

# Hardisty Synthetic Crude (HSC) Pool Quality Specifications

Quality Specifications for Component Streams to the Hardisty Synthetic Crude (HSC) Pool								
Quality	Units	Min	Max	Typical*	Pool Typical Ex-Superior**	Referee Test Method	Test Frequency	Enbridge Response to Crude Not Meeting Quality Specs
<b>Existing Specifications</b>								
Density (15C)	kg/m <sup>3</sup>	>799	<876	813-876	864	ASTM D4052	Frequency: AR <sup>2</sup>	Delayed shut-in <sup>6</sup>
Viscosity	cSt	2	<20			ASTM D7042	Frequency: QR <sup>4</sup>	Delayed shut-in <sup>6</sup>
Olefins, total <sup>1</sup>	mass%		<1			H NMR	Frequency: R <sup>7</sup>	Immediate shut-in <sup>5</sup>
Vapour Pressure (VPCR <sub>2.1</sub> @ 37.8 C)	kPa		95 <sup>8</sup>			ASTM D6377	Frequency: QR <sup>4</sup>	Immediate shut-in <sup>5</sup>
S&W	vol%		0.5			ASTM D4007	Frequency: AR <sup>2</sup>	Immediate shut-in <sup>5</sup>
Organic Chlorides <sup>1</sup>	wppm		<1			ASTM D4929	Frequency: QR <sup>4</sup>	Immediate shut-in <sup>5</sup>
<b>Component Typical</b>								
Sulphur, total	wt%			<0.2	0.19	ASTM D4294	Frequency: AR <sup>2</sup>	Notification Process <sup>6</sup>
Naphtha (IBP-350F)	mass% recovered			8-30	12	ASTM D7169	Frequency: MR <sup>3</sup>	Notification Process <sup>6</sup>
Distillate (350-650F)	mass% recovered			42-52	43	ASTM D7169	Frequency: MR <sup>3</sup>	Notification Process <sup>6</sup>
Gas Oil (650-980F)	mass% recovered			19-50	42	ASTM D7169	Frequency: MR <sup>3</sup>	Notification Process <sup>6</sup>
Resid (+980F)	mass% recovered			<1		ASTM D7169	Frequency: MR <sup>3</sup>	Notification Process <sup>6</sup>
<b>Other Requirements</b>								
● Stream must be produced by an Upgrader								

\*The expected or anticipated crude quality of individual components, understanding the fact that there may be, on occasion, variability outside of the range of the typical.

\*\*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 HSC component streams tested using weekly composite.
- MR: Monthly Random testing of HSC component streams.
- QR: Quarterly Random testing of HSC 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