



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	class E0	18,750/piece	Trace to BIPM (through mass standard 1 kg ;Stainless Steel 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		
						10011 - 10104
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



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Calibration Fee						
Mechanical Metrology						
		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	Class F2 and lower	15,000/piece		10011 - 10401
		1000 kg	Class M1 and lower	16,250/piece		10011 - 10402
		2000 kg		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
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	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; - Mass Standard	1000 kg	NIMT.M.M-12	20,250	Conventional mass	10014-10102
		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



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Calibration Fee						
Mechanical Metrology						
8	Density and volume of weight (1 g to 1 kg)	1 g	120 kg/m ³ , 0.002 cm ³	3,920/piece	Any class which no cavity by hydrostatic weighing method	10021 - 10101
		2 g	60 kg/m ³ , 0.002 cm ³			
		5 g	20 kg/m ³ , 0.002 cm ³			
		10 g	15 kg/m ³ , 0.002 cm ³			
		20 g	10 kg/m ³ , 0.004 cm ³			
		50 g	5.6 kg/m ³ , 0.004 cm ³			
		100 g	4.4 kg/m ³ , 0.004 cm ³			
		200 g	3.8 kg/m ³ , 0.007 cm ³			
		500 g	2.7 kg/m ³ , 0.018 cm ³			
		1 kg	2.6 kg/m ³ , 0.036 cm ³			
		2 kg	6.8 kg/m ³ , 0.21 cm ³			
		5 kg	3.3 kg/m ³ , 0.25 cm ³			
		10 kg	2.4 kg/m ³ , 0.4 cm ³			
		20 kg	2 kg/m ³ , 0.7 cm ³			



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Calibration Fee						
Mechanical Metrology						
9	Density and volume of solid artifact	2700 kg/m ³ to 9000 kg/m ³ 1.25 cm ³ to 110 cm ³	0.6 to 120 kg/m ³ 0.0020 to 0.25 cm ³	8,750/piece	Traceable to SI units via Silicon Cylinder	10021 - 10102
10	Density Hydrometer	600 to 2000 kg/m ³	0.100 kg/m ³	7,040/3 points + 1130 next point	scale division 0.2 kg/m ³ (or less than 0.5 kg/m ³)	10021 - 10301
			0.125 kg/m ³	5,630/3 points + 1130 next point	scale division 0.5 kg/m ³	10021 - 10302
			0.25 kg/m ³	4,230/3 points + 1130 next point	scale division more than 0.5 kg/m ³	10021 - 10303
11	Specific Gravity Hydrometer	0.590 sp/gr to 2.025 sp/gr	0.00010 sp/gr	4,230/3 points + 1130 next point		10021 - 10304
12	API Hydrometer	-1 °API to 101 °API	0.030 °API	4,230/3 points + 1130 next point		10021 - 10305
13	Brix Hydrometer	0 °Brix to 90 °Brix	0.30 °Brix	4,230/3 points + 1130 next point		10021 - 10306
14	Baumé Hydrometer	0 Bé to 100 Bé	0.030 Bé	4,230/3 points + 1130 next point		10021 - 10307
15	Glass Volume Alcoholometer	0 %vol to 100 %vol	0.10 %vol	4,230/3 points + 1130 next point		10021 - 10308
16	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
17	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
18	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



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Calibration Fee						
Mechanical Metrology						
19	Force-proving instrument	1 kN to 110* kN	Accroding to ISO 376:2011 Class 00 to 2	14,540/direction	Calibrated by deadweight force standard machine.	10030 - 10101
		0.1 kN to 1.5 kN		12,670/direction		10030 - 10102
		0.2 kN to 5 kN		12,670/direction	Digital indicator shall be provided by customer.	10030 - 10103
		16 kN to 500 kN		21,100/direction		10030 - 10104
		50 N to 500 N		7,500/direction		10030 - 10105
		20 kN to 100 kN	Accroding to ISO 376:2011 Class 0.5 to 2	10,000/direction	Calibrated by force-comparator machine.	10030 - 10201
		> 100 kN to 500 kN		13,290/direction	Digital indicator shall be provided by customer.	10030 - 10202
20	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
21	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
22	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
23	Static Torque Calibration Devices - Torque Wrench Calibration Devices	1 N·m to 1,000 N·m	DAkKS-DKD-R 3-8 0.2%	5,250/range		10040 - 10303
			DAkKS-DKD-R 3-8 0.2%	4,200/range		10040 - 10304



