Issue date: 28 February 2023
Valid until: 08 April 2028

NO: SAMM 244

LABORATORY LOCATION:
(PERMANENT LABORATORY)

CHEMSIL AIR & WATER SDN. BHD.
33, JALAN KOTA RAJA H27/H
TAMAN ALAM MEGAH, SEKSYEN 27
40400 SHAH ALAM, SELANGOR
MALAYSIA

FIELD(S) OF TESTING: **CHEMICAL, MICROBIOLOGY**

This laboratory has demonstrated its technical competence to operate in accordance with MS ISO/IEC 17025:2017 (ISO/IEC 17025:2017).

This laboratory's fulfillment 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 and calibrations. 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 (see Joint ISO-ILAC-IAF Communiqué dated April 2017).

SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Environmental Monitoring • Wastewater/ Effluent	pH	APHA 4500-H^+ B
	Temperature	APHA 2550 A, B
	Biochemical Oxygen Demand @ 20 °C for 5 days	APHA 5210 B
	Chemical Oxygen Demand	APHA 5220 C
	Total Suspended Solids (Mixed Liquor Suspended Solids)	APHA 2540 D
	Cyanide	APHA 4500-CN^- C, D.
	Sulfide as S^{2-}	APHA 4500-S^{2-} F
	Phenol	APHA 5530 B, C
	Free Chlorine	APHA 4500-Cl F
	Oil & Grease	APHA 5520 B
	Ammonia Nitrogen	APHA 4500-NH_3 B, C

SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Environmental Monitoring • Wastewater/ Effluent	Formaldehyde	In-house Method C/WTR/012 based on Intersociety Committee, Methods of Air Sampling and Analysis, Third Edition, Method 117
	Color by ADMI	APHA 2120 F
	Fluoride	APHA 4500-F^- C APHA 4500-F^- D
	Mercury	APHA 3112 B
	Acid Digestion Method	APHA 3030 E APHA 3030 F (a & b)
	Chromium, Hexavalent	APHA 3500-Cr B
	Chromium, Trivalent	In-house Method C/WTR/001 based on APHA 3120 B & APHA 3500-Cr B
	Metals by Inductively Coupled Plasma Emission Spectroscopy: Aluminium Antimony Arsenic Barium Boron Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Molybdenum Nickel Potassium Selenium Silica Silver Sodium Thallium Tin Zinc	APHA 3120 B

SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Environmental Monitoring • Wastewater/ Effluent	Fixed and Volatile Solids Ignited at 550 °C (Mixed Liquor Volatile Suspended Solids)	APHA 2540 E
	Nitrogen (Organic)	APHA 4500-N_{org} B
	Total Solids Dried at 103 ºC – 105 ºC	APHA 2540 B
	Turbidity	APHA 2130 B
	Total Dissolved Solids Dried at 180 ºC	APHA 2540 C
	Total Dissolved Solids	In-house Method C/WTR/013 based on HANNA HI 8734 N
	Total Alkalinity as $CaCO_3$	APHA 2320 B
	Phenolphthalein Alkalinity as $CaCO_3$	
	Carbonate Alkalinity as $CaCO_3$	
	Bicarbonate Alkalinity as $CaCO_3$	
	Hardness by Calculation	APHA 2340 B
	Total Hardness	APHA 2340 C
	Total Chlorine	HACH Method 8167 APHA 4500-Cl F
	Combined Chlorine as Cl_2 (Monochloroamine and Dichloroamine)	APHA 4500-Cl F
	Conductivity	APHA 2510 B
	Chloride	APHA 4500-Cl^- B
	Nitrate: Low Range	HACH Method 8192
	Nitrite: Low Range	HACH Method 8507
	Sulfate	HACH Method 8051
	Total Phosphorus	USEPA Method 200.7
	Total Phosphate	

SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Environmental Monitoring • Palm Oil Effluent	Biochemical Oxygen Demand for 3 days	D.O.E Revised Standard Method, 4th Edition 2019
	Chemical Oxygen Demand	APHA 5220 C
	Ammoniacal Nitrogen	APHA 4500-NH_3 B,C
	Total Suspended Solids	APHA 2540 D
	Total Nitrogen	D.O.E Revised Standard Method, 4th Edition 2019
	Oil & Grease	APHA 5520 B
• Solid Wastes • Industrial Sludges • River Sediment • Soils	Aluminium Antimony Arsenic Barium Boron Calcium Cadmium Chromium Copper Iron Lead Magnesium Manganese Molybdenum Nickel Potassium Selenium Silver Sodium Tin	AOAC 990.08

SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Water • Ground Water • Cooling Tower Water • Well Water • River Water • Swimming Pool Water • Boiler Water • Drinking Water • Mineral Water • Reverse Osmosis Water • Dialysis Water	pH	APHA 4500-H^+ B
	Temperature	APHA 2550 A, B
	Biochemical Oxygen Demand @ 20 °C for 5 days	APHA 5210 B
	Chemical Oxygen Demand	APHA 5220 C
	Oxygen (Dissolved)	APHA 4500-O G
	Ammonia Nitrogen	APHA 4500-NH_3 B,C
	Cyanide	APHA 4500-CN^- C, D
	Fluoride	APHA 4500-F^- D
	Formaldehyde	In-house Method C/WTR/012 based on Intersociety Committee, Methods of Air Sampling and Analysis, Third Edition, Method 117
	Phenol	APHA 5530 B, C
	Hardness by Calculation	APHA 2340 B
	Total Hardness	APHA 2340 C
	Mercury	APHA 3112 B
	Acid Digestion Method	APHA 3030 E APHA 3030 F (a & b)
	Chromium, Hexavalent	APHA 3500-Cr B
	Chromium, Trivalent	In-House Method C/WTR/001 based on APHA 3120 B & APHA 3500-Cr B

SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Water • Ground Water • Cooling Tower Water • Well Water • River Water • Swimming Pool Water • Boiler Water • Drinking Water • Mineral Water • Reverse Osmosis Water • Dialysis Water	Metals by Inductively Coupled Plasma Emission Spectroscopy: Aluminium Antimony Arsenic Barium Beryllium Boron Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Molybdenum Nickel Potassium Selenium Silica Silver Sodium Thallium Tin Zinc	APHA 3120 B
	Sulfide as S^{2-}	APHA 4500-S^{2-} F
	Total Solids Dried at 103 ºC – 105 ºC	APHA 2540 B
	Total Dissolved Solids Dried at 180 °C	APHA 2540 C
	Total Dissolved Solids	In-house Method C/WTR/013 based on HANNA HI 8734 N
	Total Suspended Solids	APHA 2540 D

SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Water • Ground Water • Cooling Tower Water • Well Water • River Water • Swimming Pool Water • Boiler Water • Drinking Water • Mineral Water • Reverse Osmosis Water • Dialysis Water	Fixed and Volatile Solids Ignited at 550 °C (Mixed Liquor Volatile Suspended Solids)	APHA 2540 E
	Turbidity	APHA 2130 B
	Nitrogen (Organic)	APHA 4500-N_{org} B
	Oil & Grease	APHA 5520 B
	Total Alkalinity as $CaCO_3$	APHA 2320 B
	Phenolphthalein Alkalinity as $CaCO_3$	
	Carbonate Alkalinity as $CaCO_3$	
	Bicarbonate Alkalinity as $CaCO_3$	
	Free Chlorine	APHA 4500-Cl F
	Total Chlorine	HACH Method 8167
		APHA 4500-Cl F
	Combined Chlorine as Cl_2 (Monochloroamine and Dichloroamine)	APHA 4500-Cl F
	Chloride	APHA 4500-Cl^- B
	Conductivity	APHA 2510 B
	Nitrate: Low Range	HACH Method 8192
	Nitrite: Low Range	HACH Method 8507
	Sulfate	HACH Method 8051
• Drinking Water	Mineral Oil	APHA 5520 F
• Drinking Water • Dialysis Water • Ground Water • Pond Water • Raw Water • River Water • Swimming Pool Water	Fluoride	APHA 4500-F^- C
	Colour	HACH Method 8025
	Free Chlorine	HACH Method 8021

SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Water • Drinking Water • Ground Water • Raw Water • Dialysis Water • Mineral Water	Chloride Fluoride Nitrate Nitrite Sulfate	APHA 4110 B
• River Water	Total Phosphorus	USEPA Method 200.7
	Total Phosphate	
• Drinking Water • River Water	Anionic Surfactants as MBAS	APHA 5540 C
• Marine Water	Total Suspended Solids	APHA 2540 D

SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Food • Animal Feed • Forage • Grain • Oil Seed	Protein (Crude)	AOAC 2001.11
• Beverages • Confectionary Products • Chocolate and Cocoa Products • Cereal Products • Dairy Products (Solid) • Food Supplement • Honey • Powdered Food • Sandwiches/Pastries • Sauces • Paste and Jam • Meat & Meat Products • Fish & Fish Products • Ready Meals • Fruit & Fruit Products	Moisture	In-house Method C/FOD/014 based on AOAC 925.45
	Ash	In-house Method C/FOD/015 based on AOAC 920.153
	Protein (Crude)	In-house Method C/FOD/016 based on AOAC 2001.11
	Total Fat	In-house Method C/FOD/017 based on AOAC 922.06 & 932.06
• Beverages • Confectionary Products • Chocolate and Cocoa Products • Cereal Products • Dairy Products (Solid) • Food Supplement • Powdered Food • Sandwiches/Pastries • Sauces • Paste and Jam	Total Dietary Fiber	AOAC 985.29
• Meat and Meat Products	Moisture	AOAC 950.46
	Free Fat	ISO 1444:1996
• Flour	Ash	AOAC 923.03
• Meat		AOAC 920.153
• Spices and Condiment		MS 81 : Part 2 : 1993

SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Food		
• Flour	pH	AOAC 943.02
• Bread	pH	AOAC 945.42
• Vegetable	Heavy Metal (As,Cd, Pb, Sb)	In-house Method C/FOD/018 based on AOAC 969.32 & APHA 3120 B
	Mercury (Hg)	In-house Method C/FOD/008 based on International Food Research Journal 19(1):135 – 140 (2012)
• Food	Tin (Sn)	In-house Method C/FOD/029 based on AOAC 985.16 & USEPA 200.7
• Alcoholic Beverages	Ethanol	In-house Method C/FOD/030 based on Journal of Food and Drug Analysis 11(2):133-140 (2003)
• Meat & Meat Products	Nitrite	In-house Method C/FOD/032 based on AOAC 973.31

SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Food • Food and Food Supplements	Sample Preparation Using Dry Ashing Method for Food	In-house Method C/FOD/011 based on AOAC 999.11
	Metals and Minerals by Inductively Coupled Plasma Emission Spectroscopy: Calcium Iron Potassium Sodium	APHA 3120 B
• Vegetables Fats • Animal Fats	Cholesterol	AOAC 970.51
• Soft Drinks	Benzoic Acid	In-house Method C/FOD/004 based on AOAC 994.11
• Food • Food Products	Ascorbic Acid (Vitamin C)	In-house Method C/FOD/003 based on USP 27
	Benzoic Acid Sorbic Acid Methyl Paraben Ethyl Paraben Propyl Paraben Butyl Paraben	In-house Method C/FOD/002 Based on USDA Food Safety and Inspection Service Method CLG-BSP.01
• Milk • Milk Products	Fat	AOAC 989.05
• Whey Cheese		AOAC 974.09 & 989.05
• Malted Milk		AOAC 922.09 & 989.05
• Sugars • Syrups • Molasses • Food • Food Supplements	Total Sugars as Invert Sugars	AOAC 968.28
• Breads • Cakes • Flour Confectionery	Propionic Acid	In-house Method C/FOD/005 based on AOAC 950.35 and HKSARG Government Laboratory Method
• Food Dressings	Total Acidity	AOAC 935.57

SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Food • Food	Carbohydrate (By Calculation)	AOAC 986.25E
	Energy (By Calculation)	MOH Guide to Nutrition Labelling and Claim 2010
	Vitamin A (ß-Carotene)	In-house Method C/FOD/006 based on Laboratory Procedure in Nutrient Analysis of Food IMR 1996
• Milk • Milk Products	Acidity	AOAC 947.05
• Cordials • Liqueurs	Total Acidity	AOAC 940.15
• Beverages • Food Supplement • Confectionary Products • Herbal Product • Seafood • Raw Meat • Spices • Cereal Products • Food Paste	Mercury	In-house Method C/FOD/008 based on International Food Research Journal 19(1): 135-140 (2012)
	Heavy Metal (As, Fe, Sb, Cd, Cr, Cu, Pb, Zn)	In-house Method C/FOD/018 based on AOAC 969.32 & APHA 3120 B
• Beverages • Spices • Food Paste • Sauces • Egg	Sudan I	In-house Method C/FOD/019 based on Government Chemist Programme LGC/GC/2007/005
	Sudan II	
	Sudan III	
	Sudan IV	
	Para Red	
	Rhodamine B	
Oils & Fats	FAME: Saturated fat Monounsaturated fat Polyunsaturated fat Trans fat	In-house Method C/FOD/009 based on Agilent Technologies Application Notes
Plastic Packages, Appliances and Containers	Specific Migration of Heavy Metals (As, Sb, Cd, Cr, Cu, Pb, Zn)	In-house Method C/FOD/010 based on Malaysia Food Act Thirteenth Schedule (Regulation 28) and APHA 3120 B

SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Cosmetics and Essential Oils Cosmetics Personal Care Products	Methyl Paraben Propyl Paraben	In-house Method C/COS/007 based on MPOB Information Series ISSN 1511-7871 and Merck HPLC Application Notes 900166
Cosmetics and Products • Facial Care Products • Toiletries	Mercury	In-house Method C/COS/022 based on International Food Research Journal 19(1): 135-140 (2012)
• Cosmetics	Heavy Metals (As, Pb, Co, Cr, Sb, Cd, Ni, Cu, Zn)	In-house Method C/COS/023 based on ISO/TR 17276
		In-house Method C/COS/033 ISO/TR 17276
Pharmaceuticals • Oral Rinses • Mouth Rinses • Mouthwash	Fluoride	In-house Method C/PHA/025 based on ISO 16408:2015 Annex A
• Toothpaste	Total Fluoride	In-house Method C/PHA/024 based on ISO 11609: 2010 Annex C.2.2
• Hand Sanitizer	Ethanol	In-house Method C/PHA/031 based on USP 37th Edition <611> (Method IIb)

SCOPE OF TESTING: CHEMICAL

Notes:

1. AOAC : Official Methods of Analysis of AOAC International, 18th Edition, 2005
2. APHA : American Public Health Association, Standard Methods for The Examination of Water & Wastewater, 21st Edition (2005) & 23rd Edition (2017)
3. ASTM : American Society for Testing and Materials
4. DOE : Department of Environment (D.O.E) Reference Method for Analysis of Rubber and Palm Oil Effluents
5. HACH : Portable Data Logging Colorimeter Instrument Manual
6. ISO : International Organization for Standardization

Signatories:

1.	**Siti Haslina binti Ahmad Rusmili**	**IKM No.: M/6255/7178/15/22**
2.	**Mohamad Rosdi bin Mohamad Razali**	**IKM No.: M/6252/7207/15/22**
3.	**Nur Syuhada binti Ahmad Taufik**	**IKM No.: L/3060/9081/21**
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5.	**Nik Athila binti Nik Ma**	**IKM No.: M/6192/9919/22**

