



3D Printing for Sand Casting Patterns

The application of possibilities of 3D printing is limitless. 3D printing has already become a routine name in applications such product design, architecture, and engineering. The transition of this nascent technology in to other verticals manufacturing and production was only natural. This transition was exemplified in one of DBZ's Mumbai-based clients Greycast Founders Pvt. Ltd's manufacturing process. Greycast Founders Pvt. Ltd.



Greycast Founders Pvt. Ltd. is a leading company in manufacturing and exporting a wide variety of metal castings based in Mumbai, India. Its product range comprises of S.S. Casting, special alloy steel, Ni-hard, haste alloy, heat resistant, high manganese steel casting to name a few making it the foremost exporters of stainless steel casting in India.

Conventional Sand Casting Patterns

In the process of designing a cast or casting, a pattern is a mock-up of the object to be cast. This mockup is used to prepare a cavity in sand followed by pouring of design molten material to complete the casting process. Conventionally, Patterns used in sand casting are made of wood or metal. Making pattern out of conventional materials is expensive, manual, time consuming and requires skilled-labor.

Current Challenges

Just like most manufactures, Greycast Founders had their sand casting patterns developed in wood or Aluminum. These were developed externally from third-party craftsmen. The client of Greycast Founders provided only design files or drawings. Following are some of the key challenges faced by Greycast Founders.

1. High Production Lead Time – Currently, the ideal lead time for developing a wooden pattern is between 2-4 weeks subject to the complexity of the design. This high turnaround time in the pattern design process adds and leads to higher production lead times.

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2. High Third-Party Dependency – The current process of having patterns developed from third-party partners depended heavily on their availability, skill-level and willingness to adhere to timelines. It also involved cumbersome manual follow up and logistics procedures. As Greycast Founder’s client only provided design files or drawings, the final outcome depended heavily on the skill-set of the third-party partners.
3. Higher Cost - Fabricating or developing the patterns is often difficult, time-consuming and expensive. The extremely skilled nature of sand casting patterns development is subject to erratic price changes by the third-party partners. Additionally, potential for problems such as design flaws, tolerance variations, incorrect shrink compensation, IPR infringement and iterations add to the cost per pattern and overall lead time.
4. Lack of Agility – All the factors mentioned above led to lack of agility and high external dependencies. Greycast Founders were unable to getting quick orders from clients due to poor availability of infrastructure for rapid sample pattern development. Greycast Founder’s also has limited or no visibility during the actual development of sand casting patterns.

Solution by DBZ

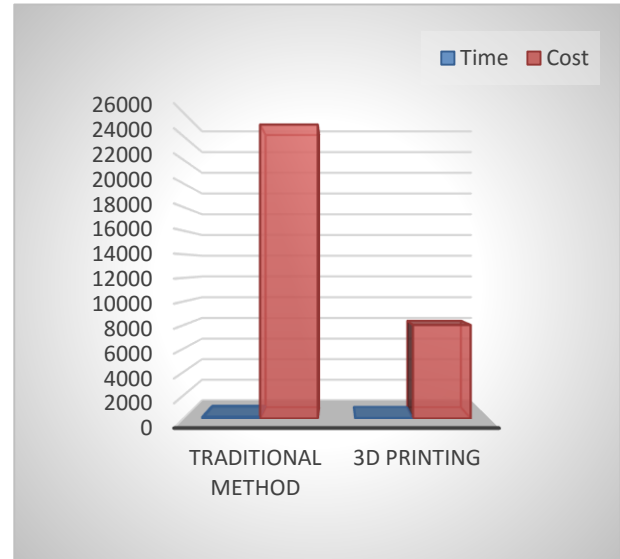
Divide by Zero provided Greycast Founders with our Aion 500 3D printer. They used 3D Printers to print samples for taking orders from their end clients eventually integrating it in their actual production scenario.





Benefits of using Divide by Zero Technologies 3D Printer
After implementing Divide by Zero Technologies 3D Printers, Greycast Founders were able to harness the following benefits:

- Diminished dependency on third-party partners
- 60% reduction in overall lead time (approx)
- Highly accurate samples with a low and acceptable of tolerance of ± 80 microns
- 80% reduction in overall cost (approx)
- Added agility thanks to rapid 3D printed sample pattern development
- Increased operational efficiency
- Faster design revisions
- Seamless integration with various designing and modeling applications (software)
- Full visibility and control during actual development of sand casting patterns



Customer Testimonial:



“Reduction in Cost and Time has given us a Competitive advantage. We are very happy to use Divide by Zero Technologies 3D Printers”

[Divide By Zero Technologies](http://DivideByZeroTechnologies.com)

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