

## Comparison of Casting Alloys and Other Materials

### Alloys

Alloy Group	Zinc				Zinc / Aluminum		Aluminum	Brass 360		Steel
Common Name	Zamak 3 AG40A	Zamak 5 AC41A	Zamak 7	Zamak 2	ZA8*	ZA27*	380	Annealed	Half Hard	SAE1018 Cold Rolled

### Mechanical Properties

Tensile Strength P.S.I.	41000	47600	N.A.	52100	54200	61700	47000	49000	68000	64000
Yield Strength P.S.I. (0.2% offset)	-	-	-	-	42000	53800	23000	18000 <sup>3</sup>	52000 <sup>3</sup>	54000
Compressive Strength P.S.I.	60000	87000	60000	93000	>87000	>87000	-	-	-	-
Shear Strength P.S.I.	31000	38000	31000	46000	40000	47100	27000	30000	38000	-
Elongation % Inch Per Inch	10	7	13	8	8	2.5	3.5	53	18	15
Hardness BHN.	82	91	80	100	103	119	80-85	61	146	126
Impact Strength Ft. Lb. (Charpy)	43	48	43	N.A.	31	9	3	-	-	-
Youngs Modulus P.S.I. X 10 <sup>6</sup>	N.A.	N.A.	N.A.	N.A.	12.4	11.3	10.3	14	14	30
Creep Strength <sup>1</sup> P.S.I.	~3000	N.A.	N.A.	N.A.	~10000 <sup>2</sup>	~10000 <sup>2</sup>	N.A.	-	-	-
Polsson's Ratio	-	-	-	-	0.295	0.32	-	-	-	-

N.A.-Not Available <sup>1</sup> Stress to a Steady Creep Rate of 1% Strain Per 100,000 Hours at 68°; Design Stress as Per ASME Boiler Code

<sup>2</sup> Estimated Value-Test in Progress <sup>3</sup> 0.5% Yield

### Physical Properties

Density Lb./Cubic Inch	.24	.24	.24	.24	.227	.181	.098	0.30	0.30	0.28
Melting Range °F	718 728	717 727	718 728	715 734	707 759	708 903	1000 1100	1630 1650	1630 1650	4
Coefficient of Thermal Expansion $\mu$ In/In/°F	15.2	15.2	15.2	15.4	12.9	14.4	12.1	11.4	11.4	8.5
Thermal Conductivity BTU/Ft Hr °F	65.3	62.9	65.3	60.5	66.3	72.5	55.6	67	67	27
Electrical Conductivity % IACS	27	26	27	25	27.7	29.7	27	26	26	12

<sup>4</sup> Melting Point - 2600°F

• Diecast Properties of ZA8/ZA27 Developed by Noranda Research

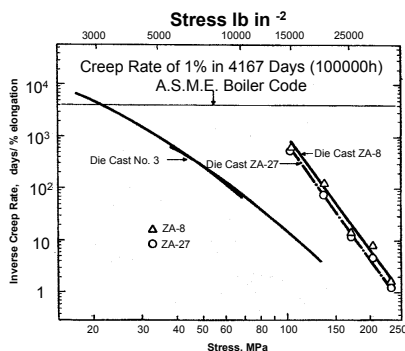


Fig. 1 - Secondary Inverse Creep Rate of No. 3 and ZA8/ZA28 Alloys as a Function of Load at 20°C (68°F)  
ZA8/ZA28 Data Developed by Noranda Research

While the technical information and suggestions for use herein are believed to be accurate and reliable, nothing stated in this bulletin is to be taken as a warranty either expressed or implied. It is the user's responsibility to determine suitability and fitness of application, preferably through independent prototype testing and field evaluation programs by users. There is no warranty of merchantability or fitness for use, nor any other warranty either expressed or implied.