

# Safer Solvents

Lyondell Chemical Company paints the industry green

If you ask people to list institutions that have done a lot for the environment, they might not think of the petrochemical industry, but they'd be overlooking significant contributions from some major chemical producers. Lyondell Chemical Company is a case in point.

Lyondell is one of the world's 10 largest chemical manufacturers, with 2006 revenues of \$20.9 billion, and for over two decades it has been bringing environmentally safer products to market. Formed in 1985, it began its corporate life as a refining asset of Atlantic Richfield (also known as ARCO), one of the largest petroleum companies in the U.S., but spun off into a separate company and grew very rapidly through acquisition.

Lyondell produces the raw materials that are used to make a broad array of household and industrial goods, ranging from food packaging to automotive parts and products, housewares, pharmaceuticals, personal care products and textiles. Paint and coating raw materials make up a relatively small part of Lyondell's operations, but, says Lyondell Technical Advisor Daniel Pourreau, "Though it's relatively small to us, it's significant to the coatings industry overall, mainly in solvents."

"Our involvement in the coatings industry started back in the early 1990s with the introduction of a line of propylene glycol ethers to replace products based on ethylene glycol," says Pourreau, adding that several ethylene glycol ethers are officially listed by the U.S. Environmental Protection Agency (EPA) as Hazardous Air Pollutants (HAP). "Our entry into the coatings market had a green flavour to begin with; already in the '90s we were focused on environmentally safer products."

Lyondell introduced solvents for both water- and solvent-based paints and cleaners. However, Pourreau explains, it was difficult in the beginning to interest customers in the new

line of products. "E-Series products were very well entrenched, so it was a bit of a struggle to gain market acceptance. We were practicing green chemistry a couple of decades before it became a buzzword."

After this first foray into green chemicals, Lyondell moved on to a new area. "Our most

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recent development is probably the most significant for the Canadian paint industry, and that is tertiary-butyl acetate (TBAC). It's an ester solvent, and it was developed specifically in response to the need for VOC-exempt solvents that do not participate in atmospheric reactions."

Since the late '70s, the EPA has been tracking the effects of various household

and industrial solvents on smog and toxic ozone, and regulating the use of Volatile Organic Compounds (VOCs). The U.S. Clean Air Act of 1990 included a list of solvents that were exempted from the regulations. "Acetone was a key exemption, and we followed with TBAC," says Pourreau.

"It was significant because TBAC has properties that are more desirable than



acetone, especially for coatings. Acetone is highly flammable and evaporates very quickly, which increases hazards in a manufacturing environment," he says. "We became aware of the need in the marketplace for more VOC-exempt solvents and purposely developed TBAC, knowing that it would have low atmospheric reactivity as well as other benefits."

In 1997, Lyondell petitioned for TBAC to be VOC-exempt, and that petition was granted federally in 2004. It has also been granted exemption in 49 U.S. states, and is only waiting for California to complete its exemption process. Meanwhile, Canada is now drafting its own, very strict VOC regulations, based on those of California and the 13 northeastern states comprising the Ozone Transport Commission (OTC).

"Canada is jumping from no VOC regulations to probably the most stringent regulations we have in the U.S.," says Pourreau. Thus far, TBAC is not officially exempt in Canada, but Environment Canada has indicated that it will consider exempting it as part of its architectural and industrial maintenance coatings regulation. If Environment Canada decides that TBAC is not photochemically reactive, it will likely be VOC-exempt by the time the regulations take effect in 2009 or 2010.

"To sum it up, it's an important message that CPCA members are probably aware of, but the general public may not appreciate as much: industry has independently and proactively looked for these environmentally safer measures without government involvement," concludes Pourreau. "It's something that we take pride in; it's good corporate citizenship. It's also something we expect to continue to do." ■