



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
Calibration Fee						
Mechanical Metrology						
1	Mass Standard	1 kg	0.038 mg (Class E0)	18,750/piece	Comparison in air	10011 - 10001
2	Mass Standard	1 mg to 1 kg	Class E1	4,500/piece	Mass and Conventional mass	10011 - 10101
		2 kg		5,070/piece		10011 - 10102
		5 kg		5,630/piece		10011 - 10103
		10 kg		5,940/piece		10011 - 10104
		20 kg		6,250/piece		10011 - 10105
	Mass Standard set	1 mg to 10 mg	Class E1	22,500/set	Mass and Conventional mass	10011 - 10101
		20 mg to 100 mg		18,000/set		
		200 mg to 1 g		18,000/set		
		2 g to 10 g		18,000/set		
		20 g to 100 g		18,000/set		
		200 g to 1 kg		18,000/set		
		2 kg to 10 kg		21,710/set		
3	Mass Standard or Mass Standard set	1 mg to 1 kg	Class E2	2,050/piece	Conventional mass	10011 - 10201
		2 kg		2,750/piece		10011 - 10202
		5 kg		2,750/piece		10011 - 10203
		10 kg		3,130/piece		10011 - 10204
		20 kg		3,940/piece		10011 - 10205
		50 kg		8,000/piece		10011 - 10206
		1 mg to 1 kg	Class F1 and lower	1,690/piece		10011 - 10301
		2 kg		2,250/piece		10011 - 10302
		5 kg		2,750/piece		10011 - 10303
		10 kg		2,750/piece		10011 - 10304
		20 kg		3,130/piece		10011 - 10305
		50 kg		6,250/piece		10011 - 10306
		100 kg		10,170/piece		10011 - 10307
		200 kg		15,000/piece		10011 - 10308
		500 kg		15,000/piece		10011 - 10401
		1000 kg	Class F2 and lower	16,250/piece		10011 - 10402
		2000 kg	Class M1 and lower	20,000/piece		10011 - 10501
4	Volume magnetic susceptibility of weight	1 g to 20 kg	In the range of 10% to 20%	2,820/piece	By the susceptometer method	10012 - 10101



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5	Surface roughness (Ra,Rz) of weight	Up to 50 μm	$Ra = \sqrt{(7.490)^2 + (1.021 \cdot Z_m)^2}$ $Rz = \sqrt{(110.116)^2 + (1.422 \cdot Z_m)^2}$ where Z_m (unit nm) being measured value of weight	7,500/piece	Nominal weight range 1 g to 1 kg	10013 - 10101
6	Inter-laboratory comparison on mass measurement; - Non Automatic Weighing Instruments (NAWI), Electronic balance"	Single range, Resolution 0.001 mg, Maximum capacity 21 g, Number of scale interval 21,000,000	NIMT.M.M-09	5,000	-	10014-10101
7	Inter-laboratory comparison on mass measurement;	1000 kg	NIMT.M.M-12	20,250	Conventional mass	10014-10102
	- Mass Standard	200 g, 1 kg and 20 kg	NIMT.M.M-13	9,830	Conventional mass (200 g, 1 kg- F2 Class and 20 kg-M1 Class)	10014-10103
	- Mass Standard	100 mg, 100 g, and 1 kg	NIMT.M.M-F1.01/2020	5,000	Conventional mass (100 mg, 100 g, and 1 kg- F1 Class)	10014-10104
8	Density and volume of weight (1 g to 1 kg)	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	120 kg/m ³ , 0.002 cm ³ 60 kg/m ³ , 0.002 cm ³ 20 kg/m ³ , 0.002 cm ³ 15 kg/m ³ , 0.002 cm ³ 10 kg/m ³ , 0.004 cm ³ 5.6 kg/m ³ , 0.004 cm ³ 4.4 kg/m ³ , 0.004 cm ³ 3.8 kg/m ³ , 0.007 cm ³ 2.7 kg/m ³ , 0.018 cm ³ 2.6 kg/m ³ , 0.036 cm ³ 6.8 kg/m ³ , 0.21 cm ³ 3.3 kg/m ³ , 0.25 cm ³ 2.4 kg/m ³ , 0.4 cm ³ 2 kg/m ³ , 0.7 cm ³	3,920/piece	Any class which no cavity by hydrostatic weighing method	10021 - 10101
9	Density and volume of solid artifact	2700 kg/m ³ to 9000 kg/m ³ 1.25 cm ³ to 110 cm ³	$\frac{6}{V} V^{0.8} \text{ kg/m}^3$ $(0.04123V + 0.4592) \text{ mm}^3$ $V = \text{volume cm}^3$	8,750/piece	Hydrostatic weighing method (Traceable to a solid density standard)	10021 - 10102
