

Medium Sour Blend (MSB) Pool Quality Specifications

Quality Specifications for Component Streams to the Medium Sour Blend (MSB) Pool							
Quality	Units	Min	Max	Pool Typical Ex- Superior*	Referee Test Method	Test Frequency	Enbridge Response to Crude Not Meeting Quality Specs
Existing Specifications							
Density (15C)	kg/m ³	>799	<876	848	ASTM D4052	Frequency: AR ²	Delayed shut-in ⁶
Viscosity	cSt	2	<20		ASTM D7042	Frequency: QR ⁴	Delayed shut-in ⁶
Olefins, total ¹	mass%		<1		H NMR	Frequency: R ⁷	Immediate shut-in ⁵
Vapour Pressure (VPCR _{4.1} @ 37.8 C)	kPa		95 ⁸		ASTM D6377	Frequency: MR ³	Immediate shut-in ⁵
S&W	vol%		0.5		ASTM D4007	Frequency: AR ²	Immediate shut-in ⁵
Organic Chlorides ¹	wppm		<1		ASTM D4929	Frequency: QR ⁴	Immediate shut-in ⁵
Component Typical							
MCR	wt%		6	3.9	ASTM D4530	Frequency: MR ³	Reclassification Process ⁶
TAN	mgKOH/g		0.5	0.3	ASTM D664	Frequency: MR ³	Reclassification Process ⁶
Nickel	mg/L		33	13	ASTM D5708-05	Frequency: MR ³	Reclassification Process ⁶
Vanadium	mg/L		75	30	ASTM D5708-05	Frequency: MR ³	Reclassification Process ⁶
Naphtha (IBP-350F)	mass% recovered			24	ASTM D7169		
Distillate (350-650F)	mass% recovered			26	ASTM D7169		
Gas Oil (650-980F)	mass% recovered			26	ASTM D7169		
Resid (+980F)	mass% recovered			22	ASTM D7169		

*The estimated crude quality of a pool is based on a limited number of random composite samples of batches ex-Superior, timeframe May 2019 – May 2020.

Notes

- For these properties, blending should not occur.
- AR: All Receipts of MSB component streams tested using weekly composite.
- MR: Monthly Random testing of MSB component streams.
- QR: Quarterly Random testing of MSB component streams. Upon violation perform probational testing at Enbridge discretion.
- Immediate shut-in upon identifying violation. Request third party Certificate of Analysis prior to subsequent receipt.
- Upon violation, notification to applicable party, increase monitoring. Consequence based on outcome of increased monitoring.
- R: Annual Random testing.
- Max 95kPa year round, specification updated September 2018