



**National Institute of Metrology (Thailand)**

3/4-5 Moo 3, Klong 5, Klong Luang, Pathumthani, 12120, Thailand

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## Price List

Item No.	Description	Range	Accuracy / Uncertainty	Price (THB)	Remark	Code
<b>Calibration Fee</b>						
<b>Dimensional Metrology</b>						
1	Iodine Stabilized He-Ne laser	633 nm	$5.0 \times 10^{-11}$	36,000/piece	Beat measurement method with Iodine stabilized He-Ne laser	08011 - 10101
2	Stabilized He-Ne laser	633 nm	$1.0 \times 10^{-9}$	22,530/piece	Beat measurement method with Iodine stabilized He-Ne laser	08011 - 10201
3	Stabilized He-Ne laser	500 - 1000 nm and 1560 nm	$1.0 \times 10^{-12}$	45,000/piece	Beat measurement method with optical comb	08011 - 10202
4	Stabilized He-Ne laser	532 nm	$4 \times 10^{-8}$	22,530/piece	Beat measurement method with Iodine stabilized Nd:YAG laser	08011 - 10203
5	Dual frequency stabilized He-Ne laser	633 nm	1.0E-09	25,000	Beat measurement method with Iodine stabilized He-Ne laser	08011 - 10204
6	Nonstabilized Laser	633 nm	$1 \times 10^{-7}$	22,530/piece	Beat measurement method with Iodine stabilized He-Ne laser	08011 - 10301
7	Nonstabilized Laser	350 - 1100 nm	$1.7 \times 10^{-7}$	21,280/piece	Direct measurement method by wavelength meter	08011 - 10401
8	Wavelength meter	532 - 1064 nm	$4.0 \times 10^{-8}$	25,000/piece	Direct measurement method by stabilized light source	08011 - 10503
9	Rectangular Gauge Block, Material : Steel	0.5 mm to 125 mm	Q[26 nm, $0.35 \times 10^{-6}$ L]	2,000/piece	Optical Interferometry method, Deviation from central length Measuring faces inspection without lapping. Both side wringing	08021 - 10101
10	Rectangular Gauge Block, Material : Ceramic	0.5 mm to 125 mm	Q[26 nm, $0.29 \times 10^{-6}$ L]	2,000/piece	Optical Interferometry method, Deviation from central length Measuring faces inspection without lapping. Both side wringing	08021 - 10101
11	Rectangular Gauge Block, Material : Tungsten Carbide	0.5 mm to 125 mm	Q[26 nm, $0.18 \times 10^{-6}$ L]	2,000/piece	Optical Interferometry method, Deviation from central length Measuring faces inspection without lapping. Both side wringing	08021 - 10101
12	Rectangular Gauge Block, Material : Chromium Carbide	0.5 mm to 125 mm	Q[26 nm, $0.27 \times 10^{-6}$ L]	2,000/piece	Optical Interferometry method, Deviation from central length Measuring faces inspection without lapping. Both side wringing	08021 - 10101
13	Rectangular Gauge Block, Material : Steel	< 0.5 mm	Q[26 nm, $0.35 \times 10^{-6}$ L]	3,000/piece	Optical Interferometry method, Deviation from central length Measuring faces inspection without lapping. Both side wringing	08021 - 10102
14	Rectangular Gauge Block, Material : Ceramic	< 0.5 mm	Q[26 nm, $0.29 \times 10^{-6}$ L]	3,000/piece	Optical Interferometry method, Deviation from central length Measuring faces inspection without lapping. Both side wringing	08021 - 10102
15	Rectangular Gauge Block, Material : Tungsten Carbide	< 0.5 mm	Q[26 nm, $0.18 \times 10^{-6}$ L]	3,000/piece	Optical Interferometry method, Deviation from central length Measuring faces inspection without lapping. Both side wringing	08021 - 10102



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16	Rectangular Gauge Block, Material : Chromium Carbide	< 0.5 mm	Q[26 nm, 0.27 x 10-6 L]	3,000/piece	Optical Interferometry method, Deviation from central length Measuring faces inspection without lapping. Both side wringing	08021 - 10102
17	Rectangular Gauge Block, Material : Steel, Ceramic, Tungsten Carbide, Chromium Carbide - Variation in length	0.5 mm to 125 mm	0.020 um	2,200/piece	Optical Interferometry method, Variation (fo, fu) in length measurement. Measuring faces inspection without lapping.	08021 - 10103
18	Rectangular Gauge Block, Material : Steel, Ceramic, Tungsten Carbide, Chromium Carbide - Flatness	0.5 mm to 125 mm	0.035 um	2,200/piece	Optical Interferometry method, Flatness measurement	08021 - 10104
19	Rectangular Gauge Block, according to Euramet cg-2/v.02 (03/2011)	0.5 mm to 100 mm	26 nm	2,500/piece	Optical Interferometry method, Deviation from central length Measuring faces inspection without lapping. Both side wringing	08021 - 10201
20	Rectangular and Square Gauge Block (Metric), Material : Steel, Tungsten Carbide, Chromium Carbide - Deviation from central length	0.5 mm to 100 mm	Q[50 nm, 0.50e-06 L]	750/piece	Comparison method, Dlc, Deviation from central length , Variation (fo, fu) Measuring faces inspection without lapping	08021 - 10301
21	Rectangular and Square Gauge Block (Metric), Material : Steel, Tungsten Carbide, Chromium Carbide - Deviation from central length	>100 mm to 125 mm	Q[50 nm, 0.50e-06 L]	3,030/piece	Comparison method, Dlc, Deviation from central length , Variation (fo, fu) Measuring faces inspection without lapping	08021 - 10302
22	Rectangular and Square Gauge Block (Metric), Material : Ceramic - Deviation from central length	0.5 mm to 100 mm	Q[70 nm, 0.50e-06 L]	750/piece	Comparison method, Dlc, Deviation from central length , Variation (fo, fu) Measuring faces inspection without lapping	08021 - 10301
23	Rectangular and Square Gauge Block (Metric), Material : Ceramic - Deviation from central length	>100 mm to 125 mm	Q[70 nm, 0.50e-06 L]	3,030/piece	Comparison method, Dlc, Deviation from central length , Variation (fo, fu) Measuring faces inspection without lapping	08021 - 10302
24	Rectangular and Square Gauge Block (Metric), Material : Steel, Ceramic, Tungsten Carbide, Chromium Carbide - Difference in central length	0.01 - 25 mm	47 nm	1,905/pair	Direct Measurement by gauge block comparator, Difference in central length, variation in length and measuring face inspection without lapping.	08021 - 10303

