

## The V-Process Advantage

At Harmony Castings, we develop long-lasting partnerships with our customers. We add value to your business by helping you bring projects from concept through prototype, and into full production. Whether your industry is food service or security, satellite systems or snow makers, we've seen it, have cast it and have helped make it successful! Our speed to market is unrivaled in the casting industry. This benefit, combined with our outstanding surface finish, excellent casting integrity, and zero degree draft, makes Harmony Castings the partner of choice.

### Key Features and Benefits:

- Speed To Market
- 150 RMS Finish
- Excellent Casting Integrity
- Corrosion Resistant
- Zero Degree Draft
- Thin Walls
- Unlimited Pattern Life
- Quick Pattern Revision



## MISSION STATEMENT

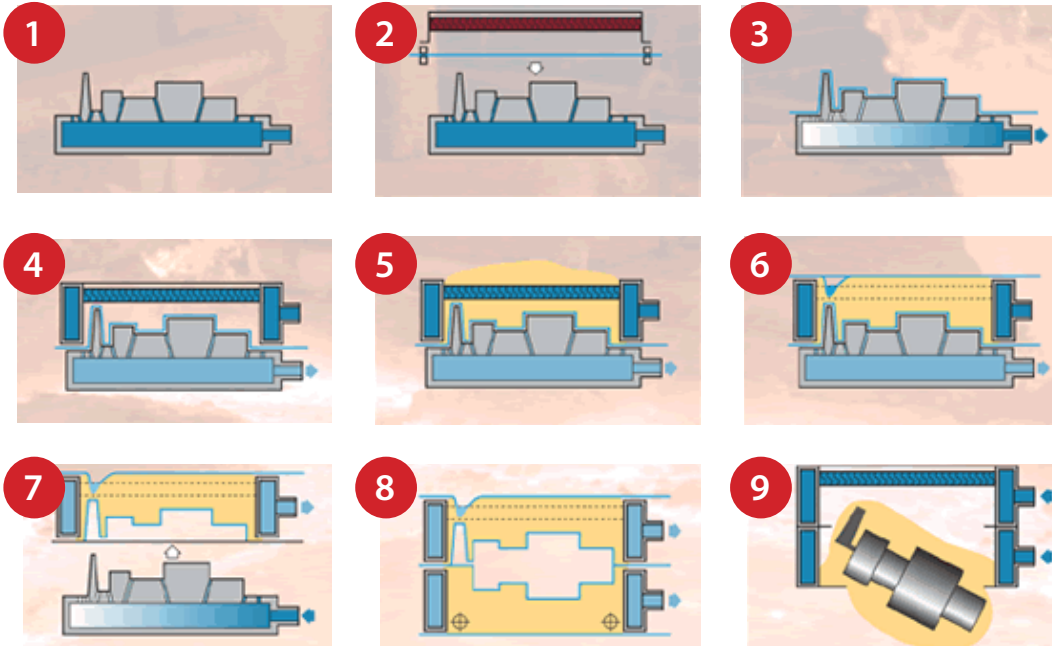
Harmony Castings exceeds customer expectations by delivering quality products and building long-term relationships based on trust and confidence in our performance. Our dealings with our customers, vendors, employees and our community are rooted in integrity.



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Send files and prints to: [quotes@harmonycastings.com](mailto:quotes@harmonycastings.com)

## 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
<b>V-PROCESS Castings</b>	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
<b>Sand Castings</b>	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
<b>Investment (Lost Wax)</b>	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
<b>Permanent Mold</b>	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
<b>Plaster Mold</b>	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
<b>Die Casting</b>	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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