

The Foundry Industry...Recycling Yesterday, Today & Tomorrow

"The foundry industry is proud of its recycling heritage...it's an integral part of our commitment to protecting America's natural resources."

Jack Pohlman, AFS President

Foundries—Recycling Leaders

Metalcasters are some of the world's first recyclers. For centuries, foundries have been making new metal objects by remelting old ones. In fact, the oldest existing casting is a copper frog made in Mesopotamia and dating back to 3200 B.C.

Old and discarded products such as appliances, sewer grates, cans, automobiles and water meters are not trash to foundries — they are raw materials. U.S. foundries convert this unwanted scrap metal and recycle it into valuable products such as faucets, engine blocks, golf clubs, aluminum wheels and much more.

Our industry recycles at all phases of the metalcasting process — from beginning to end and beyond.

- We purchase recycled-content materials and components as our feedstock;
- We use and reuse a variety of materials within the melting and molding stages;
- We produce recyclable products for our customers; and
- We supply secondary markets with usable by-products generated by our facilities.

Accordingly, a wide variety of materials including metal, sand, wax, wooden pallets, packaging materials, steel drums and other products are finding a second life through recycling as a result of our efforts.

Foundries—Creating New Life for Used Sand

Our casting processes require large volumes of sand, which are continually used, reconditioned and reused in the foundry. Metalcasters use and reuse almost 100 million tons of sand annually.

Sand that can no longer be used in the foundry process is available for beneficial reuse. Most foundries have installed sand reclamation systems that screen the metal and debris out of the sand so that a good, clean product is available for reuse in a variety of applications and industries. Below are some of the areas in which foundry sand is being successfully marketed:

- Construction Fill / Road Subbase
- Flowable Fill
- Grouts and Mortars
- Potting and Specialty Soils
- Cement Manufacturing
- Precast Concrete Products
- Highway Barriers
- Pipe Bedding
- Asphalt
- Cemetery Vaults
- Brick and Pavers
- Landfill Daily Cover

Foundries—Saving Energy & Cutting Pollution

Making castings from recycled metal products saves energy and conserves resources. Since foundries produce castings with recycled content, we are able to reduce our needs for raw materials and energy. Processing raw materials places heavy demands on our nation's energy resources; however, it requires 95% less energy to make castings out of recycled metals.

Reprocessing used materials in the foundry industry also has a domino effect by reducing the energy demands for mining, refining and many other metal-related processes.

Interestingly, every pound of steel recycled saves 5450 BTUs of energy, enough to light a 60-watt bulb for over 26 hours. Foundries recycle over 14 million tons, or 31.5 billion pounds, of steel each year...enough energy to light the homes of Chicago for one year!

Recycling also reduces pollution risks by keeping materials out of disposal facilities. For instance, reusing steel reduces both water and air pollution and saves water, compared to making new steel from iron ore. According to the U.S. Environmental Protection Agency, recycling steel, rather than using iron ore, reduces air pollution by 86%, water use by 40%, water pollution by 97% and mining wastes by 97%.

Foundries—Making Good Business Through Recycling

The U.S. foundry industry is committed to the preservation and protection of the environment and our natural resources. We all

live in this world and hope to pass on a strong environmental legacy to future generations.

Metalcasters recognize the vital role we play in recycling and take this job very seriously. Every day, foundries divert valuable materials from the waste stream, reducing the burden on landfills and incinerators and minimizing the need for virgin materials.

Our recycling efforts not only support the preservation of natural resources, but also make good business. For example, using scrap metal significantly reduces our energy usage, minimizing one of the largest expenses faced by each facility. With sand being \$38-\$65 per virgin ton, reusing it 8-10 times before disposition proves significant cost savings. Finally, in states with limited landfill space, disposal costs have quadrupled and are still on the rise—diverting foundry by-products into beneficial reuse markets reduces our disposal costs.

The metalcasting industry is excited about the great strides we have made to increase our in-process recycling and to identify and develop secondary markets for our by-products. Despite the success in these areas, we recognize that there is still more that can be done.

Increased awareness, acceptance and proactive government policies are critical in order to continue the upward trend of recycling and reusing materials whenever possible. Foundries want to continue to be recycling leaders and responsible stewards of the environment.

