6.0 – 7.5) μm	According to Euramet/CG-10 V 2.0, method 2a, 2b or 3	
		Ø(1 - 300) mm	α = 55° 60°: ± (3.2 – 4.1) μm		
		Ø(1 - 300) mm	α = 90°: ± (2.6 – 3.4) μm		
	Simple pitch diameter	Ø(4 - 100) mm	α = 30°: ± (9 – 14) μm	According to Euramet/CG-10 V 2.0, method 1a or 1b	
		Ø(4 - 100) mm	α = 55° 60°: ± (3.6 – 7) μm		
		Ø(4 - 100) mm	α = 90°: ± (3.1 – 6) μm		
	Pitch diameter	Ø(4 - 100) mm	α = 30°: ± (9 – 14) μm	According to Euramet/CG-10 V 2.0, method 2a, 2b or 3	
		Ø(4 - 100) mm	α = 55° 60°: ± (3.6 – 7) μm		
		Ø(4 - 100) mm	α = 90°: ± (3.1 – 6) μm		

of **TRESCAL Hengelo B.V.**  
**Calibration Laboratory**

This annex is valid from: **05-06-2020 to 01-12-2020**

Replaces annex dated: **23-10-2019**

**Prolonged until 01-04-2021**

HCS code	Measured quantity, Instrument, Measure	Range	CMC <sup>1</sup>	Remarks	Location
DM 9 0	Angle measurement				HLO
	Angle gauge block	0° - 180°	2 arcsec		
	Cylindrical square	up to Ø300 mm, up to height 500 mm	0.9 µm + 2.1•10 <sup>-6</sup> •l + 0.02•A	A = measured squareness	
	Square	up to 500 mm leg length	0.7 µm + 2.2x10 <sup>-6</sup> •l + 0.02•A	A = measured squareness	
	Angle plate	90°	0.5 arcsec		
	Autocollimator	up to 12.5 mm/m	0.5 µm/m + 0.001•H + 0.7•R		
		up to 2600 arcsec	0.1 arcsec + 0.001•H + 0.7•R		
	Spirit level	up to 12.5 mm/m	0.5 µm/m + 0.001•H + 0.7•R		
		up to 2600 arcsec	0.1 arcsec + 0.001•H + 0.7•R		
DM 9 1	Angle measurement				HLO
	Leveling instruments		0.01 mm/m		
DM 9 2	Angle measurement				HLO
	Polygon	up to 360°	0.5 arcsec		
	Pentagon prism	90°	0.5 arcsec		
DM 9 3	Angle measurement				HLO
	Deviation of the nominal rotation	360°	0.9 arcsec + 0.7•R	f.i. rotary heads and rotary table (1)	
DM 9 4	Angle measurement				HLO
	Clinometer	up to 360°	5 arcsec		