

SCOPE OF ACCREDITATION TO ISO/IEC 17025-2005 & KS Q ISO/IEC 17025

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CALIBRATION

Valid To :

Accreditation No. :

In recognition of the successful completion of the KOLAS evaluation process,
accreditation is granted to this laboratory to perform the following calibrations.

Field Code	Item of calibration	on-site	Field Code	Item of calibration	on-site	Field Code	Item of calibration	on-site
102. Linear dimension			105. Complex geometry			20204	push-pull gauge	N
10201	Balls	N	10502	Bench centers	N	204. Pressure		
10206	Dial/cylinder gauge testers	N	10504	Non-contact coordinate measuring machines	Y	20404	Hydraulic pressure ballances	N
10207	Doctor blades	N				20406	Absolute pressure gauges	Y
10209	End bars	N	10511	Measuring microscopes, Profile projectors	Y	20407	Blood pressure gauges	Y
10210	Extensometers, linear displacement transducers	Y				20408	Compound pressure gauges	Y
10211	Filler gauges	N	10514	Plug gauges, taper	N	20409	Differential pressure gauges	Y
10212	Filmapplicators	N	10517	Stylus type roughness testers	Y	20411	Gauge pressure gauges	Y
10213	Gapgauges	N	10525	Thread plug gauges	N	20412	Pressure transducers /transmitters	N
10214	Gauge blocks, by comparison	N	10526	Thread plug gauges, taper	N			
10216	Height gauges/measuring machines	Y	10527	Thread ring gauges	N	20413	Dial type vacuum gauges	Y
10220	Standard measuring machines	Y	10529	V-blocks,Boxblocks	N			
10223	Electronic micrometers	N	106. Various dimensional					
10224	Heightmicrometers,Riser blocks	N	10601	Inside/Outside/Gear tooth calipers, Caliper gauges	Y			
10227	Standard tape rules	N	10603	Cylinder/bore gauges	Y			
10228	Plug/pin gauges, cylindrica	N	10604	Depth gauges, Depth micrometers	Y			
10229	Radius gauges	N	10605	Dial/digital gauges	Y			
10230	Ring gauges, cylindrical	N	10608	Grind gauges	N			
10232	Step gauges	N	10609	Microindicators,Test indicators	Y			
10233	Thickness gauges, taper	N	10610	Micrometer heads	N			
10234	Ultrasonic thickness gauges	Y	10611	3-points, Micrometers	Y			
10235	Ultrasonic, coating thickness specimens	N	10612	Inside micrometers	Y			
10236	Coating thickness testers	Y	10613	Outside micrometers	Y			
			10617	Standard sieves	N			
103. Angle			10620	Welding gauges	N			
10304	Bevel protractors	N	201. Mass					
10311	Plate/Square/Electric levels	N	20102	Auto-hopper scale balances	Y			
104. Form	Precision squares	N	20105	Counter beam balances	Y			
			20107	Dial swing scale balances	Y			
			20109	Electric balances	Y			
10401	Form testers	Y	20112	Platform scale balances	Y			
10404	Optical flats	N	20113	Spring scale balances	Y			
10405	Optical parallels	N	20116	Weights	N			
10407	Precision surface plates	Y	202. Force					
10409	Roundness measurement instruments	Y	20203	Tension/compression testing machines	Y			
10412	Straight edges	N						
10413	Straight rules	N						

Note

1. This laboratory provides calibration services in permanent standard laboratory and at on-site.
2. Laboratory conducts on-site calibration should meet requirements of KOLAS-SR-008.
3. On-site calibration is allowed to items with marking 'Y', not allowed to items with marking 'N'.
4. Calibration and Measurement Capability (CMC) means capabilities provided by accredited calibration laboratories. It expresses the lowest uncertainty of measurement that can be achieved during a calibration. CMC normally is quoted as an expanded uncertainty at a
5. Due to the calibration environment such as reference standards or customers' facilities, it is note that uncertainty of measurement on a calibration certificate may be expressed larger than CMC on scope of accreditation in general.

