

Decision Matrix-Process Comparison

General Foundry Service proudly supplies components from these technologies.

Process	3D Printed Metal - Aluminum	3D Printed Sand Molds	Green Sand Molds	No-Bake (Air-Set) Sand Molds	Permanent Mold	Rubber Plaster Molding	Solid Mold Investment (Lost Wax)	Die Casting	"Graphite" Permanent Mold	V-Process Castings
Typical Size Range	oz. - 5 lbs. (Within 10" (254 mm) Cube)	1 - 500 lbs.	oz. - 200 lbs.	50 - 500 lbs.	1 - 50 lbs.	oz. - 30 lbs.	oz. - 10 lbs. (Within 10" (254 mm) Cube)	oz. - 30 lbs.	oz. - 10 lbs.	Up to 150 lbs.
Tolerances	±0.005" for first inch, then add ±0.001" per inch thereafter. (0.13 mm for first 25.4 mm, then add ±0.025 mm per 25.4 mm thereafter).	±0.020" for first 10 inches, then add ±0.001" per inch thereafter. (0.51 mm for first 254 mm, then add ±0.025 mm per 25.4 mm thereafter). Add minimum of ±0.010" (25.4 mm) across the parting line and for cored features.	±0.020" for first 10 inches, then add ±0.001" per inch thereafter. (0.51 mm for first 254 mm, then add ±0.025 mm per 25.4 mm thereafter). Add minimum of ±0.010" (25.4 mm) across the parting line and for cored features.	±0.020" for first 10 inches, then add ±0.001" per inch thereafter. (0.51 mm for first 254 mm, then add ±0.025 mm per 25.4 mm thereafter). Add minimum of ±0.010" (25.4 mm) across the parting line and for cored features.	±0.015" for first inch, then add ±0.002" per inch thereafter. (0.38 mm for first 25.4 mm, then add ±0.051 mm per 25.4 mm thereafter). Add ±0.010" (25.4 mm) to ±0.030" (0.76 mm) across the parting line.	±0.010" for first 10 inches, then add ±0.001" per inch thereafter. (0.25 mm for first 254 mm, then add ±0.025 mm per 25.4 mm thereafter). Add minimum of ±0.005" (0.13 mm) across the parting line and for cored features.	±0.005" for first 4 inches, then add ±0.001" per inch thereafter. (0.13 mm for first 102 mm, then add ±0.08 mm per 25.4 mm thereafter).	±0.002" per inch. (0.051 mm per 25.4 mm). Add ±0.015" (±0.38 mm) across the parting line.	±0.005". (0.13 mm). Add ±0.002" (±0.05 mm) across the parting line.	±0.010" for the first inch, then add ±0.002" per inch thereafter. (0.25 mm for the first 25.4 mm, then add ±0.051 mm per 25.4 mm thereafter). Add a max ±0.020" (±0.5 mm) across the parting line.
(As-Cast)										
Flatness (Geometry Dependent)	Within .015" (0.38 mm)	Within .015" (0.38 mm)	Within .015" (0.38 mm)	Within .025" (0.64 mm)	Within .015" (0.38 mm)	Within .010" (0.25 mm)	Within .010" (0.25 mm)	Within .010" (0.25 mm)	Within .015" (0.38 mm)	Within .030" (0.76 mm)
Surface Finish	150-300 RMS	200-300 RMS	125-150 RMS (Can be improved on cored features).	125-200 RMS (Can be improved on cored features).	150-200 RMS	63 RMS	63 RMS	63 RMS	63 RMS	125-150 RMS
Minimum Draft Required (Geometry Dependent)	None	None	1/2° to 3°	1/2° to 3°	2° to 4°	1/2° to 2°	None	1° to 3°	1° to 2°	None (Within Tolerance of Drawing).
Typical Wall Thickness										
Inches	0.04	0.110	.125 - .187	.125 - .187	.187 - .200	.080 - .125	0.02	.030 - .060	0.100	0.125
Metric	1.0	2.8	3.2 - 4.8	3.2 - 4.8	4.8 - 5.1	2.0 - 3.2	0.5	0.8 - 1.5	2.5	3.2
(Geometry Dependent)										
Typical Quantities	<10	<25	All	All	>500	<2,000	All	>2,500	500-1500	All
Typical Tooling Price (N.R.E.)	No Tooling	No Tooling	\$4K - 15K (May be less if "Loose" Pattern is used)	\$5K - 30K (May be less if "Loose" Pattern is used)	\$10K - 30K	\$4K - 15K (May be less if "Loose" Pattern is used)	\$4K - 15K (May be less if Direct Wax Patterns are used)	\$15K - 200K	\$7K - 20K	\$5K - 20K
Nominal Lead Times	2 - 4 wks.	2 - 6 wks.	Samples: 4 - 6 wks. Production: 3 - 6 wks. after approval.	Samples: 4 - 6 wks. Production: 3 - 6 wks. after approval.	Samples: 12 - 16 wks. Production: 3 - 6 wks. after approval.	Samples: 4 - 6 wks. Production: 3 - 6 wks. after approval.	Samples: 3 - 6 wks. Production: 3 - 6 wks. after approval.	Samples: 12 - 26 wks. Production: 8 - 14 wks. after approval.	Samples: 4 - 6 wks. Production: 3 - 6 wks. after approval.	Samples: 4 - 6 wks. Production: 6-16 wks. after approval.