

CASE STUDY

Brass, bronze & aluminum foundry

Reclaiming Sand Reduces Foundry's Sand Cost by 84%

PROFILE

Company

Manufacturer's Brass and Aluminum Foundry, Inc.

Location

Blue Island, IL - USA

Foundry

Jobbing

Casting

Brass, Bronze and Aluminum

Molding process

Green Sand and Chemically Bonded Sand Moldings

"The overall reason we wanted to do this is basically to keep the sand that we purchase within the building, minimize if at all possible anything that we throw away and give us the quality for our customers. From an environmental standpoint our carbon footprint needed to be better."

– Butch Pacula, Foundry Manager

The foundry needs

Manufacturer's Brass and Aluminum Foundry, Inc.'s (MBAF) 35,000 square foot foundry has been a quality supplier of brass, bronze and aluminum sand molded castings since 1927. Their customers cover a wide range of industries including food processing, glass molding and high voltage electrical.

As the costs of purchasing, transporting, handling and disposing of silica sand increased, MBAF sought ways to reduce costs. In addition, disposing of waste sand causes severe environmental implications so reducing landfill waste was of great concern. At the time, MBAF was only mechanically reconditioning the sand through a lump breaker sending 60% of their foundry sand to a landfill. They needed to be able to reclaim a larger volume of sand to a point that it would perform as well as or better than new sand.

Before investing in a sand reclamation system, MBAF wanted to conduct a reclamation evaluation test on their foundry's urethane bonded silica sand to confirm if making an investment in sand reclamation technology would yield a greater percentage of quality sand that could be reused.

Description of the Project

Sand that was utilized on the molding line was shipped to the Simpson Performance Laboratory facility in Aurora, IL. The testing program consisted of processing the test material at various production rates through a Simpson Even-Flo laboratory pneumatic scrubber.

The following are the reclamation test results:

Loss On Ignition (LOI)	Reduction 29%
Acid Demand Value (ADV)	Reduction 58%

Utilizing the sand reclamation system produced a substantial reduction in LOI, as received it was 1.32% and after reclamation it was down to 0.93% while maintaining the original AFS Screen Distribution and Grain Fineness Number of 57 (3 screen sand). ADV as received was 6.00 and after reclamation fell to 2.5, a 58% reduction.

With the great results from this testing program, MBAF made the decision to purchase sand reclamation technology from Simpson. The Simpson team calculated the optimal size reclaimer and selected the Model 2-Cell Simpson Pro-Claim® which processes approximately 3 tons per hour of chemically bonded sand for reuse.

“When we first started with this machine we were using 40% reclaimed sand and 60% new sand. Currently we’re using 95% reclaimed and 5% new sand.”

– Butch Pacula, Foundry Manager

Implementation

To support the Simpson Pro-Claim implementation, MBAF utilized a third party equipment company to provide all the auxiliary equipment that included bucket elevators, pneumatic transporters, feed bins, dust collection and all equipment installation.

Once the installation was complete Simpson’s service engineer arrived at the plant, confirmed that the physical and electrical installation was correct and proceeded to commission the ProClaim. That same day, quality reclaimed sand was being produced and rebonded for mold and core making. The sand through put was confirmed at three tons per hour and the sand properties were confirmed based on the original testing data collected.

“Their technical expertise is second to none in the industry.”

– Geary Smith, VP of Operations

Results

The high quality of the reclaimed sand being discharged from the Pro-Claim has enabled MBAF to mold with 95% reclaimed and a 5% new sand make-up when previously the reclaim sand was only 40% of their sand blend. The actual production sand tests very closely duplicated the results that were obtained during the initial testing phase at the Simpson Performance Laboratory.

Prior to the installation of the Pro-Claim, MBAF was purchasing 50 tons per month of new sand. Which has now been reduced to purchasing only 8 tons per month. Their monthly new sand cost has been reduced by 84%. Additional savings are being realized in handling and disposal costs too. By utilizing the Simpson Pro-Claim, every year over 500 tons less waste is being disposed by MBAF into America’s landfills.

PRODUCTS PURCHASED



Model 2-Cell Simpson Pro-Claim®

Did you know?

- Sand is the largest foundry process waste, typically constituting about 70% of total waste volume.
- Surveys have shown that disposal costs range from \$0.75 to over \$5.00 per ton.
- Over 500 Even-Flo’s/Pro-Claim’s have been installed worldwide.

Resources

Visit simpsongroup.com/reclamation

- See the animation of how the Pro-Claim works
- Watch the MBAF video to understand how sand reclamation fits into their total sand preparation and control system