102. Linear dimension

Measured Quantity Instrument or Gauge	Field Code	Range	CMC (The Confidence Level is about 95 %)	Comments
Balls	10201	(0 ~ 100) mm	$\sqrt{0.35^2 + 0.005^2 \times l^2}$ μm (l:mm)	Standard measuring machines/CTCI-10201
Dial/cylinder gauge testers	10206	(0 ~ 25) mm	$\sqrt{0.28^2 + 0.003^2 \times l^2}$ μm (l:mm)	Gauge blocks /CTCI-10206
Doctor blades	10207	(0 ~ 10) mm	1.8 μm	Electronic micrometers /CTCI-10207
End bars	10209	(25 ~ 1 600) mm	$\sqrt{1.43^2 + 0.002^2 \times l^2}$ μm (l:mm)	Electronic micrometers /CTCI-10209
Extensometers, linear displacement transducers	10210	(0 ~ 500) mm	$\sqrt{0.31^2 + 0.003^2 \times l^2}$ μm (l:mm)	Gauge blocks/CTCI-10210
Filler gauges	10211	(0 ~ 5) mm	0.8 μm	Standard measuring machines/CTCI-10211
Filmapplicators	10212	(0 ~ 1) mm	1.5 μm	Electronic micrometers /CTCI-10212
Gapgauges	10213	(0 ~ 250) mm	1.9 μm	Electronic micrometers /CTCI-10213
Gauge blocks, by comparison	10214	(0.5 ~ 100) mm (125 ~ 500) mm	$\sqrt{80^2 + 1.3^2 \times l^2}$ nm (l:mm) $\sqrt{96^2 + 1.4^2 \times l^2}$ nm (l:mm)	Gauge blocks /CTCI-10214
Height gauges/measuring machines	10216	(0 ~ 1 000) mm (1 000 ~ 1 500) mm	$\sqrt{0.9^2 + 0.003^2 \times l^2}$ μm (l:mm) $\sqrt{12^2 + 0.003^2 \times l^2}$ μm (l:mm)	Gauge blocks /CTCI-10216
Standard measuring machines	10220	(0 ~ 500) mm	$\sqrt{0.23^2 + 0.003^2 \times l^2}$ μm (l:mm)	Gauge blocks /CTCI-10220
Electronic micrometers	10223	(0 ~ ± 2) mm	0.12 μm	Gauge blocks/CTCI-10223
Heightmicrometers Block	10224	(0 ~ 600) mm	$\sqrt{0.9^2 + 0.003^2 \times l^2}$ μm (l:mm)	Gauge blocks, Measuring machines /CTCI-10224
Riserblocks Head		(0 ~ 30) mm (0 ~ 600) mm	0.9 μm $\sqrt{0.9^2 + 0.003^2 \times l^2}$ μm (l:mm)	
Standard tape rules	10227	(0 ~ 7) m (7 ~ 30) m	$\sqrt{0.11^2 + 0.008^2 \times l^2}$ mm $\sqrt{0.30^2 + 0.008^2 \times l^2}$ mm (l:m)	Standard tape rules /CTCI-10227
Plug/pin gauges, cylindrical Thread measuring wire gage	10228	(0 ~ 200) mm (0 ~ 5) mm	$\sqrt{0.77^2 + 0.004^2 \times l^2}$ μm (l:mm) 0.31 μm	Standard measuring machines/CTCI-10228
Radius gauges	10229	(0 ~ 100) mm	2.6 μm	Non-contact coordinatemeasuringmachines /CTCI-10229
Ring gauges, cylindrical	10230	(1 ~ 150) mm	$\sqrt{0.6^2 + 0.007^2 \times l^2}$ μm (l:mm)	Standard measuring machines/CTCI-10230
Step gauges	10232	(0 ~ 1 000) mm	$\sqrt{1.0^2 + 0.003^2 \times l^2}$ μm (l:mm)	Gauge blocks /CTCI-10232
Thickness gauges, taper	10233	(0 ~ 100) mm	2.4 μm	Non-contact coordinatemeasuringmachines /CTCI-10233
Ultrasonic thickness gauges	10234	(0 ~ 500) mm	$\sqrt{9.2^2 + 0.004^2 \times l^2}$ μm	Ultrasonic thickness specimens /CTCI-10234
Ultrasonic/coating thickness specimens Coating thickness specimens	10235	(0 ~ 500) mm (0 ~ 7) mm	$\sqrt{2.0^2 + 0.003^2 \times l^2}$ μm (l:mm) 0.7 μm	Standard measuring machines, Gauge blocks /CTCI-10235
Coating thickness testers	10236	(0 ~ 15) mm	2.8 μm	Coating thickness specimens /CTCI-10236

