

## A hungry new competitor on the EF dust recycling scene

The nation's electric furnace-based mills kick up a lot of dust when making steel—more than 1 million tons a year. Much of it is captured in the melt shop baghouses and sold to recover the zinc. But about 400,000 tons end up in landfills, some of it because it's not worthwhile to re-process but more because there are not enough facilities to handle the steelmaking by-product.

Steel Dust Recycling LLC (SDR), led by veteran zinc industry executive Russ Robinson, hopes to divert some of that discarded dust back into the metals recycling stream. The company is building a Waelz kiln facility in northwestern Alabama to recycle 110,000 tons of electric furnace dust per year. The facility will occupy part of a 66-acre site in Millport, Ala., near SeverCorr LLC's new steel mill in Columbus, Miss.

Robinson, former president of Houston-based U.S. Zinc Corp., and Tom Knepper, a Waelz expert with more than 30 years' experience in kiln operations, formed SDR a little more than a year ago and began constructing three buildings at the site late last year with an eye toward firing up the kiln this May.

The Waelz kiln is the preferred technology for treating electric furnace dust, Robinson said. A lot of money has been spent over the years on other technologies to process and treat electric furnace dust, but most of them didn't work, he said.

About 25 percent of the kiln's feedstock will come from SeverCorr's 1.5-million-ton-per-year sheet steel mill. If SeverCorr expands as planned to 3 million tons, it would supply up to 50 percent of the material fed into the kiln, Robinson said. In addition to the SeverCorr mill, SDR is looking to pick up material from other electric furnace steel plants in the southern United States. It will recover zinc from the dust and supply it to zinc smelters and refiners in North America and around the world, while the remaining steel-based slag will be available to cement producers or for road aggregate.

"You are taking electric furnace dust that has approximately 20-percent zinc and you are upgrading to 60-percent zinc," Robinson said. "At 60-percent zinc, it can be sold to zinc smelters around the world as a substitute for zinc concentrate.



Dust up. Steel Dust Recycling's Waelz kiln facility is designed to treat 110,000 tons of EF dust annually. About 25 percent of the feedstock for the Millport, Ala., kiln will come from SeverCorr's new sheet mill in Columbus, Miss.

The smelters will further refine the zinc and sell it back to the galvanizing industry. It's sort of a full-circle recycling loop."

A Waelz kiln is just a big, long round tube, he explained. "It's 13 feet in diameter and 180 feet long and because of that it is very robust in its ability to handle the material. You have a lot of variations in (electric furnace dust) from different steel mills and even within the same mill," he said.

Installation of the kiln at Millport is the final phase of the construction. SDR purchased it from a cement plant in Hawaii, dismantled it and shipped it to Alabama. Typically, Robinson said, all of the kilns used to recover electric furnace dust are old cement kilns.

SDR will have three buildings as part of its complex. One will serve as the preparation site, another will serve as the maintenance department and clean-up facilities of the works, while the third will store the recovered zinc. The kiln will be outdoors.

Once dust arrives at the plant, it will be pelletized in the preparation building by mixing it with water and coke, then charged into the kiln. In the kiln's reaction zone, the metal oxides are reduced at about 1,100 degrees Celsius so that zinc and lead emerge from the charge as metal vapors. In a first stage, the coarse particles are separated in a dust chamber and recycled to the kiln again. Through controlled admission of air at the kiln's outlet end, zinc and lead in the gas phase

are oxidized again. The hot, dust-laden gas is then cooled and the zinc oxide is collected in a precipitator.

Depending on the length and rotary speed of the kiln, the retention time of the feed material is between four and six hours. The kiln's slag is iron-laden. All the non-volatile components, as well as added fluxes, are removed. That's the material destined for the road aggregate makers. "The reason our slag is suitable for cement is because it has a fairly high iron content," he said. "It competes with mill scale from the steel mills.

With the recovered zinc are other heavy metals like lead. These are typically part of the processed dust and are sold to zinc refiners who further separate and recover the metals. In past years, Robinson said, lead's value was so low compared with zinc that it was not worth recovering. Today, because of the high price of lead, it is worth recovering.

Most of the zinc trapped in the electric furnace melt shop's baghouse comes from automotive shredded scrap because all auto bodies are galvanized before they are painted. Basic oxygen furnace steel mills don't generate this zinc-rich dust; it is solely a by-product of the mini-mills' melt shops. Typically, between 1.5 and 2 percent of the raw steel tonnage produced in a mini-mill is electric furnace dust.

SDR is a direct competitor with Horsehead Corp., which has announced plans to expand its electric furnace dust handling facilities in the region. Horsehead started up a second Waelz kiln at its Rockwood, Tenn., operation late last year, doubling the dust processing capacity at that location. In addition, it plans to build a new regional electric furnace dust recycling facility at another location in the South which Horsehead hopes to have on-stream by 2009.

Where the two differ, Robinson said, is that Horsehead takes the zinc-heavy metal from its kilns and uses it to make pure zinc. SDR will be selling its products to Horsehead and other zinc refiners around the world.

Robinson said he expects the SDR plant to be up and running by May. There will be a ramp-up period, but that will last only about three months.

**MICHAEL MARLEY**