

RASCHIG SUPER-PAK® 250 – 2007 CATEGORY 3/2 Executive Summary

Raschig Super-Pak® 250 (RSP 250) structured packing was tested at FRI_(SM)'s experimental distillation unit in the 4-foot (1.22 m) section of the low-pressure column with the cyclohexane/n-heptane (C₆/C₇) system at 4.5 and 23.5 psia (0.31 and 1.62 bar) and the o/p xylene system at 1.43 psia (0.1 bar), or 75 mm Hg. The test results for Raschig Super-Pak® 250 are presented in Topical Report 172

VALVE TRAY TESTS PHASE 4 (DST-7) Executive Summary

The overall test program included 5 phases of hydrocarbon testing. The valves, provided by Koch-Glitsch and installed on FRI Tray decks, were tested in the 4 ft (1.22 m) diameter low pressure column with the cyclohexane/normal heptane (C₆/C₇) system at 4.5 psia (0.31 bar) and 23.5 psia (1.62 bar), and the iso-butane/normal-butane (iC₄/nC₄) system at 100 psia (6.9 bar) and 165 psia (11.4 bar). Measurements were recorded pertaining to capacity, efficiency, pressure drop, tray holdup, downcomer backup and weeping. Phase 4 test results are found in the July-August 2009 Progress Report.

VALVE TRAY TESTS PHASE 5 (DST-7) Executive Summary

These trays were tested in the 4 ft (1.22 m) diameter low pressure column of the FRI distillation unit with the cyclohexane/normal heptane (C₆/C₇) system at 4.5 psia (0.31 bar), 23.5 psia (1.62 bar), and the iso-butane/normal-butane (iC₄/nC₄) system at 100 psia (6.9 bar) and 165 psia (11.4 bar). The Phase 5 trays were not tested with the butane system, but were tested with o/p xylene system at 75mm Hg. The Phase 5 pressure drop, bubbler and gamma scan data indicated a variety of flooding mechanisms for these trays. Gamma scan results were obtained for all of the systems. Results for the Phase 5 test can be found in the September-October 2009 Progress Report.

ZJUT AIR-WATER SIMULATOR VALVE TRAY TESTS – Test 1, Test 2 & Test 3 Executive Summary

This test program included a total of 11 tests. The Test 1, 2 and 3 valve trays were identical to each other but were installed at 36, 18 and 12 inch (914, 457 and 305 mm) tray spacings, respectively. The trays were tested in the ZJUT 3.94 ft (1.20 m) diameter air-water simulator. These trays were initially tested in the 4 ft (1.22 m) Stillwater low pressure column for the Phase 2 valve tray test program. After completion of the Phase 2 hydrocarbon testing, the valve trays were shipped to Zhejiang University of Technology in Hangzhou, China, for air-water testing. The effects of tray spacing on capacity of the Test 1, 2 and 3 valve trays were determined. Flood points, flood mechanisms and impacts of tray spacing on jet flooding were identified. Measurements relating to froth height, downcomer liquid head, entrainment, dry pressure drop and wet pressure drop were recorded. The test results for Test 1, Test 2 and Test 3 are presented in Progress Report November-December 2009.