103. Angle

Measured Quantity Instrument or Gauge	Field Code	Range	CMC (The Confidence Level is about 95 %)	Comments
Bevel protractors accuracy straight square parallel	10304	(0 ~ 90)°	1´ 1.2 µm 1.2 µm	Angle gauges blocks/ CTCI-10304
Plate/Square/Electric levels accuracy plane of the base side square	10311	±2 000"	0.66´ 0.9 µm 3.1 µm	Fine angle generators/ CTCI-10311
Precision squares square parallel	10320	(0 ~ 450) mm	3.3 µm 2.0 µm	Squareness testers/ CTCI-10320

104. Form

Measured Quantity Instrument or Gauge	Field Code	Range	CMC (The Confidence Level is about 95 %)	Comments
Form testers	10401	(0 ~ 20) mm (0 ~ 50) mm	0.14 µm 0.92 µm	Gauge blocks /CTCI-10401
Optical flats	10404	(Ø0 ~ Ø60) mm	0.13 µm	Optical flats /CTCI-10404
Optical parallels plane surface parallel	10405	(Ø0 ~ Ø60) mm	0.13 µm 0.09 µm	Optical flats /CTCI-10405
Precision surface plates	10407	(1 000×1 000) mm (2 000×2 000) mm (3 000×3 000) mm	2.8 µm 4.5 µm 6.0 µm	Electric levels /CTCI-10407
Roundness measurement instruments the accuracy of a detector Circle Direction Revolution Error of Spindle axis Error of Spindle	10409	(0 ~ 100) µm (0 ~ 360)° (0 ~ 360)°	0.51 µm 0.04 µm 0.07 µm	Roundness standard/Roundness magnification standard /CTCI-10409
Straight edges straight square parallel	10412	(0 ~ 2 000) mm	3.9 µm 3.9 µm	Electronic micrometers /CTCI-10412
Straight rules	10413	(0 ~ 3 000) mm	$\sqrt{0.12^2 + 0.0085^2 \times l^2}$ mm (l:m)	Standard tape rule /CTCI-10413

105. Complex geometry

Measured Quantity Instrument or Gauge	Field Code	Range	CMC (The Confidence Level is about 95 %)	Comments
Bench centers difference of both centers flatness of both bed	10502	(0 ~ 400) mm	3.2 µm 2.9 µm	Electronic micrometers /CTCI-10502
Non-contact coordinate measuring machines X,Y axis square	10504	(0 ~ 500) mm	$\sqrt{0.46^2 + 0.0031^2 \times l^2}$ µm (l:mm) 3.0 µm	Standard scales /CTCI-10504

