

**AVERAGE TESTED VALUE OF BUNKERS (DISTILLATE & RESIDUAL FUELS)
BY MARITIME PORT AUTHORITY SINGAPORE FOR 1st QUARTER 2025**

A. Distillate

Characteristic	Unit	Average Tested Value 4Q 2024	Average Tested Value 1Q 2025	Test Method
Kinematic Viscosity @ 40°C	mm ² /s	4.023	4.019	ISO 3104
Density @15°C	kg/m ³	868.7	874.2	ISO 12185
Cetane Index	-	46.1	44.2	ISO 4264
Sulphur	% (m/m)	0.087	0.087	ISO 8754
Flash point	°C	78.3	79.0	ISO 2719
Hydrogen Sulfide	mg/kg	<0.60	<0.60	IP 570
Acid number	mg KOH/g	<0.10	0.11	ASTM D664
Total Sediment Hot Filtration	% (m/m)	-	-	ISO 10307-1
Carbon Residue	% (m/m)	<0.10	<0.10	ISO 10370
Cloud Point	°C	4	6	ISO 3015
CFPP	°C	1	2	ASTM D6371
Pour Point	°C	-4	-6	ISO 3016
Ash	mass %	<0.001	<0.001	ISO 6245
Lubricity	µm	331	328	ISO 12156-1
Water	% (m/m)	-	-	ISO 12937
Oxidation Stability	g/m ³	6	7	ISO 12205
Strong Acid Number	mg KOH/g	Zero	Zero	ASTM D664
Total Organic Halogen Content as Chlorine	mg/kg	<2	<2	EN 14077

B. Residual Fuels - VLSFO

Characteristic	Unit	Average Tested Value 4Q 2024	Average Tested Value 1Q 2025	Test Method
Kinematic Viscosity @50°C	mm ² /s	105.1	128.9	ISO 3104
Density @15°C	kg/m ³	954.3	948.8	ISO 12185
CCAI	-	832.6	824.0	ISO 8217 Annex F
Sulphur	% (m/m)	0.48	0.48	ISO 8754
Flash point	°C	89.5	74.0	ISO 2719
Hydrogen Sulfide	mg/kg	<0.60	<0.60	IP 570
Acid number	mg KOH/g	0.83	0.60	ASTM D664
Total Sediment Potential	% (m/m)	0.03	0.03	ISO 10307-2
Carbon Residue	% (m/m)	5.63	5.97	ISO 10370
Pour Point	°C	12	12	ISO 3016
Water	% (V/V)	0.23	0.30	ISO 3733
Ash	% (m/m)	0.024	0.023	ISO 6245
Vanadium	mg/kg	7	8	IP 501
Sodium	mg/kg	26	23	IP 501
Aluminium plus Silicon	mg/kg	32	32	IP 501
Calcium	mg/kg	24	17	IP 501
Zinc	mg/kg	1	3	IP 501
Phosphorus	mg/kg	1	2	IP 501
Strong Acid Number	mg KOH/g	Zero	Zero	ASTM D664
Total Organic Halogen Content as Chlorine	mg/kg	2	3	EN 14077

C. Residual-HSFO

Characteristic	Unit	Average Tested Value 4Q 2024	Average Tested Value 1Q 2025	Test Method
Kinematic Viscosity @50°C	mm²/s	463.2	356.5	ISO 3104
Density @15°C	kg/m³	985.8	982.4	ISO 12185
CCAI	-	844.8	844.0	ISO 8217 Annex F
Sulphur	% (m/m)	2.89	3.07	ISO 8754
Flash point	°C	89.4	80.0	ISO 2719
Hydrogen Sulfide	mg/kg	<0.60	<0.60	IP 570
Acid number	mg KOH/g	0.54	0.51	ASTM D664
Total Sediment Potential	% (m/m)	0.02	0.02	ISO 10307-2
Carbon Residue	% (m/m)	13.13	13.45	ISO 10370
Pour Point	°C	0	-3	ISO 3016
Water	% (V/V)	0.27	0.28	ISO 3733
Ash	% (m/m)	0.059	0.045	ISO 6245
Vanadium	mg/kg	210	139	IP 501
Sodium	mg/kg	26	26	IP 501
Aluminium plus Silicon	mg/kg	19	19	IP 501
Calcium	mg/kg	9	9	IP 501
Zinc	mg/kg	1	1	IP 501
Phosphorus	mg/kg	1	1	IP 501
Strong Acid Number	mg KOH/g	Zero	Zero	ASTM D664
Total Organic Halogen Content as Chlorine	mg/kg	3	3	EN 14077

