



COST STRUCTURE OF TESTING FACILITY

IN THE SCHOOL OF MATERIALS &
MINERAL RESOURCES ENGINEERING



PUSAT PENGAJIAN KEJURUTERAAN BAHAN & SUMBER MINERAL
SCHOOL OF MATERIALS & MINERAL RESOURCES ENGINEERING
<http://material.eng.usm.my>

BUSINESS UNIT

ISO Accredited Lab (MS ISO/IEC 17025)

No	Instrument	Equipment/Method	Price (RM) Without SST, Per Sample
1.	Hardness Test	Rockwell C, ASTM E18-2017 ^{e1}	150/5 points
2.	Tensile Test	Metal, ASTM E8/8M-16a, Instron	200
		Plastic, ASTM D638-14, Instron	200



MS ISO/IEC 17025 : 2005
No: SAMM 903

MATERIALS TESTING LABORATORY (MTL)

No	Instrument	Equipment/Method	Price (RM) Without SST, Per Sample
1	Ageing Test (Polymeric Materials)	Oven (RT-400°C)	150 and 20 per day for additional day
2	Aggregate Crushing Value (ACV)	Standard Crushing Tester	300/run
3	Aggregate Impact Value (AIV)	Standard Impact Tester	300
4	Autotitration/Zeta Potential	Zeta Sizer	250
5	Analytical chemistry	UV-Visible Spectrometer	150
6	Autoclave (max T 250°C)	Thermal exposure	100/hr
7	Bending Test/3-point Bend Test	Instron Machine	200
8	Chemical Composition	X-ray fluorescence (XRF)	350
9	Chemical Resistant	Polymer lab testing	200
10	Compression Moulding	Hot Press Machine	120
11	Compression Test	Instron Machine	150
12	Colour Measurement	Universal Testing Machine (UTM), 50 ton	150
		Colori-Meter	50
13	Corrosion	Polarization Test, Potentiostat	150 (test run < 1hr) (subsequent hr: 50/hr)
		Open Circuit Potential / Galvanic Cell	100/1 hr (subsequent hr: 50/hr)
		Salt Spray machine (max 5 sample per run)	10/hr
		Immersion test	100/day (subject to actual test conditions)
14	Concentration of Electron, Mobility of Electron	Hall effect	300
15	Creep Test	8M-6 Tech Equipment	250/day (pro-rate depends on duration)
16	Cyclic Voltamogram	Potentiostat	150 (test run < 1hr) (subsequent hr: 50/hr)
17	Conductivity at Different Temperature and Current/Voltage Characteristic	Parameter Analyzer	300
18	Contact Angle Measurement	Statistic and Dynamic, Goinometer	100-400
19	Crushing Testwork	Jaw Crusher/ Double Swing Jaw Crusher/ Cone Crusher	200/run
20	Crushing Testwork (Min. 2 ton)	Min. 2 ton, BARMAC/VI Crusher	950/run
21	Density	Pycnometer Density/Archimedes	100
22	Dynamic Mechanical Testing Analysis	Normal, > Room Temperature	300
		Low, < Room Temperature	400
23	Elemental Analysis	Normal Scan, energy-dispersive X-ray (EDX)	150/3 points
		Line Scan EBSD, EDX Mapping	1,500/run
		Atomic Absorption Spectrometry (AAS)	120/element
		ICP-OES	30/element
24	Electrical Resistivity Test	High Resistant Meter	100
		4 Points Probe	100
25	Fatigue to Failure Test	FTFT machine	200

26	Fatigue Test	UTM Machine	150/hr
27	Film Thickness/Optical parameters	Filematic	200
28	Fine Grinding fine	Planetary Mill	200/run
		Milling machine (roller machine)	300/hr
		3-micron, Fluidized Jet Mill	500/run
29	Flotation Test	Denver Flotation Test	300/run
30	Flow Cone Test (NZS)	Flow Cone	250
31	Functional Group and Bonding analysis	FTIR	200 250 (if using KBR)
		Vacuum sintering furnace	500 (subject to actual test conditions) day
		Chamber/tube furnace	300 (subject to actual test conditions)
32	Furnaces (max T 1600°C)	Glass melting furnace	500 (subject to actual test conditions)
33	Geophysics Survey	Resistivity, Seismic	3,000-4,000/line
34	Geological Mapping	Drone	2,000-4,000/line
35	Gravity Concentrator	Spiral Shaking Table	250/run
36	Hardenability Test	Jominy test	250
37	Hardness Test	Rockwell, Brinell (micro), Vickers (micro)	120 (5 points)
38	Internal Mixer for Polymer	Internal Mixer	150
39	Impact Test	Impact Tester	150 (with liquid nitrogen add 50)
40	Impedance Spectroscopy	Potentiostat	150/hr (subsequent hr: 50/hr)
41	Magnetic Separator	Magnetic Separator/ Eddy Current Separator	200/run
42	Metallographic Sample Preparation	Cutting, mounting, grinding	Min 100 (rate depends on difficulty)
43	Microstructure/Morphology	Field Emission Scanning Electron Microscopy (FESEM)	400/ 3 magnifications
		Table-top Scanning Electron Microscopy (SEM)	180
		Optical microscopy	150, 200 (with IA)/hr
44	Melt Flow Index (MFI)	Melt Indexer	200
45	Modulus Test	Sonic Modulus Tester	150
46	Molecular Weight Measurement	Gel Permission Chromatography	400
47	Non-Destructive Test	Ultrasonic	250
		Eddy Current	250
		Liquid Penetrant	150
48	Oven (max T 200°C)	Heating/Drying	20/hr
		Laser Sizer	150
49	Particle Size Analysis	Zeta Sizer	150
		Sieves	100
50	Particle Classification	Hydrocyclone	280/run
51	pH value	pH meter	30
52	Phase Analysis (Not Inclusive of Phase Analysis)	X-ray diffraction (XRD)	300
53	Plastic Injection Moulding	Injection Moulding Machine	300/hr
54	Plastic Mixing	Heated Two Roll Mill	125
55	Plastic Mixing (Extrusion)	Single Screw Extruder	250/hr
		Twin Screw Extruder	250/hr
		Cold Isostatic Press	300/cycle run
56	Powder Compaction	Hot Isostatic Press	Min 500 (not inclusive cost of gas, subject to actual test conditions)
57	Polarized Microscope (Petrography/Petrology) Polished Section (with photomicrograph)	Microscope	200
58	Polarized Microscope (Petrology) Thin Section (with photomicrograph)	Microscope	200
59	Rock Breakage Characterization	Drop Weight Tester	250
60	Rock Strength	Point Load Tester	200
61	Rubber Compounding	Two Roll Mill	110

