

CERTIFICATE OF ACCREDITATION

Daeyoung Total Measurement Industrial Co., Ltd

Accreditation No. : KC02-127

Corporation Registration No. : 210114-0038444

Address of Laboratory : 42, Wanjusandan 1-ro, Bongdong-eup, Wanju-gun,
Jeollabuk-do, Republic of Korea

Date of Initial Accreditation : April 01, 2002.

Validity of Accreditation : April 24, 2023. ~ April 23, 2027.

Scope of Accreditation : Attached Annex

Date of issue : March 08, 2023.

This calibration laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to Joint ISO-ILAC-IAF Communiqué).



CHIN CHONGWOOK

Head

Korea Laboratory Accreditation Scheme

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017 & KS Q ISO/IEC 17025:2017

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CALIBRATION

Valid To : Apr. 23, 2027.

Accreditation No : KC02-127

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			20113	Spring scale balances	Y	50105	Thermal expansion thermometers; bimetal, gas or liquid type	N
10206	Dial/cylinder gauge testers	N	20116	Weights	Y			
10211	Filler gauges	N	202. Force			50106	Thermocouples: noble metal, base metal, pure metal, special type, etc.	N
10214	Gauge blocks, by comparison	N	20203	Tension/compression testing machines	Y			
10216	Height gauges/measuring machines	N	203. Torque			50107	Temperature transducers	N
10220	Measuring machines, standard	Y	20303	Torque wrenches/drivers	N			
10223	Electronic micrometers	N	204. Pressure			503. Humidity		
10224	Heightmicrometers,Riserblocks	N	20402	Manometers	Y	50302	Relative humidity hygrometers; polimer thin film, hair, etc.	N
10229	Radius gauges	N	20406	Absolute pressure gauges	Y			
10232	Step gauges	N	20409	Differential pressure gauges	Y	50304	Temperature humidity recorders; hygrothermograph, etc.	N
10233	Thickness gauges, taper	N	20411	Gauge pressure gauges	Y	50305	Transducers; dew-point/relative humidity	N
10234	Ultrasonic thickness gauges	Y						
10235	Ultrasonic/coating thickness specimens	N	20412	Pressure transducers/transmitters	Y	50306	Humidity generators; two-pressure, two-temperature, flow mixing humidity generator, constant temperature and humidity chamber, etc.	Y
10236	Coating thickness testers	Y	20413	Dial type vacuum gauges	Y			
104. Form			206. Volume					
10407	Precision surface plates	Y	20601	Volumetric glasswares	N			
106. Various dimensional			20602	Pycnometers	N			
10601	Inside/Outside/Gear tooth calipers, Caliper gauges	Y	20605	Concrete air content meters	N			
10603	Cylinder/bore gauges	Y	20606	Piston type volume meters	N			
10604	Depth gauges, Depth micrometers	N	501. Contact thermometry					
10605	Dial/digital gauges	Y	50101	Temperature generators: ovens, furnaces, isothermal liquid baths, ice-point baths, dry-block calibrators	Y			
10609	Microindicators, Test indicators	Y						
10612	Inside micrometers	Y	50102	Temperature indicators/ recorders/controllers, temperature calibrators	Y			
10613	Outside micrometers	Y						
10617	Standard sieves	N	50103	Glass thermometers; liquid-in-glass, Beckmann	N			
201. Mass								
20102	Auto-hopper scale balances	Y	50104	Resistance thermometers; SPRT, IPRT, thermistors, etc.	N			
20105	Counter beam balances	Y						
20109	Electric balances	Y						
20112	Platform scale balances	Y						

Note

- This laboratory provides calibration services in permanent standard laboratory and at on-site.
- Laboratory conducts on-site calibration should meet requirements of KOLAS-SR-007.
- On-site calibration is allowed to items with marking 'Y', not allowed to items with marking 'N'.
- Measurement uncertainty normally is quoted as an expanded uncertainty at a coverage probability of 95 %, which usually requires the use of a coverage factor of $k=2$. It expresses the lowest uncertainty of measurement that can be provided by accredited calibration laboratories in normal conditions.
- 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 measurement uncertainty on scope of accreditation in general.

