

# Center for Resource Recovery and Recycling (CR3)

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Center website: <http://www.wpi.edu/academics/Research/CR3/index.html>

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## Forming Advanced High Strength Steels (AHSS)

There was unanimous agreement at a recent International Sand Reclamation Conference that the low rates of reuse of foundry sand is one of the highest priority problems confronting the industry. The annual generation of foundry waste (including dust and spent foundry sand) in the United States is thought to range from 9 to 13.6 million metric tons (10 to 15 million tons). Researchers from the NSF Center for Resource Recovery and Recycling (CR3) at Victaulic, a charter sponsor of the center, and at the Kroll Institute for Extractive Metallurgy at the Colorado School of Mines have developed a more efficient process to



liberate beneficial products (clay and seacoal) from waste green sand foundry dust. The use of sand casting in U.S. foundries is well established. Sand casting is the least expensive of all casting processes. It economically produces rough metal parts. Raw castings are then machined to produce finished products.

Through research a hydrocyclone process was developed that doesn't use harsh chemicals and reclaims approximately 80% of the clay and seacoal from the dust. The advantage of this work for industry is that it offers a more economical and more environmentally friendly process for recovering clay and seacoal from green sand foundry dust and from waste green sand than was previously available. This work improves the method for disposing of green sand foundry dust and recycling of binding materials. Binders are materials added to a sand mold to bond sand particles together (i.e., it is the glue that holds the mold together).

**Economic Impact:** This breakthrough impacts original equipment manufacturers that use finished metal parts. It minimizes costs related to waste disposal of green sand foundry dust and the cost of buying bond. This CR3 based innovation is estimated to save 1/2 to 1M million USD per green sand foundry per year. It will also reduce or remove accumulations of waste materials.

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