	AA 4032			Aluminastic 4032	
Physical Properties	**Metric**	**English**	**Comments**	**Metric**	**English**
Density	2.69 g/cc	0.0968 lb/in³	AA; Typical	2.59 g/cc	0.0936 lb/in³

Mechanical Properties	**Metric**	**English**	**Comments**	**Metric**	**English**
Hardness, Brinell	76	76	500 kg load/10 mm ball	86	86
Tensile Strength, Ultimate	379 Mpa	55 KSI	at Room Temp; Typical	407 Mpa	59 KSI
Tensile Strength, Yield	317 Mpa	46 KSI	at Room Temp; Typical	345 Mpa	50 KSI
Elongation at Break	9.00%	9.00%	at Room Temp; Typical	10.00%	10.00%
Machinability	70%	70%	0-100 Scale (A=90; B=70; C=50; D=30; E=10)	80%	80%

Wear and Friction Testing		**Comments**	
Coefficient of friction			
20°C, 5N	0.32	Pin on disk tests were performed on the samples of the different alloys. The pin used was 3 mm diameter and 20 mm length. Disks of 75 mm were used. The tests were performed at relative humidity of 40%; temperature of 20C and 200C, load of 5N and 20N and without any lubricant. The automated instrumentation and data acquisition system were used to calculate the coefficient of friction through the measurement of load at each cycle. After each test the length of the pin was measured to find the wear rate. 3 replications were taken and the values were averaged.	0.22
20°C, 20N	0.29		0.2
200°C, 5N	0.26		0.18
200°C, 20N	0.23		0.15
Wear Rate (gm/m)			
20°C, 5N	0.233		0.189
20°C, 20N	0.267		0.211
200°C, 5N	0.248		0.201
200°C, 20N	0.278		0.21

Thermal Properties		**Comments**	
Coefficient of thermal expansion	20×10^{6}		17.5×10^{6}
Melting Point	532 - 571 °C / 990 - 1060 °F	AA; Typical range based on typical composition for wrought products 1/4 inch thickness or greater. Eutectic melting is not eliminated by homogenization.	532 - 571 °C / 990 - 1060 °F
Solidus	532 °C / 990 °F	AA; Typical	532 °C / 990 °F
Liquidus	571 °C / 1060 °F	AA; Typical	571 °C / 1060 °F

Processing Properties	**Metric**	**English**	**Comments**	**Metric**	**English**
Annealing Temperature	413 °C	775 °F	2 to 3 hr at temperature then furnace cooled to 500°F at 50°F per hour max	413 °C	775 °F
Solution Temperature	504 - 516 °C	940 - 960 °F	Hold 4 min at temperature then quench in cold water; for heavy or complicated forgings, quench in water at 150 to 212°F	504 - 516 °C	940 - 960 °F
Aging Temperature	168 - 174 °C	335 - 345 °F	8 to 12 hr at temperature	168 - 174 °C	335 - 345 °F

Component Elements Properties	**Metric**	**English**	**Comments**	**Metric**	**English**
Aluminum, Al	81.1 - 87.2 %	81.1 - 87.2 %	As remainder	76.91 - 74.51%	76.91 - 74.51%
Chromium, Cr	<= 0.10 %	<= 0.10 %		0.04%	0.04%
Copper, Cu	0.50 - 1.30 %	0.50 - 1.30 %		0.82 -0.94%	0.82 -0.94%
Iron, Fe	<= 1.0 %	<= 1.0 %		0.37 - 0.49%	0.37 - 0.49%
Magnesium, Mg	0.80 - 1.30 %	0.80 - 1.30 %		1.13 - 1.25%	1.13 - 1.25%
Nickel, Ni	0.50 - 1.30 %	0.50 - 1.30 %		0.78 - 1.12%	0.78 - 1.12%
Other, each	<= 0.050 %	<= 0.050 %		<= 0.050 %	<= 0.050 %
Other, total	<= 0.15 %	<= 0.15 %		<= 0.15 %	<= 0.15 %
Silicon, Si	11.0 - 13.5 %	11.0 - 13.5 %		18.8 - 20.1%	18.8 - 20.1%
Zinc, Zn	<= 0.25 %	<= 0.25 %		0.05 - 0.15%	0.05 - 0.15%
Carbon, C				0.9-1.2%	0.9-1.2%