102. Linear dimension

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Dial/cylinder gauge testers	10206	(0 ~ 100) mm	0.48 μm	Gauge blocks, Electronic micrometers / DYS-SLA-01
Filler gauges	10211	(0 ~ 5) mm	2.0 μm	Outside micrometers / DYS-SLA-03
Gauge blocks, by comparison	10214	(0.5 ~ 100) mm	$\sqrt{81^2 + (1.4 \times l_0)^2}$ nm, l_0 :mm	Gauge block comparators, gauge blocks / DYS-SLA-19
Height gauges/measuring	10216	(0 ~ 1 000) mm	$\sqrt{0.98^2 + 0.007^2 \times l_0^2}$ μm, l_0 :mm	Gauge blocks, Long gauge blocks / DYS-SLA-04
Measuring machines, standard	10220	(0 ~ 500) mm	$\sqrt{0.22^2 + (0.007 \times l_0)^2}$ μm, l_0 :mm	Gauge blocks, Long gauge blocks / DYS-SLA-05
Electronic micrometers	10223	(0 ~ 5) mm	0.16 μm	Gauge blocks / DYS-SLA-06
Heightmicrometers, Riserblocks Heightmicrometers	10224	Block height (0 ~ 600) mm	$\sqrt{1.0^2 + 0.007^2 \times l_0^2}$ μm, l_0 :mm	Gauge blocks, Long gauge blocks, Electronic micrometers/ DYS- SLA-07 / DYS-SLA-08
Micrometer Head		(0 ~ 20) mm	1.2 μm	
Riserblocks height		(150 ~ 300) mm	$\sqrt{0.90^2 + 0.007^2 \times l_0^2}$ μm, l_0 :mm	
Parallelism			0.91 μm	
Radius gauges	10229	(0.1 ~ 100) mm	2.0 μm	Non-contact coordinate measuring machines/ DYS-SLA-09
Step gauges	10232	(0 ~ 1 000) mm	$\sqrt{1.1^2 + 0.007^2 \times l_0^2}$ μm, l_0 :mm	Gauge blocks, Long gauge blocks Electronic micrometers/ DYS- SLA-10
Thickness gauges, taper	10233	(0 ~ 100) mm	0.03 mm	Non-contact coordinate measuring machines/ DYS-SLA-11
Ultrasonic thickness gauges	10234	(0 ~ 200) mm	$\sqrt{7.4^2 + 0.010^2 \times l_0^2}$ μm, l_0 :mm	Ultrasonic thickness specimens Gauge blocks/ DYS-SLA-12
Ultrasonic/coating thickness specimens	10235	(0 ~ 2) mm	3.5 μm	Gauge blocks, Electronic micrometers / DYS-SLA-14 Gauge blocks, Electronic micrometers / DYS-SLA-13
		(2 ~ 300) mm	$\sqrt{0.93^2 + 0.007^2 \times l_0^2}$ μm, l_0 :mm	
Coating thickness testers	10236	(0 ~ 1.1) mm	5.9 μm	Coating thickness specimens / DYS-SLA-14

104. Form

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Precision surface plates	10407	(1 000 mm × 1 000 mm)	2.0 μm	Electric levels / DYS-SLB-02
		(2 000 mm × 2 000 mm)	5.2 μm	
		(3 000 mm × 3 000 mm)	6.2 μm	