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Calibration Fee						
Mechanical Metrology						
	- Torque Screwdriver Calibration Devices	1 N·m to 10 N·m	Based on DAkkS-DKD-R 3-8 0.2%	5,250/range		10040 - 10302
24	Hand Torque Tools (Type I and Type I)					
	- Wrench	1 N·m to 1,000 N·m	ISO 6789, 1%	3,500/range		10040 - 10401
	- Screwdriver	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		
25	Adjustment charge of torque device for permanent laboratory calibration			100% of the calibration cost of each item and each range		10040 - 10601
26	Recalibration of Reference Block	20 HRA to 88 HRA	0.40 HRA	5,250/piece	Reference Block shall be provided by client.	10050 - 10101
	Rockwell Scale : HRA, HRB, HRC	20 HRB to 100 HRB	0.40 HRB			
		20 HRC to 70 HRC	0.40 HRC			
	Vickers : HV	HV5, HV10, HV20, HV30, HV50, HV100	$\pm \left(2 + \frac{1400}{d^2} \right) \% \text{ of } HV$	5,820/piece		10050 - 10201
	Vickers : HV	HV0.1	$\pm \sqrt{4 + \frac{19300}{d^2}} \% \text{ of } HV$	5,820/piece		10050 - 10501
	Brinell Scale: HB	HB10/3000	0.6 % of HB	6,250/piece		10050 - 10401
27	Elastomer Hardness Testing Machine	IRHD-N IRHD Pocket IRHD-M Durometer Type A Durometer Type D Durometer Type AO	According ISO 18898	6,850/machine		10050 - 10302
		Durometer Type C	According ASTM D2240			



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Calibration Fee						
Mechanical Metrology						
28	Gas Pressure Balances	Up to 7 MPa	$> 5 \times 10^{-4} \times Pe$ to $1 \times 10^{-4} \times Pe$	33,750	1. Price per 1 piston & cylinder assembly	10060 - 10101
			$< 1 \times 10^{-4} \times Pe$	50,000		10060 - 10102
		> 7 MPa to 40 MPa	$> 5 \times 10^{-4} \times Pe$	33,750	2. Calibration of weight set is included.	10060 - 10103
			$5 \times 10^{-4} \times Pe$ to $1 \times 10^{-4} \times Pe$	45,000		10060 - 10104
			$< 1 \times 10^{-4} \times Pe$	55,000		10060 - 10105
29	Hydraulic Pressure Balances	Up to 200 MPa	$> 5 \times 10^{-4} \times Pe$ to $1 \times 10^{-4} \times Pe$	33,750	1. Price per 1 piston & cylinder assembly	10060 - 10201
			$< 1 \times 10^{-4} \times Pe$	50,000		10060 - 10202
		> 200 MPa to 500 MPa	$> 5 \times 10^{-4} \times Pe$ to $2 \times 10^{-4} \times Pe$	52,500	2. Calibration of weight set is included.	10060 - 10203
			$< 2 \times 10^{-4} \times Pe$	60,000		10060 - 10204
30	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
			Smaller than 0.2 mbar	11,250/range		10061 - 10319
		0 kPa to -15 kPa	$> 1 \times 10^{-3} \times Pe$	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 than 0,003 mbar	6,250/range		10060 - 10303



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Calibration Fee						
Mechanical Metrology						
		0 kPa to 3 kPa	$> 6 \times 10^{-3} \times P_e$	3,750/range		10060 - 10304
			$6 \times 10^{-3} \times P_e$ to $1 \times 10^{-3} \times P_e$	5,000/range		10060 - 10305
			$< 1 \times 10^{-3} \times P_e$, but not smaller than 0.003 mbar	6,300/range		10060 - 10306
		0 kPa to 15 kPa	$> 1 \times 10^{-3} \times P_e$	8,750/range		10060 - 10317
			$\leq 1 \times 10^{-3} \times P_e$	11,250/range		10060 - 10318
		10 kPa to 7 MPa	$> 6 \times 10^{-3} \times P_e$	4,070/range		10060 - 10307
		1,5 kPa to 7 MPa	$6 \times 10^{-3} \times P_e$ to $1 \times 10^{-3} \times P_e$	6,250/range		10060 - 10308
			$< 1 \times 10^{-3} \times P_e$	7,500/range		10060 - 10309
		> 7 MPa to 100 MPa	$> 6 \times 10^{-3} \times P_e$	7,040/range		10060 - 10310
			$6 \times 10^{-3} \times P_e$ to $1 \times 10^{-3} \times P_e$	9,850/range		10060 - 10311
			$< 1 \times 10^{-3} \times P_e$	12,670/range		10060 - 10312
31	Gas Pressure Measuring Instruments (absolute pressure, Pabs)	80 kPa to 115 kPa	$< 1 \times 10^{-3} \times P_{abs}$	8,750/range		10060 - 10401
			Not smaller than 0.35 mbar	4,230/range		10060 - 10402
		0 kPa to 15 kPa	$> 1 \times 10^{-3} \times P_{abs}$	10,000/range		10060 - 10405
			$\leq 1 \times 10^{-3} \times P_{abs}$	12,500/range		10060 - 10406
		2 kPa to 7 MPa	Not smaller than 0.35 mbar	4,230/range		10060 - 10403
		1,5 kPa to 40 MPa	$\geq 1 \times 10^{-4} \times P_{abs}$	8,750/range		10060 - 10404
32	Mercury Barometers	85 kPa to 105 kPa	Not smaller than 0.35 mbar	6,250/range	Cistern type	10060 - 10501
				7,500/range	Fortin type	10060 - 10502



