



stratasys
DIRECT MANUFACTURING



FOUNDRIES

After more than 20 years working with foundries, we deliver what is most important: high-yield rates, quality, value and on-time delivery. Each foundry is unique and our solutions are tailored to customers' distinct operations. Whether you are looking for a quality supplier or are new to using tool-less patterns, we can help you broaden your customer base.



INVESTMENT CASTING PATTERNS

Tool-less patterns made with additive manufacturing (AM) open opportunities to increase foundry business by making investment casting more viable for customers.

An alternative to wax and wood, patterns made with Stereolithography (SL) technology significantly reduce lead times and eliminate high tooling costs. SL delivers excellent pattern accuracy and repeatability at less expense than conventional methods. These benefits translate to higher yields during casting. Additionally, design changes can be easily incorporated into production, and gating systems can be proven prior to production tooling being built.

Stratasys Direct Manufacturing builds SL investment casting patterns with a nearly hollow structure while

maintaining fine features. This proprietary print method results in patterns 25% lighter than conventional SL patterns, translating to proportionately less ash and minimized coefficient of thermal expansion (CTE) forces during flash-firing. The durable pattern has complete internal draining and final surface sealing.

3D printed patterns for investment castings aren't restricted to machine size. Stratasys Direct builds patterns in segments and then assembles into complete investment casting patterns. Projects more than seven feet in diameter have been assembled with custom fixtures and expertly delivered in large part packaging.

For tips on designing investment casting patterns for additive manufacturing, reference our guideline at [StratasyDirect.com/IC-Guide](https://www.stratasydirect.com/IC-Guide).

FOUNDRIES

MATERIALS

With AM investment casting patterns, features like low moisture absorption, low viscosity, high green strength and elemental composition are key. The benefits of SL investment casting patterns materials are:

- Thin walls and fine features
- Dimensional accuracy and stability
- Low ash on pattern burnout
- Super alloy compatibility
- High casting yield

SC1000P is a custom photopolymer formulation developed by Stratasys Direct and is qualified with many U.S. foundries. **Somos® Element** is an antimony-free formulation that is used in castings with reactive metal alloys where antimony may contaminate metallurgical properties.

TOOLING

Additive manufacturing offers a powerful solution for foundries with custom tooling produced quickly and at less cost. AM is combined with in-house machining to deliver:

- Lower tooling costs and faster delivery
- Greater freedom of design
- Component consolidation
- Better ergonomics through customization
- Weight reduction
- On-demand production

Applications:

- Hybrid wax setters
- Wax pattern assembly jigs
- Straightening fixtures
- Pattern and core inspection gauges
- Sand casting patterns, details, match-plates and core-boxes



THE PATH TO HIGH YIELD-RATE

Stratasys Direct works to accommodate each customer's unique operations by utilizing a successful four step process.



1

Planning starts by determining the needs associated with each project, including lot size, materials, as-cast shrink compensation, surface roughness and dimensional requirements. This effort delivers quality patterns, on-time and at lower cost.



2

Printing parameters are custom to each pattern geometry and cast metal alloy. The goal of every print is to provide the lowest weight-to-part-volume. Patterns are made hollow to provide low CTE, print time and material usage, while not sacrificing accuracy or feature detail.



3

Finishing is a vital step for pattern accuracy and high yield. Patterns are closely inspected for single voids and full drainage. We developed a sophisticated leak testing device to check each pattern for a perfect seal. Any leaks are meticulously sealed and then retested. We also offer vacuum ports and testing equipment for quality control at the foundry. Each investment casting pattern is finished per foundry requirements. We provide the exact surface finish required to work with foundry specific face-coats.



4

Shipping is the last step to a successful investment casting pattern. Large casting patterns can be hydroscopic and sensitive to heat and light, so expert shipping knowledge for careful delivery of parts is key. Patterns are typically shipped overnight to ensure quick delivery and optimal use.

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