



U. S. Oil & Refining Co.

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Product Specification ISO Marine Residual Fuels

<u>Characteristic</u>	<u>Limit</u>	<u>Test Method</u>		<u>Specifications</u> ^a				
		ISO	ASTM	RME-180	RMG-380	RMG-500	RMK-500	RMK-700
Viscosity @50°C mm ² /s	max	3104	D 445	180.0	380.0	500.0	500.0	700.0
Density @15°C, kg/m ³	max	12185	D 4052	991.0	991.0	991.0	1010.0	1010.0
Gravity, °API, reference only	min		D 4052	11.2	11.2	11.2	8.6	8.6
CCAI	max	8217aF		860	870	870	870	870
Sulfur, mass %	max	8754	D 4294	3.50	3.50	3.50	3.50	3.50
Flash Point, PMCC, °C	min	2719	D 93B	60.0	60.0	60.0	60.0	60.0
Acid number, mg KOH/g	max	D 664	D 664	2.5	2.5	2.5	2.5	2.5
Hydrogen Sulfide, mg/kg	max	IP570	D 7621	2.00	2.00	2.00	2.00	2.00
Total sediment, potential, mass %	max	10307-2	D 4870A	0.10	0.10	0.10	0.10	0.10
Carbon residue, mass %	max	10370	D 4530	15.00	18.00	18.00	20.00	20.00
Pour Point, °C Winter/Summer	max	3016	D 5950	30/30	30/30	30/30	30/30	30/30
Water, volume %	max	3733	D 4006	0.50	0.50	0.50	0.50	0.50
Ash, mass %	max	6245	D 482	0.070	0.100	0.100	0.150	0.150
Vanadium, mg/kg	max	14597	IP501	150	350	350	450	450
Sodium, mg/kg	max	IP501	IP501	50	100	100	100	100
Aluminum + Silicon, mg/kg	max	10478	IP501	50	60	60	60	60
Used lubricating oil (ULO) mg/kg	---	IP501	IP501	The fuel shall be free of ULO ^b				
calcium & zinc				calcium > 30 and zinc > 15				
calcium & phosphorus				calcium > 30 and phosphorus > 15				

a. Product conforms to ISO 8217:2010(E) listed grade.

b. A fuel shall be considered to contain ULO if either of the conditions is met.

c. Reserved

d. Reserved