SINGAPORE LABORATORY ACCREDITATION SCHEME

Accredited Laboratory SAC-SINGLAS

Schedule

Admaterials Technologies Pte Ltd
58 Sungei Kadut Loop
Singapore 729501

Certificate No. : LA-2013-0546-F

Issue No. : 7

Date : 24 January 2020

FIELD OF TESTING : Environmental Testing

MATERIALS / PRODUCTS TESTED		TESTS / PROPERTIES	STANDARD METHODS / TECHNIQUES / EQUIPMENT	SIGNATORY
			APHA Methods are based on 23rd Edition: 2017	
A. Water Analysis	1	Acidity	APHA 2310 B	LJP, CY
1. Potable water	2	Alkalinity (as $CaCO_3$) / Bicarbonate / Carbonate	APHA 2320 B	
2. Non-potable water	3	Aluminium (Al)	APHA 3120 B APHA 3125 B	
3. Sewage, effluents and trade wastes	4	Ammonia (NH_3)	APHA 4500-NH3 F HACH 8038	
4. Water for industrial purposes	5	Ammonium	Hach Doc 022.53.80029	
5. Swimming pool water	6	Antimony (Sb)	APHA 3120 B APHA 3125 B	
6. Ground water	7	Arsenic (As)	APHA 3120 B	
7. RO water			APHA 3125 B	
8. Sea water	8	Barium (Ba)	APHA 3120 B	
9. Pond water			APHA 3125 B	
10. Chiller water	9	Beryllium (Be)	APHA 3120 B	
11. Cooling tower water			APHA 3125 B	
12. Water Fountain water	10	Biochemical Oxygen Demand (BOD)	APHA 5210 B	
13. Boiler water	11	Boron (B)	APHA 3120 B	
14. Mineral, Spring Water			APHA 3125 B	
	12	Bromide	APHA 4110 B	
	13	Cadmium (Cd)	APHA 3120 B APHA 3125 B	

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A. Water Analysis 1. Potable water 2. Non-potable water 3. Sewage, effluents and trade wastes 4. Water for industrial purposes 5. Swimming pool water 6. Ground water 7. RO water 8. Sea water 9. Pond water 10. Chiller water 11. Cooling tower water 12. Water Fountain water 13. Boiler water 14. Mineral, Spring Water	14	Calcium (Ca)	APHA 3120 B	LJP, CY
	15	Calcium Hardness	APHA 3120B / APHA 2340 B	
	16	Chemical Oxygen Demand (COD)	Hach 8000	
	17	Chloride (Cl^-)	APHA 4110 B	
	18	Chlorine (Total Residual)	Hach 8167	
	19	Chlorine (Free)	Hach 8021	
	20	Chromium (Cr)	APHA 3120 B APHA 3125 B	
	21	Chromate (CrO_4^{2-})	ADM/ENV/005:2018	
	22	Cobalt (Co)	APHA 3120 B APHA 3125 B	
	23	Colour	Hach 8025	
	24	Conductivity	APHA 2510 B	
	25	Copper (Cu)	APHA 3120 B APHA 3125 B	
	26	Cyanide (CN^-)	Hach 8027	
	27	Detergents (Linear alkylate sulphonate as methylene blue active substances)	APHA 5540 C Hach 8028	
	28	Dissolved Oxygen	APHA 4500-O, H	
	29	Fluoride (F^-)	APHA 4110 B APHA 4500-F- C	
	30	ffCOD	ADM/ENV/006:2018	
	31	Hardness	APHA 2340 C APHA 3120B / APHA 2340 B	
	32	Iron (Fe)	APHA 3120 B	
	33	Iodide (I^-)	ADM/ENV/005:2018	
	34	Lead (Pb)	APHA 3120 B APHA 3125 B	

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A. Water Analysis 1. Potable water 2. Non-potable water 3. Sewage, effluents and trade wastes 4. Water for industrial purposes 5. Swimming pool water 6. Ground water 7. RO water 8. Sea water 9. Pond water 10. Chiller water 11. Cooling tower water 12. Water Fountain water 13. Boiler water 14. Mineral, Spring Water	35 Lithium (Li) 36 Magnesium (Mg) 37 Manganese (Mn) 38 Mercury (Hg) 39 Molybdenum (Mo) 40 Nickel (Ni) 41 Nitrate (NO^{3-}) 42 Nitrite (NO^{2-}) 43 Oil & Grease (Total) 44 Oil & Grease (Hydrocarbon) 45 pH 46 Phenolic Compounds (as Phenol) 47 Phosphate (PO_4^{3-}) 48 Total Phosphorus, Total Phosphate 49 Potassium (K) 50 Salinity 51 Selenium (Se) 52 Silver (Ag)	APHA 3120 B APHA 3125 B APHA 3120 B APHA 3120 B APHA 3125 B ADM/ENV/004:2017 APHA 3125 B APHA 3120 B APHA 3125 B APHA 3120 B APHA 3125 B APHA 4110B APHA 4110B APHA 5520 G APHA 5520 F APHA 4500-H^+ B Hach 8047 APHA 4110B Hach 8190 Test 'N Tube™ vials APHA 3120 B APHA 2520 B APHA 3120 B APHA 3125 B APHA 3120 B APHA 3125 B	LJP, CY