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Item No.	Description	Range	Accuracy / Uncertainty	Price (THB)	Remark	Code
25	Rectangular and Square Gauge Block (inch), - Deviation from central length Material : Steel, Tungsten Carbide, Chromium Carbide	0.005 inch to 4 inch	Q[50 nm, 0.50e-06 L]	750/piece	Comparison method, $D/c$ , Deviation from central length , Variation ( $fo$ , $fu$ ) Measuring faces inspection without lapping	08021 - 10501
26	Rectangular and Square Gauge Block (inch), - Deviation from central length Material : Ceramic	0.005 inch to 4 inch	Q[70 nm, 0.50e-06 L]	750/piece	Comparison method, $D/c$ , Deviation from central length , Variation ( $fo$ , $fu$ ) Measuring faces inspection without lapping	08021 - 10501
27	Long Gauge Block (Metric Rectangular, Square) Material : Steel	>125 mm to 500 mm	Q[50 nm, 0.80 x 10-6 L]	3,380/piece	Comparison Method, $D/c$ , Deviation from central length, Variation ( $fo$ , $fu$ ) Measuring faces inspection without lapping.	08021 - 10601
28	Long Gauge Block (Metric Rectangular, Square) Material : Steel	600 mm to 1000 mm	Q[50 nm, 0.80 x 10-6 L]	6,750/piece	Comparison Method, $D/c$ , Deviation from central length, Variation ( $fo$ , $fu$ ) Measuring faces inspection without lapping.	08021 - 10603
29	Length Bar	Up to 800 mm	Q[50 nm, 0.80 x 10-6 L]	3,380/piece	Comparison Method, $D/c$ , Deviation from central length, Variation ( $fo$ , $fu$ ) Measuring faces inspection.	08021 - 10701
30	Ball Bar / Nest Bar	up to 800 mm	1.2 $\mu$ m	3,780/piece	Direct measurement by ULM and laser interferometer	08021 - 10703
31	Long Gauge Block (Metric Rectangular) Material : Steel	>125 mm to 500 mm	Q[20 nm, 0.44 x 10-6 L]	10,000/piece	Optical Interferometry method, Deviation from central length Measuring faces inspection and lapping. Both side wringing	08021 - 10801
32	Long Gauge Block (Metric Rectangular) Material : Steel	600 mm to 1000 mm	Q[20 nm, 0.44 x 10-6 L]	15,000/piece	Optical Interferometry method, Deviation from central length Measuring faces inspection and lapping. Both side wringing	08021 - 10802
33	Square Gauge Block Material : Steel	0.5 mm to 125 mm	Q[28 nm, 0.35 x 10-6 L]	1,730/piece	Optical Interferometry method, Deviation from central length Measuring faces inspection without lapping. Both side wringing	08021 - 11001
34	Autocollimator (Analog, Digital)	$\pm 1000''$	0.2"	25,000/piece	Calibration by standard autocollimator	08031 - 10101
35	Autocollimator (Analog, Digital)	$\pm 1500''$	0.15"	25,000/piece	Calibration by Self calibration angle system	08031 - 10103
36	Rotary Encoder	0 - 360 degree	0.06"	25,000/piece	Calibration by self calibration angle system (SCMS-127)	08031 - 10201
37	Rotary Encoder	0 - 360 degree	0.11"	25,000/piece	Calibration by self calibration angle system (SCMS-107)	08031 - 10202
38	Rotary Encoder	0 - 360 degree	7"	25,000/piece	Calibration by self calibration angle system	08031 - 10203
39	Polygon	8 to 72 faces	0.2"	1,000/face	Calibration by one autocollimator	08031 - 10301

