

Pentz Cast Solutions

Aluminum Casting: Prototype Process Comparisons

Prototype Method	Description	Application	Lead Time
Rapid Tooling/Casting	Utilizes rapid tooling made from CNC machine, SLA, LOM, or FDM prototyping methods to build patterns for sand cast molds. The parts are molded using automated precision green sand molding process. Highly accurate, inexpensive and easy to modify through iterative design changes.	Excellent for almost any size or shape of part. Since parts are cast from an actual aluminum alloy they are fully functional and can be used as prototypes or short run production parts.	4 days to 2 weeks
SLA Stereolithography	Utilizes UV laser to cure a thin layer of liquid plastic into a solid model of parts. Highly accurate and creates excellent surface finish.	Excellent for complex or intricate shapes. Ideal to test form and fit or for use as a visual aid. It is also very good for use as a pattern for Rapid Tooling/Casting.	1 to 5 days
LOM Laminate Object Manufacturing	Part is built by taking individual sheets of a paper-like material that are formed and laminated together to build up successive sections of the solid model of the part. Very strong and durable. May require some additional finishing to smooth surface. Easy to paint.	Excellent for larger models or for use as a pattern for Rapid Tooling/Casting.	1 to 5 days
FDM Fuse Deposition Modeling	Plastic is melted in a small nozzle and deposited in a fine bead to build a solid model of the part. Exceptionally strong and durable.	Excellent for use as a pattern for Rapid Tooling/Casting.	1 to 5 days
CNC Machining Computer Numerical Controlled Machining	A computer controls the motion of a milling machine as it cuts the surrounding metal or plastic to form the part. Produces very accurate parts.	Can be used as a "one-off" production part, a functional prototype, or to make patterns for Rapid Tooling/Casting.	3 to 10 days
Reverse Engineering	Digitally scan or measure part with a CMM. Use data to create 3D CAD files that can be used to make prototype part(s) or production tooling.	Use when no 3D part data is available.	1 to 5 weeks for prototypes