What does **RECYCLE** mean?

re-cy-cle (rē-sī'kel) *tr.v.* **re-cy-cled**, **re-cy-cling**. 1. To reuse materials that otherwise would have been thrown away. 2. To pass through a process again. 3. To recondition and adapt spent materials to a new use or function. --re-cy'cler *n.*

Recycling in the Foundry Process

Annually, investment casters purchase 45 million pounds of virgin wax to make their precise patterns (red wax). Over 50% is continually reused in other forms, such as pattern trees (brown wax).



15-20 million tons of scrap metal that would otherwise be dumped in already overcrowded landfills is being remade into casting each year.



Mid-City Foundry of Wisconsin processes up to 36 tons of sand daily, reusing it up to 20 times, compared to the industry average of eight, before disposal.



A consortium of West Michigan foundries reuses foundry by-products in asphalt paving and as a landfill liner cover.



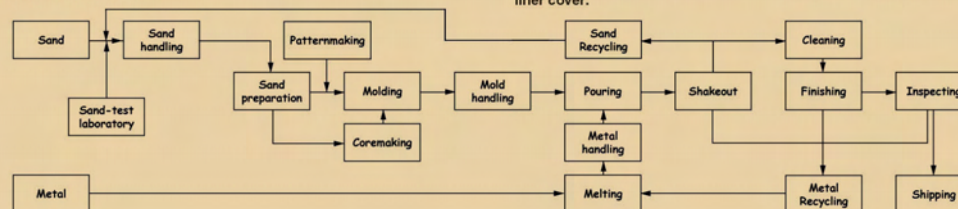
Many foundries are processing their wood pallets through a local recycler to manufacture new pallets. Any scrap wood from this process is ground into mulch and sold for landscaping.



Ford Motor Company's Cleveland Casting Plant beneficially reuses 100% of their spent sand. These projects include the construction of golf course tee boxes.



Wheland Foundry of Tennessee uses foundry sand mixed with cement and clay to make terra blocks. These blocks built this Habitat for Humanity home in Chattanooga.



Beneficial Reuse Success Stories Across the Nation

- For over 10 years, **Waterman Industries**, a **California** foundry, has completely eliminated all of its landfill costs. In addition, it has recycled and developed manufacturing materials and saleable by-products out of "would-be-wastes."
- **Kohler Co. of Wisconsin** used 25,000 tons of foundry sand in the last three years as construction fill material in several road and building construction projects, displacing the need for virgin materials.
- **Ford Motor Company's Cleveland** Casting Plant beneficially reuses 100% of their spent sand in a wide variety of environmentally responsible projects. Since 1994, they have recycled over 1,000,000 tons of spent sand.
- A consortium of 33 foundries in southeastern **Pennsylvania** has established alternative uses for spent sand, resulting in over 80,000 tons being recycled.
- Foundries and legislators in **Ohio**, working with the state Environmental Protection Agency and Department of Transportation, have developed applications for foundry sand for low-strength concrete.
- A **Buffalo, New York**, foundry had accumulated an 8000-ton pile of spent sand on its property that would have cost \$680,000 for disposal. The foundry partnered with a cement and fill manufacturer, and today that pile of sand is gone.
- Spent sand has been used to make concrete barriers, including barrier production, for the Cleveland Grand Prix car race.
- The **Grede Foundry** plant in **Michigan** built a state-of-the-art employee training facility, learning center and lunchroom using concrete blocks made from foundry slag.

Fact or Fiction

Foundry sand is cleaner than water. FACT—98% of foundry sand will exceed the federal Safe Drinking Water Act leachate standards.

Some foundries produce ZERO waste. FACT—Several foundries treat and recycle all of their wastewater, sand and other refuse or find beneficial reuses for it, producing no waste to be landfilled.

Buildings are made from foundry sand. FACT—Foundry sand is used to make concrete, cement, blocks and bricks, all of which are basic construction materials.

Reused foundry by-products are a widespread part of our everyday lives. FACT—Foundry sands and other recycled materials are commonly found in our roads (asphalt), gardens (mulch), buildings (blocks), parking lots (concrete) and recreation areas (specialty topsoils).

Some states refuse to allow foundries to recycle sand and other by-products. FACT—Despite the efforts of our industry, many states maintain rules and regulations that prevent the beneficial reuse of foundry materials.



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