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40	Polygon	8 to 72 faces	0.25"	750/face	Calibration by two autocollimator	08031 - 10305
41	Polygon	8 to 72 faces	0.2"	1,000/face	Calibration by self calibration rotay encoder system	08031 - 10309
42	Angle Gauge Block	up to 90°	0.33"	1,500/piece	Calibration by autocalimator	08031 - 10401
43	Indexing Table	0° to 360°	0.2"	1,000/position	Calibration by one autocollimator	08031 - 10501
44	Electronic Inclinometer	±1000"	0.35"	15,000/range	Calibration by autocollimator	08031 - 10901
45	Electronic Level	±60°	0.002o	5,000	Calibration by rotary encoder	08031 - 10902
46	Cylindrical Square	Up to 400 mm	2.3 μm	5,000/side	Calibration by Master Square	08031 - 11101
47	Standard Square	Up to 400 mm	2.3 μm	5,000/side	Calibration by Master Square and Measuring Probe	08031 - 11201
48	Squareness Tester	Up to 400 mm	2.0 μm	5,000	Calibration by Master Square	08031 - 11301
49	Precision Square	Up to 400 mm	2.5 μm	5,000	Calibration by Master Square & Gauge Blocks	08031 - 11401
50	Square and Squareness Tester	Up to 1000 mm	0.4 μm	10,000 (For up to 10 points) + 1,000/point	Calibration by using reversal method	08031 - 11501
51	Small Angle Generator	±5,000 μm/m	2 μm/m	15,000	Calibration by autocollimator	08031 - 11901
52	Sine Bar	up to 450	1"	5,000	Calibration by Gauge Blocks and Angle Gauge Blocks	08031 - 12001
53	Straightedge	up to 1000 mm	1.0 μm	5,000	Calibration straightness measuring machine	08031 - 12201
54	Straightness Measuring Machine	up to 2,500 mm	(1.6x10-3 /) μm	5,000	Calibration by standard autocollimator	08031 - 12202
55	Straightness Measuring Machine and Straightedge	Up to 1000 mm	0.7 μm	10,000	Calibration by using reversal method	08031 - 12203
56	Plain Ring Gauge	0.1 to 100 mm	Q[0.37 μm, 1.3E-06 D]	2,410/piece	Calibration by Small Internal Diameter Measurement (IDM)	08041 - 10101
57	Plain Ring Gauge	0.5 mm to 100 mm	Q[0.25 μm, 1.8E-06 D]	4,410/piece	Compare measurement method with setting plain ring gauge	08041 - 10102
58	Plain Ring Gauge	100 to 300 mm	Q[0.25 μm, 1.8E-06 D]	4,410/piece	Compare measurement method with setting plain ring gauge	08041 - 10103
59	Go - No Go Plain Ring Gauge	0.1 to 100 mm	Q[0.37 μm, 1.3E-06 D]	2,410/side	Calibration by Small Internal Diameter Measurement (IDM)	08041 - 10201

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60	Taper Plain Ring Gauge	Pitch 0.45 mm to 8 mm	2.0 $\mu\text{m}$	2,410/piece	Cal. by Universal length measuring Machine	08041 - 10301
61	Go - No Go Taper Plain Ring Gauge	Pitch 0.45 mm to 8 mm	2.0 $\mu\text{m}$	2,410/side	Cal. by Universal length measuring Machine	08041 - 10401
62	Plain Plug Gauge	0.1 to 1 mm	Q[0.20 $\mu\text{m}$ , 1.0E-06 D]	2,410/piece	Cal. by Universal length measuring Machine	08041 - 10501
63	Plain Plug Gauge	1 to 100 mm	Q[0.20 $\mu\text{m}$ , 1.0E-06 D]	2,410/piece	Cal. by Universal length measuring Machine	08041 - 10502
64	Plain Plug Gauge	100 to 300 mm	Q[0.20 $\mu\text{m}$ , 1.0E-06 D]	2,410/piece	Cal. by Universal length measuring Machine	08041 - 10503
65	Go-No Go Plain Plug Gauge	0.1 to 1 mm	Q[0.20 $\mu\text{m}$ , 1.0E-06 D]	2,410/side	Cal. by Universal length measuring Machine	08041 - 10601
66	Go-No Go Plain Plug Gauge	1 to 100 mm	Q[0.20 $\mu\text{m}$ , 1.0E-06 D]	2,410/side	Cal. by Universal length measuring Machine	08041 - 10602
67	Go-No Go Plain Plug Gauge	100 to 300 mm	Q[0.20 $\mu\text{m}$ , 1.0E-06 D]	2,410/side	Cal. by Universal length measuring Machine	08041 - 10603
68	Pin Gauge	0.1 to 1 mm	Q[0.20 $\mu\text{m}$ , 1.0E-06 D]	2,410/piece	Cal. by Universal length measuring Machine	08041 - 10701
69	Pin Gauge	1 to 100 mm	Q[0.20 $\mu\text{m}$ , 1.0E-06 D]	2,410/piece	Cal. by Universal length measuring Machine	08041 - 10702
70	Pin Gauge	100 to 300 mm	Q[0.20 $\mu\text{m}$ , 1.0E-06 D]	2,410/piece	Cal. by Universal length measuring Machine	08041 - 10703
71	Sphere	dia. Up to 300 mm	Q[0.20 $\mu\text{m}$ , 1.0E-06 D]	2,410/piece	Cal. by Universal length measuring Machine	08041 - 10801
72	3-Wire Unit	All sizes	Q[0.20 $\mu\text{m}$ , 1.0E-06 D]	2,820/set	Cal. by Universal length measuring Machine	08041 - 10901
73	Taper Plain Plug Gauge	from pitch 0.45 - 8 mm	2.0 $\mu\text{m}$	2,820/piece	Cal. by Universal length measuring Machine and T-Ball Stylus	08041 - 11501
74	Parallel Thread Ring Gauge	from pitch 0.45 - 8 mm	1.5 $\mu\text{m}$	2,820/piece	Cal. by Universal length measuring Machine and T-Ball Stylus	08041 - 11701
75	Go - No Go Parallel Thread Ring Gague	from pitch 0.45 - 8 mm	1.5 $\mu\text{m}$	2,820/side	Cal. by Universal length measuring Machine and T-Ball Stylus	08041 - 11801
76	Taper Thread Ring Gauge	from pitch 0.45 - 8 mm	2.0 $\mu\text{m}$	2,820/piece	Cal. by Universal length measuring Machine and T-Ball Stylus	08041 - 11901
77	Parallel Thread Plug Gauge	from pitch 0.2 - 6 mm	1.5 $\mu\text{m}$	2,820/piece	Cal. by Universal length measuring Machine and 3-Wires	08041 - 12101
78	Go - No Go Parallel Thread Plug Gauge	from pitch 0.2 - 6 mm	1.5 $\mu\text{m}$	2,820/side	Cal. by Universal length measuring Machine and 3-Wires	08041 - 12201
79	Taper Thread Plug Gauge	from pitch 0.45 - 8 mm	2.0 $\mu\text{m}$	2,820/piece	Cal. by Universal length measuring Machine and T-Ball Stylus	08041 - 12301
80	Pitch of thread gauge	0 mm to 120 mm	2.3 $\mu\text{m}$	2,030/piece	Cal. By Contour Measuring Machine	08041 - 12501

