

Schedule

CCIC Singapore Pte Ltd
Blk 192 Pandan Loop
#04-22 Pantech Business Hub
Singapore 128381

Certificate No. : LA-2007-0402-A
Issue No. : 16
Date : 02 March 2023
Expiry of Certificate : 09 December 2025
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FIELD OF TESTING : Chemical and Biological Testing

MATERIALS / PRODUCTS TESTED	TESTS / PROPERTIES	STANDARD METHODS / TECHNIQUES / EQUIPMENT
A. Naphtha	1. Distillation on Petroleum Products	ASTM D86-20b
	2. Density, Specific Gravity or API Gravity	ASTM D1298-12b (2017)
	3. Density	ASTM D4052-22
	4. Sulphur	ASTM D4294-21
	5. Vapor Pressure (Mini Method)	ASTM D5191-22
	6. Paraffin, Naphthene and Aromatic by Gas Chromatography	ASTM D5443-14 (2018)
	7. Research Octane Number	ASTM D2699-22 IP 237/19 ISO 5164 : 2014
	8. Mercury in Liquid Hydrocarbons	UOP 938-20
	9. Lead Content of Light Petroleum Distillates by Dithizone Extraction and Colorimetric Determination	IP 224/02 (2014)
	10. Determination of Total Sulfur in Light Hydrocarbons, Spark Ignition Engine Fuel, Diesel Engine Fuel, Engine Oil by Ultraviolet Fluorescence	ASTM D5453-19a
	11. Motor Octane Number	ASTM D2700-22a IP236/19 ISO 5163-2014

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MATERIALS / PRODUCTS TESTED	TESTS / PROPERTIES	STANDARD METHODS / TECHNIQUES / EQUIPMENT
A. Naphtha	<ul style="list-style-type: none">12. Carbon13. Hydrogen14. Nitrogen15. DHA by High Resolution GC16. Oxygenates17. Carbon Disulfide and Sulfur compounds	<ul style="list-style-type: none">ASTM D5291-21ASTM D5291-21ASTM D5291-21ASTM D6730-22ASTM D7754-19ASTM D5623-19
B. Mogas / Gasoline	<ul style="list-style-type: none">1. Distillation on Petroleum Products2. Density, Specific Gravity or API Gravity3. Density4. Vapor Pressure of Petroleum Products (Mini Method)5. Oxygenates, Paraffin, Olefin, Naphthene, Aromatic (O-PONA) by Gas Chromatography6. Hydrocarbon Types, Oxygenated Compounds and Benzene (O-PONA) by Gas Chromatography7. Existent Gum8. Sulphur9. MTBE and other oxygenates10. Benzene and other aromatics11. Copper Corrosion (No. 1 to No. 4)	<ul style="list-style-type: none">ASTM D86-20bASTM D1298-12b (2017)ASTM D4052-22ASTM D5191-22ASTM D6293-98 (2003)^{e1}ASTM D6839-21aASTM D381-22 IP 131/99 ISO 6246 : 2017ASTM D4294-21ASTM D4815-22ASTM D5580-21ASTM D130-19 IP 154/2000 (2018) ISO2160:1998

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B. Mogas / Gasoline	12. Aromatics (5-99% Vol %))
	13. Olefins (0.3-55% Vol %)) ASTM D1319-20a
	14. Saturates (1-95% Vol %))
	15. Research Octane Number	ASTM D2699-22 IP 237/19 ISO 5164: 2014
	16. Doctor Test	ASTM D4952-12 (2017) IP 30/07 (2014)
	17. Mercaptan Sulfur	ASTM D3227-16 IP 342/2000 (2014) ISO 3012: 1999
	18. Oxidation Stability/ Induction Period	ASTM D525-12a (2019)
	19. Lead Content by AAS (0.0025-0.025 g/l)	ASTM D3237-22
	20. Manganese in Gasoline by AAS	ASTM D3831-22)
	21. Determination of Total Sulfur in Light Hydrocarbons, Spark Ignition Engine Fuel, Diesel Engine Fuel, Engine Oil by Ultraviolet Fluorescence	ASTM D5453-19a
	22. Bromine number	ASTM D1159-07 (2017)
	23. Motor Octane Number	ASTM D2700-22a IP236/19 ISO 5163-2014
	24. Silver Corrosion	ASTM D7671-21
	25. Driveability Index	ASTM D4814-22
26. Temperature for Vapour Liquid Ratio of 20	ASTM D4814-22	
27. Carbon	ASTM D5291-21	
28. Hydrogen	ASTM D5291-21	
29. Nitrogen	ASTM D5291-21	

