

# SAND CAST ALLOYS

## TYPICAL FOUNDRY AND PHYSICAL CHARACTERISTICS

ALUMINUM ASSOCIATION DESIGNATION	Resistance to Hot Cracking	Shrinkage	Fluidity – Die Filling Capacity	Pressure Tightness	Machinability	Weldability	Polishability	Electroplatability	Anodizing Appearance	Corrosion Resistance	Elevated Temperature Strength
319.0	2	2	2	2	3	2	4	3	4	3	3
355.0	1	1	1	1	3	2	3	1	4	3	2
C355.0	1	1	1	1	3	2	3	1	4	3	2
356.0	1	1	1	1	3	2	4	1	4	2	3
A356.0	1	1	1	1	3	2	4	1	4	2	3
A357.0	1	1	1	1	3	2	4	1	4	2	2
359.0	1	1	1	1	3	2	4	1	4	3	...
535.0	4	5	4	5	1	3	1	...	1	1	3
713.0	4	4	3	3	1	3	1	...	1	2	4
771.0	4	4	3	3	1	...	1	...	1	2	4

Ratings: 1 – Excellent, 2 – Very Good, 3 – Good, 4 – Fair, 5 - Poor

## TYPICAL HEAT TREATMENT AND MECHANICAL PROPERTIES FOR ALUMINUM SAND CASTINGS

ALLOY AND HEAT TREATMENT	SOLUTION HEAT TREATMENT			ARTIFICIAL AGING TREATMENT		MECHANICAL PROPERTIES			
	TIME <sup>1</sup> HOURS	TEMP. <sup>2</sup> °F	QUENCH <sup>3</sup>	TIME <sup>4</sup> HOURS	TEMP <sup>2</sup> °F	ULTIMATE TENSILE STRENGTH	YIELD STRENGTH (.2% OFFSET) lbs./sq. in.	ELONGATION % IN 2 in.	BRINELL 500 Kg. LOAD 10mm BALL
319.0-F	-	-	-	-	-	27,000	18,000	2.0	70
319.0-T6	12	940	Water	2-5	310	36,000	24,000	2.0	80
355.0-F	-	-	-	-	-	25,000	12,000	2.5	65
355.0-T4	6-24	980	Water	-	-	25,000	14,000	3.5	75
355.0-T6	8-12	980	Water	3-5	310	35,000	25,000	2.5	80
355.0-T7	8-12	980	Water	7-9	440	38,000	36,000	.5	85
355.0-T51	-	-	-	7-9	440	28,000	23,000	1.5	65
355.0-T61	12	980	Water	8-10	310	39,000	35,000	1.0	90
355.0-T71	8-12	980	Water	4-6	475	35,000	29,000	1.5	75
C355.0-T6	8-12	980	Water	3-5	310	42,000	31,000	4.0	85
356.0-F	-	-	-	-	-	23,000	12,000	3.5	55
356.0-T4	6-24	980	Water	-	-	30,000	17,000	6.0	60
356.0-T6	8-12	1,000	Water	2-5	310	33,000	24,000	3.5	70
356.0-T7	8-12	1,000	Water	7-9	440	34,000	30,000	2.0	75
356.0-T51	-	-	-	7-9	440	25,000	20,000	2.0	60
356.0-T71	12	1,000	Water	2-4	475	28,000	21,000	3.5	60
A356.0-F	-	-	-	-	-	24,000	12,000	4.0	55
A356.0-T6	8-12	1,000	Water	2-5	320-350	40,000	30,000	5.0	75
A357.0-T6	8-12	1,000	Water	2-5	320-350	46,000	36,000	3.0	85
713.0	-	-	-	12-16**	250**	36,000*	26,000*	5.0*	74*

- Soaking time periods, after load has reached specified temperature, required for average casting. Time can be decreased or may have to be increased, depending on particular castings, as demonstrated by experience.
- Temperature setting for control instrument. Variation of temperature in furnace should not exceed plus or minus 10°F.
- Water temperature from 150 to 212°F can be employed. Boiling water is recommended since it minimizes quenching stresses and distortion.

- Exact time required influenced by foundry variables. Select on basis of obtaining typical harness values.

\* Natural aging alloy, after aging at room temperature for 21 days, will acquire properties to those achieved by heat treatment.

\*\* 1 days at room temperature plus artificial aging.



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