Question 76: What is considered industry Best Practices with respect to the control of thermal cracking in vacuum tower bottoms? If quench is not available, what other parameters do you monitor and control? How do you establish the target control points?

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Thermal cracking of liquid in the vacuum tower bottoms depends upon time and temperature. The higher the temperature, the higher the cracking rate. The longer the residence time, the more cracking. The key to reduced cracking in the vacuum tower bottoms is to keep the bottoms temperature down and the residence time low.

Temperature limits to avoid cracking depend upon the crude. The most common method to reduce thermal cracking uses a quench recycle to cool the boot. Most plants target a bottoms temperature of ~650°F to avoid cracking.

If you cannot reduce the bottoms temperature, the other strategy is to run with minimum liquid inventory in the bottoms.

One of the most sensitive measures of thermal cracking is non-condensable gas make from the vacuum system. Monitor the flow rate of the vacuum system off-gas from the hot well. Higher cracking rates give higher off-gas production.

Tags

Crudes

Vacuum Tower

Year