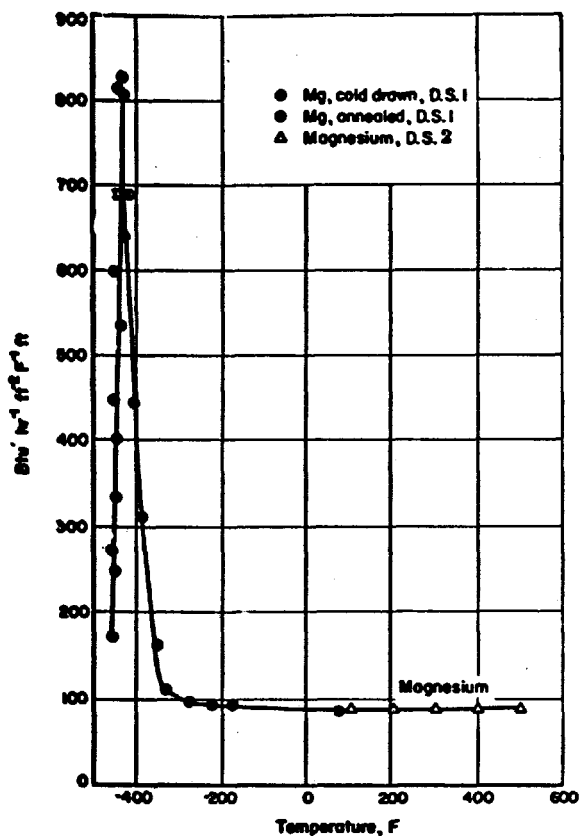
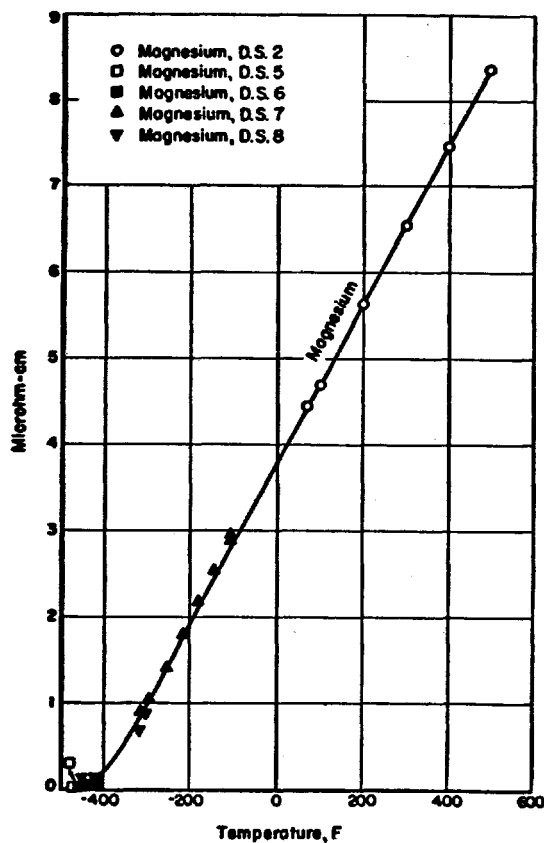
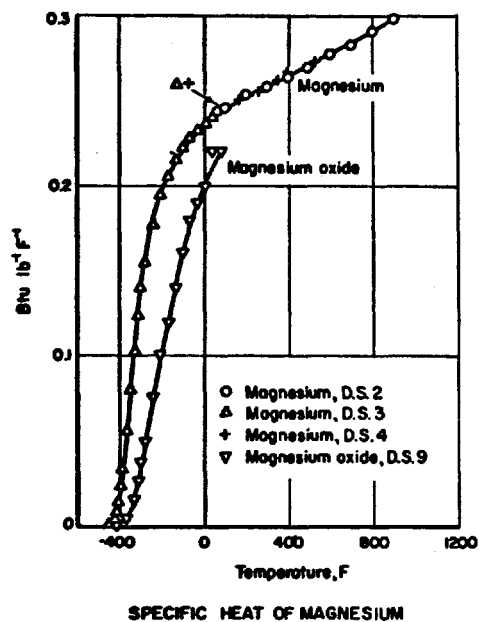