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Calibration Fee						
Mechanical Metrology						
33	Hydraulic Pressure Measuring Instruments (gauge pressure, Pe)	up to 200 MPa	$> 6 \times 10^{-3} \times P_e$	5,000/range		10060 - 10601
			$6 \times 10^{-3} \times P_e$ to $1 \times 10^{-3} \times P_e$	7,500/range		10060 - 10602
			$< 1 \times 10^{-3} \times P_e$	10,000/range		10060 - 10603
		> 200 MPa to 500 MPa	$\geq 1 \times 10^{-3} \times P_e$	8,750/range		10060 - 10604
			$< 1 \times 10^{-3} \times P_e$	11,250/range		10060 - 10605
34	Hydraulic Pressure Measuring Instruments (absolute pressure, Pabs)	0,1 MPa to 200 MPa	$> 6 \times 10^{-3} \times P_{abs}$	6,250/range		10060 - 10801
			$6 \times 10^{-3} \times P_{abs}$ to $1 \times 10^{-3} \times P_{abs}$	8,750/range		10060 - 10802
			$< 1 \times 10^{-3} \times P_{abs}$	11,250/range		10060 - 10803
		> 200 MPa to 500 MPa	$\geq 1 \times 10^{-3} \times P_{abs}$	10,000/range		10060 - 10804
			$< 1 \times 10^{-3} \times P_{abs}$	12,500/range		10060 - 10805
35	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
36	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
37	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
38	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



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Mechanical Metrology						
39	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
40	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
41	Additional cost for electrical calibration (which the accuracy is not better than +/-0.01% rdg)			2,250/item		10070 - 10501
42	Adjustment charge of pressure and vacuum devices for permanent laboratory calibration			50% of the calibration cost of each range		10070 - 10502
43	Measurement audit report			1,000 Baht/report + 1,000 Bath/only for artifact provided + Calibration fee		10070 - 10503
44	Vacuum Gauges by Static Expansion Method (absolute pressure : capacitance diaphragm gauge, spinning rotor gauge)	0.13 Pa to 1.3 kPa	0.50% rdg to 0.25% rdg	26,400/sensor head		10070 - 10601
45	Liquid Flowmeter (Turbine Flowmeter)	0.19 L/min to 150* L/min	0.075%**	13,750/ 5 points	Calibration Fluid : Water	10080 - 10101
	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
46	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
47	Small Water Flow Meter (Volume Mod)	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
48	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
49	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



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Calibration Fee						
Mechanical Metrology						
50	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
51	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
52	Orifice flow device (Volumetric method)	(1 to 100) m ³ /h	1.00%	7,500/piece (5-7 points)	Comparison Method	10080 - 10208
53	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
54	Liquid Volume (Proving tank: Neck scale type, Weir neck type)	1 L to 10 L	0.02% to 0.03%	6,250/piece	Gravimetric Method	10080 - 10501
		<10 L to 20 L	0.02% to 0.03%	10,000/piece	Gravimetric Method	10080 - 10502
55	Gas Flowmeter (Volume gas flow rate)	2 (cm ³ /min) to 24000 (cm ³ /min)	0.23%	17,250/range	Calibration Fluid : Nitrogen Reference Conditions @ 0 degree C, 101.325 kPa	10081 - 10101
		2 (cm ³ /min) to 1 (m ³ /min)	0.23%	17,250/range	Calibration Fluid : Dry Air Reference Conditions @ 0 degree C, 101.325 kPa	10081 - 10102
56	Gas Flowmeter (Mass gas flow rate)	0.043 (mg/s) to 500 (mg/s)	0.23%	17,250/range	Calibration Fluid : Nitrogen	10080 - 10201
		0.043 (mg/s) to 21545 (mg/s)	0.23%	17,250/range	Calibration Fluid : Dry Air	10080 - 10202
57	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
		25 L/min to 120 L/min	NIMT.MW-L1/2019	15,750/range (N = 2)	Calibration Fluid : Water	10080 - 10106
58	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



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Price List

Item No.	Description	Range	Accuracy / Uncertainty	Price (THB)	Remark	Code
Calibration Fee						
Mechanical Metrology						
Reference Materials For Sale						
59	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
60	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



