TIRE SHREDDING:

An OLD TUNE with New Lyrics

Americans dispose of approximately 250 million tires annually. What is done with them? It seems lately the answer has become more complicated...but like any problem, first you've got to cut it down to size.

According to the U.S. EPA, 242 million scrap tires were generated in the U.S. in 1990. EPA estimates that 188 million were landfilled, stockpiled, or illegally dumped. Twenty-six million were burned for their energy value; 16 million were recycled; and 12 million were exported. An additional 33.5 million scrap tires were retreaded and 10 million were reused. It is also estimated that two to three billion scrap tires are already stockpiled in the U.S.

To make matters even more complicated, tires are among a host of other materials now being banned from landfills. According to a recent Waste Age survey (see “If They Ban It, Will it Go Away?” this issue), by 1996, 34 states will ban tires from landfills. “Of the 34 states...
Contd. with tire disposal bans,” the survey says, “some flatly ban the disposal of whole or shredded tires. Most, however, require tires to be shredded before landfilling.”

Twenty-five states have imposed fees on the purchase of new tires to help pay for managing used tires and for handling illegally dumped tires, according to Keep America Beautiful (Stamford, Conn.). Five other states fund tire disposal programs with vehicle registration and licensing fees, the organization says.

The brunt of these bans—and the costs associated with them—ultimately rests on those who collect the tires. Subsequently, many of these businesses (made up of waste haulers, tire dealers, etc.) have turned to inventing new uses for the scrap tires they collect—nearly all involve shredding the tire as a first step for volume reduction, but very few shred for volume reduction alone.

**Been there, done that**

Currently, shredded tires are used as a fuel in cement kilns, dedicated tire-to-energy facilities, and for fuel in pulp and paper mills. In recent years, shredded rubber has been put to use in secondary capacities, such as building roads or athletic tracks.

Chaz Miller, recycling manager for the National Solid Wastes Management Association (NSWMA, Washington, D.C.), says “Crumb rubber is by far the biggest recycling market for scrap tires. Using crumb rubber as an additive in pavement is a proven technology with tremendous end-market potential. Yearly asphalt needs are 10 times the annual supply of scrap tires.”

Crumb rubber adds elasticity and allows more flexibility with changes in temperatures and road pressures.

In addition, the federal 1991 Intermodal Surface Transportation Efficiency Act requires that 5% of federally financed asphalt laid in a state must contain recycled rubber. That percentage rises to 20% in 1997.

“Crumb rubber is the buzzword,” says Steve Otto, technical salesman for SSI Shredding Systems, Inc. (Wilsonville, Ore.). “It may be because crumb rubber represents more money per ton,” he says. According to Otto, SSI manufactures the front-end machinery used for crumbing. “We don’t manufacture a crumb machine,” he says. “We’re still perfecting TDF [tire-derived fuel], and don’t have any plans on getting into the crumbing line. But,” he adds, “A lot of people are in TDF with the idea that they will get into crumb if the market develops.”

It is estimated that the demand for crumb rubber could reach 1 million tons by 1997 as compared to approximately 75,000 tons used in 1992.

SSI’s new shredder/trommel/reclassification system (Model 3200-ED TDF), Otto says, processes up to 12 tons per hour of truck and passenger tires into one- or two-inch chips suitable for TDF or crumb rubber applications.

**Unique approaches**

SSI’s Otto is quick to add that “tire shredding has always been an entrepreneurial area and more and more
markets for shredded tires are being put into effect.”

The use of crumb rubber, for example, is being perfected in the fabrication of many items, including bumpers, mudflaps, car mats, and body-liners for trucks, as well as other extruded and molded rubber products.

Nearly 2,000 shredded scrap tires went into producing President Clinton’s five-foot-wide, nearly quarter-mile track installed on the South Lawn of the White House earlier this year. Winston-Salem, N.C.-based TIRES, Inc., supplied the material.