MAGNESIUM AND ITS ALLOYS

MAGNESIUM



THERMAL CONDUCTIVITY OF MAGNESIUM



ELECTRICAL RESISTIVITY OF MAGNESIUM

5

MATERIAL				Magnesium				HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT											
FORM											
HEAT											
TREATMENT											
REFERENCE Tentama; received from V. J. Johnson, NBS Cryogenic Engineering Laboratory, Boulder, Colorado.											
REMARKS											

ELECTRICAL RESISTIVITY

[illegible]

6

MATERIAL		Magnesium	HEAT NUMBER						
CHEMICAL COMPOSITION PER CENT									
FORM									
HEAT									
TREATMENT									
REFERENCE	Rosenberg, received from V. J. Johnson, NBS Cryogenic Engineering Laboratory, Boulder, Colorado.								
REMARKS									

ELECTRICAL RESISTIVITY

[illegible]

①

MATERIAL	Magnesium	HEAT NUMBER				
CHEMICAL COMPOSITION PER CENT						
FORM						
HEAT						
TREATMENT						
REFERENCE	Dewar and Flemming: received from V. J. Johnson, NBS Cryogenic Engineering Laboratory, Boulder, Colorado.					
REMARKS						

ELECTRICAL RESISTIVITY

[illegible]

①

MATERIAL		Magnesium		HEAT NUMBER	
CHEMICAL COMPOSITION PER CENT					
FORM					
HEAT TREATMENT					
REFERENCE	Meissner and Voigt; received from V. J. Johnson, NBS Cryogenic Engineering Laboratory, Boulder, Colorado.				
REMARKS					

ELECTRICAL RESISTIVITY

[illegible]

