



Every other year, Chemical Processing magazine honors chemical industry innovations through the John C. Vaaler Awards program. The Vaaler Awards program is the chemical industry's only awards program judged by an independent panel of experts. Judges are asked to evaluate each entry on the significance of its contribution to the chemical industry, on its novelty or uniqueness.

Reprinted by permission from Chemical Processing Magazine, October 2003:

More-Benign Heat-Transfer Fluids Replace Biphenyls

Biphenyl-containing heat-transfer fluids remain widely popular because of their high heat-transfer efficiency and thermal stability at elevated operating temperatures. However, the fluids are subject to environmental regulations that mandate reporting and penalize companies for emissions and spills. The Xceltherm LV series of fluids doesn't pose such environmental issues and is compatible and performs comparably with biphenyl-containing ones. The fluids also boast lower removal and disposal costs.

One judge describes them as "environmentally friendly and effective at the same time."

Xceltherm LV fluids, which consist of mixtures of diphenyl oxide and 1,1-diphenylethane, do not face any regulatory reporting requirements, yet offer physical and thermal properties almost identical to diphenyl-oxide/biphenyl mixtures. The LV fluids can serve as drop-in replacements, including for makeup in existing diphenyl-oxide/biphenyl systems. Plants that have switched over entirely have needed minimal, if any, system adjustments or modifications.

Rick Jones, operations supervisor at the Pinova Div. of Hercules in Brunswick, Ga., was drawn to Xceltherm LV because of its environmental friendliness. He switched three boilers from biphenyl-containing fluid in May. Radco took the old fluid and cleaning solution and provided a credit for usable materials recovered.

The boilers are operating extremely well. "It's an excellent fluid. We haven't seen any performance problems," notes Jones. The boilers even run at a little lower pressure, he added. Jones now is planning to convert other boilers on the site. Avoiding costs incurred by biphenyl-containing fluids is a factor, but the more-benign nature of Xceltherm LV is his prime motivation. "It's great to know that you're not causing environmental damage," he emphasizes.

The fluids also offer benefits over non-biphenyl liquid-phase alternatives being used in the

temperature range of 600°F to 660°F. Xceltherm LV can provide a 15 percent to 25 percent boost in heat-transfer efficiency, which can translate into energy savings in existing systems or smaller components in new units. The fluids also boast better thermal stability, leading to longer life.

The three fluids in the series, LV1, LV2 and LV3, are designed to offer improved crystallization points – 45°F, 11°F and -35°F, respectively—and low-end operating ranges compared to diphenyl-oxide/biphenyl mixtures. The lower crystallization points may eliminate the need for heat-tracing. The fluids can be used in the liquid phase from -35°F to +700°F and the vapor phase from +496°F to +700°F.

Radco Industries, La Fox, Ill.



Xceltherm LV1 provides a higher heat-transfer coefficient than biphenyl blends at temperatures above 650°F.