

# Comparison of Casting Alloys and other materials

## Alloys

Alloy Group	Zinc		Zinc-Aluminum		Aluminum	
Common Name	Zamak 3 AG40A	Zamak 5 AG41A	ZA-8 B669-84	ZA-27	380/383	360

## Mechanical Properties

Tensile Strength P.S.I.	41000	47600	54200	62	47000	46000
Yield Strength P.S.I. (0.2%Offset)	-	-	42000	52-55	23000	24000
Compressive Strength P.S.I.	60000	87000	>87000	52	-	-
Shear Strength P.S.I.	31000	38000	40000	47	27000	26000
Elongation % Inch Per Inch	10	7	8	2.0 – 3.5	3.5	3.5
Hardness BHN.	82	91	103	116-122	80-85	80
Impact Strength Ft. Lb. (Charpy)	43	48	31	7-12	3	3
Youngs Modulus P.S.I. X 10-6	N.A.	N.A.	12.4	11.3	10.3	10.3
Creep Strength-1 P.S.I.	~3000	N.A.	~10000-2	-	-	-
Poisson's Ratio	-	-	0.295	0.030	-	-

N.A. – Not Available 1 – Stress To Produce A Steady Creep Rate Of 1% Strain Per 100,000 Hours At 68°F; Design Stress As Per ASME Boiler Code, 2 – Estimated Value – Test In Progress 3/0.5% Yield.

## Physical Properties

Density Lb./Cubic Inch	0.24	0.24	0.227	0.181	0.099	0.095
Melting Range Degree F	718 728	717 727	707 759	708 903	1000 1100	1035 1105
Coefficient of Thermal Expansion u in/in Degree F	15.2	15.2	12.9	14.4	12.1	12.2
Thermal Conductivity BTU/Ft. Hr. Degree F	65.3	62.9	66.3	72.5	55.6	65.3
Electrical Conductivity % IACS	27	26	27.7	29.7	23	30

4 – Melting Point 2600°F

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