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81	X-Axis Contour Measuring Machine	0 mm to 120 mm	1.3 $\mu\text{m}$	10,030/piece	Compare with standard glass scale	08041 - 12502
82	Included angle of thread gauge	0-90 degree	0.06 degree	2,030/piece	Cal. By Contour Measuring Machine	08041 - 12601
83	Contour specimen - x-axis (pitch)	up to 200 mm	2.3 $\mu\text{m}$	5,000/5 points + 1,000/point	Direct measurement by using Contour Measuring Machine	08041 - 12701
84	Contour specimen - z-axis (step, height)	up to 20 mm	1.6 $\mu\text{m}$	5,000/5 points + 1,000/point	Direct measurement by using Contour Measuring Machine	08041 - 12702
85	Check Master/ Step Gauge	0 to 300 mm	Q[0.20 $\mu\text{m}$ , 7.7E-07 L]	10,660/piece	Cal. By Laser Interferometer	08051 - 10201
86	Check Master/ Step Gauge	0 to 600 mm	Q[0.20 $\mu\text{m}$ , 7.7E-07 L]	13,160/piece	Cal. By Laser Interferometer	08051 - 10202
87	Check Master/ Step Gauge	0 to 1020 mm	Q[0.20 $\mu\text{m}$ , 7.7E-07 L]	15,660/piece	Cal. By Laser Interferometer	08051 - 10203
88	Gear standard Spur gear : Profile slope deviation	25 to 400 mm	1.0 to 3.0 $\mu\text{m}$	7,880/piece	Cal. by Coordinate Measuring Machine	08051 - 10301
89	Gear standard Spur gear : Profile slope deviation	up to 45°	1.0 to 2.0 $\mu\text{m}$	7,880/piece	Cal. by Coordinate Measuring Machine	08051 - 10401
90	Spur gear : Pitch	up to 400 mm	2.0 $\mu\text{m}$	7,880/piece	Cal. by Coordinate Measuring Machine	08051 - 10501
91	Bevel Gear : form deviation	up to 300 mm	2.0 $\mu\text{m}$	7,880/piece	Cal. by Coordinate Measuring Machine	08051 - 10601
92	Ball Plate	up to 1000 mm	Q[0.26 $\mu\text{m}$ , 1.9E-06 L]	36,000/piece	Cal. by Coordinate Measuring Machine with Laser Interferometer	08051 - 10701
93	2-D Coordinate (Hole Plate)	Up to 1000 mm	Q[0.25 $\mu\text{m}$ , 0.42×10-6L]	106,250/piece	Swing-round method and laser interferometer integrated with CMM	08051 - 10702
94	Depth Micro-Checker	0 to 150 mm	Q[0.68 $\mu\text{m}$ , 1.1E-06 L]	9,000/piece	Cal. by Coordinate Measuring Machine	08051 - 10801
95	Depth Micro-Checker	0 to 300 mm	Q[0.68 $\mu\text{m}$ , 1.1E-06 L]	11,250/piece	Cal. by Coordinate Measuring Machine	08051 - 10802
96	Inside Micro-Checker	0 to 300 mm	Q[0.20 $\mu\text{m}$ , 7.7E-07 L]	10,660/piece	Cal. by Laser Interferometer	08051 - 10901
97	Inside Micro-Checker	0 to 600 mm	Q[0.20 $\mu\text{m}$ , 7.7E-07 L]	13,160/piece	Cal. by Laser Interferometer	08051 - 10902
98	Inside Micro-Checker	0 to 1020 mm	Q[0.20 $\mu\text{m}$ , 7.7E-07 L]	15,660/piece	Cal. by Laser Interferometer	08051 - 10903
99	Caliper Checker/ Vernier Checker	0 to 300 mm	Q[0.20 $\mu\text{m}$ , 7.7E-07 L]	10,660/piece	Cal. by Laser Interferometer	08051 - 11001
100	Caliper Checker/ Vernier Checker	0 to 600 mm	Q[0.20 $\mu\text{m}$ , 7.7E-07 L]	13,160/piece	Cal. by Laser Interferometer	08051 - 11002