105. Complex geometry

Measured Quantity Instrument or Gauge	Field Code	Range	CMC (The Confidence Level is about 95 %)	Comments
Measuring microscopes, Profile projectors Measuring microscopes X,Y axis square Profile projectors X,Y axis square magnification accuracy angle divided accuracy	10511	(0 ~ 500) mm (0 ~ 300) mm	$\sqrt{0.44^2 + 0.003 \cdot 1^2 \times l^2} \mu\text{m}$ (l:mm) 3.1 μm $\sqrt{1.3^2 + 0.003 \cdot 1^2 \times l^2} \mu\text{m}$ (l:mm) 3.3 μm 0.024 % 1.1'	Standard scales /CTCI-10511
Plug gauges, taper Taper angle External of small dia External of large dia Length of gage	10514	(0 ~ 90) ° (2 ~ 200) mm (2 ~ 200) mm (2 ~ 200) mm	2" $\sqrt{1.2^2 + 0.010 \cdot 4^2 \times l^2} \mu\text{m}$ (l:mm) $\sqrt{1.9^2 + 0.010 \cdot 5^2 \times l^2} \mu\text{m}$ (l:mm) $\sqrt{1.4^2 + 0.003 \cdot 0^2 \times l^2} \mu\text{m}$ (l:mm)	Measuring machines, standard, Gage block /CTCI-10514
Stylus type roughness testers Ra Rz Height	10517	(0 ~ 20) μm (0 ~ 50) μm (0 ~ 300) μm	0.046 μm 0.13 μm 0.081 μm	Roughness standard Specimens CTCI-10517
Thread plug gauges Pitch dia External dia Pitch dia Included angle of thread	10525	(2 ~ 200) mm (2 ~ 200) mm (0.3 ~ 5)mm (0 ~ 30) °	$\sqrt{1.7^2 + 0.004 \cdot 9^2 \times l^2} \mu\text{m}$ (l:mm) $\sqrt{0.5^2 + 0.004 \cdot 8^2 \times l^2} \mu\text{m}$ (l:mm) 0.9 μm 1'	Measuring machines, standard, Gage block /CTCI-10525
Thread plug gauges, taper Pitch of small dia Pitch of large dia External of small dia External of large dia Pitch dia Included angle of thread Length of gage Length of notch	10526	(2 ~ 200) mm (2 ~ 200) mm (2 ~ 200) mm (2 ~ 200) mm (0.3 ~ 5)mm (0 ~ 30) ° (1.0 ~ 200) mm	$\sqrt{1.9^2 + 0.014 \cdot 2^2 \times l^2} \mu\text{m}$ (l:mm) $\sqrt{2.4^2 + 0.022 \cdot 1^2 \times l^2} \mu\text{m}$ (l:mm) $\sqrt{1.1^2 + 0.014 \cdot 2^2 \times l^2} \mu\text{m}$ (l:mm) $\sqrt{1.8^2 + 0.022 \cdot 1^2 \times l^2} \mu\text{m}$ (l:mm) 0.9 μm 1' $\sqrt{1.4^2 + 0.003 \cdot 0^2 \times l^2} \mu\text{m}$ (l:mm) $\sqrt{2.2^2 + 0.003 \cdot 0^2 \times l^2} \mu\text{m}$ (l:mm)	Measuring machines, standard, Thread wire gage /CTCI-10526
Thread ring gauges Pitch dia Inside dia	10527	(2 ~ 100) mm (2 ~ 100) mm	$\sqrt{1.9^2 + 0.006 \cdot 5^2 \times l^2} \mu\text{m}$ (l:mm) $\sqrt{1.8^2 + 0.006 \cdot 9^2 \times l^2} \mu\text{m}$ (l:mm)	Measuring machines, standard, 3-point /CTCI-10527

105. Complex geometry

Measured Quantity Instrument or Gauge	Field Code	Range	CMC (The Confidence Level is about 95 %)	Comments
V-blocks, Box blocks plane of the base side plane of the V slop of V-groove base parallel of the base and cylinder parallel of the side and cylinder square	10529	(0 ~ 300) mm	1.6 μm 1.6 μm 1.2 μm 2.8 μm 2.8 μm 3.1 μm	Electronic micrometers /CTCI-10529