MATERIALS / PRODUCTS TESTED		TESTS / PROPERTIES	STANDARD METHODS / TECHNIQUES / EQUIPMENT	SIGNATORY
A. Water Analysis 1. Potable water 2. Non-potable water 3. Sewage, effluents and trade wastes 4. Water for industrial purposes 5. Swimming pool water 6. Ground water 7. RO water 8. Sea water 9. Pond water 10. Chiller water 11. Cooling tower water 12. Water Fountain water 13. Boiler water 14. Mineral, Spring Water	53	Sodium (Na)	APHA 3120 B	LJP, CY
	54	Total Solid	APHA 2540 B	
	55	Total Dissolved Solid	APHA 2540 C	
	56	Total Suspended Solid	APHA 2540 D	
	57	Strontium (Sr)	APHA 3120 B APHA 3125 B	
	58	Sulphate (SO_4^{2-})	APHA 4110B	
	59	Sulphide (S^{2-})	APHA 4500-S^{2-} F Hach 8131	
	60	Temperature	APHA 2550 B	
	61	Thallium	APHA 3125 B	
	62	Tin (Sn)	APHA 3120 B	
	63	Titanium	APHA 3125 B	
	64	Total Organic Carbon (TOC)	APHA 5310 B	
	65	Turbidity	Hach 8195	
	66	Vanadium (V)	APHA 3120 B APHA 3125 B	
	67	Zinc (Zn)	APHA 3120 B	
	68	Zirconium	APHA 3125 B	
	69	Appearance	APHA 2110	
	70	Total Nitrogen	ADM/ENV/003:2017	
	71	Odour	ADM/ENV/002:2017	
	72	Oil & Grease (Non Hydrocarbon)	APHA 5520 G & APHA 5520 F	
	73	Chlorophyll a	APHA 10200 H	

MATERIALS / PRODUCTS TESTED	TESTS / PROPERTIES	STANDARD METHODS / TECHNIQUES / EQUIPMENT	SIGNATORY
B. Environmental Samples (Water, Soil, Sediment Sludge)	1 Toxicity Characterictic Leaching Procedure As, Ag, Ba, Cr, Cd, Cu, Co, Fe, F, Hg, Mn, Ni, Pb, Se, Zn and Phenolic Compounds (as Phenol)	USEPA 1311: 1992 (exclude ZHE: Zero Headspace Extraction)	LJP, CY
	2 Heavy Metals (As, Al, Ag, B, Be, Ba, Ca, Cd, Co, Cr, Cu, Fe, K, Mg, Mn, Mo, Na, Ni, Pb, Se, Sn, Sr, V, Zn and Hg)	Digestion by: USEPA 3051 A: 2007 Analysis by: USEPA 6010D-2014 (ICP-AES)	
	3 Volatile Organic Compounds by GC/MS	USEPA 8260D: 2017 Refer to Appendix 1 for the list of volatile organic compounds	
	4 Semivolatile Organic Compounds by GC/MS	USEPA 8270E: 2017 Refer to Appendix 2 for the list of semivolatile organic compounds	
	5 ALKALINE DIGESTION FOR HEXAVALENT CHROMIUM	USEPA 3060A Rev.1 Dec 1996	
	6 HEXAVALENT CHROMIUM	USEPA 7196A Rev.1 Jul 1992	
	7 Falling Velocity	ADM/ENV/007:2019	
C. Mixing water for concrete	<u>Suitability of Water</u> 1 Oil and Fats 2 Detergents 3 Colour 4 Suspended Matter 5 Odour 6 Acids 7 Humic Matter 8 Chloride Content 9 Sulphate Content 10 Alkali Content	BS EN 1008: 2002	