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101	Caliper Checker/ Vernier Checker	0 to 1020 mm	Q[0.20 µm, 7.7E-07 L]	15,660/piece	Cal. by Laser Interferometer	08051 - 11003
102	3-D Artifacts	Up to X×Y×Z (1200×1000×700) mm	Q[0.70 µm, 2.50×10-6L]	2,500 + 900/parameter or depen on drawing	Direct measurement by CMM	08051 - 11011
103	Optical Flat	max. dia. 60 mm	20 nm	2,500/piece	Cal. by Flatness Interferometer	08061 - 10201
104	Optical Flat	max. dia. 300 mm	37 nm	7,500/piece	Cal. by Non-contact measurement using Flatness Interferometer	08061 - 10202
105	Transmission Flat/Reference Flat	max. dia. 300 mm	25 nm	11,500/piece	Absolute Flatness calibration by 3-Flat Test method	08061 - 10203
106	Glass Hemisphere Roundness specimen (High precision)	dia. Up to 355 mm	Q[7.7 nm, 7.6E-03 R]	11,500/piece	Error seperation technique by multistep method (Stylus-on-spindle) where R representing roundness value Soft file of measurement result charge +2500 baht/file	08061 - 10301
107	Roundness of specimen/workpiece	dia. Up to 355 mm	Q[11.1 nm, 1.1E-02 R]	7,530/piece	Soft file of measurement result charge +2500 baht/file where R representing measured value of roundness	08061 - 10401
108	Cylinder/Cylindrical standard - Cylindricity	Height up to 500 mm Diameter up to 300 mm Maximum runout: 2.06 mm	Q[0.16 µm, 1.17E-06 H]	7,530	Direct measurement by Roundness Measuring Instrument where H representing measured height of the cylinder	08061 - 10402
109	Cylinder/Cylindrical standard - Straightness	Height up to 500 mm Diameter up to 300 mm Maximum runout: 2.06 mm	Q[77 nm, 0.10E-06 L]	7,530	Direct measurement by Roundness Measuring Instrument based on Reversal method where L representing travel length	08061 - 10403
110	Cylinder/Cylindrical standard - Parallelism	Height up to 500 mm Diameter up to 300 mm Maximum runout: 2.06 mm	Q[0.16 µm, 1.2E-06 H]	7,530	Direct measurement by Roundness Measuring Instrument where H representing measured height of the cylinder	08061 - 10404
111	Cylinder/Cylindrical standard - Squareness	Height up to 500 mm Diameter up to 300 mm Maximum runout: 2.06 mm	Q[0.10 µm, 1.2E-06 H]	7,530	Direct measurement by Roundness Measuring Instrument where H representing measured height of the cylindrical square	08061 - 10405
112	Harmonic Standard	Up to 80 mm (Diameter up to 300 mm, Height up to 500 mm)	Q[53 nm, 8.0E-3 R]	7,530/range	Direct measurement by roundness measuring instrument (TR595H machine)	08061 - 10406
112	Roughness Specimen (Type A), Step Height	25 nm to 32 um	Q[6.6 nm, 1.2E-02 d]	5,030/step	Contact measurement by Roughness (stylus) Measuring Instrument where d representing depth	08061 - 10501
113	Roughness Specimen (Type A), Step Height	10 nm to 10 µm	Q[2.4 nm, 5.4E-03 d]	6,280/step	Non-contact measurement using Interference Microscope where d representing depth	08061 - 10502



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114	Roughness Specimen (Type C or Type D), Roughness Specimen	25 nm to 32 um	$R_a$ : Q[10 nm, 12E-03 $R_a$ ]	7,530/range	Contact measurement by Roughness (stylus) Measuring Instrument where $R_a$ , $R_z$ and $S_m$ representing roughness value	08061 - 10601
115	Roughness Specimen (Type C or Type D), Roughness Specimen	25 nm to 32 um	$R_z$ : Q[18 nm, 17E-03 $R_z$ ]	7,530/range	Contact measurement by Roughness (stylus) Measuring Instrument where $R_a$ , $R_z$ and $S_m$ representing roughness value	08061 - 10602
116	Roughness Specimen (Type C or Type D), Roughness Specimen	25 nm to 32 um	$R_{sm}$ : Q[0.58 um, 20E-03 $S_m$ ]	7,530/range	Contact measurement by Roughness (stylus) Measuring Instrument where $R_a$ , $R_z$ and $S_m$ representing roughness value	08061 - 10603
117	Roughness specimen (Areal parameter)	0.01 um to 3 um	$S_a$ : Q[29.5 nm, 7.28E-03 $Z_m$ ]	7,530/range	Non-contact measurement using Interference Microscope where $Z_m$ representing measured value	08061 - 10611
118	Roughness specimen (Areal parameter)	0.01 um to 3 um	$S_q$ : Q[30.3 nm, 7.23E-03 $Z_m$ ]	7,530/range	Non-contact measurement using Interference Microscope where $Z_m$ representing measured value	08061 - 10612
119	Roughness specimen (Areal parameter)	0.01 um to 7 um	$S_a$ : Q[52 nm, 7.3E-3 $Z_m$ ]	7,530/range	Non-contact measurement using 3D Measuring Laser Microscope where $Z_m$ representing measured value	08061 - 10621
120	Roughness specimen (Areal parameter)	0.01 um to 7 um	$S_z$ : Q[166 nm, 1.1E-2 $Z_m$ ]	7,530/range	Non-contact measurement using 3D Measuring Laser Microscope where $Z_m$ representing measured value	08061 - 10622
121	Step height / depth standard	1 nm to 100 nm	Q[0.73 nm, 1.73E-06 $Z_m$ ]	11,500/piece	Measurement by Metrological Nanomeasuring and Nanopositioning Machine	08061 - 10901
122	Pitch standard	0.1 um to 100 um	Q[3.39 nm, 1.73E-06 $Z_m$ ]	11,500/piece	Measurement by Metrological Nanomeasuring and Nanopositioning Machine	08061 - 11001
123	Radius of curvature	up to 600 mm	Q[0.75 um, 22.1E-06 $L$ ]	2,530	Non-contact measurement using Fizeau interferometer where $L$ representing measured radius of curvature	08061 - 11101
124	Sphericity and form error of spherical part	F#: 10.7	23 nm	7,530/piece	Non-contact measurement using Fizeau interferometer	08061 - 11102
125	Lens : Sag	Aperture: 100 mm	1 um	2,530/piece	Non-contact measurement using Fizeau interferometer	08061 - 11103
126	Lens : Focal length	Concave radius: up to 600 mm Convex radius: up to 600 mm	(7.87 + 0.47E-03 $F$ ) um	3,780/piece	Non-contact measurement using Fizeau Interferometer where $F$ representing calculated focal length Reflective Index ( $n$ ) of a lens is required	08061 - 11201
127	Lens : Ophthalmic power	Concave radius: up to 600 mm Convex radius: up to 600 mm	(0.0006 + 0.0005 $D$ ) m-1	3,780/piece	Non-contact measurement using Fizeau Interferometer where $D$ representing calculated ophthalmic power Reflective Index ( $n$ ) of a lens is required	08061 - 11202
128	Lens : Prism Diopter	Up to 50Δ	15Δ	5,000/piece	Prism diopter calibration using Mechanical-Bearing Rotary Stage Reflective Index ( $n$ ) of a lens is required	08061 - 11203