106. Various dimensional

Measured Quantity Instrument or Gauge	Field Code	Range	CMC (The Confidence Level is about 95 %)	Comments
Inside/Outside/Gear tooth calipers, Caliper gauges Inside/Outside/Caliper gauges Caliper gauges	10601	(0 ~ 2 000) mm (0 ~ 100) mm (100 ~ 300) mm	$\sqrt{15^2 + 0.003 4^2 \times l^2}$ μm (l: mm) 0.73 μm 5.8 μm	Gauge blocks /CTCI-10601
Cylinder/bore gauges	10603	(0 ~ 800) mm	0.5 μm	Dial/cylinder gauge testers /CTCI-10603
Depth gauges, Depth micrometers Depth gauges Depth micrometers	10604	(0 ~ 1 000) mm (0 ~ 300) mm	$\sqrt{7.1^2 + 0.003 0^2 \times l^2}$ μm (l: mm) $\sqrt{1.1^2 + 0.003 5^2 \times l^2}$ μm (l: mm)	Gauge blocks /CTCI-10604
Dial/digital gauges	10605	(0 ~ 50) mm (50 ~ 100) mm	$\sqrt{0.17^2 + 0.003 7^2 \times l^2}$ μm (l: mm) $\sqrt{0.77^2 + 0.003 7^2 \times l^2}$ μm (l: mm)	Gauge blocks /CTCI-10605
Grind gauges Depth Square	10608	(0 ~ 1) mm (0 ~ 150) mm	1.8 μm 1.2 μm	Electronic micrometers /CTCI-10608
Microindicators, Test indicators	10609	(0 ~ 5) mm	0.33 μm	Dial/cylinder gauge testers/ CTCI-10609
Micrometer heads	10610	(0 ~ 100) mm	$\sqrt{0.62^2 + 0.003 2^2 \times l^2}$ μm (l: mm)	Gauge block s/CTCI-10610
3-points, Micrometers	10611	(2 ~ 200) mm	$\sqrt{1.3^2 + 0.004 1^2 \times l^2}$ μm (l: mm)	Cylindrical ring gauges /CTCI-10611
Inside micrometers Inside micrometers bar type Micrometers	10612	(0 ~ 300) mm (50 ~ 2 100) mm	$\sqrt{0.84^2 + 0.003 3^2 \times l^2}$ μm (l: mm) $\sqrt{1.5^2 + 0.003 0^2 \times l^2}$ μm (l: mm)	Gauge blocks /CTCI-10612
Outside micrometers	10613	(0 ~ 100) mm (100 ~ 2 000) mm	1.0 μm $\sqrt{1.5^2 + 0.003 0^2 \times l^2}$ μm (l: mm)	Gauge blocks /CTCI-10613
Standard sieves wire diameter sieves size	10617	(0 ~ 53) mm	2.8 μm 4.0 μm	Non-contact coordinate measuring machines /CTCI-10617
Welding gauges length angle	10620	(0 ~ 100) mm (0 ~ 90)°	0.12 mm 36'	Non-contact coordinate measuring machines /CTCI-10620

201. Mass

Measured Quantity Instrument or Gauge	Field Code	Range	CMC (The Confidence Level is about 95 %)	Comments
Auto-hopper scale balances	20102	(0 ~ 20) kg (20 ~ 50) kg (50 ~ 100) kg (100 ~ 500) kg (500 ~ 1 000) kg (1 000 ~ 2 000) kg	10 g 19 g 46 g 0.10 kg 0.19 kg 0.46 kg	Weights/CTCI-20102
Counter beam balances	20105	(0 ~ 311) g (311 ~ 2 610) g (2.61 ~ 20) kg	9.1 mg 91 mg 0.91 g	Weights/CTCI-20105
Dial swing scale balances	20107	(0 ~ 20) kg (20 ~ 50) kg (50 ~ 100) kg (100 ~ 500) kg (500 ~ 1 000) kg (1 000 ~ 2 000) kg	46 g 91 g 0.19 kg 0.46 kg 0.91 kg 1.9 kg	Weights/CTCI-20107
Electric balances Electric balances	20109	(0 ~ 2) g (2 ~ 20) g (20 ~ 50) g (50 ~ 100) g (100 ~ 200) g (200 ~ 500) g (0.5 ~ 1) kg (1 ~ 2) kg (2 ~ 5) kg (5 ~ 10) kg (10 ~ 20) kg (20 ~ 40) kg (40 ~ 60) kg (60 ~ 100) kg (100 ~ 500) kg (500 ~ 1 000) kg (1 000 ~ 2 000) kg	16 µg 31 µg 39 µg 62 µg 0.12 mg 0.32 mg 1.1 mg 1.4 mg 3.2 mg 7.0 mg 13 mg 16 mg 0.11 g 1.4 g 12 g 24 g 52 g	Weights/CTCI-20109
Platform scale balances	20112	(0 ~ 10) kg (10 ~ 20) kg (20 ~ 50) kg (50 ~ 100) kg (100 ~ 500) kg (500 ~ 1 000) kg (1 000 ~ 2 000) kg	0.91 g 1.8 g 9.1 g 18 g 91 g 0.46 kg 0.91 kg	Weights/CTCI-20112
Spring scale balances	20113	(0 ~ 1) kg (1 ~ 5) kg (5 ~ 10) kg (10 ~ 50) kg (50 ~ 100) kg	0.91 g 4.6 g 9.1 g 45 g 91 g	Weights/CTCI-20113

