

Schedule

Issue date: 4 April 2017
Valid until: 29 July 2017



NO: SMM 111

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LABORATORY LOCATION:
(PERMANENT LABORATORY)

SPECTRUM LABORATORIES (PENANG) SDN. BHD.
1904 TINGKAT 1, JALAN BUKIT MINYAK
TAMAN SRI MANGGA, 14000 BUKIT MERTAJAM
SEBERANG PRAI TENGAH
PULAU PINANG
MALAYSIA

This laboratory accredited under *Skim Akreditasi Makmal Malaysia (SMM)* meets the requirements of MS ISO/IEC 17025:2005 'General requirements for competence of testing and calibration laboratories'. This Malaysian Standards is identical with ISO/IEC 17025:2005 published by the International Organization for Standardization (ISO).

FIELD OF TESTING: CHEMICAL

SCOPE OF ACCREDITATION:

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Environmental Monitoring <ul style="list-style-type: none"> Effluent / Water 	Arsenic as As	ASTM D2972-88 A
	Arsenic	APHA 3114 C-Continuous Hydride Generation-AAS Method
	Biochemical Oxygen Demand (BOD)	APHA 5210B /4500 O-G
	Boron as B	APHA 4500-B,C
	Calcium as Ca	APHA 3111-B
	Chromium, Hexavalent	APHA 3500 Cr-B
	Chromium, Trivalent	In-house method No. 5 based on APHA 3500 Cr-B
	Chromium, Total	APHA 3111-B
	Cadmium as Cd	APHA 3111-B
	Chemical Oxygen Demand	APHA 5220 C
	Copper as Cu	APHA 3111-B
	Cyanide as CN	OSMRA P.456
	Free Chlorine	APHA 4500-CI F

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Environmental Monitoring (continued)		
• Effluent / Water	Iron as Fe	APHA 3111-B
	Lead as Pb	APHA 3111-B
	Magnesium as Mg	APHA 3111-B
	Manganese as Mn	APHA 3111-B
	Mercury	APHA 3112 B-Cold-Vapor Atomic Absorption Spectrometric
	Nickel as Ni	APHA 3111-B
	Oil & Grease	APHA 5520 B
	pH	APHA 4500-H ⁺ B
	Nitrite as N / as NO ₂	APHA 4500-NO ₂ B
	Total Hardness as CaCO ₃	APHA 2340 C
	Phosphorus as P and Phosphate as PO ₄	APHA 4500-P,B & APHA 4500-P,C
	Sulphate as SO ₄	APHA 4500 SO ₄ E
	Selenium as Se	APHA 3114-C
	Phenol	APHA 5530-B,C
	Potassium as K	APHA 3111-B
	Sodium as Na	APHA 3111-B
	Sulphide as S ²⁻	APHA 4500 – S ²⁻ F
	Suspended Solids	APHA 2540-D
	Tin	In-house method No. 1 based on APHA 3114-C-Continuous Hydride Generation - AAS Method

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Environmental Monitoring (continued) <ul style="list-style-type: none"> Effluent / Water 	Zinc as Zn	APHA 3111-B
	Aluminium as Al	APHA 3500 Al-B
	Ammonia as NH ₃	APHA 4500 NH ₃ - B,C
	Preliminary Treatment of Samples : Digestion for Metals	APHA 3030-D
	Preliminary treatment of Samples: Nitric Acid Digestion.	APHA 3030-E
	Preliminary Treatment of Samples : Nitric Acid – Hydrochloric Acid Digestion	APHA 3030-F
	Chloride as Cl	APHA 4500-Cl C
	Fluoride as F	APHA 4500-F D
	Silver as Ag	APHA 3111-B
	Strontium as Sr	APHA 3111-B
	Molybdate Reactive Silica as SiO ₂	APHA 4500 SiO ₂ D
	Total Dissolved Solid Dried at 180°C	APHA 2540 C
	Dissolved Oxygen	APHA 4500 O-G
	Total Organic Carbon (TOC)	APHA 5310-C Persulfate-Ultraviolet or Heated-Persulfate Oxidation Method
	Anionic Surfactant as MBAS	APHA 5540 C
	Total Alkalinity	OSRMA p.334 - 336
	P- Alkalinity	OSRMA p.334 - 336
m- Alkalinity	OSRMA p.334 - 336	
Bicarbonate Alkalinity	APHA 4500 CO ₂ D	

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Environmental Monitoring (continued)		
• Effluent / Water	Carbonate Alkalinity	APHA 4500 CO ₂ D
	Hydroxide Alkalinity	APHA 4500 CO ₂ D
	Free Carbon Dioxide	APHA 4500 CO ₂ D
	Total Carbon Dioxide	APHA 4500 CO ₂ D
	Total Acidity	APHA 2310 B
	p- Acidity	APHA 2310 B
	m- Acidity	APHA 2310 B
	Total Solid	APHA 2540 B
	Nitrate as N / as NO ₃	APHA 4500 NO ₃ B
	Nitrate as N / as NO ₃	APHA 419 D (14 th)
	Turbidity	APHA 2130 B
	Hardness by calculation	APHA 2340 B
	Total Kjeldahl Nitrogen	APHA 4500 Norg A
	Organic Nitrogen	APHA 4500 Norg B
	Total Nitrogen	In-house method No. 7 (based on APHA 4500 Norg B, APHA 4500 NO ₂ B, APHA 4500 NH ₃ B C, APHA 419D 14 th)
	Formaldehyde	HACH SPECTROPHOTOMETER Method 8110
	Formaldehyde	OSRMA p.458
	Color (ADMI)	APHA 2120 F
	Barium	HACH SPECTROPHOTOMETER Method 8014