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**Price List**

Item No.	Description	Range	Accuracy / Uncertainty	Price (THB)	Remark	Code
129	Lens  Back focal length	33 mm to 250 mm (Diameter up to 100mm)	Q[0.032 mm, 2.5E-6 F <sup>2</sup> ]	2,530/piece	Non contact method by Fizeau interferometer with a sliding	08061 - 11204
130	Lens  Lens power	4 m-1 to 30 m-1 (Diameter up to 100mm)	Q[0.003 m <sup>-1</sup> , 2.7E-5 P <sup>2</sup> ]	2,530/piece	Non contact method by Fizeau interferometer with a sliding	08061 - 11205
131	Angular deviation of a centerline of cylindrical lens	Up to 30'	1.8'	2,530/piece	Direct measurement with a calibrated CCD camera using a standard glass scale	08061 - 11206
132	Vernier Caliper	0 mm to 600 mm	Q[13 um, 1.33x10-5 L]	3,380/piece	Cal. by Gauge Block	08071 - 10201
133	Vernier Caliper	0 mm to 1000 mm	Q[14 um, 1.33x10-5 L]	3,380/piece	Cal. by Gauge Block	08071 - 10202
134	Height Measuring Station	0 mm to 300 mm	Q[0.70 µm, 1.0E-06 D]	11,250/piece	Cal. by Gauge Block	08071 - 10301
135	Height Measuring Station	0 mm to 600 mm	Q[0.70 µm, 1.0E-06 D]	12,600/piece	Cal. by Gauge Block	08071 - 10302
136	Height Gauge	0 mm to 600 mm	Q[6 um, 1.3x10-5L]	9,000/piece	Cal. by Gauge block and Electronic comparator	08071 - 10401
137	Height Gauge	0 mm to 1000 mm	Q[7 um, 1.3x10-5L]	12,600/piece	Cal. by Gauge block and Electronic comparator	08071 - 10402
138	External Micrometer	>25 mm to 225 mm	Q[0.6 um, 1.36x10-5L]	2,820/piece	Cal. by Gauge Block	08071 - 10501
139	External Micrometer	>225 mm to 300 mm	Q[0.7 um, 1.42x10-5L]	3,380/piece	Cal. by Gauge Block	08071 - 10502
140	External Micrometer (Resolution : < 0.001 mm)	0 mm to 25 mm	Q[0.1 um, 1.35x10-5 L]	3,380/piece	Cal. by Gauge Block	08071 - 10504
141	Setting Zero Rod	Up to 1000 mm	(0.2 <sup>2</sup> + 2.3 L <sup>2</sup> ) um	2,030/piece	Cal. by ULM	08071 - 10601
142	Dial gauge (analog/digital)	0-10 mm	Q[2.6 um, 1.8E-4 L]	2,820/piece	Cal. by dial gauge tester	08071 - 10602
143	Dial gauge (analog/digital)	0-25 mm	Q[2.6 um, 1.8E-4 L]	3,380/piece	Cal. by dial gauge tester	08071 - 10603
144	Dial gauge (analog/digital)	0-50 mm	Q[2.6 um, 1.8E-4 L]	5,660/piece	Cal. by dial gauge tester	08071 - 10604
145	Dial gauge (analog/digital)	0-10 mm	Q[0.34 um, 4.5E-5 L]	2,820/piece	Cal. by ULM	08071 - 10605
146	Dial gauge (analog/digital)	0-25 mm	Q[0.34 um, 4.5E-5 L]	3,380/piece	Cal. by ULM	08071 - 10606
147	Dial gauge (analog/digital)	0-50 mm	Q[0.34 um, 4.5E-5 L]	5,660/piece	Cal. by ULM	08071 - 10607
148	Dial test indicator	up to 1.6 mm	0.8 µm	2,820/piece	Cal. by calibration tester	08071 - 10608
149	Laser displacement sensor	0-50 mm	Q[12 um, 1.7E-4 L]	3,380/piece	Cal. by dial gauge tester	08071 - 10609



