

Project Title: Reclaim Spent Green Sand for Coremaking

Full Scale Implementation OR Pilot Scale/Study

1. Description of the project: What is the issue and how did you fix it?

While the facility has recognized tremendous opportunities in the offsite beneficial reuse of these spent foundry sands in lieu of disposal, it is known that the highest and best use of excess foundry sand is for reuse within the foundry itself.

Achieving a greater utilization of foundry sand within the facility offered energy savings, reduced generation of solid wastes and air emissions, and a potential cost savings in reducing the purchase of virgin sands. However, a feasible and proven technology to achieve these goals was not commonly available to the industry.

Technologies which had been utilized by some foundries to recover foundry sands included mechanical or thermal sand reclamation. Examples existed within the U.S. where foundry facilities had installed sand reclamation systems which had demonstrated the limited capability to recover the most select and unblended sands, such as in the recovery of scrap cores. This represents a recovery success; however scrap cores represent only a very small percentage of the excess sands produced by a working foundry.

A pilot project to recover a far greater quantity of foundry sands was initiated at the facility. The project focused on applying a combination of available technologies in a new way to develop a foundry sand reclamation system which could recover a far greater quantity of the excess sands being removed from the foundry process. This technology would need to provide cost and environmental benefits, be tolerant of a regular foundry sand feedstock (which unlike cores contains clays requiring removal) and have the ability to reliably support a three shift, high volume production facility year round.

After an extensive technology review and analysis of how excess foundry sands containing clay may be recovered from the metalcasting process, a 2.5 ton per hour pilot reclamation system was installed. This system represented a combined mechanical-thermal-mechanical reclamation process, and was immediately put into

service generating small quantities of reclaimed foundry sand to replace a portion of the virgin sands used in the manufacture of cores.

2. Environmental Benefits: Conservation of raw materials or energy, reduction or elimination of emissions, wastes, toxics, water discharges, etc.

The pilot system demonstrated immediate success, proving that greater quantities of reclaimed sands could be recovered and reintroduced to the process. The reuse of recovered sands was incrementally increased, culminating in cores being manufactured with a 30% reclaimed foundry sand content with no detriment to the quality requirements of the products being produced.

The overwhelming success of this effort has resulted in an annual 38,000 tons of foundry sand being recovered from disposal, and a new opportunity to utilize similar production size systems to greatly improve the utilization of foundry sands at sister facilities.

3. Other Benefits: Productivity, health and safety, employee morale, etc.

The project has resulted in significant sand related cost savings to date, and has validated a feasible technology to recover a wider array of foundry sands from the foundry process than historically achieved in the industry. The sand reclamation technology provides quality sands for reuse and a critical offset to the rising costs of energy and raw materials necessary to run a metalcasting facility.

4. Cost Savings: Capital cost, operating cost, ROI or other pertinent cost information.

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5. Applicability to other foundries and additional Comments

This project poses widespread applicability for metalcasting facilities utilizing the green sand molding process.

6. Applicable Environmental Categories and Foundry Processes. Select all that apply.

Environmental Categories

- Carbon (GHG) Emissions Measurement and Reduction
- Air Quality Water Use and Discharge Waste Management
- Beneficial Use Stormwater Material and Resource Conservation
- Community Engagement

Foundry Process(es) Impacted

- Melt Pour Mold Core sand system/reclaim
- Shakeout Heat Treat Quench Finishing Shipping
- Maintenance Pattern Shop Casting Design
- Management Systems and Metrics
- Other, explain:

7. Add photos to enhance your application, if applicable.