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
<p>Environmental Monitoring (continued)</p> <ul style="list-style-type: none"> Effluent / Water 	<p>Total Chromium</p> <p>Chromium, Hexavalent</p> <p>Chromium, Trivalent</p> <p>Cyanide</p> <p>Tin</p>	<p>HACH SPECTROPHOTOMETER Method 8024</p> <p>HACH SPECTROPHOTOMETER Method 8023</p> <p>In-house method No. 6 based on HACH SPECTROPHOTOMETER Method 8024 / Method 8023</p> <p>APHA 4500 – CN·C and F</p> <p>APHA 3111B/ Direct Air-Acetylene Flame Method</p>
<ul style="list-style-type: none"> Rubber / Palm Oil Mill Effluent 	<p>Biochemical Oxygen Demand</p> <p>Chemical Oxygen Demand</p> <p>Suspended Solids</p> <p>Oil & Grease</p> <p>Ammoniacal Nitrogen</p> <p>Total Nitrogen</p>	<p>DOE Malaysia Alternative Method</p> <p>DOE Malaysia Reference Method</p> <p>DOE Malaysia Alternative Method</p> <p>DOE Malaysia Reference Method</p> <p>DOE Malaysia Reference Method</p> <p>DOE Malaysia Reference Method</p>
<ul style="list-style-type: none"> Sediments, Sludges, Soil & Solid Waste 	<p>Cadmium as Cd</p> <p>Chromium as Cr</p> <p>Copper as Cu</p> <p>Iron as Fe</p> <p>Manganese as Mn</p> <p>Nickel as Ni</p> <p>Lead as Pb</p> <p>Zinc as Zn</p> <p>Calcium as Ca</p> <p>Magnesium as Mg</p> <p>Potassium as K</p> <p>Sodium as Na</p>	<p>} APHA 3111-B</p>

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FIELD OF TESTING: CHEMICAL**SCOPE OF ACCREDITATION:**

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Environmental Monitoring (continued) <ul style="list-style-type: none"> Sediments, Sludges, Soil & Solid Waste 	Moisture content Solid content Organic content Inorganic content Acid Digestion of Sediments, Sludges & Soils pH	OSRMA p.472 (By calculation) OSRMA p.472 OSRMA p.472 OSRMA p.472 (By calculation) EPA 3050 B EPA 9045 D

Signatories:

- Kan King Choy**
- Lee Foon Lin**
- Ng Choon Yee**

IKM No.: L 1886/88
IKM No.: A 4086/00/2004
IKM No.: A 4619/2004

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SCOPE OF ACCREDITATION:

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Environmental Monitoring <ul style="list-style-type: none"> Air 	Ambient Air – Determination of Total Suspended Particulates (TSP)	AS 2724.3
	Ambient Air – Determination of Particulate Lead (Pb)	AS 2800
	Nitrogen Dioxide (NO ₂) in the Atmosphere	ISC 408
	Sulphur Dioxide (SO ₂) in the Atmosphere	ISC 704A
	Suspended Particulate Matter – PM ₁₀	AS 3580.9.6 – 1990
	Lead by Flame AAS	NIOSH 7082
	Cadmium and Compounds, as Cd	NIOSH 7048
	Chromium and Compounds, as Cr	NIOSH 7024
	Copper (dust and fume)	NIOSH 7029
	Iron	In-house method-Air-No.1 (based on NIOSH 7030)
	Manganese and compounds, as Mn	In-house method-Air-No.2 (based on NIOSH 7030)
	Nickel and Compounds, as Ni	In-house method-Air-No.3 (based on NIOSH 7030)
Zinc and Compounds, as Zn	NIOSH 7030	

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Signatories:

- Kan King Choy**
- Lee Foon Lin**
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<p>Environmental Monitoring</p> <ul style="list-style-type: none"> Stack / Flue Gas 	<p>Determination of Particulate Emissions from stationary sources</p> <p>Determination of Sulfur Dioxide emissions from stationary sources</p> <p>Determination of Nitrogen Oxide emissions from stationary sources</p> <p>Determination of Sulfuric Acid mist and Sulfur Dioxide emissions from stationary sources</p> <p>Determination of metals emissions from stationary sources</p> <p>Determination of Hydrogen Halide and Halogen Emissions from stationary sources</p> <p>Determination of concentration & mass flow of particulate matter in flue gas for stationary source emissions</p>	<p>EPA 40 CFR 60, App. A, Method 5.</p> <p>EPA 40 CFR 60, App. A, Method 6.</p> <p>EPA 40 CFR 60, App. A, Method 7.</p> <p>EPA 40 CFR 60, App. A, Method 8.</p> <p>EPA 40 CFR 60, App. A Method 29</p> <p>In House Method No. 2 based on EPA 40 CFR 60, App. A, Method 26A</p> <p>MS 1596 : 2003</p>

The valid scope of accreditation is in www.ism.gov.my/cab-directories.