MATERIALS / PRODUCTS TESTED		TESTS / PROPERTIES	STANDARD METHODS / TECHNIQUES / EQUIPMENT	SIGNATORY
D.	**Non-metallic Products for Use in Contact with Water, and Glass Reinforced Polyester Sectional Water Tanks for PUB Potable Water**	Effects on Water		LJP, CY
		1 Odour	SS 375: 2015	
		2 Appearance	SS 375: 2015	
		3 Extraction of Metals	SS 375: 2015	
E.	**Soil**	1 pH Value	BS 1377-3: 2018 Clause 12	LJP, SW, JUL, MAY, CY
		2 Organic Matter	BS 1377-3: 2018 Clause 4	
		3 Mass Loss on Ignition	BS 1377-3: 2018 Clause 6	
		4 Water soluble sulphate in soil	BS 1377-3: 2018 Clause 7.3	
		Water extract or groundwater sulfate (Ion Chromatography IC method)	BS 1377-3: 2018 Clause 7.4	
		Acid or water extract or groundwater sulfate (Gravimetric method)	BS 1377-3: 2018 Clause 7.6	
		Sulfate in groundwater	BS 1377-3: 2018 Clause 7.8	
		Acid soluble sulfate	BS 1377-3: 2018 Clause 7.9	
		5 Carbonate Content	BS 1377-3: 2018 Clause 8.2	LJP, SW, JUL, MAY, CY
		Carbonate Content	BS 1377-3: 2018 Clause 8.3	
		Carbonate Content	BS 1377-3: 2018 Clause 8.4	
		6 Water soluble Chloride	BS 1377-3: 2018 Clause 9.2	
		Acid soluble Chloride	BS 1377-3: 2018 Clause 9.3	
		7 Total Dissolved Solid	BS 1377-3: 2018 Clause 11	
		8 Total Organic carbon (TOC)	BS 1377-3: 2018 Clause 5	

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MATERIALS / PRODUCTS TESTED	TESTS / PROPERTIES	STANDARD METHODS / TECHNIQUES / EQUIPMENT	SIGNATORY
	9 Heavy Metals (As, Al, Ag, B, Be, Ba, Ca, Cd, Co, Cr, Cu, Fe, K, Mg, Mn, Mo, Na, Ni, Pb, Se, Sn, Sr, V, Zn and Hg)	Digestion by: USEPA 3050 B-1996 USEPA 3051 A-2007 (Microwave assisted acid digestion) Analysis by: USEPA 6010D-2014 (ICP-AES)	
	10 Rapid Determination of Carbonate Content of Soils	ASTM D4373-14	
	11 Electrical resistivity	BS 1377-3: 2018 Clause 13	
	12 Redox potential	BS 1377-3: 2018 Clause 14	

Approved Signatories

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Tay Chiou Yann	CY
May Soe Moe	MAY

Note :

This laboratory is accredited in accordance with the recognised International Standard ISO/IEC 17025. A laboratory's fulfilment of the requirements of ISO/IEC 17025 means the laboratory meets both the technical competence requirements and **management system requirements** that are necessary for it to consistently deliver technically valid test results. The **management system requirements** in ISO/IEC 17025 are written in language relevant to laboratory operations and operate generally in accordance with the principles of ISO 9001.

Appendix 1 (Volatile Organic Compound List)

Compound Name	Method Detection Limit (MDL)
Dichlorodifluoromethane	2 µg/L
Methane, chloro-	
bromomethane	
Ethyl Chloride	
Trichloromonofluoromethane	
Ethene, 1,1-dichloro-	
Methylene Chloride	
Ethene, 1,2-dichloro-, (Z)-	
Ethane, 1,1-dichloro-	
Ethene, 1,2-dichloro-, (E)-	
1 Propane, 2,2-dichloro-	
Methane, bromochloro-	
chloroform	
Ethane, 1,1,1-trichloro-	
Ethane, 1,2-dichloro-	
1-Propene, 1,1-dichloro-	
Benzene	
Propane, 1,2-dichloro-	
Trichloroethylene	
Methane, bromodichloro-	
Toluene	
Ethane, 1,1,2-trichloro-	
Propane, 1,3-dichloro-	
Methane, dibromochloro-	
Ethane, 1,2-dibromo-	
Tetrachloroethylene	
Benzene, chloro-	
Ethane, 1,1,1,2-tetrachloro-	
Ethylbenzene	
p-Xylene,m-xylene	
bromoform	
Styrene	
o-Xylene	
Ethane, 1,1,2,2-tetrachloro-	
Propane, 1,2,3-trichloro-	
isopropylbenzene	
Benzene, bromo-	
Benzene, propyl-	
4-chlorotoluene	
2-chlorotoluene	
Benzene, 1,3,5-trimethyl-	
Benzene, tert-butyl-	
Benzene, 1,2,4-trimethyl-	
Benzene, 1,3-dichloro-	
sec-butylbenzene	
Benzene, 1,2-dichloro-	
4-isopropyltoluene	
Benzene, 1,4-dichloro-	
Benzene, butyl-	
Benzene, 1,3,4-trichloro-	
Naphthalene	
Benzene, 1,2,3-trichloro-	

Appendix 1 (Volatile Organic Compound List)

Compound Name	Method Detection Limit (MDL)
hexane	2 µg/L
heptane	
Tetrahydrofuran	
Nonane	
Decane	
Octane	
tetrachloromethane	
Methyl tert-butyl-ether	
furan	
Isobutanol	
DMF (N,N-Dimethylformamide)	
Turpentine	
Methyl Ethyl Ketone	
Methyl Isobutyl Ketone	
Isopropyl ether	
Diethyl ether	
Dimethyl Sulphide	
Dimethyl Sulphoxide	
Epichlorohydrin	