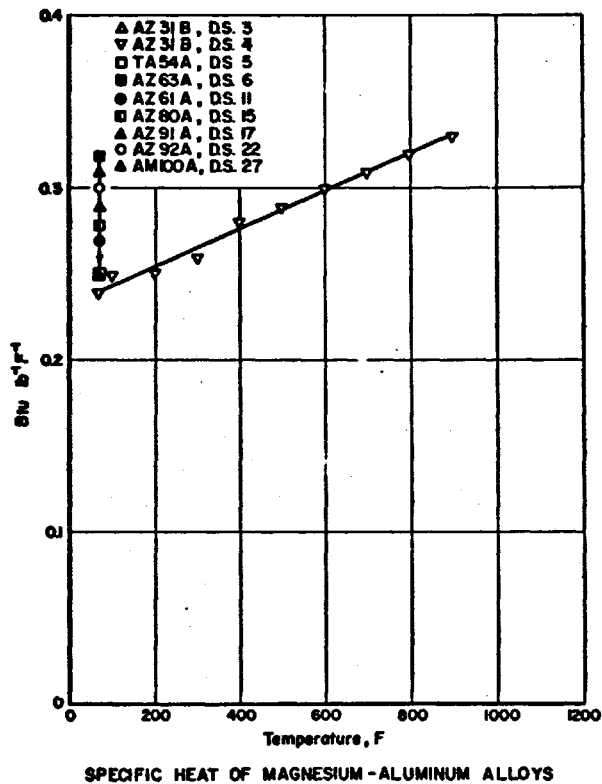
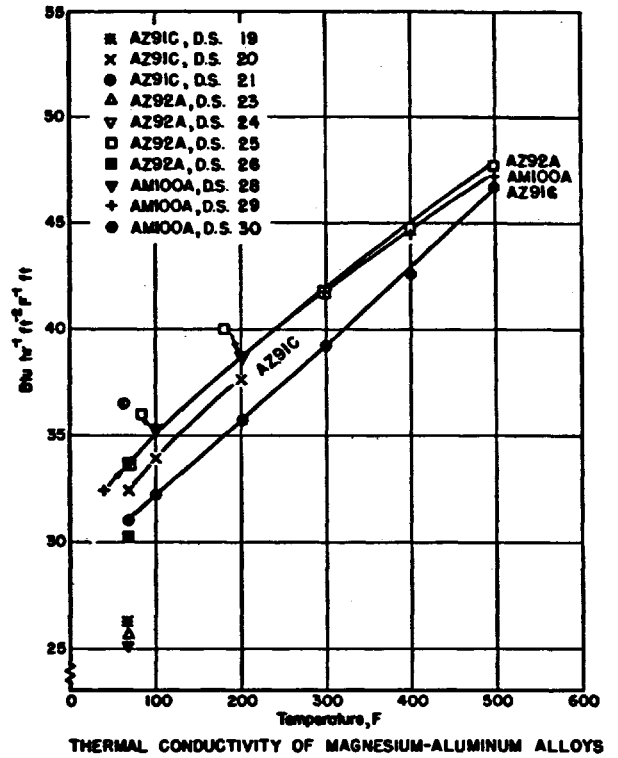
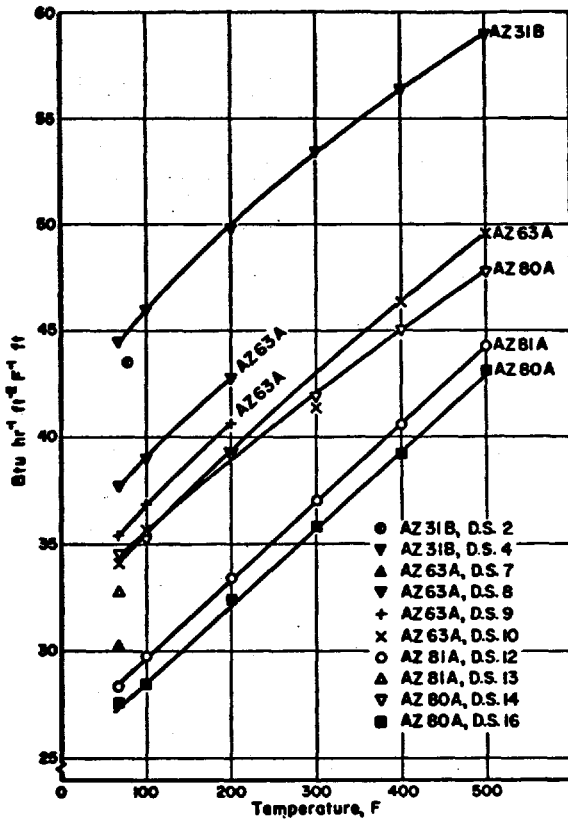
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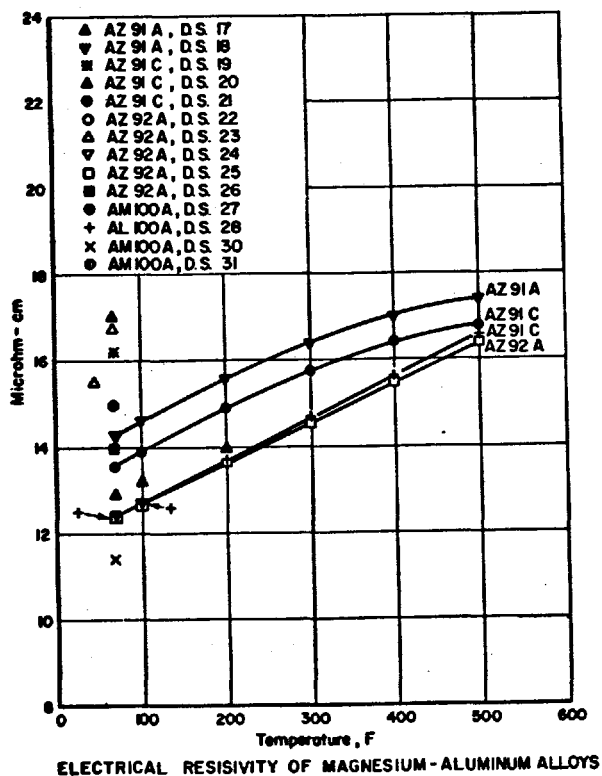
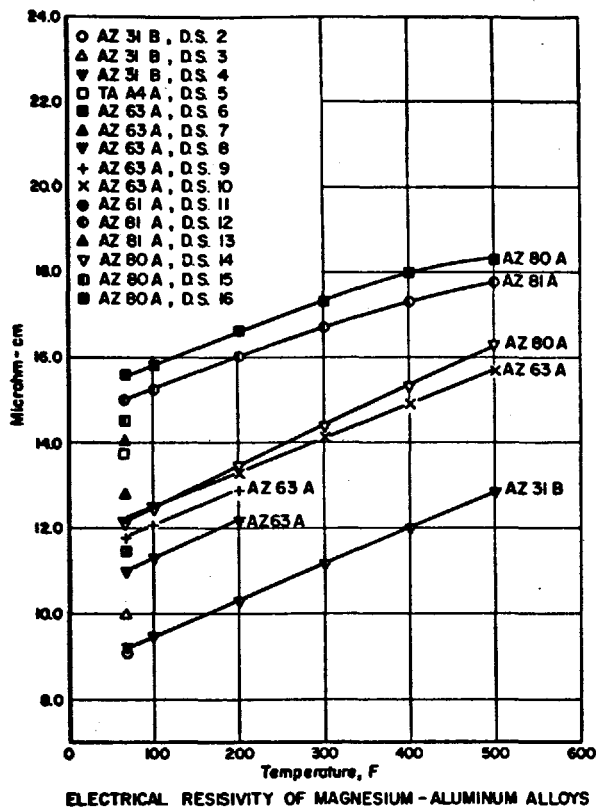
MATERIAL	Magnesium Oxide	HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT					
FORM					
HEAT TREATMENT	Ginsque, W. R. and Archibold, R. C., Journal of American Chemical Society, Vol 59, p. 561 (1937); Gunther, P., American Physics, Vol 51, 1. 838 (1916; and Parks, G. S. and Kelley, K. K., Journal of Physical Chemistry, Vol 30, p 47 (1936); as found in "A Compendium of the Properties of Materials at Low Temperatures, Phase I", Part II, edited by Victor J. Johnson, N.B.S. Cryogenic Engineering Laboratory, Boulder, Colorado (December, 1959).				
REFERENCE					
REMARKS					