106. Various dimensional

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Inside/Outside/Geartoothcalipers, Calipergauges	10601	(0 ~ 200) mm (200 ~ 2 000) mm	$\sqrt{9.6^2 + (0.007 \times l_0)^2}$ $\mu\text{m}, l_0:\text{mm}$ $\sqrt{12^2 + (0.007 \times l_0)^2}$ $\mu\text{m}, l_0:\text{mm}$	Step gauges, Long gauge blocks / DYS-SLD-01, DYS-SLD-02
Cylinder/bore gauges	10603	(0 ~ 200) mm	0.94 μm	Dial gauge testers, Gauge blocks / DYS-SLD-03, DYS-SLD-04
Depthgauges, Depthmicrometers	10604	(0 ~ 500) mm	$\sqrt{1.2^2 + (0.007 \times l_0)^2}$ $\mu\text{m}, l_0:\text{mm}$	Gauge blocks, Long gauge blocks / DYS-SLD-05, DYS-SLD-06
Dial/digital gauges	10605	(0 ~ 100) mm	$\sqrt{0.91^2 + (0.007 \times l_0)^2}$ $\mu\text{m}, l_0:\text{mm}$	Dial gauge testers, Gauge blocks / DYS-SLD-07
Microindicators, Testindicators	10609	(0 ~ 2) mm	1.6 μm	Dial gauge testers / DYS-SLD-08, DYS-SLD-09
Inside micrometers Tubular inside micrometers	10612	(5 ~ 300) mm (300 ~ 2 100) mm	$\sqrt{1.1^2 + (0.007 \times l_0)^2}$ $\mu\text{m}, l_0:\text{mm}$ $\sqrt{7.7^2 + (0.007 \times l_0)^2}$ $\mu\text{m}, l_0:\text{mm}$	Gauge blocks, Long gauge blocks, Gauge block accessories/ DYS-SLD-10, DYS-SLD-13
Outside micrometers V-anvil micrometers	10613	(0 ~ 1 500) mm (5 ~ 50) mm	$\sqrt{1.6^2 + (0.007 \times l_0)^2}$ $\mu\text{m}, l_0:\text{mm}$ 8.4 μm	Gauge blocks, Long gauge blocks / DYS-SLD-11
Standard sieves The diameter of the wire The size of sieve opening	10617	(0 ~ 100) mm	1.6 μm 3.2 μm	Non-contact coordinatemeasuring machines/ DYS-SLD-12

201. Mass

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Auto-hopper scale balances	20102	0 kg ~ 20 kg 20 kg ~ 70 kg 70 kg ~ 300 kg 300 kg ~ 1 000 kg 1 000 kg ~ 2 000 kg 2 000 kg ~ 3 500 kg 3 500 kg ~ 5 000 kg	2.1 g 16 g 77 g 0.16 kg 0.31 kg 0.8 kg 1.6 kg	Weights / DYS-SM-07
Counter beam balances	20105	0 g ~ 400 g 400 g ~ 3 000 g 3 000 g ~ 20 kg	11 mg 0.11 g 1.1 g	Weights / DYS-SM-02
Electric balances	20109	0 g ~ 6 g 6 g ~ 60 g 60 g ~ 220 g 220 g ~ 500 g 500 g ~ 1.5 kg 1.5 kg ~ 8.5 kg 8.5 kg ~ 15 kg 15 kg ~ 35 kg 35 kg ~ 60 kg 60 kg ~ 200 kg 200 kg ~ 500 kg 500 kg ~ 1 000 kg 1 000 kg ~ 3 000 kg 3 000 kg ~ 5 000 kg	61 μg 0.13 mg 0.19 mg 0.50 mg 1.1 mg 4.7 mg 11 mg 21 mg 0.94 g 3.3 g 8 g 18 g 0.18 kg 0.28 kg	Weights / DYS-SM-05, DYS-SM-06

201. Mass

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Electric balances	20109	5 000 kg ~ 10 000 kg 10 000 kg ~ 30 000 kg 30 000 kg ~ 60 000 kg	0.55 kg 6 kg 12 kg	Weights / DYS-SM-05, DYS-SM-06
Platform scale balances	20112	0 kg ~ 5 kg 5 kg ~ 10 kg 10 kg ~ 20 kg 20 kg ~ 50 kg 50 kg ~ 200 kg 200 kg ~ 500 kg 500 kg ~ 1 000 kg	0.52 g 1.1 g 2.1 g 21 g 52 g 0.21 kg 0.52 kg	Weights / DYS-SM-03
Spring scale balances	20113	0 kg ~ 1 kg 1 kg ~ 10 kg 10 kg ~ 50 kg 50 kg ~ 100 kg	5.2 g 11 g 0.11 kg 0.52 kg	Weights / DYS-SM-01
Weights	20116	(1 mg ~ 20 kg) 1 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 5 kg 10 kg 20 kg (100 kg) 100 kg (500 kg ~ 1 000 kg) 500 kg 1 000 kg	(F ₁) 6.1 μg 7.6 μg 9.1 μg 13 μg 16 μg 19 μg 25 μg 31 μg 37 μg 49 μg 61 μg 76 μg 91 μg 0.16 mg 0.31 mg 0.8 mg 1.6 mg 3.1 mg 7.6 mg 16 mg 31 mg (M ₃) 16 g (M ₂) 25 g 49 g	Weights / DYS-SM-08