10	Hydrometer - Density	600 to 2000 kg/m ³	$3.22 \times 10^{-5} d + 0.0207 \text{ kg/m}^3$ หรือเทียบเท่าในหน่วยอื่น $d = \text{density kg/m}^3$	7,040/3 points + 1250 next point	Hydrostatic weighing method (Cuckow method)	10021 - 10301
	- Specific Gravity		0.25 kg/m ³ 0.00010 sp/gr	4,230/3 points + 1250 next point		10021 - 10302

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1 September 2021



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	- API - Brix - Brumé - Alcoholometer		0.030 °API 0.30 °Brix 0.030 Bé 0.10 %vol			
11	Density of liquid	600 to 1500 kg/m ³	0.1 to 2.0 kg/m ³	6,750/piece	By hydrostatic weighing method	10021 - 10401
12	Density of liquid	700 to 1600 kg/m ³	0.10 kg/m ³	1,250/piece	By oscillation-type density meter	10021 - 10402
13	Density Meter, Benchtop & Portable Oscillation Type	700 to 1600 kg/m ³	0.030 kg/m ³	22,000/piece	By direct comparison with reference fluids	10021 - 10501
14	Inter-laboratory comparison on density measurement - Artifact: Hydrometer	9 - 81 °API 640 – 1320 kg/m ³	NIMT.M.D-01/2018	5,000		10021 - 10601
15	CRM - Density of Water : 20 Litres @ 20°C	998.20 kg/m ³	1.00 kg/m ³	500/piece		10021 - 10701
16	Force-proving instrument	1 kN to 110* kN	According to ISO 376:2011 Class 00 to 2	14,540/direction	Calibrated by deadweight force standard machine. Digital indicator shall be provided by customer.	10030 - 10101
		0.1 kN to 1.5 kN		12,670/direction		10030 - 10102
		0.2 kN to 5 kN		12,670/direction		10030 - 10103
		16 kN to 500 kN		21,100/direction		10030 - 10104
		50 N to 500 N	According to ISO 376:2011 Class 0.5 to 2	7,500/direction	Calibrated by force-comparator machine. Digital indicator shall be provided by customer.	10030 - 10105
		20 N to 200 N		7,500/direction		10030 - 10106
		20 kN to 100 kN		10,000/direction		10030 - 10201
		> 100 kN to 500 kN		13,290/direction		10030 - 10202
17	Strain Amplifier (Digital Measurement Amplifier)	± 5.0 mV/V	2.0 x 10-5 mV/V	3,750/range	Calibrated by Bridge Calibration Unit	10030 - 10401
18	Static Torque Measuring Devices (Torque Transducer)	0.1 N·m to 1 N·m 1 N·m to 10 N·m 10 N·m to 1,000 N·m	DIN 51309, 0.015% DIN 51309, 0.01%, 0.03% DIN 51309, 0.01%	10,500/range		10040 - 10101
		100 N·m to 5,000 N·m	DIN 51309, 0.01%	21,000/range		10040 - 10102
19	Static Torque Transfer Wrenches	1 N·m to 10 N·m 10 N·m to 2,000 N·m	DAkkS-DKD-R 3-7, 0.04% DAkkS-DKD-R 3-7, 0.03%	10,500/range		10040 - 10202
20	Static Torque Calibration Devices - Torque Wrench Calibration Devices	1 N·m to 2,000 N·m	DAkkS-DKD-R 3-8 0.2%	5,250/range		10040 - 10303
			max. 1 - 2560 0.2%	4,200/range		10040 - 10304
		0.1 N·m to 1 N·m	Based on DAkkS-DKD-R 3-8, 0.3%	5,250/range		10040 - 10305
		1 N·m to 10 N·m	Based on DAkkS-DKD-R 3-8, 0.2%	5,250/range		10040 - 10302
	- Torque Screwdriver Calibration Devices					



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21	Hand Torque Tools (Type I and Type II) - Wrench - Screwdriver	1 N·m to 1,000 N·m	ISO 6789, 1%	3,500/range		10040 - 10401
		0.1 N·m to 1 N·m	ISO 6789, 1.5%	3,500/range		10040 - 10402
		1 N·m to 10 N·m	ISO 6789, 1%	3,500/range		
22	Adjustment charge of torque device for permanent laboratory calibration			100% of the calibration cost of each item and each range		10040 - 10601
23	Recalibration of Reference Block Rockwell Scale : HRA, HRB, HRC	20 HRA to 95 HRA	0.40 HRA	5,250/piece	Reference Block shall be provided by client.	10050 - 10101
		10 HRBW to 100 HRBW	0.40 HRBW			
		20 HRC to 70 HRC	0.40 HRC			
