Question 28: What is your best practice for determining the maximum allowable temperature rise in hydrotreating beds? What solutions do you have for managing temperature rise?

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Operating philosophy regarding the maximum allowable temperature rise in hydrotreating beds from a design perspective is determined by several factors. Feed rate, composition in regards to feed reactivity and ratio of various feeds, length and diameter of each bed (L/D) designed catalyst type to be employed including graded bed type and main hydrotreating type, and estimated heat release. General design guidelines for maximum heat rise in a single hydrotreating catalyst bed are 28°C-42°C (50°F-75°F). However, there are single hydrotreating catalyst beds depending on feed composition (relative ratios of straight run and cracked stocks) where actual rise can exceed these guidelines and be in excess of 55-60°C (100°F-110°F). The decision to operate a single hydrotreating catalyst bed in these temperature ranges should be evaluated beforehand to determine available hydrogen gas rates, lower bed available hydrogen quench and hydrogen quench valve operation, multi-bed temperature profiles, and overall heat release in the reactor. Another consideration should be given to activity grading the first catalyst bed which, dependent upon feed composition, might reduce the overall bed temperature rise.

Tags

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