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B. Mogas / Gasoline	30. DHA by High Resolution GC 31. Oxygenates 32. Carbon Disulfide and Sulfur compounds 33. Elements by ICP-MS 34. Arsenic by ICP-MS	ASTM D6730-22 ASTM D7754-19 ASTM D5623-19 ASTMD8110-17 CCICSOP0028
C. Crude	1. Sediment by Extraction 2. Density, Specific Gravity or API Gravity 3. Sulphur 4. Density 5. Mercury in Liquid Hydrocarbons 6. Organic Chloride 7. Simdist 8. Water By Distillation 9. Water and Sediment by Centrifuge 10. Carbon 11. Hydrogen 12. Nitrogen 13. Hydrogen Sulfide 14. Pour Point 15. Metals 16. Nitrogen 17. Nitrogen	ASTM D473-22 ASTM D1298-12b (2017) ASTM D4294-21 ASTM D5002-22 UOP 938-20 ASTM D4929-22 ASTM D7169-20e1 ASTM D4006-16 ^{e1} ASTM D4007-11 (2016) ^{e1} ASTM D5291-21 ASTM D5291-21 ASTM D5291-21 ASTM D7621-16 (2021) ASTM D5853 - 17a ASTM D5863 – 00a (Reapproved 2016) ASTM D4629-17 ASTM D5762-18a

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MATERIALS / PRODUCTS TESTED	TESTS / PROPERTIES	STANDARD METHODS / TECHNIQUES / EQUIPMENT
C. Crude	18. Salt Content 19. Crude Assay 20. Lead and Arsenic by ICP-MS	ASTM D3230-19 IP 265-01(2013) ASTM D2892-20 ASTM D5236-18a CCICSOP0028
D. Kerosene / Jet A-1	1. Distillation on Petroleum Products 2. Color Saybolt 3. Density, Specific Gravity or API Gravity 4. Freezing Point 5. Mercaptan Sulfur (0.0003-0.01% wt) 6. Density 7. Sulphur 8. Appearance 9. Flash Point - Abel 10. Copper Corrosion (No. 1 to No. 4) 11. Existent Gum 12. Total Acidity 13. Aromatics (5-99 % Vol %) 14. Olefins (0.3 – 55% Vol %) 15. Saturates (1– 95 % Vol %)	ASTM D86-20b ASTM D156-15 ASTM D1298-12b (2017) ASTM D2386- 19 ASTM D3227-16 ASTM D4052-22 ASTM D4294-21 CCICSOP0001 IP170/2021 ASTM D130-19 IP 154/2000 (2018) ISO 2160: 1998 ASTM D381-22 IP 131/99 ISO 6246 : 2017 ASTM D3242-11 (2017) IP354/22)) ASTM D1319-20a)

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D. Kerosene / Jet A-1	16. Determination of Total Sulfur in Light Hydrocarbons, Spark Ignition Engine Fuel, Diesel Engine Fuel, Engine Oil by Ultraviolet Fluorescence	ASTM D5453-19a
	17. Estimation of net heat of combustion	ASTM D3338-20a
	18. Smoke Point	ASTM D1322-22 IP 57/95 (2013) ISO 3014: 1993
	19. Naphthalene	ASTM D1840-07 (2017)
	20. Thermal Oxidation Stability	ASTM D3241-20c IP 323/21
	21. Water Separation Characteristics	ASTM D3948-22
	22. Doctor Test	ASTM D4952-12 (2017) IP 30/07 (2014)
	23. Fuel System Icing Inhibitors (Esther Type) in Aviation Fuels	ASTM D5006-11 (2021)
	24. Electrical Conductivity of Aviation	ASTM D2624-21a
	25. Kinematic Viscosity	ASTM D445-21 ^{e1} ISO 3104-20
	26. Determination of the level of cleanliness of aviation turbine fuel – laboratory automatic particle counter Method	IP 564/13
	27. FAME content	IP 585/21
	28. Particulate	ASTM D5452-20
	29. Freezing Point	ASTM D7153-22