Appendix 2 (Semi-Volatile Organic Compound List)

Compound Name	Method Detection Limit (MDL)
N-Nitrosodimethylamine	4 µg/L
Pyridine	
2-Picoline	
Ethanamine, N-methyl-N-nitroso-	
Ethanamine, N-ethyl-N-nitroso-	
Phenol	
Aniline	
Bis(2-chloroethyl) ether	
Phenol, 2-chloro-	
Benzene, 1,3-dichloro-	
Benzene, 1,4-dichloro-	
Benzyl Alcohol	
Benzene, 1,2-dichloro-	
Phenol, 2-methyl-	
Bis(2-chloroisopropyl) ether	
Phenol, 3-methyl- & Phenol, 4-methyl-	
Pyrrolidine, 1-nitroso-	
N-nitrosomorpholine	
1-Propanamine, N-nitroso-N-propyl-	
o-Toluidine	
Ethane, hexachloro-	
Benzene, nitro-	
Piperidine, 1-nitroso-	
2-Cyclohexen-1-one, 3,5,5-trimethyl-	
Phenol, 2-nitro-	
Phenol, 2,4-dimethyl-	
Methane, bis(2-chloroethoxy)-	
O,O,O-Triethyl thiophosphate	
Phenol, 2,4-dichloro-	
Benzene, 1,2,4-trichloro-	
Naphthalene	
4-Chloroaniline	
1,3-Butadiene, 1,1,2,3,4,4-hexachloro-	
N-nitrosodibutylamine	
1,4-Benzenediamine	
Phenol, 4-chloro-3-methyl-	
Naphthalene, 1-methyl-	
Naphthalene, 2-methyl-	
1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-	
Phenol, 2,4,6-trichloro-	
Phenol, 2,4,5-trichloro-	
Naphthalene, 2-chloro-	

Appendix 2 (Semi-Volatile Organic Compound List)

Compound Name	Method Detection Limit (MDL)
2-Nitroaniline	4 µg/L
Benzene, 1,4-dinitro-	
Dimethyl phthalate	
Benzene, 1,3-dinitro-	
Benzene, 2-methyl-1,3-dinitro-	
Acenaphthylene	
Benzene, 1,2-dinitro-	
3-Nitroaniline	
Acenaphthene	
Phenol, 2,4-dinitro-	
Phenol, 4-nitro-	
Dibenzofuran	
Benzene, 1-methyl-2,4-dinitro-	
1-Naphthalenamine	
Phenol, 2,3,5,6-tetrachloro-	
2-Naphthalenamine	
Phenol, 2,3,4,6-tetrachloro-	
Diethyl Phthalate	
Benzene, 1-chloro-3-phenoxy-	
Thionazin	
Fluorene	
5-nitro-o-toluidine	
4-Nitroaniline	
Phenol, 2-methyl-4,6-dinitro-	
Diphenylamine	
Azobenzene	
Sulfotep	
Phorate	
Benzene, 1-bromo-4-phenoxy-	
alpha-BHC	
Dimethoate	
Benzene, hexachloro-	
[1,1'-Biphenyl]-4-amine	
beta-BHC	
Phenol, pentachloro-	
delta-BHC	
Disulfoton	
Phenanthrene	
Anthracene	
Lindane	
Carbazole	
Methyl parathion	

Appendix 2 (Semi-Volatile Organic Compound List)

Compound Name	Method Detection Limit (MDL)
Heptachlor	4 µg/L
Dibutyl phthalate	
Parathion	
Aldrin	
Methapyrilene	
Heptachlor epoxide	
Fluoranthene	
Benzidine	
trans-Chlordane	
Pyrene - D10	
Pyrene	
cis-Chlordane	
Endosulfan I	
4,4'-DDE	
Dieldrin	
Benzenamine, N,N-dimethyl-4-(phenylazo)-	
Endrin	
4,4'-DDD	
Endosulfan II	
Famphur	
Benzyl butyl phthalate	
Benzidine, 3,3'-dimethyl-	
Bis(2-ethylhexyl)adipate	
4,4'-DDT	
Endosulfan sulfate	
2-acetylaminofluorene	
Methoxychlor	
Bis(2-ethylhexyl) phthalate	
[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dichloro-	
Endrin ketone	
Endrin aldehyde	
Chrysene	
Benz[a]anthracene	
di-n-octyl phthalate	
Benzo[b]fluoranthene	
Benzo[a]pyrene	
Benzo[k]fluoranthene	
Indeno[1,2,3-cd]pyrene	
Dibenz[a,h]anthracene	
Benzo[ghi]perylene	