201. Mass

Measured Quantity Instrument or Gauge	Field Code	Range	CMC (The Confidence Level is about 95 %)	Comments
Weights	20116	(1 mg ~ 1 kg) 1 mg 2 mg 5 mg 10 mg 20 mg 50 mg 100 mg 200 mg 500 mg 1 g 2 g 5 g 10 g 20 g 50 g 100 g 200 g 500 g 1 kg (2 kg ~ 20 kg) 2 kg 5 kg 10 kg 20 kg	(Class F ₂) 20 µg 20 µg 20 µg 27 µg 33 µg 40 µg 53 µg 67 µg 83 µg 0.10 mg 0.13 mg 0.17 mg 0.20 mg 0.27 mg 0.33 mg 0.53 mg 1.0 mg 2.7 mg 5.3 mg (Class M ₁) 33 mg 83 mg 0.17 g 0.33 g	Weights, Electronic balance /CTCI-20116

202. Force

Measured Quantity Instrument or Gauge	Field Code	Range	CMC (The Confidence Level is about 95 %)	Comments
Tension/compression testing machines Tension Compression	20203	(0.005 ~ 1) kN (1 ~ 2) kN (2 ~ 5) kN (5 ~ 10) kN (10 ~ 20) kN (20 ~ 50) kN (0.005 ~ 1) kN (1 ~ 2) kN (2 ~ 5) kN (5 ~ 10) kN (10 ~ 20) kN (20 ~ 50) kN (50 ~ 100) kN (100 ~ 200) kN (200 ~ 500) kN (500 ~ 1 000) kN (1 000 ~ 2 000) kN	7.1×10^{-4} 1.4×10^{-3} 1.4×10^{-3} 1.4×10^{-3} 1.4×10^{-3} 1.6×10^{-3} 7.1×10^{-4} 1.3×10^{-3} 1.7×10^{-3} 1.6×10^{-3} 1.4×10^{-3} 1.4×10^{-3} 1.6×10^{-3} 1.7×10^{-3} 1.9×10^{-3} 1.7×10^{-3} 1.6×10^{-3}	Force measuring devices, electrical /CTCI-20203
push-pull gauge Tension Compression	20204	(0.005 ~ 1) kN (0.005 ~ 1) kN	6.5×10^{-4} 6.5×10^{-4}	Weights/CTCI-20204

204. Pressure

Measured Quantity Instrument or Gauge	Field Code	Range	CMC (The Confidence Level is about 95 %)	Comments
Hydraulic pressure ballances	20404	(0.2 ~ 200) MPa	8.8×10^{-5}	Hydraulic pressure ballances /CTCI-20404
Absolute pressure gauges	20406	(0.02 ~ 7) MPa abs.	1.4×10^{-4}	Digital pressure gauges /CTCI-20406
Blood pressure gauges	20407	(0 ~ 40) kPa	2.5×10^{-3}	Pressure generators/controllers /CTCI-20407
Compound pressure gauges	20408	-100 kPa ~ 7 MPa	3.0×10^{-4}	Digital pressure gauges /CTCI-20408
Differential pressure gauges	20409	(0 ~ 20) kPa (0.02 ~ 7) MPa	5.5×10^{-3} 8.6×10^{-5}	Pneumatic pressure ballances/ CTCI-20409
Gauge pressure gauges Dial, Digital	20411	(0 ~ 20) kPa (0.02 ~ 7) MPa (7 ~ 70) MPa (70 ~ 200) MPa	5.5×10^{-3} 8.6×10^{-5} 1.4×10^{-4} 1.0×10^{-4}	Pneumatic pressure ballances/ CTCI-20411 Hydraulic pressure ballances/ CTCI-20404
Pressure transducers/transmitters	20412	(0.02 ~ 7) MPa abs. (0 ~ 20) kPa (0.02 ~ 70) MPa (70 ~ 200) MPa	5.7×10^{-4} 5.5×10^{-3} 5.7×10^{-4} 6.0×10^{-4}	Pneumatic pressure ballances/ CTCI-20412 Hydraulic pressure ballances/ CTCI-20404
Dial type vacuum gauges	20413	(-100 ~ 0) kPa	3.0×10^{-3}	Digital pressure gauges /CTCI-20413