202. Force

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Tension/compression testing machines	20203			
Tension		20 N ~ 1 kN	1.8×10^{-3}	Force measuring devices / DYS-SF-01
		1 kN ~ 3 kN	1.8×10^{-3}	
		3 kN ~ 5 kN	1.9×10^{-3}	
Compression		0.1 kN ~ 1 kN	1.7×10^{-3}	
		1 kN ~ 3 kN	1.7×10^{-3}	
		3 kN ~ 5 kN	1.7×10^{-3}	
		5 kN ~ 10 kN	1.7×10^{-3}	
		10 kN ~ 30 kN	1.9×10^{-3}	
		30 kN ~ 50 kN	1.8×10^{-3}	
		50 kN ~ 100 kN	1.9×10^{-3}	
		100 kN ~ 300 kN	1.9×10^{-3}	
		300 kN ~ 500 kN	1.9×10^{-3}	
		500 kN ~ 1 MN	1.9×10^{-3}	
		1.5 MN ~ 3 MN	2.3×10^{-3}	

203. Torque

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Torque wrenches/drivers	20303			
		(5 ~ 50) N·m	4.1×10^{-3}	Torque measuring devices / DYS-STO-01
		(50 ~ 100) N·m	9.2×10^{-3}	
		(100 ~ 250) N·m	6.9×10^{-3}	
		(250 ~ 500) N·m	9.5×10^{-3}	
		(500 ~ 1 000) N·m	9.1×10^{-3}	

204. Pressure

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Manometers	20402	(0 ~ 133) kPa	7.5×10^{-3}	Pressure regulator / DYS-SP-01
Absolute pressure gauges	20406	5 kPa abs. ~ 7 MPa abs.	2.4×10^{-3}	Pressure regulator / DYS-SP-06
Compound pressure gauges	20408	-95 kPa ~ 7 MPa	7.4×10^{-3}	Pressure regulator / DYS-SP-03
Differential pressure gauges	20409	(0 ~ 700) kPa 700 kPa ~ 7 MPa	1.4×10^{-4} 2.3×10^{-4}	Pressure ballances / DYS-SP-05
Gauge pressure gauges	20411	(0 ~ 7) MPa (7 ~ 100) MPa	1.4×10^{-4} 1.0×10^{-4}	Pressure ballances / DYS-SP-02
Pressure transducers/ transmitters	20412	(-95 ~ 0) kPa (0 ~ 70) MPa (70 ~ 100) MPa	7.4×10^{-3} 4.3×10^{-4} 5.0×10^{-4}	Pressure regulator, Pressure ballances / DYS-SP-07
Dial type vacuum gauges	20413	(-95 ~ 0) kPa	5.3×10^{-3}	Pressure regulator / DYS-SP-04

206. Volume

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Volumetric glasswares	20601	(0 ~ 1) ml (1 ~ 2) ml (2 ~ 5) ml (5 ~ 10) ml (10 ~ 25) ml (25 ~ 50) ml (50 ~ 100) ml (100 ~ 200) ml (200 ~ 500) ml (500 ~ 1 000) ml (1 000 ~ 2 000) ml	1.2 μl 2.2 μl 2.9 μl 4.9 μl 11 μl 22 μl 39 μl 52 μl 69 μl 0.16 ml 0.24 ml	Electric balances, Weights / DYS-SV-01
Pycnometers	20602	(0 ~ 10) ml (10 ~ 25) ml (25 ~ 50) ml (50 ~ 100) ml (100 ~ 250) ml (250 ~ 500) ml	1.1 μl 1.7 μl 3.5 μl 5.2 μl 36 μl 42 μl	Electric balances, Weights / DYS-SV-05
Concrete air content meters	20605	(0 ~ 10) %	0.06 %	Electric balances, Weights/ DYS-SV-03
Piston type volume meters	20606	(0 ~ 0.01) ml (0.01 ~ 0.02) ml (0.02 ~ 0.05) ml (0.05 ~ 0.1) ml (0.1 ~ 0.5) ml (0.5 ~ 1) ml (1 ~ 2) ml (2 ~ 5) ml (5 ~ 10) ml	0.029 μl 0.034 μl 0.069 μl 0.11 μl 0.46 μl 0.81 μl 1.5 μl 2.3 μl 6.1 μl	Electric balances, Weights / DYS-SV-04

