

Schedule

Admaterials Technologies Pte Ltd
58 Sungei Kadut Loop
Singapore 729501

Certificate No. : LA-2013-0546-F
Issue No. : 5
Date : 21 September 2017
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FIELD OF TESTING : Environmental Testing

MATERIALS / PRODUCTS TESTED	TESTS / PROPERTIES	STANDARD METHODS / TECHNIQUES / EQUIPMENT	SIGNATORY
A. Water Analysis		<u>APHA Methods are based on 22nd Edition: 2012</u>	LJP, THIRU, CY
1. Potable water	1. Acidity	APHA 2310 B	
2. Non-potable water	2. Alkalinity (as CaCO ₃) / Bicarbonate / Carbonate	APHA 2320 B	
3. Sewage, effluents and trade wastes	3. Aluminium (Al)	APHA 3120 B	
4. Water for industrial purposes	4. Ammonia (NH ₃)	APHA 4500-NH3 F HACH 8038	
5. Swimming pool water	5. Antimony (Sb)	APHA 3120 B	
6. Ground water	6. Arsenic (As)	APHA 3120 B	
7. RO water	7. Barium (Ba)	APHA 3120 B	
8. Sea water	8. Beryllium (Be)	APHA 3120 B	
	9. Biochemical Oxygen Demand (BOD)	APHA 5210 B	
	10. Boron (B)	APHA 3120 B	
	11. Cadmium (Cd)	APHA 3120 B	
	12. Calcium (Ca)	APHA 3120 B	
	13. Chemical Oxygen Demand (COD)	HACH 8000	

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A. Water Analysis	14. Chloride (Cl)	APHA 4110 B	LJP, THIRU, CY
1. Potable water	15. Chlorine (Total Residual)	HACH 8167	
2. Non-potable water	16. Chlorine (Free)	HACH 8021	
3. Sewage, effluents and trade wastes	17. Chromium (Cr)	APHA 3120 B	
4. Water for industrial purposes	18. Cobalt (Co)	APHA 3120 B	
5. Swimming pool water	19. Colour	HACH 8025	
6. Ground water	20. Conductivity	APHA 2510 B	
7. RO water	21. Copper (Cu)	APHA 3120 B	
8. Sea water	22. Cyanide (CN ⁻)	HACH 8027	
	23. Detergents (Linear alkylate sulphonate as methylene blue active substances)	APHA 5540 C HACH 8028	
	24. Dissolved Oxygen	APHA 4500-O, Dissolved Oxygen Meter	
	25. Fluoride (F ⁻)	APHA 4110 B APHA 4500-F- C	
	26. Hardness	APHA 2340 C	
	27. Iron (Fe)	APHA 3120 B	
	28. Lead (Pb)	APHA 3120 B	
	29. Lithium (Li)	APHA 3120 B	
	30. Magnesium (Mg)	APHA 3120 B	
	31. Manganese (Mn)	APHA 3120 B	
	32. Mercury (Hg)	ADM/ENV/004: 2017	
	33. Molybdenum (Mo)	APHA 3120 B	
	34. Nickel (Ni)	APHA 3120 B	

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A. Water Analysis	35. Nitrate (NO ₃ ⁻)	APHA 4110B	LJP, THIRU, CY
1. Potable water	36. Nitrite (NO ₂ ⁻)	APHA 4110B	
2. Non-potable water	37. Oil & Grease (Total)	APHA 5520 G	
3. Sewage, effluents and trade wastes	38. Oil & Grease (Hydrocarbon)	APHA 5520 F	
4. Water for industrial purposes	39. pH	APHA 4500-H B	
5. Swimming pool Water	40. Phenolic Compounds (as Phenol)	HACH 8047	
6. Ground water	41. Phosphate (PO ₄ ³⁻)	APHA 4110B	
7. RO water	42. Potassium (K)	APHA 3120 B	
8. Sea water	43. Salinity	APHA 2520 B	
	44. Selenium (Se)	APHA 3120 B	
	45. Silver (Ag)	APHA 3120 B	
	46. Sodium (Na)	APHA 3120 B	
	47. Total Solid	APHA 2540 B	
	48. Total Dissolved Solid	APHA 2540 C	
	49. Total Suspended Solid	APHA 2540 D	
	50. Strontium (Sr)	APHA 3120 B	
	51. Sulphate (SO ₄ ²⁻)	APHA 4110B	
	52. Sulphide (S ²⁻)	APHA 4500-S2- F/HACH 8131	
	53. Temperature	APHA 2550 B	
	54. Tin (Sn)	APHA 3120 B	
	55. Total Organic Carbon (TOC)	APHA 5310 B	
	56. Turbidity	HACH 8195	
	57. Vanadium (V)	APHA 3120 B	