D. Bio-Residual¹

Characteristic	Unit	Average Tested Value 4Q 2024	Average Tested Value 1Q 2025	Test Method
Kinematic Viscosity @50°C	mm ² /s	39.63	46.30	ISO 3104
Density @15°C	kg/m ³	928.8	937.5	ISO 12185
CCAI	-	824.1	825.6	ISO 8217 Annex F
Sulphur	% (m/m)	0.43	0.44	ISO 8754
Flash point	°C	95.0	93.1	ISO 2719
Hydrogen Sulfide	mg/kg	<0.60	<0.60	IP 570
Acid number	mg KOH/g	0.62	0.49	ASTM D664
Total Sediment Potential	% (m/m)	0.02	0.02	ISO 10307-2
Carbon Residue	% (m/m)	5.41	5.87	ISO 10370
Pour Point	°C	15	8	ISO 3016
Water	% (V/V)	0.18	0.22	ISO 3733
Ash	% (m/m)	0.022	0.019	ISO 6245
Vanadium	mg/kg	14	21	IP 501
Sodium	mg/kg	18	16	IP 501
Aluminium plus Silicon	mg/kg	33	23	IP 501
Calcium	mg/kg	19	7	IP 501
Zinc	mg/kg	1	1	IP 501
Phosphorus	mg/kg	1	1	IP 501
FAME content	% (m/m)	24.3	24.7	ASTM D7963

¹ Based on COQs received.

E. B100²

Characteristic	Unit	Average Tested Value 4Q 2024	Average Tested Value 1Q 2025	Test Method
Ester Content	% (m/m)	97.5	97.2	EN 14103
Density @15°C	% (m/m)	877.3	894.5	EN 14103
Kinematic Viscosity @ 40 °C	mm ² /s	3.890	4.551	EN ISO 3104
Flash Point, PMCC	°C	158.0	122.6	EN ISO 2719
Cetane Number	-	59.7	58.4	EN ISO 5165
Copper Corrosion @ 50°C (122°F) for 3hrs	-	1a	1a	EN ISO 2160
Oxidation Stability @ 110°C	hours	>8	>8	EN 14112
Acid Value	mg KOH/g	0.43	0.40	EN 14104
Iodine Value	g iodine /100g	62.5	55.3	EN 14111
Linolenic Acid Methyl Ester Content	kg/m ³	1	1	EN ISO 12185
Polyunsaturated (>= 4 Double Bonds) Methyl Esters	% (m/m)	<0.60	<0.60	EN 15779
Methanol Content	% (m/m)	0.046	0.026	EN 14110B
Monoglycerides Content	% (m/m)	0.17	0.33	EN 14105
Diglycerides Content	% (m/m)	<0.10	<0.10	EN 14105
Triglycerides Content	% (m/m)	<0.10	<0.10	EN 14105
Free Glycerol	% (m/m)	0.007	0.011	EN 14105
Total Glycerol	% (m/m)	0.065	0.109	EN 14105
Water content	ppm (m/m)	188	280	EN ISO 12937

² Based on COQs received.

Total Contamination	mg/kg	13.5	12.0	EN 12662
Sulfated Ash Content	% (m/m)	<0.02	<0.02	ISO 3987
Sulfur Content	mg/kg	4	6	EN ISO 20846
Group II Metals (Ca + Mg)	mg/kg	<2	<2	EN 14538
Group I Metals (Na + K)	mg/kg	<2	<2	EN 14538
Phosphorus Content	mg/kg	<4	<4	EN 14107
Cold Filter Plugging Point (CFPP)	°C	9	10	EN 116