	Vickers : HV	HV 5, HV 10, HV 20, HV 30, HV 50, HV 100	$\left(2.1 + \frac{2600}{d^2}\right) \% \text{ of HV}$	5,820/piece		10050 - 10201
	Vickers : HV	HV 0.1	$\sqrt{6.5 + \frac{16500}{d^2}} \% \text{ of HV}$	5,820/piece		10050 - 10501
	Brinell Scale: HB	HBW 5/750	1.2% of HBW for Force 7.355 kN (750 kgf)	5,000/piece		
		HBW 10/500	1.2% of HBW for Force 4.903 kN (500 kgf)			
		HBW 10/3000	0.6% of HBW for Force 29.42 kN (3,000 kgf)	6,250/piece		10050 - 10401
24	Elastomer Hardness Testing Machine	IRHD-N IRHD Pocket IRHD-M Durometer Type A Durometer Type D Durometer Type AO	According to ISO48-9, ASTM D2240, JIS K6253, JIS K7215, JIS K6301, DIN 53505	6,850/machine		10050 - 10302
		Durometer Type C	ASTM D2240			
25	Gas Pressure Balances	Up to 7 MPa	$> 5 \times 10^{-4} \times \text{Pe to } 1 \times 10^{-4} \times \text{Pe}$	33,750	1. Price per 1 piston & cylinder assembly 2. Calibration of weight set is included.	10060 - 10101
			$< 1 \times 10^{-4} \times \text{Pe}$	50,000		10060 - 10102
		> 7 MPa to 40 MPa	$> 5 \times 10^{-4} \times \text{Pe}$	33,750		10060 - 10103
			$5 \times 10^{-4} \times \text{Pe to } 1 \times 10^{-4} \times \text{Pe}$	45,000		10060 - 10104
			$< 1 \times 10^{-4} \times \text{Pe}$	55,000		10060 - 10105
26	Hydraulic Pressure Balances	Up to 200 MPa	$> 5 \times 10^{-4} \times \text{Pe to } 1 \times 10^{-4} \times \text{Pe}$	33,750	1. Price per 1 piston & cylinder assembly 2. Calibration of weight set is included.	10060 - 10201
			$< 1 \times 10^{-4} \times \text{Pe}$	50,000		10060 - 10202
		> 200 MPa to 500 MPa	$> 5 \times 10^{-4} \times \text{Pe to } 2 \times 10^{-4} \times \text{Pe}$	52,500		10060 - 10203
			$< 2 \times 10^{-4} \times \text{Pe}$	60,000		10060 - 10204
27	Gas Pressure Measuring Instruments (gauge pressure, Pe)	0 kPa to -100 kPa	Not smaller than 0.2 mbar	8,750/range		10060 - 10313
			Not smaller than 1 mbar	4,070/range		10060 - 10314

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		0 kPa to -15 kPa	Smaller than 0.2 mbar	11,250/range		10061 - 10319
			$> 1 \times 10^{-3} \times Pe$	8,750/range		10060 - 10315
			$\leq 1 \times 10^{-3} \times Pe$	11,250/range		10060 - 10316
		-1 kPa to 0 kPa	$> 6 \times 10^{-3} \times Pe$	3,750/range		10060 - 10301
			$6 \times 10^{-3} \times Pe$ to $1 \times 10^{-3} \times Pe$	5,000/range		10060 - 10302
			$< 1 \times 10^{-3} \times Pe$, but not smaller	6,250/range		10060 - 10303
		0 kPa to 3 kPa	$> 6 \times 10^{-3} \times Pe$	3,750/range		10060 - 10304
			$6 \times 10^{-3} \times Pe$ to $1 \times 10^{-3} \times Pe$	5,000/range		10060 - 10305
			$< 1 \times 10^{-3} \times Pe$, but not smaller	6,300/range		10060 - 10306
		-4 kPa to 4 kPa	$> 6 \times 10^{-3} \times Pe$	3,750/range		10060 - 10323
			$6 \times 10^{-3} \times Pe$ to $1 \times 10^{-3} \times Pe$	5,000/range		10060 - 10324
			$< 1 \times 10^{-3} \times Pe$, but not smaller	6,300/range		10060 - 10325
		0 kPa to 15 kPa	$> 1 \times 10^{-3} \times Pe$	8,750/range		10060 - 10317
			$\leq 1 \times 10^{-3} \times Pe$	11,250/range		10060 - 10318
		10 kPa to 7 MPa	$> 6 \times 10^{-3} \times Pe$	4,070/range		10060 - 10307
28	Gas Pressure Measuring Instruments (absolute pressure, Pabs)	80 kPa to 115 kPa	$6 \times 10^{-3} \times Pe$ to $1 \times 10^{-3} \times Pe$	6,250/range		10060 - 10308
			$< 1 \times 10^{-3} \times Pe$	7,500/range		10060 - 10309
		> 7 MPa to 100 MPa	$> 6 \times 10^{-3} \times Pe$	7,040/range		10060 - 10310