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A. Water Analysis	58. Zinc (Zn)	APHA 3120 B	LJP, CY THIRU		
	1. Potable water	59. Appearance		APHA 2110	
	2. Non-potable water	60. Total Nitrogen		ADM/ENV/003: 2017	
	3. Sewage, effluents and trade wastes	61. Odour		ADM/ENV/002: 2017	
	4. Water for industrial Purposes	62. Oil & Grease (Non Hydrocarbon)		APHA 5520 G & APHA 5520 F	
	5. Swimming pool Water	63. Fecal Enterococcus / Streptococcus		APHA 9230 C	
	6. Ground water	64. Heterotrophic plate count / Standard Plate Count		APHA 9215 B APHA 9215 C	
	7. RO water	65. Legionella		BS 6068-4.12: 1998, BS EN ISO 11731: 1998 BS 6068-4.18: 2004 BS EN ISO 11731-2: 2008 AS/NZS 3896: 2008	
	8. Sea water	66. Total Coliform		APHA 9222 B	
		67. Total Coliform and E.coli		APHA 9223 B	
		68. Thermotolerant (Fecal) Coliform		APHA 9222 D	
	B. Environmental Samples (Water, Soil, Sediment Sludge)	1. Toxicity Characteristic Leaching Procedure As, Ag, Ba, Cr, Cd, Cu, CN, Fe, F, Hg, Mn, Ni, Pb, Se, Zn and Phenolic Compounds (as Phenol)		USEPA 1311: 1992 (exclude ZHE: Zero Headspace Extraction)	LJP, THIRU, 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)	

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C. Mixing water for concrete	3. Volatile Organic Compounds by GC/MS	USEPA 8260 C: 2006 Refer to Appendix 1 for the list of volatile organic compounds	LJP, CY
	4. Semivolatile Organic Compounds by GC/MS	USEPA 8270 D: 2007 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	LJP, THIRU, CY
	1. Suitability of Water <ul style="list-style-type: none"> • Oil and Fats • Detergents • Colour • Suspended Matter • Odour • Acids • Humic Matter • Chloride Content • Sulphate Content • Alkali Content 	BS EN 1008: 2002	
	D. Non-metallic Products for Use in Contact with Water, and Glass Reinforced Polyester Sectional Water Tanks for PUB Potable Water	1. Effects on Water <ul style="list-style-type: none"> • Odour • Appearance • Extraction of Metals 	
E. Soil	1. pH Value Organic Matter Mass Loss on Ignition Sulphate Content Carbonate Content Chloride Content Total Dissolved Solid	BS 1377-3: 1990	LJP, SW, JUL, MAY, THIRU, CY

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	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 3050 B-1996 USEPA 3051 A-2007 (Microwave assisted acid digestion) Analysis by: USEPA 6010D-2014 (ICP-AES)	LJP, SW, JUL, MAY, THIRU, CY
	3. Rapid Determination of Carbonate Content of Soils	ASTM D4373-14	

Approved Signatories

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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.

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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-	

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Compound Name	Method Detection Limit (MDL)
Benzene, tert-butyl-	2 µg/L
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-	

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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- 4 µg/L	
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-	

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Compound Name	Method Detection Limit (MDL)
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-	
2-Nitroaniline	
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	

4 µg/L

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Compound Name	Method Detection Limit (MDL)
beta-BHC	4 µg/L
Phenol, pentachloro-	
delta-BHC	
Disulfoton	
Phenanthrene	
Anthracene	
Lindane	
Carbazole	
Methyl parathion	
Heptachlor	
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 4 µg/L	
[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dichloro-	

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Compound Name	Method Detection Limit (MDL)
Endrin ketone	4 µg/L
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	