

V-Process Aluminum Casting Advantages

Zero Degree Draft

This is a unique feature of the V-PROCESS, which reduces weight and machining, and offers thinner and consistent wall thickness.

Thin Walls

The V-PROCESS allows consistent wall thickness of 0.125"(3.175mm), thinner wall sections are achievable in isolated areas.

Tight Tolerances

The V-PROCESS produces castings approximately twice as accurate as typical sand castings:
+/- 0.010"(0.25mm) for the first 6"(152.4mm),
add 0.002"(0.05mm) per inch thereafter,
add +/-0.020"(0.508mm) across parting line.

Unlimited Pattern Life

We guarantee the pattern will last the life of your product with quick, easy, and inexpensive tool modifications.

150 RMS Finish

Compared to 250-550 for sand and 200-500 for permanent mold, V-PROCESS offers a considerable advantage.

Excellent Casting Integrity

With our automated molding line, the casting dimensions are repeatable.

MISSION STATEMENT

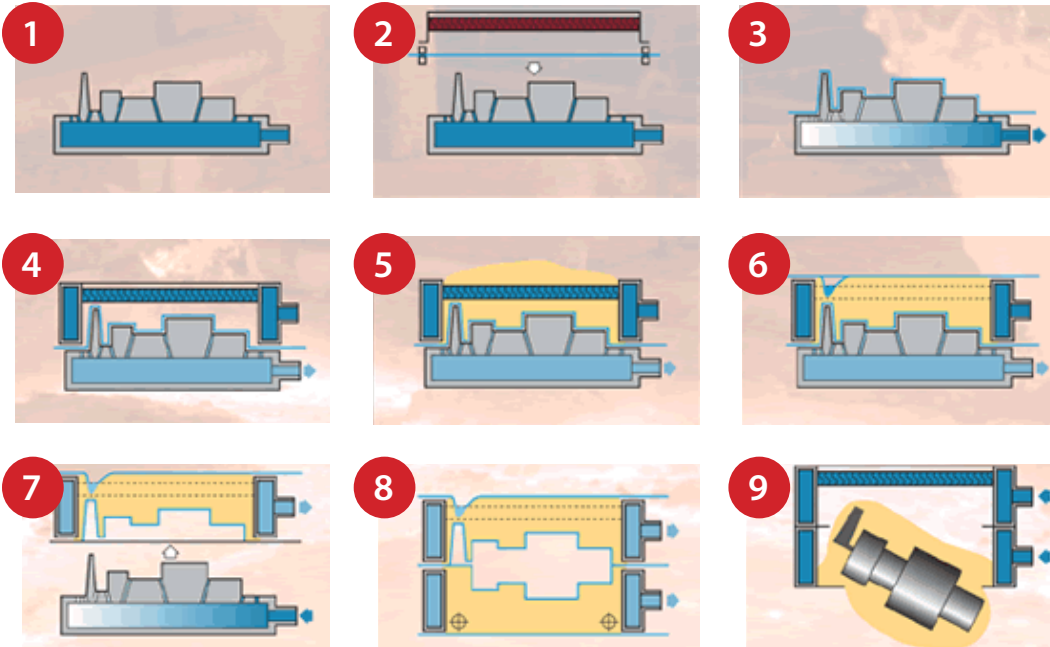
Harmony Castings exceeds customer expectations by delivering quality products and building long-term relationships based on trust and confidence in our performance. Our dealings with our customers, vendors, employees and our community are rooted in integrity.



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V-PROCESS Sequence



- Step 1:** The pattern (with vent holes) is placed on a hollow carrier plate.
- Step 2:** A heater softens the .003" to .008" plastic film. Plastic has good elasticity and a high deformation ratio.
- Step 3:** Softened film drapes over the pattern with 200 to 400 mm Hg vacuum acting through the pattern vents to draw it tightly around the pattern.
- Step 4:** The flask is placed on the film-coated pattern. Flask walls are also a vacuum chamber with the outlet shown at right.
- Step 5:** The flask is filled with dry, unbonded sand. A slight vibration compacts sand to maximum bulk density.
- Step 6:** A sprue cup is formed and the mold surface leveled. The back of the mold is covered with unheated plastic film.
- Step 7:** Vacuum is applied to the flask. Atmospheric pressure then hardens the sand. The vacuum is released, pressurized air is introduced into the carrier and the mold is stripped.
- Step 8:** The cope and drag assembly form a plastic-lined cavity. During pouring, molds are kept under vacuum.
- Step 9:** After cooling, the vacuum is released and free-flowing sand drops away leaving a clean casting, with no sand lumps. The sand is cooled for re-use.

Aluminum Castings: Process Comparisons

Process	Typical Size Range	Tolerances	Surface Finish	Min. Draft Required	Min. Section Thickness	Nominal Lead Time
V-PROCESS Castings	Up to 150 lbs	± .010" for the first 1", then add ± .002" per inch. Add a maximum .020" across parting line	125-150 RMS	None	.125"	Samples: 2 to 6 weeks Production: 2 to 6 weeks after approval
Sand Castings	Ounces to tons	± 1/32" to 6", then add ± .003" per inch. Add ± .020" to .090" across parting line	200-550 RMS	1 to 5 degrees	.25"	Samples: 2 to 6 weeks Production: 2 to 6 weeks after approval
Investment (Lost Wax)	Ounces to 20lbs	± .003" to 1/4" ± .004" to 1/2" ± .005" to 3", then add ± .003" per inch	63-125 RMS	None	.060"	Samples: 8 to 10 weeks Production: 5 to 12 weeks after approval
Permanent Mold	Ounces to 100lbs	± .015" to 1", then add ± .002" per inch. Add ± .010" to .030" across parting line	150-300 RMS	2 to 5 degrees	.1875"	Samples: 8 to 20 weeks Production: 10 to 12 weeks after approval
Plaster Mold	Ounces to 50lbs	± .005" to 2", then add ± .002" per inch. Add ± .010" across parting line	63-125 RMS	1/2 to 2 degrees	.070"	Samples: 2 to 10 weeks Production: 4 to 8 weeks after approval
Die Casting	Ounces to 15 lbs	± .002" per inch. Add ± .015" across parting line	32-63 RMS	1 to 3 degrees	.030" to .060"	Samples: 12 to 22 weeks Production: 8 to 14 weeks after approval



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