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150	Laser displacement sensor	0-100 mm	Q[1.2 um, 4E-4 L]	5,660/piece	Cal. by gauge block	08071 - 10610
151	Micrometer Head	0 mm to 25 mm	Q[0.8 um, 8x10-6 L]	3,380/piece	Direct measurement by length gauge	08071 - 10701
152	Micrometer Head	0 mm to 50 mm	Q[0.8 um, 8x10-6 L]	4,500/piece	Direct measurement by length gauge	08071 - 10702
153	Dial Gauge Tester (Scale, Digital)	0 mm to 25 mm	Q[0.13 um, 8.0x10-6 L]	6,750/piece	Cal. by Standard linear gauge	08071 - 10901
154	Dial Gauge Tester (Scale, Digital)	0 mm to 60 mm	Q[0.13 um, 8.0x10-6 L]	8,780/piece	Cal. by Standard linear gauge	08071 - 10902
155	Dial Gauge Tester (Scale, Digital)	0 mm to 100 mm	Q[0.20 um, 8.0x10-6 L]	10,030/piece	Cal. by Standard linear gauge	08071 - 10903
156	Calibration Tester	Up to 5 mm	Q[0.13 um, 4.8x10-6 L]	7,880/piece	Cal. by Laser interferometer	08071 - 10801
157	Electronic Comparator (Mu-Checker / Millitron) (Include: Probe and display unit) Analog M-Checker	0 mm to 5 mm	0.2 um	4,500/piece	Comparison with Laser Hologauge	08071 - 11201
158	Calibration Gauge for Seam Metal	0 to 5 mm	0.0003 mm	2,530/piece	Cal. By NIMT Line scale interferometer system	08071 - 11301
159	Laser Hologauge / Linear gauge	0 to 10 mm	Q[0.05 um, 1.7x10-6L]	11,250/piece	Cal. by Gauge Block	08071 - 11401
160	Laser Hologauge / Linear gauge	0 to 50 mm	Q[0.05 um, 1.7x10-6L]	15,750/piece	Cal. by Gauge Block	08071 - 11402
161	Thickness of specimen/ feeler gauge	up to 10 mm	Q[0.5 um, 9.1x10-6 L]	750/point	Cal. by length gauge	08071 - 11801
162	Laser Scan Micrometer (Display Unit, Measuring Unit)	Up to 100 mm	0.5 μm	11,250/piece	Cal. by Standard plug gauge	08071 - 11901
163	Magnification calibrator / Magnification Checker	0 mm to 0.4 mm	0.2 um	5,630/piece	Direct measurement by linear gauge	08071 - 12401
164	Calibration block	V1	0.01 mm	4,500/piece	Cal. by QV *Depend on the quality of artifact	08071 - 12601
165	Calibration block	V2	0.01 mm	3,380/piece	Cal. by QV *Depend on the quality of artifact	08071 - 12602
166	Calibration block	LSW	0.01 mm	3,380/piece	Cal. by QV *Depend on the quality of artifact	08071 - 12603
167	Scale lupe : Line spacing	0 - 30 mm	Q[0.0003 mm, 1.8 x 10-6 L]	2,820/piece + 500 / ne	Cal. by NIMT Line Scale interferometer system	08071 - 12701
168	Scale lupe : Diameter/Ellipse	upto 20 mm	Q[0.0005 mm, 3.21 x 10-6 L]	2,820/piece + 500 / ne	Cal. By QV	08071 - 12702

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169	Scale loupe : Angle	0 to 360 degree	1 minute	2,820/piece + 500 / ne	Cal. By QV	08071 - 12703
170	Objective/Stage micrometer : Line scale	0 - 10 mm	Q[0.0003 mm, 1.8 x 10-6 L]	2,820/piece + 500 / ne	Cal. by NIMT Line Scale interferometer system	08071 - 12711
171	Objective/Stage micrometer : Angle	0 to 360 degree	1 minute	2,820/piece + 500 / ne	Cal. By QV	08071 - 12712
172	Objective/Stage micrometer : Diameter	upto 5 mm	Q[0.0005 mm, 3.21 x 10-6 L]	2,820/piece + 500 / ne	Cal. By QV	08071 - 12713
173	Specimens : Line spacing	0 - 300 mm	Q[0.0003 mm, 1.8 x 10-6 L]	3,000 /piece + 500 / ne	Cal. by NIMT Line Scale interferometer system	08071 - 12721
174	Specimens : Angle	0 to 360 degree	1 minute	3,000 /piece + 500 / ne	Cal. By QV	08071 - 12722
175	Specimens : Diameter/Ellipse	upto 300 mm	Q[0.0005 mm, 3.21 x 10-6 L]	3,000 /piece + 500 / ne	Cal. By QV	08071 - 12723
176	Test sieve	0.020 - 125 mm	0.012 - 0.025 mm	5,000/piece	Cal. By QV	08071 - 12901
177	Standard Glass Scale	0 mm to 300 mm	Q[41 nm, 0.1x10-6 L]	15,750/piece	Cal. by Line Scale Interferometer	08081 - 10103
178	Standard Glass Scale	>300 mm to 500 mm	Q[41 nm, 0.1x10-6 L]	18,000/piece	Cal. by Line Scale Interferometer	08081 - 10104
179	Standard Metal Scale	0 mm to 1000 mm	8 $\mu\text{m}$ + 2.3x10 $^{-6}$ /	4,500/piece	Cal. By NIMT Line scale interferometer	08081 - 10201
180	Glass scale	0 mm to 200 mm	Q[0.0006 mm + 1.8x10-6 L]	3,380/piece	Cal. By NIMT Line scale interferometer (Price per 10 measuring points) *Depend on the quality of glass scale	08081 - 10301
181	Glass scale	0 mm to 400 mm	Q[0.0006 mm + 1.8x10-6 L]	5,630/piece	Cal. By NIMT Line scale interferometer (Price per 10 measuring points) *Depend on the quality of glass scale	08081 - 10302
182	Glass scale	0 mm to 500 mm	Q[0.0003 mm, 1.0 x 10-6 L]	6,750/piece	Cal. By QV	08081 - 10303
183	Glass scale	0 mm to 1000 mm	Q[0.0005 mm, 1.0 x 10-6 L]	7,880/piece	Cal. By QV	08081 - 10304
184	Standard Glass Scale/ Working Standard Scale/Glass scale	0 mm to 200 mm	Q[0.11 um, 2.9x10-6 L]	6,650/piece	Cal. by Line Scale Interferometer	08081 - 10305
185	Standard Glass Scale/ Working Standard Scale/Glass scale	>200 mm to 500 mm	Q[0.11 um, 2.9x10-6 L]	10,140/piece	Cal. by Line Scale Interferometer	08081 - 10306
186	Calibration Grid	100x100 mm	0.0003 mm	4,500/piece	Cal. by QV *Depend on the quality of artifact	08081 - 10501
187	Calibration Grid	200x200 mm	0.0003 mm	5,400/piece	Cal. by QV *Depend on the quality of artifact	08081 - 10502