SPECIFIC HEAT

[illegible]

MAGNESIUM-ALUMINUM ALLOYS





ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

1

MATERIAL	Magnesium Alloy--Mg-An-M-29									HEAT NUMBER
CHEMICAL COMPOSITION PER CENT	Al	An	Si	Mn	Cu	Ni	Fe	other elem.	Mg	
	2.5-	0.7-								
	3.5	1.3	0.3	0.2	0.05	0.005	0.005	0.3	Bal.	
FORM										
HEAT TREATMENT										
REFERENCE	Lucke, C. F. and Deem, H. W., "Thermal Properties of Thirteen Metals". ASTM Special Technical Publication No. 227.									
REMARKS	Hot rolled. Annealed 1 hour, 600°F, furnace cool.									

THERMAL CONDUCTIVITY

TEMP. F	BTU HR-1 FT-2 F-1 FT			TEMP. F	BTU HR-1 FT-2 F-1 FT		
-250	26 *			-250	31 *		
-200	29			-200	34		
-100	36			-100	40		
68	45			68	49		
200	51			200	54		
400	58			400	61		
600	62			600	64		
Longitudinal				Vertical			
* Extrapolated.							

COEFFICIENT OF LINEAR THERMAL EXPANSION

TEMP. RANGE, F	F-1 X 10 ⁶	TEMP. RANGE, F	F-1 X 10 ⁶	TEMP. RANGE, F	F-1 X 10 ⁶		
68-(-250)	12.20	68-(-250)	12.58	68-(-250)	13.68		
68-(-200)	12.54	68-(-200)	12.95	68-(-200)	14.03		
68-(-100)	12.98	68-(-100)	13.57	68-(-100)	14.64		
68-200	13.41	68-200	14.62	68-200	14.62		
68-400	14.07	68-400	14.76	68-400	14.85		
68-600	14.68	68-600	15.11	68-600	15.28		
Longitudinal		Transverse		Vertical			

SPECIFIC HEAT

TEMP. F	BTU LB-1 F-1	TEMP. F	BTU LB-1 F-1	TEMP. F	BTU LB-1 F-1	TEMP. F	BTU LB-1 F-1
-250	0.179	-100	0.209	200	0.251	600	0.276
-200	0.190	68	0.235	400	0.265		

DENSITY

TEMP. F	LB CU IN-1	TEMP. F	LB CU IN-1	TEMP. F	LB CU IN-1	TEMP. F	LB CU IN-1
-250	0.0651	-100	0.0647	200	0.0638	600	0.0627
-200	0.0649	68	0.0642	400	0.0633		
Calculated from thermal expansion data and measured density of 0.0643 lb in ⁻³ at 32°F.							

DIFFUSIVITY

TEMP. F	FT ² HR-1			TEMP. F	FT ² HR-1		
-250	1.27			-250	1.52		
-200	1.37			-200	1.58		
-100	1.53			-100	1.69		
68	1.74			68	1.86		
200	1.85			200	1.95		
400	2.00			400	2.09		
600	2.07			600	2.15		
Longitudinal		Vertical					

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

2

MATERIAL	Magnesium Alloy--AZ31B									HEAT NUMBER
CHEMICAL COMPOSITION PER CENT	Al	Zn	Mn	Mg						
	2.5-	0.7-	0.2	Bal						
	3.5	1.3	0.3							
FORM	Sheet (0.030 in.).									
HEAT TREATMENT	Temper-H24.									
REFERENCE	Weiss, V., Schaeffer, G. T., Saule, A., and Sachs, G., "Thermal Cycling Under Constant Load to Low Temperatures of Aluminum and Magnesium Alloys, presented at 63rd Annual Meeting of ASTM, June 26-July 1, 1960.									

THERMAL CONDUCTIVITY

TEMP. F	BTU IN-1 FT-2 F-1 FT	TEMP. F	BTU IN-1 FT-2 F-1 FT	TEMP. F	BTU IN-1 FT-2 F-1 FT	TEMP. F	BTU IN-1 FT-2 F-1 FT
77	43.5						

COEFFICIENT OF LINEAR THERMAL EXPANSION

TEMP. RANGE, F	F-1 X 10 ⁶	TEMP. RANGE, F	F-1 X 10 ⁶	TEMP. RANGE, F	F-1 X 10 ⁶	TEMP. RANGE, F	F-1 X 10 ⁶
68-(-32R)	5.9-14.1	68-212	14.5	68-392	15.0		

ELECTRICAL RESISTIVITY

TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM
68	9.1						

DENSITY

TEMP. F	LB CU IN-1	TEMP. F	LB CU IN-1	TEMP. F	LB CU IN-1	TEMP. F	LB CU IN-1
Room	0.064						
Data assumed to be at room temperature.							

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

3

MATERIAL	Magnesium Alloy--AZ31B									HEAT NUMBER
CHEMICAL COMPOSITION PER CENT	Al	Zn	Mn	Mg						
	2.5-	0.6-								
	3.5	1.4	0.20	Bal						
FORM										
HEAT TREATMENT	Annealing temperature: 650 F, Stress relief temperature: (for extrusions) 500 F, Hot working temperature range: 450-650 F.									
REFERENCE	"Materials in Design Engineering", Materials Selector, edited by H. R. Clauser, Vol 46, No. 4 (September, 1957).									