			$6 \times 10^{-3} \times Pe$ to $1 \times 10^{-3} \times Pe$	9,850/range		10060 - 10311
		80 kPa to 115 kPa	$< 1 \times 10^{-3} \times Pe$	12,670/range		10060 - 10312
			$< 1 \times 10^{-3} \times Pabs$	8,750/range		10060 - 10401
		0 kPa to 15 kPa	Not smaller than 0.35 mbar	4,230/range		10060 - 10402
			$> 1 \times 10^{-3} \times Pabs$	10,000/range		10060 - 10405
		2 kPa to 7 MPa	$\leq 1 \times 10^{-3} \times Pabs$	12,500/range		10060 - 10406
			Not smaller than 0.35 mbar	4,230/range		10060 - 10403
29	Mercury Barometers	85 kPa to 105 kPa	$\geq 1 \times 10^{-4} \times Pabs$	8,750/range		10060 - 10404
			Not smaller than 0.35 mbar	6,250/range	Cistern type	10060 - 10501
30	Hydraulic Pressure Measuring Instruments (gauge pressure, Pe)	up to 200 MPa	$> 6 \times 10^{-3} \times Pe$	5,000/range	Fortin type	10060 - 10502
			$6 \times 10^{-3} \times Pe$ to $1 \times 10^{-3} \times Pe$	7,500/range		10060 - 10601
			$< 1 \times 10^{-3} \times Pe$	10,000/range		10060 - 10602
		> 200 MPa to 500 MPa	$\geq 1 \times 10^{-3} \times Pe$	8,750/range		10060 - 10603
			$< 1 \times 10^{-3} \times Pe$	11,250/range		10060 - 10604
			$\geq 1 \times 10^{-3} \times Pabs$	10,000/range		10060 - 10605
31	Hydraulic Pressure Measuring Instruments (absolute pressure, Pabs)	0.1 MPa to 200 MPa	$> 6 \times 10^{-3} \times Pabs$	6,250/range		10060 - 10801
			$6 \times 10^{-3} \times Pabs$ to $1 \times 10^{-3} \times Pabs$	8,750/range		10060 - 10802
		> 200 MPa to 500 MPa	$< 1 \times 10^{-3} \times Pabs$	11,250/range		10060 - 10803
			$\geq 1 \times 10^{-3} \times Pabs$	10,000/range		10060 - 10804



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			$< 1 \times 10^{-3} \times P_{abs}$	12,500/range		10060 - 10805
32	Gas Differential Pressure at High Static Line pressure (not higher than 40 MPa), ΔP	350 kPa maximum differential pressure	$3.5 \times 10^{-5} \times \Delta P$, but not less than 2.9 Pa	16,250/sensor head	Price per 1 range of differential pressure and 1 range of high static line pressure	10060 - 10701
33	Inter-laboratory comparison on gas gauge pressure	-10 mbar to 0 mbar 0 mbar to 10 mbar	$6 \times 10^{-3} \times P_e$ to $1 \times 10^{-3} \times P_e$	11,000/range		10060 - 10320
34	Inter-laboratory comparison on gas gauge pressure	0 bar to 70 bar	$< 1 \times 10^{-3} \times P_e$	9,500/range		10060 - 10321
35	Inter-laboratory comparison on gas gauge pressure	0 bar to 120 bar	$< 1 \times 10^{-3} \times P_e$	14,670/range		10060 - 10322
36	Pressure Measuring Device	0 to 3500 kPa	0.01%rdg but not less than 0.1 kPa	6,500/range	Media: Water	10060-10901
37	Blood Pressure (Static Mode) (gauge pressure, P_e)	(0 kPa to 40 kPa) (0 mm Hg to 300 mm Hg)	Not smaller than 0.13 kPa (1 mm Hg)	1,875/range	To include leak check	10060 - 10902
38	Vacuum Gauges (absolute pressure : pirani gauge, thermal conductivity gauge)	10^5 Pa to 10^{-1} Pa	0.3% rdg to 1% rdg	7,040/sensor head	Calibration 10 points minimum	10070 - 10101
39	Vacuum Gauges (absolute pressure : capacitance diaphragm gauge)	10^5 Pa to 10^{-1} Pa	0.2% rdg to 0.45% rdg	12,670/sensor head	Calibration 3 decades for the head range (1000, 100,10, 1) torr Calibration 2 decades for the head range 0.1 torr	10070 - 10201
40	Vacuum Gauges (absolute pressure : hot cathode ion gauge, cold cathode ion gauge)	10^{-1} Pa to 10^{-5} Pa	0.5% rdg to 6% rdg	11,090/for first decade +2,250 for next decade		10070 - 10301
