

**AVERAGE TESTED VALUE OF BUNKERS (DISTILLATE & RESIDUAL FUELS)  
BY MARITIME PORT AUTHORITY SINGAPORE FOR 2<sup>nd</sup> QUARTER 2022**

A. Distillate Fuels

Characteristic	Unit	Average Tested Value 2Q 2022	Average Tested Value 1Q 2022	Test Method
Kinematic Viscosity @ 40°C	mm <sup>2</sup> /s	3.504	3.650	ISO 3104
Density @15°C	kg/m <sup>3</sup>	860.067	869.833	ISO 12185
Cetane Index	-	46.000	44.067	ISO 4264
Sulphur	mass%	0.080	0.073	ISO 8754
Flash point	°C	69.600	69.933	ISO2719
Hydrogen Sulfide	mg/kg	0.010	0.010	IP 570
Acid number	mg KOH/g	0.100	0.100	ASTM D664
Total Sediment Hot Filtration	mass %			ISO 10307-1
Carbon Residue	mass %	0.027	0.023	10370
Cloud Point	°C	3.667	5.167	ISO 3015
CFPP	°C	-2.000	-0.900	ASTM D6371
Pour Point	°C	-6.333	-6.433	ISO 3016
Ash	mass %	0.001	0.001	ISO 6245
Lubricity	microns	357.000	373.267	ISO 12156-1
Water	volume %	0.000	0.000	ISO 12937
Oxidation Stability	g/m <sup>3</sup>	6.667	4.100	ISO 12205
Fame	volume %	0.053	0.087	IP 579 Range A

B. Residual Fuels - VLSFO

Characteristic	Unit	Average Tested Value 2Q 2022	Average Tested Value 1Q 2022	Test Method
Kinematic Viscosity@50°C	mm <sup>2</sup> /s	115.447	121.347	ISO 3104
Density @15°C	kg/m <sup>3</sup>	949.867	952.900	ISO 12185
CCAI	-	826	829.000	ISO 8217 Annex F
Sulphur	mass%	0.480	0.480	ISO 8754
Flash point	°C	68.400	68.800	ISO 2719
Hydrogen Sulfide	mg/kg	0.010	0.010	IP 570
Acid number	mg KOH/g	1.167	0.993	ASTM D664
Total Sediment	mass %	0.020	0.023	ISO 10307-2
Carbon Residue	mass %	6.327	6.233	ISO 10370
Pour Point	°C	15.000	13.333	ISO 3016
Water	volume %	0.280	0.223	ISO 3733
Ash	mass %	0.031	0.030	ISO 6245
Vanadium	mg/kg	9.833	10.667	IP 501
Sodium	mg/kg	23.767	18.000	IP 501
Aluminium plus Silicon	mg/kg	23.867	26.000	IP 501
Calcium	<30	29.400	25.667	IP 501
Zinc	<15	1.100	1.000	IP 501
Phosphorus	<15	1.133	1.000	IP 501

C. Residual-HFO

<b>Characteristic</b>	<b>Unit</b>	<b>Average Tested Value 2Q 2022</b>	<b>Average Tested Value 1Q 2022</b>	<b>Test Method</b>
Kinematic Viscosity @50°C	mm <sup>2</sup> /s	363.563	322.230	ISO 3104
Density @15°C	kg/m <sup>3</sup>	983.300	981.933	ISO 12185
CCAI	-	844.667	845.333	ISO 8217 Annex F
Sulphur	mass%	3.070	3.260	ISO 8754
Flash point	°C	69.300	69.033	ISO 2719
Hydrogen Sulfide	mg/kg	0.010	0.010	IP 570
Acid number	mg KOH/g	0.233	0.197	ASTM D664
Total Sediment	mass %	0.043	0.037	ISO 10307-2
Carbon Residue	mass %	14.643	14.680	ISO 10370
Pour Point	°C	9.333	9.000	ISO 3016
Water	volume %	0.323	0.283	ISO 3733
Ash	mass %	0.050	0.048	ISO 6245
Vanadium	mg/kg	140.000	142.333	IP 501
Sodium	mg/kg	30.333	27.333	IP 501
Aluminium plus Silicon	mg/kg	14.000	15.667	IP 501
Calcium	<30	8.333	8.333	IP 501
Zinc	<15	1.000	1.667	IP 501
Phosphorus	<15	1.000	1.000	IP 501