

X5 Grade High Sulfur Fuel Oil Specifications

Product Property	Test Method	Origin		Deliveries ^{1/}
		Minimum	Maximum	
Gravity, ° API	D287	30.0		
Color	D1500		2.5	3.0
Distillation				
50% Recovered, °F	D86		Report	
90% Recovered, °F		540	640	
Copper Corrosion	D130		1	
Cetane				
(1) Cetane Number	D613	40.0		
OR (2) Cetane Index, procedure A	D4737	40.0		
Flash Point, °F	D93	140		130
Stability				
(1) Thermal, % reflectance	D6468 (W)	75		
	D6468 (Y)	82		
Aging Period (Minutes)	D6468	90		
OR (2) Potential Color ^{2/} AND	MPL P. Color		6	
Potential Gum, mg/100 ml ^{3/}	MPL P. Gum		50	
OR (3) Oxidation, mg/100 ml	D2274		2.5	
Carbon Residue on 10% Bottoms, %	D524		0.35	
Cloud Point, °F	D2500		^{4/}	
Pour Point, °F	D97		^{4/}	
Viscosity, cSt at 104 °F	D445	1.9	4.1	
Ash, wt %	D482		0.01	
Haze Rating ^{5/}	D4176		2	3
NACE Corrosion	TM0172	B+		
Sulfur, ppm	D2622		5000	

- 1/ Delivered products meets all applicable requirements at time and place of delivery.
- 2/ The Potential Color will be determined by ASTM method D1500 on a filtered sample after a 16 hour induction period by ASTM method D525 modified. Contact Magellan QC to request a copy of this method.
- 3/ The Potential Gum will be determined by ASTM method D381 modified (Steam Jet Evaporation at 485 °F) after a 16 hour induction period by ASTM method D525 modified. Contact Magellan QC to request a copy of this method.

X5 Grade High Sulfur Fuel Oil Specifications (continued)

4/	<u>Month</u>	<u>Pour Point °F, max</u>	<u>Cloud Point °F, max</u>
	January	0	+14
	February	0	+14
	March	0	+14
	April	+10	+20
	May	+10	+20
	June	+10	+20
	July	+10	+20
	August	+10	+20
	September	+10	+20
	October	0	+14
	November	0	+14
	December	0	+14

5/ Compliance with ASTM D4176 will be determined using Procedure 2 at 77 °F or tank temperature at the time of sampling, whichever is lower.

Additional Requirements:

Biodiesel: The use of any biodiesel fuel as a blending component is prohibited.

Dyes: X5 Grade shipments require red dye. A minimum of 4.0 PTB (11.5ppm) solid dye standard Solvent Red 26 or a spectrally equivalent quantity of a diluted dye formulation must be added to all X5 shipments before entering Magellan Pipeline. Red dye concentrations may be measured using a Petrospec DT100c or equivalent.