62	Rubber Curing Characteristics	Rheometer	150
63	Rubber Injection Moulding	Injection Moulding Machine	300/hr
64	Shape Analysis (BS) Elongation Index	Elongation Gauge	220
65	Shape Analysis (BS) Flakiness Index	Flakiness Gauge	220
66	Sound and Vibration Measuring for blasting	Blastmate	230
67	Solder Reliability Test	Solder Checker	200
68	Standard Bond Grindability Test	Ball Mill	450/run
69	Standard Polished Section Preparation (Ore Specimen)	Sample cutter and Polishing Machine	200
70	Standard Thin Section Preparation (Ore & Rock Specimen)	Sample cutter and Polishing Machine	200
71	Surface Analysis	Atomic Force Microscope	250
72	Surface Area	Brunauer–Emmett–Teller (BET)	250
73	Surface Resistivity	Resistivity Meter	200
74	Thermal analysis	Thermal Gravimetric Analysis (TGA) (Normal, > Room Temperature)	250-400
		Differential Thermal Analysis (DTA) (Normal, > Room Temperature)	250-400
		Differential scanning calorimetry (DSC) (Normal, > Room Temperature)	250
		Differential scanning calorimetry (DSC) (Low, < Room Temperature)	350
75	Tensile Test	Universal Testing Machine (UTM)	150
76	Thermal Conductivity Analysis	Thermal Conductivity Analyzer	200
77	Thermal Expansion Coefficient	Dilatometer	200
78	Total Dissolved Solid (Latex/Emulsion)	-	80
79	Total Solid (Latex/Emulsion)	-	80
80	Total Suspended Solid (Latex/Emulsion)	-	80
81	Torsion Test	UTM Servo Hydraulic	200
82	Viscosity	Cone and Plate Rheometer	250
83	Voids Contents (ASTM)	TGA/Furnace	250
84	Weathering Test	Q-UV	10/hr
		Q-Sun	15/r
85	Zeta Potential	Particle Size Analysis, Zeta Sizer	200 with cuvette
			250 w/o cuvette

*All price does not include sample preparation and subject to change

*For result within 3 days consider as urgent and double price will be charged

* Testing result depends on number of samples, instrument availability.

MATERIALS TESTING LABORATORY (MTL)



MS ISO/IEC 17025 : 2017
No: SAMM 903

Materials Testing Laboratory (MTL) is one of the service facilities at School Materials & Mineral Resources Engineering, Universiti Sains Malaysia. It is equipped with highly advanced instruments to provide accurate and reliable testing services.

MTL is an MS ISO/IEC 17025:2017 accredited laboratory for mechanical testing of Tensile Strength for metallic and plastic samples (ASTM E8/E8M-16a and ASTM D638-14) and Rockwell Hardness Test (ASTM E18-2017^{ε1}).

MISSION

To provide our customers with high quality mechanical testing and advisory services whilst generating sustainable shareholder values

TENSILE TEST

Machine : Instron
Model : 5982
Load Cell : 5 kN and 100 kN

SCOPE OF TESTING :

- ✓ ASTM E8/E8M-16a – Metallic Samples for Round and Rectangular Specimen
- ✓ ASTM D638-14 – Plastic Samples, Type 1 only.



ROCKWELL HARDNESS TEST

Machine : LECO
Model : FR-3EL
Test Type : Hardness HRC

SCOPE OF TESTING :

- ✓ ASTM E18-2017^{ε1} – Metallic Samples, 20 -70 HRC



No	Type of Testing	Equipment / Method	Rate of Testing (RM/sample)
1	Tensile	ASTM E8/E8M-16a	200.00
2	Tensile	ASTM D638-14	200.00
3	Rockwell Hardness	ASTM E18-2017 ^{ε1}	150.00 (5 measurement points/sample)

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