41	Vacuum Gauge (absolute pressure : spinning rotor gauge)	10 Pa to 10^{-3} Pa	0.6% rdg to 4.5% rdg	to be determined		10070 - 10401
42	Additional cost for electrical calibration (which the accuracy is not better than $\pm 0.01\%$ rdg)			2,250/item		10070 - 10501
43	Adjustment charge of pressure and vacuum devices for permanent laboratory calibration			50% of the calibration cost of each range		10070 - 10502
44	Measurement audit report			1,000 Baht/report + 1,000 Baht/only for artifact provided + Calibration fee		10070 - 10503
45	Vacuum Gauges by Static Expansion Method (absolute pressure : capacitance diaphragm gauge,	0.13 Pa to 1.3 kPa	0.50% rdg to 0.25% rdg	26,400/sensor head		10070 - 10601
46	Liquid Flowmeter (Turbine Flowmeter)	0.19 L/min to 150* L/min	0.075%**	13,750/ 5 points	Calibration Fluid : Water	10080 - 10101

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	Liquid Flowmeter (Turbine Flowmeter)	20 L/min to 1300 L/min	0.075%	13,750		10080 - 10108
	Liquid Flowmeter (with indicator)	0.19 L/min to 150* L/min	2%	7,880/ 5 points		10080 - 10102
	Coriolis Flowmeter (Volumetric method)	0.2 L/min to 150 L/min	0.075%	13,750/5 points		10080 - 10103
	Ultrasonic flow meter (Clamp-on)	20 L/min to 1300 L/min	1.0%	8,750		10080 - 10109
47	Small Water Flow Meter (Mass Mode)	10 mL/h to 50 mL/h 50 mL/h to 1000 mL/h	0.35% 0.24%	16,875/range	Calibration Fluid : Water Gravimetric Method	10080-10104
48	Small Water Flow Meter (Volume Mode)	10 g/h to 50 g/h 50 g/h to 1000 g/h	0.35% 0.24%	16,875/range	Calibration Fluid : Water Gravimetric Method	10080 - 10301
	Medium Liquid Flow Meter (Gravimetric Method)	0.036 kg/min to 0.32 kg/min	0.30%	12,500/5 points	Calibration Fluid : Water Gravimetric Method	10080 - 10302
49	Gas Flowmeter with display in standard flow (molbloc-L)	100 cm ³ /min to 24000 cm ³ /min	0.25%	30,000/range	Calibration Gas: Dry Air Reference Conditions @ 0°C, 101.325 kPa	10080 - 10202
50	Gas Flowmeter with display in standard flow (molbloc-S)	1 m ³ /h to 65 m ³ /h	0.23%	30,000/range	Calibration Gas: Dry Air Reference Conditions @ 0°C, 101.325 kPa	10080 - 10204
51	Sonic Nozzle at ambient pressure	1 m ³ /h to 100 m ³ /h	0.22%	25,000/range	Calibration Gas: Ambient Air	10080 - 10205
52	Gas Flow rate (Gas meter with impulse output)	1 m ³ /h to 100 m ³ /h	0.20%	30,000/piece (5 points)	Comparison Method	10080 - 10203
53	Orifice flow device (Volumetric method)	(1 to 100) m ³ /h	1.00%	7,500/piece (5-7 points)	Comparison Method	10080 - 10208
54	Gas Flow rate (Gas meter with flow rate output)	1.2 kg/h to 117 kg/h	0.20%	30,000/piece (5 points)	Comparison Method	10080 - 10403
55	Liquid Volume (Proving tank: Neck scale type, Weir neck type)	1 L to 10 L <10 L to 20 L	0.02% to 0.03% 0.02% to 0.03%	6,250/piece 10,000/piece	Gravimetric Method Gravimetric Method	10080 - 10501 10080 - 10502
56	Gas Flowmeter (Volume gas flow rate)	2 (cm ³ /min) to 24000 (cm ³ /min) 2 (cm ³ /min) to 1 (m ³ /min)	0.23% 0.23%	17,250/range 17,250/range	Calibration Fluid : Nitrogen Reference Conditions @ 0 degree C, 101.325 kPa Calibration Fluid : Dry Air Reference Conditions @ 0 degree C, 101.325 kPa	10081 - 10101 10081 - 10102
57	Gas Flowmeter	0.043 (mg/s) to 500 (mg/s)	0.23%	17,250/range	Calibration Fluid : Nitrogen	10080 - 10201
58	(Mass gas flow rate)	0.043 (mg/s) to 21545 (mg/s)	0.23%	17,250/range	Calibration Fluid : Dry Air	10080 - 10202
