

“Manufacturer Recycles Solvents, Cuts Air Emissions”

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AUCKLAND, NEW ZEALAND — Sellotape Products Ltd., located here, last year recovered 438,000 liters of solvent used in the manufacture of cellophane and various adhesive tape products. According to Sellotape factory manager Barry Long, this figure is expected to increase by 15 percent in the year ahead, translating into a solvent cost savings of 250,000 New Zealand dollars since a carbon adsorption system went online at the plant in September 1996.

The carbon adsorption system, designed and installed by Vara International, a Vero Beach, Fla., U.S.A., division of Calgon Carbon Corp., recovers solvent from the plant's high-speed tape coating machine. At full-load operation, the tape coater yields air containing about 360 kg per hour of an N-heptane/toluene mix.

Operating under an air discharge permit from the New Zealand Resource Management Act of 1991, Sellotape was required to reduce air emissions to less than 4 kg per hour. The recovery system has reduced solvent emissions to the air by more than 98 percent, according to Long. The skid-mounted system uses three vertical carbon adsorber vessels, each containing 3628 kg of granular activated carbon. Two adsorbers are used at a time, while the third is regenerating. The sequencing of adsorption and regeneration cycles ensures each carbon adsorber is online for an equivalent period, providing continuous and automatic processing of contaminated air.

The solvent-laden air passes through the adsorber vessel, where solvent vapors are adsorbed by the activated carbon. During the regeneration cycle, low-pressure steam strips the solvent vapors from the carbon. The steam/solvent mixture is condensed and cooled, and then is passed through a decanter that separates the solvent and the water. The solvent is returned to a storage tank for reuse by the tape coating machine; the water is released to the sewer system.

Microprocessor-based, preprogrammed process controls minimize operator intervention. All system operating parameters and moving equipment are monitored, and alarms give early warning of possible process or equipment problems. Vara provided start-up and training services in Auckland, and now services the system online, via modem, from its Florida office. This allows a direct connection to the programmable logic controller (PLC) controlling the system. For example, when a change in tape coater operating conditions required modification of an alarm trip point on the solvent recovery system, the modification was accomplished online with the PLC in New Zealand.