

Decision Matrix-Process Comparison

Process	Precision Sand Castings	No-Bake Sand Castings	Rubber Plaster Molding	Permanent Mold	Die Casting	"Graphite" Permanent Mold	V-Process Castings	Investment (Lost Wax) Castings
Typical Size Range	oz. - 200 lbs.	50 - 200 lbs.	oz. - 30 lbs.	oz. - 100 lbs.	oz. - 30 lbs.	oz. - 10 lbs.	Up to 150 lbs.	oz. - 20 lbs.
Tolerances	±.020" to 10", then add ±.001"/", thereafter. Add minimum of .010" across the parting line and for cored features.	±.020" to 10", then add ±.001"/", thereafter. Add minimum of .010" across the parting line and for cored features.	±.010" to 8", then add ±.001"/", thereafter. Add minimum of .005" across the parting line and for cored	±.015"/" to 1", then add ±.002"/" thereafter. Add ±.010" to .030" across the parting line.	±.002"/" Add ±.015" across the parting line.	±.005" Add ±.002" across the parting line.	±.020" to 6", then add ±.002"/" Add ±.020" across the parting line.	±.003" to 1/4" ±.004" to 1/2" ±.005" to 3", then add ±.003"/".
Flatness	Within .015" (geometry dependent)	Within .030" (geometry dependent)	Within .010" (geometry dependent)	Within .015" (geometry dependent)				Within .015" (geometry dependent)
Surface Finish	120-175 RMS, except on cored areas.	120-300 RMS, except on cored areas.	63-125 RMS	150-300 RMS	32-63 RMS	25 RMS or better	125-150 RMS	63-125 RMS
Minimum Draft Required	1/2° to 3°	1/2° to 3°	1/2° to 2°	2° to 4°	1° to 3°	1° to 2°	None	None
Minimum Wall Section	Typical: .140"-.187" Minimum: .080" (geometry dependent)	Typical: .187"-.500" Minimum: .150" (geometry dependent)	Typical: .100"-.187" Minimum: .040" (geometry dependent)	Typical: .187"	.030" to .060"	.100"	.125"	.060"
Typical Quantities	All	All	<2,000	>500	>2,500	500-1500	All	<1,000
Typical Tooling Price (N.R.E.)	\$800 - 6K	\$2,500 - 10K	\$3K - 15K	\$10K - 15K	\$5K - 250K	\$1.5K - 5.5K	\$3K - 6K	\$3K - 10K
Nominal Lead Times	Samples: 1 - 4 wks. Production: 1 - 5 wks. after approval.	Samples: 2 - 8 wks. Production: 1 - 5 wks. after approval.	Samples: 2 - 4 wks. Production: 1 - 5 wks. after approval.	Samples: 12 - 16 wks. Production: 1 - 5 wks. after approval	Samples: 12 - 26 wks. Production: 8 - 14 wks. after approval	Samples: 3 - 6 wks. Production: 2 - 4 wks. after approval	Samples: 2 - 6 wks. Production: 2 - 6 wks. after approval	Samples: 2 - 4 wks. Production: 5 - 12 wks. after approval



General Foundry Service proudly supplies castings from these foundry technologies.

Alloy Comparison

The following table illustrates properties of cast and wrought alloys.

Alloy	Heat Treatment**	Tensile Strength (ksi) Ultimate	Tensile Strength (ksi) Yield	Elongation in 2 inches (%)	Typical Brinell Hardness 500 kgf load (10-mm ball)
Alloys Poured at General Foundry Service					
Aluminum - A356.2	F	19	...	3.0	40-70
Aluminum - A356.2	T51	23	16	...	45-75
Aluminum - A356.2	T6	30	20	3.0	55-90
Aluminum - A356.2	T7	31	29	3.0	60-90
Zinc Aluminum - ZA8	F	38	28	1.5	85-90
Zinc Aluminum - ZA12	F	42	30	2	105-125
A319	T6	31	20	1.5	65-95
535 (Almag)	F	35	18	8.0	60-90
A380 (Die Cast)	F	47	23	3.5	80
6061 (Machine Stock)	T6	45	40	12.0	95

**Heat Treatment of Aluminum Castings

- F** **As Cast** – Castings are cooled naturally from the mold in room temperature air with no further heat-treatment.
- T-51** **Aging Treatment** – Castings that are artificially aged by heating metal to 400F for 7-9 hours.
- T-6** **Solution Heat-treated and Artificially Aged** – Castings are Solution Heat-treated by heating metal to 1000F for 4-12 hours and quenched in water at 150-212F.
- T-7** **Solution Heat-treated and Stabilized** -- Castings are stabilized to carry them beyond the point of maximum hardness, providing control of growth or residual stress, or both.