59	Flow speed device	(0.1-40) m/s	0.50%	12,500/5 points+2,500/next point	Wind tunnel Calibration Fluid : Water	10080 - 10701
60	Inter-laboratory comparison on liquid volume flow rate measurement; Artifact : Coriolis flow meter	25 L/min to 120 L/min	NIMT.MW-L1/2017	20,333/range (N = 3)	Calibration Fluid : Water	10080 - 10105

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		25 L/min to 120 L/min	NIMT.MW-L1/2019	15,750/range (N = 2)	Calibration Fluid : Water	10080 - 10106
61	Inter-laboratory comparison on water flow meter and pressure of infusion pump analyzer	(20 - 200) mL/h ((0 - 1200) mmHg	0.35% 0.35 mbar	12,552.50/range	Infusion device analyzer	10080 - 10107
Reference Materials For Sale						
62	Standard Torque Transducer	$\leq 2,000 \text{ N}\cdot\text{m}$	DIN 51309 Class 0.2, 0.1, 0.05	117,190/piece		10040 - 20501
		$\leq 1,000 \text{ N}\cdot\text{m}$		103,130/piece		10040 - 20502
		$\leq 500 \text{ N}\cdot\text{m}$		88,750/piece		
		$\leq 200 \text{ N}\cdot\text{m}$		75,790/piece		
		$\leq 50 \text{ N}\cdot\text{m}$		45,320/piece		
		$\leq 20 \text{ N}\cdot\text{m}$		39,070/piece		10040 - 20503
63	Standard Torque Transfer Wrench	$\leq 2,000 \text{ N}\cdot\text{m}$	DAkkS-DKD-R 3-7 Class 0.2	125,000/piece		10040 - 20601
		$\leq 1,000 \text{ N}\cdot\text{m}$		115,000/piece		10040 - 20602
		$\leq 500 \text{ N}\cdot\text{m}$		87,500/piece		
		$\leq 200 \text{ N}\cdot\text{m}$		78,500/piece		
		$\leq 50 \text{ N}\cdot\text{m}$		56,250/piece		
		$\leq 20 \text{ N}\cdot\text{m}$		50,000/piece		10040 - 20603
64	Standard Torque Transfer Wrench Model: TW-MCS01	$\leq 2,000 \text{ N}\cdot\text{m}$	DAkkS-DKD-R 3-7 Class 0.2	225,080/piece	Standard Option	10040-20604
		$\leq 1,000 \text{ N}\cdot\text{m}$		161,450/piece	1. Temperature compensation on zero signal	
		$\leq 500 \text{ N}\cdot\text{m}$		128,750/piece	2. Temperature compensation on span signal	
		$\leq 200 \text{ N}\cdot\text{m}$		111,430/piece	3. Zero balance	
		$\leq 50 \text{ N}\cdot\text{m}$		85,930/piece	4. Measurement and check signals	
		$\leq 20 \text{ N}\cdot\text{m}$		79,740/piece		
65	V-notch Charpy Impact CRM	$30 \text{ J} \pm 10 \text{ J}$	According to ISO148-3	18,530/set		10050 - 20301
		$100 \text{ J} \pm 10 \text{ J}$		18,530/set		10050 - 20302
	Calibration of metallic -charpy pendulum Testing Machine	Low(<40J) and high (≥40J) energy	According to ISO148-2	81,250		10050 - 20303
66	Certified Reference Block	20 HRA to 95 HRA	0.40 HRA			



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	Rockwell Scale : HRA, HRB, HRC	10 HRBW to 100 HRBW	0.40 HRBW	10,940/piece		10050 - 20101
		20 HRC to 65 HRC	0.40 HRC			
	Vickers : HV	HV 5, HV 10, HV 20, HV 30, HV 50, HV 100	$\left(2.1 + \frac{2600}{d^2}\right)$ % of HV	20,320/piece		10050 - 20201
	Vickers : HV	HV 0.1	$\sqrt{6.5 + \frac{16500}{d^2}}$ % of HV	26,250/piece		10050 - 20501
	Brinell Scale: HB	HBW 5/750	1.2% of HBW for Force 7.355 kN (750 kgf)	15,000/piece		10050 - 20401
		HBW 10/500	1.2% of HBW for Force 4.903 kN (500 kgf)	16,880/piece		
		HBW 10/3000	0.6% of HBW for Force 29.42 kN (3,000 kgf)			
On-site Calibration						
67	Universal Testing Machine	50 N to 500 kN (for Tension and Compression mode) 50 N to 2,000 kN (for Compression mode)	According to ISO 7500-1 : 2018	10,000/force scale /mode	Calibrated by force-measuring device and accessories shall be provided by customer	10030 - 30201
68	Static Torque Calibration devices - Torque Wrench Calibration Devices	1 N·m to 2,000 N·m	DAkKS-DKD-R 3-8 0.2%	5,250/range		10040 - 30303