SCOPE OF TESTING: CHEMICAL

SITE: CATEGORY I

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Environmental/ Work Place Monitoring • Compressed Air	Measurement of Humidity (Dew Point)	ISO 8573-3:1999
	Solid Particle Content	In-house Method E/ENV/003 based on ISO 8573-4:2001
	Oil Vapor	In-house Method E/ENV/004 based on S120 Oil Vapor Sensor
• Noise	Sound Pressure Level	DOE Guidelines for Environmental Noise Limits and Control, Third Edition, 2019, Annex B
• Effluent	pH	APHA 4500-H^+B
	Temperature	APHA 2550 A, B
	Oxygen (Dissolved)	APHA 4500-O G
• Effluent • Drinking Water • Dialysis Water • Ground Water • Raw Water • Pond Water • River Water • Swimming Pool Water	Free Chlorine	HACH Method 8021
• Dialysis Water	Sampling procedure	ANSI/AAMI/ISO 23500-1:2019, Section 8.3.2
• Ambient Air • Air Emission	Total Volatile Organic Compound	In-house method E/ENV/001 based on MiniRAE 3000 VOC Meter
• Ambient Air	Dust Particulate (PM_{10}, $PM_{2.5}$)	In-house Method E/ENV/005 based on MiniVol TAS Instrument

SCOPE OF TESTING: CHEMICAL

SITE: CATEGORY

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Environmental Monitoring • Chimney Stack Emission	Sample Velocity and Traverses for Stationary Sources	USEPA METHOD 1:1996
	Stack Gas Velocity and Volumetric Flow rate (Type S Pitot Tube)	USEPA METHOD 2:1996
	Dry Gas Molecular Weight & Percent Excess Air	USEPA METHOD 3:1996
	Moisture Content	USEPA METHOD 4:1995
	Particulate Matter	USEPA METHOD 5:1996
	Sampling of Polychlorinated Dibenzo-p-dioxins and Polychlorinated Dibenzofuran Emissions from Stationary Sources	USEPA METHOD 23:1996
	Sulphur Dioxide (SO_2)	USEPA 40 CFR 60, Appendix A Method 6C
	Oxides of Nitrogen (NOx)	USEPA 40 CFR 60, Appendix A Method 7E
	Dark Smoke	BS 2742:2009
Environmental/ Work Place Monitoring • Cleanroom & Associated Controlled Environments	Airborne Particle Count	In-house Method E/ENV/002 based on ISO 14644-1:2015
	Airflow Rate	ISO 14644-3: 2019 Annex B.2
	Air Pressure Difference	ISO 14644-3: 2019 Annex B.1
	HEPA Filter Leak Test	ISO 14644-3: 2019 Annex B.7
	Temperature	ISO 14644-3: 2019 Annex B.5
	Humidity	ISO 14644-3: 2019 Annex B.6

Notes:

1. ISO : International Organization for Standardization
2. USEPA : U.S. Environmental Protection Agency

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SCOPE OF TESTING: CHEMICAL

SITE: CATEGORY I

Signatories:

1.	**Siti Haslina binti Ahmad Rusmili**	**IKM No.: M/6255/7178/15/22**
2.	**Mohamad Rosdi bin Mohamad Razali**	**IKM No.: M/6252/7207/15/22**
3.	**Nurul Salma binti Ab. Ghani**	**IKM No.: M/6253/7621/17/22**
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5.	**Muhamad Afiq bin Md Zin**	**IKM No.: L/3061/9082/21**

SCOPE OF TESTING: MICROBIOLOGY

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Food • Food • Processed Food • Prepared Food	Yeast and Mould Counts	AOAC 997.02
	Enumeration of *Staphylococcus aureus*	AOAC 2003.07
• Dairy Foods	Enumeration of *Staphylococcus aureus*	AOAC 2003.08
• Meat • Seafood • Poultry	Enumeration of *Staphylococcus aureus*	AOAC 2003.11
	Confirmed *Escherichia coli* Counts	AOAC 998.08
• Cheddar Cheese • Milk • Flour • Frozen Prepared Meals • Frozen Broccoli • Nut Pieces	Enumeration of *Enterobacteriaceae*	AOAC 2003.01
• Food	*Staphylococcus aureus* – Most Probable Number	AOAC 987.09
	Enumeration of Mesophilic Lactic Acid Bacteria	ISO 15214: 1998
• Food • Perishable Food • Frozen Food • Canned Food	Coagulase Positive Staphylococci	AS 5013.12.1 – 2004
	Standard Plate Count	AS 5013.1 – 2004
• Ready Meals • Milk & Milk products • Meat & Meat products • Fish & Fish products • Vegetable & Vegetable products • Seafood (Crustacean & Mollusc)	Detection of *Campylobacter* spp.	ISO 10272-1: 2017