501. Contact thermometry

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Temperature generators: ovens, furnaces, isothermal liquid baths, ice-point baths, dry-block calibrators Ovens Isothermal liquid baths Furnaces	50101	(-90 ~ 200) °C (-90 ~ 50) °C (50 ~ 250) °C (250 ~ 1 100) °C (1 100 ~ 1 500) °C	1.0 °C 0.02 °C 0.06 °C 1.8 °C 3.7 °C	SPRT / DYS-ST-01, DYS-ST-02 Standard thermocouples / DYS-ST-12
Temperature indicators/ recorders/controllers, temperature calibrators Except sensors Including sensors	50102	(-90 ~ 1 100) °C (1 100 ~ 1 500) °C (-90 ~ 250) °C (250 ~ 1 100) °C (1 100 ~ 1 500) °C	0.49 °C 0.96 °C 0.03 °C 1.8 °C 3.6 °C	Calibrator / DYS-ST-03 SPRT, Standard thermocouples / DYS-ST-04

501. Contact thermometry

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Glass thermometers; liquid-in-glass, Beckmann liquid-in-glass	50103	(-90 ~ 0) °C (0 ~ 250) °C	0.15 °C 0.04 °C	SPRT/ DYS-ST-05
Resistance thermometers; SPRT, IPRT, thermistors, etc. IPRT	50104	(-90 ~ 250) °C	0.04 °C	SPRT/ DYS-ST-06
Thermal expansion thermometers; bimetal, gas or liquid type Bimetal	50105	(-90 ~ 0) °C (0 ~ 250) °C	0.6 °C 0.3 °C	SPRT/ DYS-ST-07
Thermocouples: noble metal, base metal, pure metal, special type, etc. Noble metal Base metal	50106	(0 ~ 250) °C (250 ~ 1 100) °C (1 100 ~ 1 500) °C (-90 ~ 250) °C (250 ~ 1 100) °C	1.3 °C 1.8 °C 3.6 °C 0.40 °C 1.8 °C	SPRT, Standard thermocouples / DYS-ST-10 SPRT, Standard thermocouples / DYS-ST-08
Temperature transducers	50107	(-90 ~ 250) °C (250 ~ 1 100) °C (1 100 ~ 1 500) °C	0.24 °C 1.8 °C 3.6 °C	SPRT, Standard thermocouples / DYS-ST-09

503. Humidity

Measured Quantity Instrument or Gauge	Field Code	Range	Measurement uncertainty (The Confidence Level is about 95 %)	Standard/Method of Measurement etc.
Relative humidity hygrometers; polymer thin film, hair, etc. (polymer thin film) (hair)	50302	(20 ~ 95) % R.H. (5 ~ 70) °C (20 ~ 95) % R.H.	3.0 % R.H. 0.6 °C 3.8 % R.H.	Auto dew-point hygrometers / DYS-SH-01, DYS-SH-02
Temperature humidity recorders; hygrothermograph, etc.	50304	(20 ~ 95) % R.H. (5 ~ 70) °C	3.5 % R.H. 1.1 °C	Auto dew-point hygrometers / DYS-SH-03
Transducers; dew-point/ relative humidity (relative humidity)	50305	(20 ~ 95) % R.H.	2.6 % R.H.	Auto dew-point hygrometers / DYS-SH-04
Humidity generators; two-pressure, two-temperature, flow mixing humidity generator, constant temperature and humidity chamber, etc. (humidity chamber)	50306	(20 ~ 70) % R.H. (70 ~ 95) % R.H. (5 ~ 70) °C	4.2 % R.H. 5.6 % R.H. 1.0 °C	Auto dew-point hygrometers, Temperature recorders / DYS-SH-05