	ตาม 1 - 2560 0.2%		4,200/range		10040 - 30304	
	- Torque Screwdriver Calibration Devices	1 N·m to 10 N·m	Based on DAkKS-DKD-R 3-8 0.2%	5,250/range		10040 - 30302
69	Adjustment charge of torque device for on-site calibration			100% of the calibration cost of each item and each range		10040 - 30601
70	Inter-laboratoty comparison on torque with cross force					



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	- Artifact: Torque wrench	40 N·m to 400 N·m	MT 01/2550	9,750		10040 - 30501
	- Artifact: Torque wrench	8 N·m to 40 N·m	MT 01.1/2551	9,750		10040 - 30502
	- Artifact: Torque wrench calibrator	10 N·m to 200 N·m	MT 02/2551	9,750		10040 - 30503
	- Artifact: Setting torque wrench	20 N·m to 330 N·m	MT 03/2553	7,800		10040 - 30504
	- Artifact: Torque wrench	400 N·m to 1000 N·m	MT 01.2/2563	7,800		10040 - 30505
	- Artifact: Torque wrench calibrator	200 N·m to 1000 N·m	MT 02.1/2564	9,750		10040 - 30506
71	Extensometer	Gauge length up to 200 mm	According to ISO 9513	3,910	/scale	10050 - 30001
72	Calibration of Testing Machine Rockwell Hardness Testing Machine	20 HRA to 95 HRA	According to ISO 6508-2			10050 - 30102
	- direct and indirect verification	10 HRBW to 100 HRBW		8,440	/machine/scale	
	- indirect verification	20 HRC to 70 HRC		3,500	/scale	
	- diamond indenter verification	70 HR15N to 94 HR15N		4,880		
	- ball indenter verification	42 HR30N to 86 HR30N		1,000		
		67 HR15TW to 93 HR15TW				
		29 HR30TW to 82 HR30TW				
		70 HREW to 100 HREW				
73	Calibration of Testing Machine Vickers Hardness Testing Machine	HV 0.2, HV 0.3, HV 0.5, HV 5, HV 10, HV 20, HV 30, HV 50	According to ISO 6507-2			10050 - 30202
	- direct and indirect verification			8,440	/machine/scale	
	- indirect verification			3,500	/scale	
	- Vickers Indenter	Tip angle 0°, 90°, 136° Line of conjunction 0 to 5 µm		10,000		
74	Calibration of Testing Machine Brinell Hardness testing machine	HBW 10/3000, HBW 10/500, HBW 10/100	According to ISO 6506-2			10050 - 30402
	- direct and indirect verification	HBW 5/750, HBW 5/125, HBW 5/62.5		8,440	/machine/scale	
	- indirect verification	HBW 2.5/62.5, HBW 2.5/31.25, HBW 2.5/15.625		3,500	/scale	



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	- ball indenter verification	HBW 1/30		1,000		
75	Inter-laboratory comparison on hardness measurement					
	- Artifact hardness specimen	Scale B	MH01.1	9,750		10050 - 30103
	- Artifact hardness specimen	Scale C	MH01.2	9,750		10050 - 30203
	- Artifact hardness specimen	Scale R	MH01.3	9,820	Plastic artifacts shall be provided by client	10050 - 30803
	- Artifact hardness specimen	HV 5	MH02.1	8,250		10050 - 30403
	- Artifact hardness specimen	HV 10	MH02.2	8,250		10050 - 31403
	- Artifact hardness specimen	HV 30	MH02.3	8,250		10050 - 31503
	- Artifact hardness testing machine	Rockwell Scale A, B and C	MH03	9,750		10050 - 30303
	- Artifact hardness testing machine	Rockwell Scale A	MH03.1	5,500		10050 - 32303
	- Artifact hardness testing machine	Rockwell Scale B	MH03.2	5,500		10050 - 32403
	- Artifact hardness testing machine	Rockwell Scale C	MH03.3	5,500		10050 - 32503
	- Artifact hardness testing machine	Vickers HV 0.3	MH04.1	5,500		10050 - 31203
	- Artifact hardness testing machine	Vickers HV 1	MH04.2	5,500		10050 - 31603
	- Artifact hardness testing machine	Vickers HV 5	MH04.3	5,500		10050 - 31703
