CHEMICAL ENGINEERING

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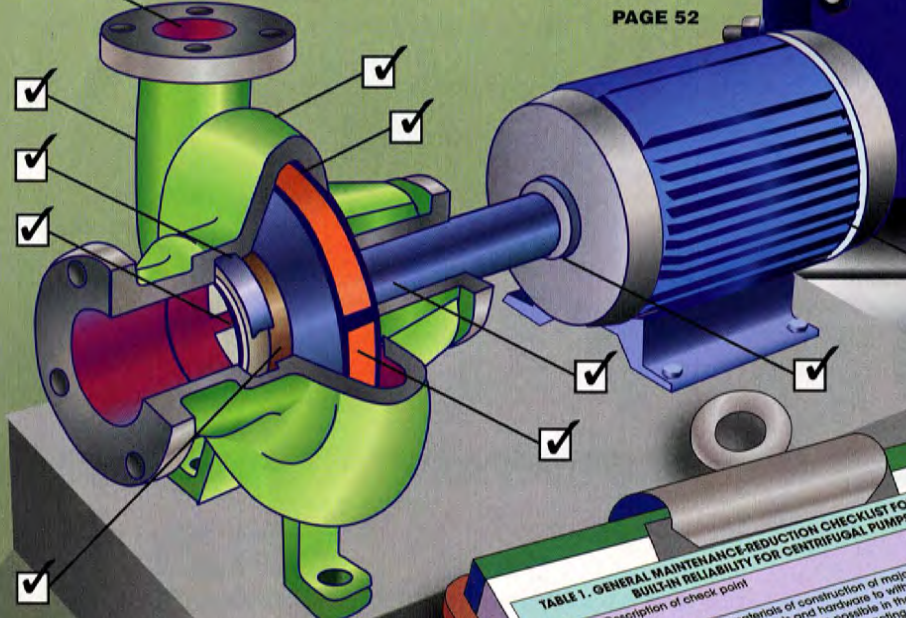

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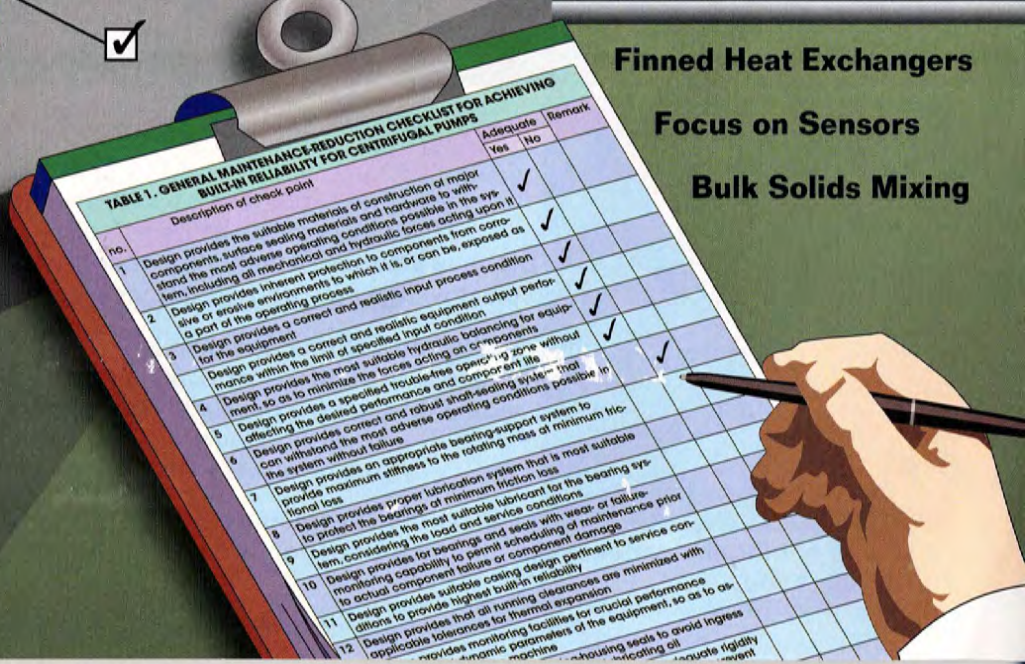
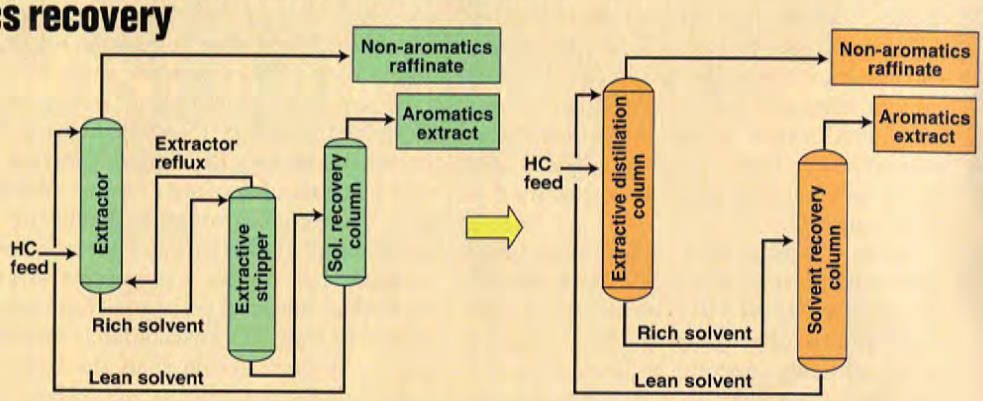