SCOPE OF TESTING: MICROBIOLOGY

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Food Food	Detection & Enumeration of Coliform	AS 5013.3 - 2022
	Enumeration of Coliform	FDA-BAM Chapter 4 (I.G)
	Detection & Enumeration of *Escherichia coli*	AS 5013.15 – 2006
	Enumeration of *Escherichia coli*	FDA-BAM Chapter 4 (I.G)
	Detection of *Salmonella* spp.	AS 5013.10 - 2009
	Enumeration of Yeast and Molds	FDA – BAM Chapter: 18
	Detection of *Listeria monocytogenes*	In-house Method M/FOD/010 based on FDA – BAM Chapter 10:2011
	Enumeration of *Bacillus cereus*	In-house Method M/FOD/011 based on FDA – BAM Chapter 14:2012
	Enumeration of Fecal Coliform	CMME of Foods - Chapter 8.8
	Clostridium perfringens Count	ISO 7937:2004

SCOPE OF TESTING: MICROBIOLOGY

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Water • Dialysis Water	Bacterial Endotoxins Test	USP 36TH Edition <85> LAL Gel Clot Method.
• Ground Water • Cooling Tower Water • Well Water • Marine Water • River Water • Swimming Pool Water • Boiler Water • Drinking Water • Mineral Water • Reverse Osmosis Water • Effluent/ Wastewater	Standard Total Coliform Fermentation Technique	APHA 9221 B
	Enumeration of *Escherichia coli*	APHA 9221 G
	Heterotrophic Plate Count (Pour Plate Method)	APHA 9215 B
• River Water	Standard Total Coliform	APHA 9222 B
• Drinking Water	Heterotrophic Plate Count	APHA 9215 D
• Ground Water	Faecal Coliform	APHA 9222 D
• Reverse Osmosis Water • Dialysis Water • Drinking Water	Aerobic Endospores	APHA 9218 B
• Drinking Water • Swimming Pool Water • Cooling Tower Water	Enumeration of *Legionella*	ISO 11731: 2017

SCOPE OF TESTING: MICROBIOLOGY

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Water • Drinking Water • Portable Water • Swimming Pool Water	Fecal *Streptococcus* Count	APHA 9230 C
	Pseudomonas aeruginosa Count	APHA 9213 E
	Enumeration of Sulphite-reducing Clostridia (Sulphite Reducing Anaerobe)	The Microbiology of Drinking Water (2010) - Methods for the Examination of Waters and Associated Materials - Environment Agency UK - Part 6A
	Enumeration of *Clostridium perfringens*	The Microbiology of Drinking Water (2010) - Methods for the Examination of Waters and Associated Materials – Environment Agency UK - Part 6B
	Enumeration of *Escherichia coli* and coliform	ISO 9308-1: 2014
Medical Devices and Products	Method Suitability Test	ISO 11737-1:2006 & ISO 11737-2:2009
	Bioburden Estimation	ISO 11737-1:2006
	Sterility Test	ISO 11737-2:2009
	Endotoxin in Medical Devices	USP 29th Edition (LAL Gel Clot Method) <85> & <161>
• Medical Devices • Liquid & Culture Medium • Sterile Product	Sterility Test	BP 2013 (Appendix XVI A)
		USP 35th Edition <71>
Pharmaceutical • Toiletries • Cosmetics • Herbal Product & Health Supplement • Raw Materials • Finished Products	Tests for Specified Microorganisms (*Escherichia coli*, *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Salmonella* spp., Bile-Tolerant Gram-Negative Bacteria, *Candida albicans*)	USP 40th Edition <62>, BP 2013 Edition Appendix XVI B.1
	Enumeration of Bile-tolerant Gram-Negative Bacteria	USP 40th Edition <62>, BP 2013 Edition Appendix XVI B.1
	Microbial Enumeration Tests (Total Aerobic Microbial Count, Total Combined Yeasts and Molds Count)	USP 40th Edition <61>, BP 2013 Edition Appendix XVI B.2