Signatories:

- | | |
|------------------|--------------------------------|
| 1. Kan King Choy | IKM No.: L 1886/88 |
| 2. Lee Foon Lin | IKM No.: A 4086/00/2004 |
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FIELD OF TESTING: CHEMICAL

SITE TESTING: CATEGORY I

SCOPE OF ACCREDITATION:

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Environmental Monitoring <ul style="list-style-type: none">Effluent / Water	pH Temperature Dissolved Oxygen Conductivity Turbidity	APHA 4500 H ⁺ B APHA 2550 B APHA 4500 O G APHA 2510 B APHA 2130 B

Signatories:

- | | |
|------------------------------|-------------------------|
| 1. Kan King Choy | IKM No.: L 1886/88 |
| 2. Lee Foon Lin | IKM No.: A 4086/00/2004 |
| 3. Ng Choon Yee | IKM No.: A 4619/2004 |
| 4. Norhafizah binti Ad Fauzi | IKM No.: A/3527/6361/13 |
| 5. Siti Indah binti Serat | IKM No.: A/4006/6760/14 |

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MS ISO/IEC 17025

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FIELD OF TESTING: CHEMICAL

SITE TESTING: CATEGORY I

SCOPE OF ACCREDITATION:

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Environmental Monitoring <ul style="list-style-type: none">Noise MeasurementAir	Acoustics – Description and Measurement of Environmental Noise Measurement of Methane, Carbon Dioxide, Oxygen, Nitrogen, Hydrogen Sulphide, & Carbon Monoxide using Portable Gas Analyser	ISO 1996/1 In-house method-Air-No.4 (based on Manufacturer's Measurement Procedures)

Signatories:

- | | |
|------------------|--------------------------------|
| 1. Kan King Choy | IKM No.: L 1886/88 |
| 2. Lee Foon Lin | IKM No.: A 4086/00/2004 |
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FIELD OF TESTING: MICROBIOLOGY

SCOPE OF ACCREDITATION:

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Effluent / Water	Heterotrophic Plate Count / Total Plate Count – Pour Plate Method	APHA 9215 B
	Heterotrophic Plate Count / Total Plate Count – Spread Plate Method	APHA 9215 C
	Heterotrophic Plate Count / Total Plate Count – Membrane Filtration Method	APHA 9215 D
	Total Coliform (MPN) Method	APHA 9221 B
	Fecal Coliform (MPN) Method	APHA 9221 E
	<i>E. coli</i> (MPN) Method	In-house method-Microb-No. 3 (based on APHA 9221 E)
	Total Coliform (Membrane Filtration)	In-house method-Microb-No. 1 (based on APHA 9222 B)
	<i>E. coli</i> (Membrane Filtration)	In-house method-Microb-No. 2 (based on APHA 9222 G)
	Fecal Coliform (Membrane Filtration)	APHA 9222 D
<i>E. coli</i> (MPN) Method	APHA 9221 F	
Food	Aerobic Plate Count / Total Plate Count (Spread Plate and Pour Plate Method)	FDA-BAM Chapter 3
	Yeast and Mold - Spread Plate Method	FDA-BAM Chapter 18
	Coliform (MPN) Method	FDA-BAM Chapter 4
	Fecal Coliform (MPN) Method	FDA-BAM Chapter 4
	<i>E. coli</i> (MPN) Method	FDA-BAM Chapter 4
	<i>Staphylococcus aureus</i>	FDA-BAM Chapter 12

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FIELD OF TESTING: MICROBIOLOGY**Signatories:**

1. **Prof. Dr Thong Kwai Lin**
2. **Lee Foon Lin**
3. **Ng Choon Yee**
4. **Afiqah Liyana binti Zaimi**

Note:

APHA	- Standard Method for the Examination of Water and Wastewater, 21 st Edition, 2005 (American Public Health Association)
OSRMA	- Official, Standardised & Recommended Methods of Analysis, 2 nd Edition, 1973, Society of Analytical Chemistry
ASTM	- 1993 Annual Book of ASTM Standards, Volume 11.01
AS	- Australia Standard
ISC	- Methods of Air Sampling & Analysis, 3 rd Edition, 1990, Inter Society Committee
ISO	- International Organization for Standardization
EPA 40 CFR 60, App. A	- Environmental Protection Agency, Code of Federal Regulations, Title 40, Part 60; Appendix A to Part 60 – Test Methods, 1/7/1998 (Using Graseby-Anderson Universal Stack Sampler)
FDA-BAM	- U.S Food & Drug Administration, Bacteriological Analytical Manual, 2003
DOE (M) Methods	- Revised Standard Methods (1985) for Analysis of Rubber and Palm Oil Mill Effluents, 2 nd edition, 1995.

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