

CLINKENBEARD® PROCESS FUELS PRODUCT DEVELOPMENT

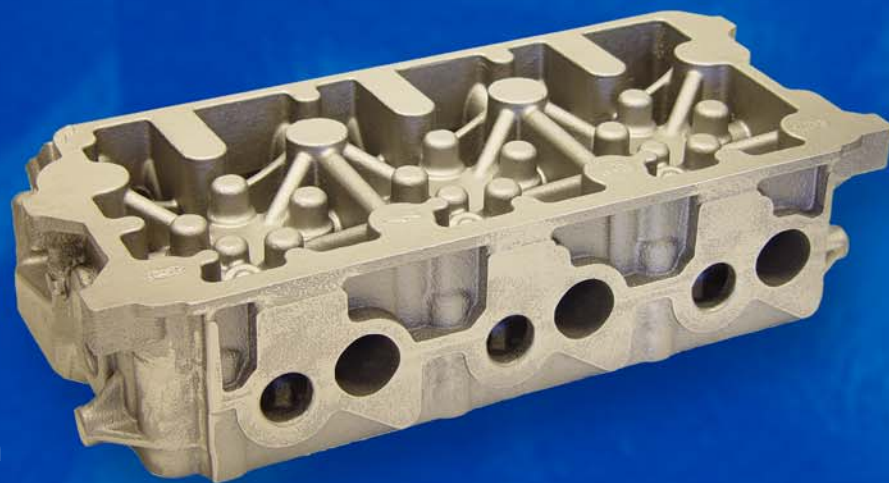
The 2007 V6 Cylinder Head – Prototype casting created in just 4 days from a 3D CAD file!

Our customer's goal was to develop a V6 engine for the 2007 model year that would meet the emissions milestone set for that year. This engine required a new fuel injector system built into the cylinder head with new intake and exhaust part shapes. We worked very closely with our customer, as a team, to meet this goal.

Our project was a success. Not only did we create a useable casting in a dramatic 4 days, but by using the Clinkenbeard Process, our customer was able to also do the following:

- Verification of the core models to determine manufacturability and assembly
- Incorporate changes to the core models prior to manufacturing foundry tooling
- Ultrasonically test the casting to verify proper wall thickness
- Use the casting as an aid for testing final machining setups

Another large benefit of working with Clinkenbeard's patented process was that our casting sparked ideas for further product improvements and how the part would interact with other components.



At Clinkenbeard

Our patented process of machining sand cores and molds is extremely accurate and offers fast turn around for cast metal parts – minimizing typical costs associated with product development.

With the Clinkenbeard® Process:

1. You can eliminate the need for prototype tooling - depending on your project requirements.
2. Have great flexibility to make and test multiple design iterations during product development – from simple to complex parts.
3. Significantly reduce the costs of production tooling for one-off and small quantities.
4. Quickly get accurate, prototype parts in-hand while large quantity tooling is being developed.
5. Completely eliminate the need to inventory or store tooling.
6. Match exact production core materials & chemical levels so that prototype castings emulate production.
7. Incorporate engineering changes into high-volume production sand cores.

Clinkenbeard Services

Clinkenbeard strives to provide its customers with the highest quality product and services available - within a compressed time schedule – and we constantly work to develop new methods allowing us to meet this goal.

Our general products and services include:

- Mock-ups
- Rapid Prototyping
- Foundry Tooling
- CNC Machining
- Castings

Whatever we do... we do FAST!