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D. Kerosene / Jet A-1	33. Carbon	ASTM D5291-21
	34. Hydrogen	ASTM D5291-21
	35. Nitrogen	ASTM D5291-21
	36. Aromatics	ASTM D6379-21e1
	37. Hydrogen	ASTM D3343-22
	38. Cetane Index	ASTM D976-21
	39. Cleanliness by auto particle counter	ASTM D7619-22 IP 565/13
	40. BP distribution (Procedure B)	ASTM D2887-22 IP406-14(2017)
	41. MSEP	ASTM D7224-20
	42. Refractive Index	ASTM D1218 – 21
43. Elements by ICP-MS	ASTMD8110-17	
44. Arsenic by ICP-MS	CCICSOP0028	

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E. Diesel / Gas Oil	1. Appearance	CCICSOP0001
	2. Distillation on Petroleum Products	ASTM D86-20b
	3. Flash Point	ASTM D93-20 ISO 2719-16
	4. Water by Distillation	ASTM D95-13 (2018) ISO 3733-99
	5. Pour Point	ASTM D97-17b (re-approved 2022) ISO 3016-19
	6. Copper Corrosion	ASTM D130-19
	7. Heat of Combustion	ASTM D240-19
	8. Kinematic Viscosity	ASTM D445-21 ^{e1} ISO 3104-20
	9. Sediment by Extraction	ASTM D473-22 ISO 3735-99
	10. Ash Content	ASTM D482-19 ISO 6245-01
	11. Density, Specific Gravity or API Gravity	ASTM D1298-12b (2017) ISO 3675-98
	12. Cloud Point	ASTM D2500-17a ISO 3015-19
	13. Density, Specific Gravity or API Gravity	ASTM D4052-22 ISO 12185-96
	14. Sulphur	ASTM D4294-21 ISO 8754-03
	15. Micro Carbon Residue	ASTM D4530-15(2020) ISO 10370-14
	16. Calculated Cetane Index	ASTM D4737-21 ISO4264-18

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E. Diesel / Gas Oil	17. Oxidation Stability	ASTM D2274-14(2019) ISO 12205: 1995
	18. Lubricity at 60°C	ASTM D6079-18 ISO 12156-1:2018 IP 450/2020
	19. ASTM Colour Scale	ASTM D1500-12 (2017)
	20. Asphaltenes (Heptanes Insolubles) in Crude Petroleum and Petroleum Products	ASTM D6560-22 IP 143/04 (2021)
	21. Electrical conductivity of Aviation and Distillation Fuels	ASTM D2624-21a
	22. Determination of Total Sulfur in Light Hydrocarbons, Spark Ignition Engine Fuel, Diesel Engine Fuel, Engine Oil by Ultraviolet Fluorescence	ASTM D5453-19a
	23. Determination of aromatic hydrocarbon types in middle distillate – HPLC	IP 391/19 EN 12916-19
	24. Determination of filter blocking tendency	IP 387/21
	25. Hydrogen Sulfide	IP 570/21
	26. Total contamination	IP 440-14/ EN12662-14
	27. Total Acid Number	ASTM D664-18 ^{e2}
	28. Appearance	ASTM D4176-21a
	29. Total Acid Number	ASTM D974-21
	30. Particulates	ASTM D6217-21
31. Metals by ICP	ASTM D7111-16 (2021)	

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E. Diesel / Gas Oil	32. CFPP	ASTM D6371-17a IP 309/16 EN 116:2015
	33. FAME	ASTM D7371-14 EN14078-14
	34. Heat of Combustion	ASTM D4868-17
	35. Simdist	ASTM D7169-20e1
	36. Carbon	ASTM D5291-21
	37. Hydrogen	ASTM D5291-21
	38. Nitrogen	ASTM D5291-21
	39. Nitrogen	ASTM D4629-17
	40. Nitrogen	ASTM D5762-18a
	41. Water and Sediment	ASTM D2709-22
	42. Water – Procedure A	ASTM D6304-20
	43. Cetane Index	ASTM D976-21
	44. BP distribution (Procedure B)	ASTMD2887-22 IP406-14(2017)
	45. DSEP	ASTM D7261-22
	46. Refractive Index	ASTM D1218 – 21
	47. Elements by ICP-MS	ASTMD8110-17
48. Arsenic by ICP-MS	CCICSOP0028	