Facts at Your Fingertips: PVC and CPVC plastics

Access Intelligence

Successful implementation of a new extractive-distillation technology for aromatics recovery

AMT International Inc. (Plano, Texas; www.amtintl.com) and LG Chem, Ltd. (Seoul, Korea; www.lgchem.com) have successfully converted an existing sulfolane liquid-liquid extraction (LLE) unit at LG Chem's Yeosu plant using a new extractive-distillation (ED) process for aromatics recovery. This technology was jointly developed by AMT International Inc. and CPC Corp. (Taipei, Taiwan, R.O.C.; www.cpc.com.tw).



The conversion reused most of the existing equipment, added a new ED column, and reused the original sulfolane solvent without any modifications. The new ED unit, which started up in late April, achieved all revamp objectives, including over 35% savings in energy (compared to the duty of the extractive stripper in the prior LLE unit), over 12% increase in production (only limited by inherent existing equipment capacities), and resulted in on-specification raffinate, benzene and toluene purities and recoveries, says Kuang Wu, vice-president at AMT International. The return on investment for LG Chem is expected to result in a payback period of less than 12 months.

Recovering aromatic hydrocarbons from reformate or pyrolysis-gasoline (pygas) mixtures can be accomplished through LLE (flowsheet, left) or ED processes (flowsheet, right). The ED process typically requires less equipment and lower energy consumption than the conventional LLE process, but it suffers from feedstock boiling-range restrictions, heavy hydrocarbon accumulations in the lean solvent and two-liquid-phase distillation, explains Wu. AMT International, in collaboration with CPC, has conducted a long-term process-technology development program by converting a CPC commercial pygas sulfolane LLE unit at its Kaohsiung plant to an ED unit for BTX (benzene, toluene, xylenes) aromatics recovery. This work has resolved all of the ED process deficiencies and demonstrated significant advantages over the LLE process.

Highlights of this new ED process technology include the following: the effective recovery of BTX aromatics directly from full-range (C6–C8) reformate or pygas feedstocks without pre-cutting C8+ components; the use of the original sulfolane solvent as the ED solvent without modification; the application of proprietary process and mass-transfer equipment designs and operation in an ED column to achieve effective three-phase (L+L+V) fractionation; and the control of heavy hydrocarbons in the lean solvent to maintain optimum solvent performance.

Ceramic membranes and O_3 combine to treat wastewater

High fluxes and micro-contaminant reduction have been achieved in a 2.5-m^3/h pilot plant to test the performance of ceramic membranes and ozonation in treating wastewater at Melbourne Water's (www.melbournewater.com.au) Eastern Treatment Plant. The project, to be completed in a few months, is testing CeraMac technology from PWN Technologies (Velserbroek, the Netherlands; www.pwntechnologies.nl). Although the technology has already been applied in Holland, the U.K., the U.S. and Singapore, the Australian pilot test is unique because it involves secondary effluent. The test results also showed enhanced removal of *Escherichia coli* bacteria.

High-level wastewater treatment usually involves three steps: membrane microfiltration and reverse osmosis followed by advanced oxidation. This is costly when treatment of most surface water can be achieved with membrane filtration alone. The present project achieves the same treatment in a single step. The key feature of the CeraMac technology is that, instead of having ceramic membrane modules in individual stainless-steel casings, up to 192 ceramic elements are now housed in a single stainless-steel vessel. This makes the ceramic membrane system cost-competitive with polymeric membranes, says the company. O_3 can be applied directly on the membrane, destroying micro-contaminants, allowing the system to work at a very high rate (flux) with little water loss.

According to PWN Technologies, cost saving compared with polymeric membranes are

(*Continues on p. 12*)

Solar steam

The Middle East's first solar enhanced-oil-recovery (EOR) project was recently commissioned by Petroleum Development Oman (PDO; Muscat, Oman; www.pdo.co.om). The project uses Enclosed Trough technology from GlassPoint (Fremont, Calif.; www.glasspoint.com) to produce an average of 50 ton/d of steam that feeds directly into existing thermal EOR operations at PDO's Amal West field in Southern Oman. The 7-MW system is 27 times larger than GlassPoint's solar EOR system installed at Berry Petroleum's 21Z oilfield in Kern

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Note: For more information, circle the 3-digit number on p. 76, or use the website designation.