	- Artifact hardness testing machine	Vickers HV 10	MH04.4	5,500		10050 - 31103
	- Artifact hardness testing machine	Brinell HBW 10/3000	MH05.1	5,500		10050 - 30903
76	Absolute Gravity	9.75 m/s ² to 9.85 m/s ²	Not smaller than 10 µGal (0.01 ppm)	240,000 120,000	for the first measurement location for each additional location	10060 - 30101
77	Local Gravity	9.75 m/s ² to 9.85 m/s ²	Not smaller than 180 µGal (0.18 ppm)	40,000	Using relative method	10060 - 30102
78	Mooney Viscometer	All range	According to ISO 289	20,000	/machine	10050 - 30602
79	Extrusion plastometer (Melt flow tester)	All range	According to ASTM D1238	15,000	/machine	10050-30702
80	Gas Pressure Measuring Instruments (on-site)					
	- (differential gauge pressure,Pe)	0.1 kPa to 130 kPa	2.6E-4P _e but not less than 0.03 kPa	6,250 baht/range	Differential against ambient pressure	10060 - 30103

Effective date
1 September 2021



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	- (absolute pressure, Pabs)	10 kPa to 700 kPa	2.0E-4P _{abs} but not less than 0.03 kPa			
81	Displacement Measuring Systems and Devices Used in Material Testing Machines	Displacement length up to 2,000 mm.	According to ASTM E2309/E2309M-16	5,000	/machine	10050-30802
82	Speed for material testing machines	Speed 0.05 mm/Min to 2,500 mm/Min.	According to ASTM E2658-15	5,000	/speed	10050 - 30902
83	Rolling resistance testing machine (Force method)					
	- Run-out (Radial run-out and Lateral run-out)	Nominal section width, RN from 95 mm to 315 mm	Radial run-out = 0.02 mm	5,000.00		10040 - 30701
			Lateral run-out = 0.02 mm	5,000.00		10040 - 30702
	- Load application (Deviation angular from wheel center)		0.002°	7,500.00		10040 - 30703
	- Tyre alignment (Camber angle and Slip angle)		Camber angle = 0.035°	7,500.00		10040 - 30704
			Slip angle = 0.030°	7,500.00		10040 - 30705
	- Tyre load	At Load index, LI = 0 to 121 (TLCC = 46 kgf to 1,450 kgf) and At Load index, LI = 122 to 279 (TLCC = 1,500 kgf to 136,000 kgf)	0.037% for increasing only 0.11% for increasing and decreasing	10,000.00	UN Regulation No. 117 and มอก. 2721-2560	10040 - 30706
	- Spindle force		0.037% for increasing only 0.11% for increasing and decreasing	10,000.00 / Direction		10040 - 30707
	- Surface speed	0 km/h to 300 km/h	0.20 km/h	5,000.00 / Direction		10040 - 30708
	- Drum diameter	1,700 mm and 2,000 mm	0.15 mm	7,500.00		10040 - 30709
84	Rolling resistance testing machine (Torque method)					
	- Run-out (Radial run-out and Lateral run-out)	Nominal section width, RN from 95 mm to 315 mm	Radial run-out = 0.02 mm	5,000.00		10040 - 30801
			Lateral run-out = 0.02 mm	5,000.00		10040 - 30802
	- Load application (Deviation angular from wheel center)		0.001°	7,500.00		10040 - 30803
	- Tyre alignment (Camber angle and Slip angle)		Camber angle = 0.035°	7,500.00		10040 - 30804
			Slip angle = 0.030°	7,500.00		10040 - 30805
	- Tyre load	At Load index, LI = 0 to 121 (TLCC = 46 kgf to 1,450 kgf) and At Load index, LI = 122 to 279 (TLCC = 1,500 kgf to 136,000 kgf)	0.037% for increasing only 0.11% for increasing and decreasing	10,000.00	UN Regulation No. 117 and มอก. 2721-2560	10040 - 30806
	- Torque input	0.1 N·m to 5 kN·m	0.015% (0.1 N·m to 1 N·m) 0.010% (1 N·m to 5 kN·m)	20,000.00 / Range		10040 - 30807
	- Surface speed	0 km/h to 300 km/h	0.20 km/h	5,000.00 / Direction		10040 - 30808
	- Drum diameter	1,700 mm and 2,000 mm	0.15 mm	7,500.00		10040 - 30809