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F. Fuel Oil	1. Flash Point	ASTM D93-20 ISO 2719-16
	2. Water by Distillation	ASTM D95-13 (2018) ISO 3733-99
	3. Pour Point	ASTM D97-17b (re-approved 2022) ISO 3016-19
	4. Heat of Combustion	ASTM D240-19
	5. Kinematic Viscosity	ASTM D445-21 ^{e1} ISO 3104-20
	6. Sediment by Extraction	ASTM D473-22 ISO 3735-99
	7. Ash Content	ASTM D482-19 ISO 6245-01
	8. Total Acid Number	ASTM D664-18 ^{e2}
	9. Density	ASTM D4052-22 ISO 12185-96
	10. Density, Specific Gravity or API Gravity	ASTM D1298-12b (2017) ISO 3675-98
	11. Sulphur	ASTM D4294-21 ISO 8754-03
	12. Micro Carbon Residue	ASTM D4530-15(2020) ISO 10370-14
	13. Total Sediment	ASTM D4870-18 ISO 10307-09
	14. Total Sediment	IP 375/11 (2021) ISO 10307/1-09

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F. Fuel Oil	15. Total Sediment (Accelerated/Potential)	IP 390/11 (2017) ISO 10307/2-09
	16. n-Heptane insolubles	ASTM D3279-19
	17. Chloride in Petroleum Distillate	UOP 779-08
	18. Metals (Al, Si)	IP 377/95 (2014) ISO 10478-94
	19. Metals (Na, V, Al, Fe, Si, Ca, Zn, Ni, P)	IP 501/05 (2019)
	20. Compatibility spot test	ASTM D4740-20
	21. Net calorific value	ISO 8217-17
	22. Mercury in Liquid Hydrocarbons	UOP 938-20
	23. CCAI (Calculated Carbon Aromaticity Index)	ISO 8217-17
	24. Asphaltenes (Heptanes Insolubles) in Crude Petroleum and Petroleum Products	IP 143/04 (2021) ASTM D6560-22
	25. Hydrogen Sulfide	IP 570/21
	26. Distillation of Petroleum Products at Reduced Pressure	ASTM D1160-18
	27. Simdist	ASTM D7169-20e1
	28. Heat of Combustion	ASTM D4868-17
	29. Carbon	ASTM D5291-21
	30. Hydrogen	ASTM D5291-21
31. Nitrogen	ASTM D5291-21	
32. Chemical Species in Marine Fuel Oil by Multidimensional GC-MS	ASTM D7845-20	

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MATERIALS / PRODUCTS TESTED	TESTS / PROPERTIES	STANDARD METHODS / TECHNIQUES / EQUIPMENT
F. Fuel Oil	33. Hydrogen Sulfide	ASTM D7621-16 (2021)
	34. Viscosity Conversion	ASTM D341-20e1
	35. Metals	ASTM D5863 – 00a (Reapproved 2016)
	36. Nitrogen	ASTM D4629-17
	37. Nitrogen	ASTM D5762-18a
	38. Water and Sediment	ASTM D1796-11(2016)
	39. Salt Content	ASTM D3230-19 IP 265-01(2013)
	40. Hydrogen Sulfide	IP399/16
	41. P-value	SMS 1600-01
	42. Modified Xylene equivalent	BP 230-75
	43. Wax content	UOP46-85
	44. Hydrogen Sulfide and mercaptan sulfur	UOP163-10
	45. Crude Assay	ASTM D2892-20 ASTM D5236-18a
46. Arsenic and lead by ICP-MS	CCICSOP0028	
G. Condensate	1. Mercury in Liquid Hydrocarbons	UOP 938-20
H. Biodiesel	1. Ester content, Linolenic acid methyl ester content	BS EN 14103:2020
	2. Polyunsaturated (≥ 4 Double bonds)	EN 15779:2009
	3. Density @ 15°C	EN ISO 12185:1996
	4. Kinematic Viscosity @ 40°C	EN ISO 3104: 2020

