COMPARISON OF TYPICAL CASTING ALLOY PROPERTIES

ALLOY	ZINC									ALUMINUM				BRASS/BRONZE			IRON	
	ZA-8			ZA-12			ZA-27											
MECHANICAL PROPERTIES	Sand Cast	Perm Mold	Die Cast	Sand Cast	Perm Mold	Die Cast	Sand Cast	Perm Mold	Die Cast	No.3 Zinc Die Cast Alloy (AG-40)A	380 Die Cast	319 Sand cast	356-T6 Sand Cast	Sand Cast	Sae 40 C83600 Sand Cast	SAE 64 C93700 Sand Cast	Class 30 Cast Iron	32510 Malleable Iron
Ultimate Tensile strength (psi x 10^3)	36-40	32-37	54	40-46	45-50	58	58-64	45-47	61	41	47	27	33	35	37	35	31	50
Yield Strength 0.2% Offset (psi x 10^3)	28	29	42	30	30	46	53	37	53	-	24	18	24	18[C]	17[C]	18[C]	18	32
Elongation	1-2	1-2	6-10	1-3	1-3	4-7	3-6	8-11	1-3	10	2	3.5	3.5	20	30	20	-	10
Young's Modulis (psi x 10^3)	-	12.4	-	12	-	-	10.9	11.5	-	-	10.3	10.7	10.5	14.5	13.5	11	13-16	25
Shear Strength (psi x 10^3)	-	35	40	37	-	43	42	33	47	31	27	22	26	-	-	-	43	45
Hardness (Brinell)	82-88	85-90	95-110	90-105	90-105	95-115	110-120	90-110	105-125	82	75	70	70	65	60	60	170-269	110-156
Impact Strength (ft-lb)	13-18[A]	-	31[B]	19[A]	-	21[B]	35[A]	43[A]	9[B]	43[B]	3[A]	4[A]	8[A]	6[D]	11[E]	11[E]	-	40-65[A]
Fatigue Strength Rotory Bend (psi x 10^3)	-	7.5	15	15	-	-	25	15	21	6.9	20	10	8.5	16	11	13	14	28
Compressive Yield Strength (psi x 10^3)	29[H]	31[H]	37	33[H]	34[H]	39	48[H]	37[H]	52	60[F]	-	19	25	46[G]	37.5[G]	47[G]	109[F]	-
PHYSICAL PROPERTIES																		
Density (in/cu in)		0.227			0.218			0.181		0.24	0.098	0.101	0.097	0.322	0.318	0.32	0.25	0.26
Melting Range (F)		707-759			710-810			708-903		718-728	1000-1100	960-1120	1035-1135	1570-1790	1570-1850	1403-1705	>2150	>2250
Electrical Conductivity (% IACS)		27.7			28.3			29.7		27	27	27	39	12	15	10	-	6
Thermal Conductivity (BTU/ft. Hr. F)		66.3			67.1			72.5		65.3	55.6	65.5	87	34	41.6	27.1	28-30	-
COEF. Of Thermal Expansion (68-212 F) (u in/in/F)		12.9			13.4			14.4		15.2	11.6	11.9.	11.9	10	10	10.3	6.7	6.6
Pattern Shrinkage	1/8 in/ft		.007 in/in	1/8 in/ft		0.0075 in/in	5/32 in/ft		0.008 in/in	0.006 in/in	0.006 in/in			7/32 in/ft	3/16 in/ft	1/8 in/ft	1/8 in/ft	1/8 in/ft