SCOPE OF TESTING: MICROBIOLOGY

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Pharmaceutical • Toiletries • Cosmetics • Herbal Product & Health Supplement • Raw Materials • Finished Products	Efficacy of Antimicrobial Preservation	BP 2013 Edition (Appendix XVI C)
	Efficacy of Antimicrobial Preservation (*Burkholderia cepacia*)	
	Detection of *Burkholderia cepacia*	In-house Method M/COS/012 based on Journal of AOAC International, Vol. 83, No. 4, 2000
Herbal Medicinal Products for Oral Use	Detection and Enumeration of *Escherichia coli*	BP 2013 Edition (Appendix XVI F)
	Detection of *Salmonella* spp.	
	Enumeration of Bile-tolerant Gram-Negative Bacteria	
	Total Aerobic Microbial Count	
	Total Combined Yeast and Mould Count	
Environmental Monitoring (Site Sampling & Laboratory Testing) • Contact Plate	Total Viable Aerobic Count	In-house Method M/ENV/002 based on ISO 14698-1:2003 and USP 40th Edition <61> & <62>
	Total Mould and Yeast Count	
	Total *Staphylococcus aureus*	
• Swab	Total Viable Aerobic Count	In-house Method M/ENV/003 based on ISO 14698-1:2003 and USP 40th Edition <61>
	Total Mould and Yeast Count	In-house Method M/ENV/004 based on ISO 14698-1:2003 and USP 40th Edition <61>
	Total Coliform Count	In-house Method M/ENV/005 based on ISO 14698-1:2003 and AS 1766.2.3
	Detection of *Escherichia coli*	In-house Method M/ENV/006 based on ISO 14698-1:2003 and USP 29th Edition <61>
	Staphylococcus aureus count	In-house Method M/ENV/007 based on ISO 14698-1:2003 and AOAC 975.55

SCOPE OF TESTING: MICROBIOLOGY

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Environmental Monitoring (Site Sampling & Laboratory Testing)		
• Bioaerosol	Total Viable Aerobic Count	In-house Method M/ENV/001 based on ISO 8573-7:2003 and USP 40th Edition <61>
	Total Mould and Yeast Count	
• Compressed Air	Total Viable Aerobic Count	In-house Method M/ENV/008 based on ISO 8573-7:2003 and USP 40th Edition <61>
	Total Mould and Yeast Count	
	Viable Microbiological Contaminant Content	ISO 8573-7:2003
• Airborne Viable Particles – Settle Plate	Total Aerobic Microbial Count	In-house Method M/ENV/009 based on ISO 14698-1:2003 & USP 40th Edition <61>
	Total Mould and Yeast Count	
Gram Staining		
• Bacteria Colonies	Gram Negative/ Gram Positive	AS 5013.14.1 – 2010

Notes:

1. CMME- Compendium of Methods for the Microbiological Examination of Foods 4th Edition 2001
2. FDA-BAM - Food and Drug Administration – Bacteriological Analytical Manual
3. AOAC - Official Methods of Analysis of AOAC International, 18th Edition, 2005
4. APHA - American Public Health Association, Standard Methods for the Examination of Water & Wastewater, 21st Edition (2005) & 23rd Edition (2017)
5. AS - Australian Standard
6. BP - British Pharmacopeia
7. ISO - International Organization for Standardization
8. USP - United States Pharmacopeia

Signatories:

1. **Ramesh Subramaniam** **MJMM No.: 0325**
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