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H. Biodiesel	<ol style="list-style-type: none">5. Copper Strip Corrosion (3Hrs @ 50°C)6. Methanol7. Mono-glycerides8. Di-glycerides9. Triglycerides10. Free Glycerol11. Total Glycerol12. Iodine Value13. Elements (Ca, K, Mg and Na contents) by ICP14. Phosphorus (P) by ICP	<p>EN ISO 2160: 1998</p> <p>EN 14110: 2019</p> <p>EN 14105: 2020</p> <p>EN 14105: 2020</p> <p>EN 14105: 2020</p> <p>EN 14105: 2020</p> <p>EN 14105: 2020</p> <p>EN 14111: 2003</p> <p>EN 14538:2006</p> <p>EN 14107:2003</p>
I. Lubrication Oil / Engine Oil/ Gear Oil	<ol style="list-style-type: none">1. Base Number of Petroleum Products by Potentiometric Perchloric Acid Titration2. Base Number Determination by Potentiometric Hydrochloric Acid Titration3. Flash Point4. Flash Point5. Kinematic Viscosity6. Insolubles in Used Lubricating Oils7. Metals (Al, Ba, B, Ca, Cd, Cr, Cu, Fe, Li, Pb, Mg, Mn, Mo, Ni, P, K, Si, Ag, Na, S, Sn, Ti, V, Zn)8. Soot in Engine Oils Merit of Dispersancy of In-Service Engine Oils9. Total Acid Number	<p>ASTM D2896-21</p> <p>ASTM D4739-17</p> <p>ASTM D92-18</p> <p>ASTM D3828-16a (2021)</p> <p>ASTM D7279-20</p> <p>ASTM D893-14 (2018)</p> <p>ASTM D5185-18</p> <p>ASTM D7899-19</p> <p>ASTM D974-21</p>

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I. Lubrication Oil / Engine Oil/ Gear Oil	10. Water in Liquid Petroleum Products by Karl Fischer Reagent	ASTM D1744-13
	11. Water in Lube Oil by Coulometric Karl Fischer Titration	ASTM D6304-20
	12. Acid Number	ASTM D664-18 ^{e2}
	13. Color	ASTM D1500-12 (2017)
	14. Copper Corrosion	ASTM D130-19
	15. Density	ASTM D4052-22
	16. Flash Point	ASTM D93-20
	17. Kinematic Viscosity	ASTM D445-21 ^{e1} ISO 3104-20
	18. Sulfur	ASTM D4294-21
	19. Water by Distillation	ASTM D95-13 (2018)
	20. Simdist	ASTM D7169-20e1
	21. Carbon	ASTM D5291-21
	22. Hydrogen	ASTM D5291-21
	23. Nitrogen	ASTM D5291-21
	24. Viscosity, apparent, Proc A	ASTM D4684-20a
	25. Viscosity, HTHS	ASTM D4683-20
	26. Foaming Characteristics	ASTM D892-18
	27. Evaporation Loss – Procedure B	ASTM D5800-21
	28. Air Release	ASTM D3427-19
	29. Oxidation Stability	ASTM D2272-22
	30. PQ Index	ASTM D8184-18e1
	31. Water Separability	ASTM D1401-21

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J. MTBE	1. MTBE purity	ASTM D5441-21
K. Petrochemicals and Solvents	1. Chloride 2. Carbon Disulfide and Sulfur compounds 3. Refractive Index	ASTM D5808-20 ASTM D5623-19 ASTM D1218-21
L. LSWR	1. Simdist	ASTM D7169-20e1

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Approved Signatories

S/N	Name	Scope
1.	Ms Madeleine Wang	- For all accredited tests.
2.	Ms Susan Toh Sok Tin	- For all accredited tests.
3.	Mr Tham Jiin Ming	- For all accredited tests.
4.	Mr Lu Kim Sun	- For all accredited tests.
5.	Mr Susanto Huang	- For all accredited tests.
6.	Ms Ten Chaw Hsia	- For all accredited tests.
7.	Ms Chun Shu Juan	- For all accredited tests.
8.	Mr Melvin Tay	- For all accredited tests except Section I.
9.	Mr Muthukkannu Ravichandran	- For all tests in Sections C, E and F except simdist test.
10.	Mr Calvin Chung Wai Leong	- For all tests in Sections A, B, J, L and all tests related to GC, HPLC, GC/MS.
11.	Mr Terance Yeow Xo Ming	- For all accredited tests in Section I.
12.	Mr Joe Lim Boon Keong	- For all tests in Sections C, E and F.

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.