

Riding the Recycling Cycle

In love with aluminum recycling

Pull up a chair and find out why Secat's Subodh Das is smiling

By Edward Worden
Special to AMM

NEW YORK — An unhealthy trend in aluminum recycling came about as industry mergers closed laboratories designed to improve technologies, according to a researcher who wants to help pick up the slack.

With U.S. production of primary aluminum waning, it is incumbent on recyclers to step up the efficiency of secondary production, according to Subodh K. Das, a metallurgist and president of Secat Inc., which has 15 scientists at work at Secat's University of Kentucky headquarters in Lexington.

Prior to the start-up of Secat in August 1999, Das had been vice president of research and development at Arco Aluminum Inc., a can sheet producer in Louisville. The new organization began as the Southeast Center for Aluminum Technology, but the acronym—Secat—was chosen to recognize a wider industry region.

"The U.S. industry basically went away from mining bauxite and refining alumina with a couple of exceptions. In fact, the number of primary smelters running now stands at just 12 or 13," Das said. "The economy is based on a nation of consumers. We can either fight it or go with the wind. With the high costs of power and labor, any smelting facilities aren't going to be economical. The last U.S. primary smelter was built in 1979 in Mt. Holly, S.C."

As a nation of consumers, the United States possesses a wealth of such materials as used beverage cans (UBCs) and scrapped automobiles, while nations with production-based economies materials here. The recovery of available materials thus ought to be a U.S. strong point, Das said.

"Our technology must be strongest when it comes to recycling and remelting," he said.

"Alloys must be made that are the friendliest to recycling. Most specifications unfortunately were based on primary metal because that's what we made 50 years ago. To make the purest aluminum, we took impure bauxite and we added elements to make it so—silicon, manganese, magnesium—and the costs today of those items are rising more than aluminum is."

Das said the most cost-efficient processes must be used in manufacturing; market share must be increased by creating the most "market-appealing" product available; and the most efficient recycling of those materials has to take place at the end of their lives. The secondary industry has to ask itself if a specification exists because a product requires it, or because that's what incoming scrap traditionally contained. Needless specifications should be discarded in favor of attributes worthy of doing the job, and that is why new alloys should be developed.

"There were so many mergers and acquisitions. When company A bought company B, we heard first that the corporate headquarters would be moved and the second thing was that the research facilities of the acquired company vanished. The labs went away but the need didn't," he said. "How can we get our lawmakers and public at large to see lack of recycling as a threat to national economic security and a way to cut our trade deficit with China? Scrap going to China is coming back in as finished goods in Wal-Mart, further upsetting our trade imbalance."

He maintains that the true incentive for recycling domestically must be economic development, including the creation of additional employment.

He said that if the true value of aluminum scrap were recognized and put to best use, "all of

a sudden we have discovered an urban mine, we have found the purest form of bauxite available. That is how we can compete."

The recycling of UBCs entails what Das considers an unnecessary cost, the addition of magnesium because it has a lower melting point than aluminum and is partially lost. A pioneering effort in the 1970s to develop "uni-alloy" did not last, Das said.

A single alloy for all aluminum can components—bodies, lids and tabs—would make UBC recycling more economical, he said. "That would minimize the need for magnesium and make cans more scrap-friendly."

The two most powerful aluminum recycling loops—automotive and can sheet—exist separately. But according to Das, ways could be found to commingle the streams.

A native of India, Das came to the United States in 1971 and earned a doctorate in metallurgy from the University of Michi-

gan, and after that a master's of business administration from the University of Pittsburgh.

The Secat lab has 10,000 square feet holding some \$4 million in equipment. Companies in Kentucky and Ohio use Secat's expertise "just as if they had their own lab, to develop new products, make processes more energy efficient and improve customer satisfaction," Das said. "There are contractual arrangements, where we do R&D for certain dollar amounts, or for a certain project, although we're moving more to contract-based agreements."

A grant was awarded to Secat this year from the Sloan Foundation in New York and funding also is provided by the state of Kentucky and from various aluminum companies. The three sectors will bring in nearly \$1 million over the next three years. In addition, funding from the U.S. Energy Department over the past six years has totaled close to \$18 million.

A hands-on relationship has been established with Fayette County,

Ky., home of Lexington, with Secat setting up a "consumer behavior study lab" at the county's material recovery facility (MRF). Since aluminum is only 2 percent of the incoming waste stream but generates 20 percent of the revenue, Secat's goal is to help the county maximize its efficiency at the MRF. Resulting programs would be available for implementation elsewhere, Das said.

"Waste composition studies from key demographics will be carried out to identify the source where cans are escaping into the landfills," he said. "The key demographics can be targeted individually to improve the recycling rate." For example, if rates were determined to be particularly low at college and university campuses, recycling information and container locations could become part of an incoming freshman's information packet.

Das said that researchers need to better understand the reasons for low UBC recycling rates. The United States, as one of the world's largest consumers of aluminum cans, also is one of the largest disposers, with billions of cans going into landfills every year. He said that data provided by the Aluminum Association indicated recycling rates of some 95 percent in the U.S. transportation and construction sectors last year compared with just 51 percent for UBCs.

Das called UBC recycling "the one dark spot in the otherwise promising outlook for sustainable development in the aluminum industry."

Secat has been a partner in a number of large projects with the U.S. Energy Department's Office of Industrial Technologies. One project was set up to increase melting efficiency by 25 percent in an experimental reverberatory furnace. Another project aims to reduce ingot scrap by developing advanced models leading to improved ingot consistency and quality.

The Secat staff answers to an 18-member board of directors, the chairman of which is Patrick M. Franc, president of Arco Aluminum, a unit of petroleum company BP Plc and itself a customer of Secat.

"The processes at Secat are unique and extremely successful, and for Arco it's our R&D," Franc said. "There is shared research, funded by all participating companies, and each company also can arrange for proprietary research, which Arco does." Some of the sophisticated work is done in conjunction with the national laboratories (Argonne in Illinois, Oak Ridge in Tennessee and Albany in Oregon).

"What's happening at Secat with aluminum can be a blueprint for what other industries want to do," Franc said. "The topic of aluminum and sustainable development hasn't been disseminated as widely as it needs to be." ■



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