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Calibration Fee						
Mechanical Metrology						
61	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	<u>Standard Option</u> 1. Temperature compensation on zero signal 2. Temperature compensation on span signal 3. Zero balance 4. Measurement and check signals	10040-20604
		$\leq 1,000 \text{ N}\cdot\text{m}$		161,450/piece		
		$\leq 500 \text{ N}\cdot\text{m}$		128,750/piece		
		$\leq 200 \text{ N}\cdot\text{m}$		111,430/piece		
		$\leq 50 \text{ N}\cdot\text{m}$		85,930/piece		
		$\leq 20 \text{ N}\cdot\text{m}$		79,740/piece		
62	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
	Callibration of metellic -charpy pendulum Testing Machine	Low(<40J) and high ($\geq 40\text{J}$)energy	According to ISO148-2	81,250		10050 - 20303
63	Certified Reference Block	20 HRA to 88 HRA	0.40 HRA	10,940/piece		10050 - 20101
	Rockwell Scale : HRA, HRB, HRC	20 HRB to 100 HRB	0.40 HRB			
		20 HRC to 65 HRC	0.40 HRC			
	Vickers : HV	HV5, HV10, HV20, HV30, HV50, HV100	$\pm \left(2 + \frac{1400}{d^2} \right) \% \text{ of } HV$	20,320/piece		10050 - 20201
	Vickers : HV	HV0.1	$\pm \sqrt{4 + \frac{19300}{d^2}} \% \text{ of } HV$	26,250/piece		10050 - 20501
	Brinell Scale: HB	HB10/3000	0.6 % of HB	16,880/piece		10050 - 20401



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Item No.	Description	Range	Accuracy / Uncertainty	Price (THB)	Remark	Code
Calibration Fee						
Mechanical Metrology						
On-site Calibration						
64	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
65	Static Torque Calibration devices - Torque Wrench Calibration Devices	1 N·m to 1,000 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
66	Adjustment charge of torque device for on-site calibration			100% of the calibration cost of each item and each range		10040 - 30601
67	Inter-laboratory comparison on torque with cross force					
	- 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



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Calibration Fee						
Mechanical Metrology						
	- Artifact: Setting torque wrench	20 N·m to 330 N·m	MT 03/2553	7,800		10040 - 30504
68	Extensometer	Gauge length up to 200 mm	According to ISO 9513	3,910	/scale	10050 - 30001
69	Callibration of Testing Machine Rockwell Hardness Testing Machine	20 HRA to 88 HRA	According to ISO 6508-2			10050 - 30102
	- direct and indirect verification	20 HRB to 100 HRB		8,440	/machine/scale	
	- indirect verification	20 HRC to 65 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 HR15T to 93 HR15T				
		29 HR30T to 82 HR30T				
		70 HRE to 100 HRE				
70	Callibration of Testing Machine Vickers Hardness Testing Machine	HV0.2, HV0.3, HV0.5, HV5, HV10, HV20, HV30, HV50	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	± 0.15° ± 0.2 µm	10,000		



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Calibration Fee						
Mechanical Metrology						
71	Calibration of Testing Machine Brinell Hardness testing machine	HB10/3000, HB10/500, HB10/100	According to ISO 6506-2			10050 - 30402
	- direct and indirect verification	HB5/750, HB5/125, HB5/62.5		8,440	/machine/scale	
	- indirect verification	HB2.5/62.5, HB2.5/31.25, HB2.5/15.625		3,500	/scale	
	- ball indenter verification	HB1/30		1,000		
72	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	HV5	MH02.1	8,250		10050 - 30403
	- Artifact hardness specimen	HV10	MH02.2	8,250		10050 - 31403
	- Artifact hardness specimen	HV30	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



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Item No.	Description	Range	Accuracy / Uncertainty	Price (THB)	Remark	Code
Calibration Fee						
Mechanical Metrology						
	- Artifact hardness testing machine	Vickers HV0.3	MH04.1	5,500		10050 - 31203
	- Artifact hardness testing machine	Vickers HV1	MH04.2	5,500		10050 - 31603
	- Artifact hardness testing machine	Vickers HV5	MH04.3	5,500		10050 - 31703
	- Artifact hardness testing machine	Vickers HV10	MH04.4	5,500		10050 - 31103
	- Artifact hardness testing machine	Brinell HB10/3000	MH05.1	5,500		10050 - 30903
73	Absolute Gravity	9.75 m/s^2 to 9.85 m/s^2	Not smaller than $10 \mu\text{Gal}$ (0.01 ppm)	240,000 120,000	for the first measurement location for each additional location	10060 - 30101
74	Local Gravity	9.75 m/s^2 to 9.85 m/s^2	Not smaller than $180 \mu\text{Gal}$ (0.18 ppm)	40,000	Using relative method	10060 - 30102
75	Mooney Viscometer	All range	According to ISO 289	20,000	/machine	10050 - 30602