Casting Process

- Pattern
- Mold
- Molten Metal / Pouring
- Cooling / Shakeout
- Cleaning / HT
- QC
- Machining – Added value
Pattern Making

1. Casting Design – PL, draft, shrink, mach stock, tolerances, machine locators
2. Rigging: risers, gating system, chills, vents
3. Solidification / Mold Filling Analysis
4. Pattern Construction / Mounting
   – Cope – top half
   – Drag – bottom half
   – Core Boxes
   – Mounting boards / AML boxes
Casting Design

SOLIDCast solidification analysis

MAGMAMSoft – mold filling

Rigging
Pattern / Core Boxes

CNC Router
Cope Pattern - Floor Molding
Drag Pattern – Floor Molding
AML Patterns / Storage
The pattern is rigged for shroud pour with the 3 piece impact well. The pattern is mounted on a 96 x 108 board for a 36 inch deep cope. 6 - .875 inch pipe vents with the pattern.

1. Place 1 - 02B05 chill on the pattern where marked.
2. Place 8 - 6 x 9 domes over the posts.
3. Place 2 - 8 x 9 inch domes over the posts.
4. Place 2 - 7 x 7.75 domes over the posts.
5. Place 1 - 11 x 13 x 11, 1 - 11 x 13 x 5.5 (cut), and 1 - 12 x 14.5 x 12 sleeve over each black head.
6. Place 1 - 12 x 8 x 12 neckdown and 1 - 12 x 13 x 12 over each red head.
7. Place 1 - 11 x 7 x 12 over the yellow head. Place head caps over each open head.
8. Place Core Heads over the pattern.
<table>
<thead>
<tr>
<th>Box</th>
<th>Description</th>
<th>Sand</th>
<th>Weight</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>DRAG BODY</td>
<td>DM1</td>
<td>781.0</td>
<td>Hand compact</td>
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</tbody>
</table>

1. This core is made at the DM1 mixer.
2. Partially fill the box. Hand compact. Place 1 - .5 x 30 inch rod with 2 - 2 inch hooks, hooks up, in the large end of the box.
3. Place 1 - .5 x 30 inch rod with 1 - 2 inch hook, hook up, in the center of the box.
4. Place 1 - .5 x 24 inch rod with 2 - 2 inch hooks, hooks up, in the small end of the box.
5. Place 2 - .625 x 84 inch rods along the long side and the center of the box.
6. Place 1 - .625 x 81 inch rod along the short side of the box.
7. Place 2 - .625 x 33 inch rods in the large end of the box.
8. Place 1 - .625 x 30 inch rod in the center of the box.
9. Place 1 - .625 x 24 inch rod in the small end of the box.
Molding / Core Making

- Floor molding – Flasks
- Automatic Molding Line (AML) Flaskless
Floor Molding
Drag Mold – Floor Molding
Core making

B - Core
Core making
Cope Mold - finishing
Mold Assembled
Mold Rollover Station
Flow Coating mold wash being applied
AML – Drying Ovens / Wash Station
AML – Core Setting
AML – Pouring /Cooling Lines
Melting / Alloying

Scrap Metal

Electric Arc Furnaces

2 – 20T Furnaces / 1 – 8.5T Furnace
Electric Arc
1 20T (Basic) 1 20T (Acid) 8.5T (Acid)
Furnace Bay - (2) 20 Ton Electric Arc Furnaces
Tapping / Pouring
Pouring Steel - Flaskless Molds
Cleaning

- Blasting
- Burning
- Flame washing / Chipping
- Grinding
- Inspection (MPI, G-Ray, UT)
- Weld repair / Grinding
- Heat Treatment
Cleaning
Cleaning – Cope after Blast
QC – Inspection / Layout

Inspection - Wet Magnaflux
Machining
Finish Machining - Mazak
HS Quality Policy and Objectives

Satisfy Your Customer

- Quality
- Delivery
- Efficiency