TIRES, which stands for “Tires Into Recycled Energy and Supplies,” opened in June 1992 and shreds tires for use as fuel chips, or crumb rubber for use in asphalt, playground mats, and athletic surfaces. According to John Serumgard of the Scrap Tire Management Council (Washington, D.C.), ground rubber from scrap tires is becoming widely used for building running and jogging tracks because the material provides resiliency and durability and is easy on runners’ legs.

TIRES uses a high-volume Columbus McKinnon (Amherst, N.Y.) shredder to maintain a consistent throughput, says David Forrester, TIRES president. The plant has the capacity to handle over 2 million scrap tires per year. In June, the California Integrated Waste Management Board announced the recipients of grants to clear up unsightly piles of waste tires. Yolo County, one of the grant recipients, intends to study the potential for shredding tires and using them to cover garbage at landfills.

Another recipient, Kern County, will be demonstrating the potential for solving the oversized waste tire problem by using an Eagle Tuf-Cut (Tire Resources Systems, Sioux City, Iowa) to shred and process the material for other uses. According to Greg Strakaluse with the county’s waste management department, the county has an existing program for smaller tires, contracted with Oxford Energy, whereby the tires are shipped whole and used as fuel in a nearby cement plant, or Oxford’s energy plant, or sent to a recovery facility for reuse. However, he says, Oxford cannot handle the oversized tires. The grants are to be combined to local dollars or in-kind contributions.

According to Tire Review (April 1993), some tire dealers “have found that there is money to be saved by doing their own scrap tire processing, and a handful have even ventured full-scale into the scrap tire business in addition to their retailing operations.”

Lee Stidham of Stidham Lee’s Tire in Columbia, Mo., generates 120 scrap tires weekly. Stidham, along with friend Gary Martin of nearby Booneville, developed and built a simple tire-cutting machine he could fit into his shop. The machine—called ERIT (tire spelled backwards)—takes up about five square feet of floor space, costs less than $4,000, and is easily maintained, Stidham says. He estimates the tire cutter has saved him about $33,000 over the last three years.

The machine not only saves him money—he can now transport the processed tires to the landfill at a cost of $19 per ton—but he has found a way to increase customer loyalty. For every tire sold to a filling station, Stidham picks up one scrap tire.

Norman Emanuel of Baltimore, says he has been shredding tires since 1978. He puts the tires through the first two shredding stages and sells the chipped tires to end users who further process the tires for a variety of uses, including fuel, rubber boots and gloves, and recycled asphalt. Eventually, he says, he’d like to see shredded tires used as the primary fuel in his own 1.5-megawatt power plant.

Emanuel uses five shredders he designed and built himself in addition to shredders manufactured by ERS (Pittsburgh, Kan.), Columbus McKinnon, and Ameri-Shred (Monroeville, Pa.). He also has a Mats & Merrill tire shredder (Reduction Technology, Inc., Leeds, Ala.).

I wasn’t planning to, but...

Even individuals who hadn’t initially planned on getting into tire shredding are now finding themselves on that road. In the 1970s, Noble Kirby of Sycamore, Ohio, collected more than 4.5 million tires, packing them into 12 acres of land, “hoping to convert the mountain of rubber into money,” he says. Today, Kirby still collects and the growing piles are still made of rubber. Ohio, however, is preparing to enact scrap tire regulations that may make him a violator. If the proposed regulations are enacted, Kirby will have to shred all incoming tires, downgrade all piles to 2,500 or smaller, include 50-foot fire lanes around each pile, and cover all piles from the elements.

Ohio is among those states that have already banned the landfilling of whole tires, and after 1995, tires of any kind will be banned from landfills. Then, only shredded tire monofills or a legitimate recycling facility will be able to accept them.

Another state, Florida, recently mandated that all road projects use scrap tire rubber. The county of Hillsborough in Florida purchased a mobile Columbus McKinnon tire shredder to convert scrap tires in small chips for use as daily cover for the county’s landfills. Columbus McKinnon claims this is their first shredder sold to a municipality. 