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188	Calibration Grid	300x300 mm	0.0005 mm	6,300/piece	Cal. by QV *Depend on the quality of artifact	08081 - 10503
189	Calibration Grid	> 300 mm	0.0007 mm	10,800/piece	Cal. by QV *Depend on the quality of artifact	08081 - 10504
190	Linear Scale	Up to 1000 mm	7 $\mu\text{m}$	5,630/piece	Cal. by laser interferometer	08081 - 10801
191	3D non-contact	x- and y-axis up to 500 mm	Q[0.00015 mm, 0.16x10-6 L]	14,500/piece	Cal by glass scale, angle gauge, standard square and gauge blocks	08081 - 30803
192	3D non-contact	z-axis up to 100 mm	Q[0.0012 mm, 4.5x10-6 L]	14,500/piece	Cal by glass scale, angle gauge, standard square and gauge blocks	08081 - 30803
193	Measuring Microscope	Up to 500 mm	1 $\mu\text{m}$	6,750/piece	Cal. by standard glass scale	08081 - 10901
<b>On-site Calibration</b>						
194	Universal Length Measuring Machine (ULM)	Up to 500 mm	Q[0.050 $\mu\text{m}$ , 0.80 x 10-6 L]	30,000/piece (10 points) + 1,000/point	Direct measurement with gauge block	08021 - 30901
195	Universal Length Measuring Machine (ULM)	>500 mm to 1000 mm	Q[0.060 $\mu\text{m}$ , 0.80 x 10-6 L]	30,000/piece (10 points) + 1,000/point	Direct measurement with gauge block	08021 - 30901
196	Universal Length Measuring Machine (ULM)	Up to 2000 mm	Q[0.040 $\mu\text{m}$ , 0.40 x 10-6 L]	40,000/piece (10 points) + 1,000/point	Direct measurement with Laser Interferometer	08021 - 30902
197	Profile projector	Up to 500 mm	Q[0.0015 mm, 0.15 x 10-3 L]	12,530/piece	Cal by Glass Scale, Angle Gauge Block.	08071 - 30601
198	3D non-contact	x- and y-axis up to 500 mm	Q[0.00015 mm, 0.16x10-6 L]	14,500/piece	Cal by glass scale, angle gauge, standard square and gauge blocks	08081 - 30803
199	3D non-contact	z-axis up to 100 mm	Q[0.0012 mm, 4.5x10-6 L]	14,500/piece	Cal by glass scale, angle gauge, standard square and gauge blocks	08081 - 30803
200	Rotary encoder	0-360 degree	5"	30,000	Comparative measurement using reference encoder	08031 - 30201
201	Measuring Microscope	Up to 500 mm	1 $\mu\text{m}$	6,750/piece	Cal by standard glass scale	08081 - 30901
<b>PT and Inter-laboratory comparison only</b>						
202	Optical Parallel : Flatness	max. dia. 60 mm	0.02 $\mu\text{m}$	1,600/piece	Cal. by Flatness Interferometer, Universal Length Measuring Machine (ULM) and/or	08061 - 10101
203	Optical Parallel : Parallelism	max. dia. 60 mm	ULM : Q[0.060 $\mu\text{m}$ , 6.48E-06 P]	1,600/piece	Cal. by Flatness Interferometer, Universal Length Measuring Machine (ULM) and/or	08061 - 10101
204	Optical Parallel : Thickness	max. dia. 60 mm	0.15 $\mu\text{m}$	1,600/piece	Cal. by Flatness Interferometer, Universal Length Measuring Machine (ULM) and/or	08061 - 10101
205	Precision Level	Full range	5 $\mu\text{m}/\text{m}$	5,630/piece	Calibration by autocollimator	08031 - 11001
206	Bevel protractor	0° to 360°	1.3'	5,000	Cal. By angle gauge block	08031 - 11501

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207	Height Master (analog/digital)	0 to 300 mm	$0.3 \mu\text{m} + 3 \times 10^{-6} l$	13,500/piece	Cal. by Gauge block or Length Bar	08051 - 10101
208	Height Master (analog/digital)	0 to 600 mm	$0.3 \mu\text{m} + 3 \times 10^{-6} l$	22,500/piece	Cal. by Gauge block or Length Bar	08051 - 10102
209	Gauge Block Comparator	0.5 mm to 100 mm	37 nm	25,000/piece	Cal. by 11 Gauge Blocks 0.5 to 100 mm Euramet cg-2/v.02 (03/2011)	08021 - 30801
210	Holttest / 3-point internal micrometer	Up to 100 mm	$1.5 \mu\text{m} + 1.5 \times 10^{-6} d$	2,250/piece	Cal. by Ring gauge	08071 - 12001

**Instrument/measuring system/specimen/TRM**

211	Flatness Tester		$\geq 40 \text{ nm}$	200,000/ea.	The flatness tester system, reference flat, software, including training	08061 - 10701
212	Monodisperse Polystyrene Particle	Diameter 150 nm	10 mL	5,000/ea.	TRM-M-9001	08091 - 10101
213	Monodisperse Polystyrene Particle	Diameter 100 nm	10 mL	5,000/ea.	TRM-M-9002	08091 - 10102
214	Monodisperse Polystyrene Particle	Diameter 1.5 $\mu\text{m}$	10 mL	5,000/ea.	TRM-M-9003	08091 - 10103
215	Monodisperse Polystyrene Particle	Diameter 300 nm	10 mL	5,000/ea.	TRM-M-9005	08091 - 10105