THERMAL CONDUCTIVITY

TEMP. F	BTU IN-1 FT-2 F-1 FT	TEMP. F	BTU IN-1 FT-2 F-1 FT	TEMP. F	BTU IN-1 FT-2 F-1 FT	TEMP. F	BTU IN-1 FT-2 F-1 FT
212-372	55.6						

COEFFICIENT OF LINEAR THERMAL EXPANSION

TEMP. RANGE, F	F-1 X 10 ⁶	TEMP. RANGE, F	F-1 X 10 ⁶	TEMP. RANGE, F	F-1 X 10 ⁶	TEMP. RANGE, F	F-1 X 10 ⁶
65-212	14	65-750	14				

SPECIFIC HEAT

TEMP. F	BTU LB-1 F-1	TEMP. F	BTU LB-1 F-1	TEMP. F	BTU LB-1 F-1	TEMP. F	BTU LB-1 F-1
78	0.25						

ELECTRICAL RESISTIVITY

TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM
68	10.0						

DENSITY

TEMP. F	LB CU IN-1	TEMP. F	LB CU IN-1	TEMP. F	LB CU IN-1	TEMP. F	LB CU IN-1
1050-1170	0.064						

ASTM-ASME JOINT COMMITTEE ON EFFECT OF TEMPERATURE ON PROPERTIES OF METALS

(4)

MATERIAL	Magnesium Alloy--AZ31B				HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Al	Zn	Mn	Mg				
	3.0	1.0	0.5	Bal				
FORM	Cast and wrought.							
HEAT TREATMENT	Temper-F, -T4, -H24, -0.							
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.							

THERMAL CONDUCTIVITY

TEMP. F	BTU IN-1 FT-2 F-1 FT	TEMP. F	BTU IN-1 FT-2 F-1 FT	TEMP. F	BTU IN-1 FT-2 F-1 FT	TEMP. F	BTU IN-1 FT-2 F-1 FT
68	44.5	200	49.8	400	56.4	500	59.0
100	46.0	300	53.5				
Data calculated from electrical resistivity values.							

SPECIFIC HEAT

TEMP. F	BTU LB-1 F-1	TEMP. F	BTU LB-1 F-1	TEMP. F	BTU LB-1 F-1	TEMP. F	BTU LB-1 F-1
68	0.24	300	0.26	650	0.30	800	0.32
100	0.25	400	0.28	750	0.31	900	0.33
200	0.25	500	0.29				

ELECTRICAL RESISTIVITY

TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM
68	9.2	200	10.3	400	12.0	500	12.9
100	9.5	300	11.2				

DENSITY

TEMP. F	LB CU IN-1	TEMP. F	LB CU IN-1	TEMP. F	LB CU IN-1	TEMP. F	LB CU IN-1
68	0.0640	300	0.0636	600	0.0625	800	0.0618
100	0.0640	400	0.0632	750	0.0623	900	0.0614
200	0.0636	500	0.0629				
Density calculated using density at 68°F and thermal expansion.							

DIFFUSIVITY

TEMP. F	FT2 HR-1	TEMP. F	FT2 HR-1	TEMP. F	FT2 HR-1	TEMP. F	FT2 HR-1
68	3.4	300	3.19	600	3.02	800	2.93
100	3.33	400	3.13	700	2.98	900	2.88
200	3.25	500	3.07				
Calculated from density, specific heat, and thermal conductivity.							

ASTM-ASME JOINT COMMITTEE ON EFFECT OF TEMPERATURE ON PROPERTIES OF METALS

(5)

MATERIAL	Magnesium Alloy--TA54A				HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Sn	Al	Mn	Mg				
	4.0- 6.0	3.0- 4.0	0.20	Bal				
FORM								
HEAT TREATMENT	Annealing temperature: 650 F, Hot working temperature range: 450-820 F.							
REFERENCE	"Materials in Design Engineering", Materials Selector, edited by H. R. Clauser, Vol 46, No. 4 (September, 1957).							
REMARKS								

COEFFICIENT OF LINEAR THERMAL EXPANSION

TEMP RANGE, F	F-1 X 10 ⁶	TEMP RANGE, F	F-1 X 10 ⁶	TEMP RANGE, F	F-1 X 10 ⁶	TEMP RANGE, F	F-1 X 10 ⁶
65-212	14	65-750	16				

SPECIFIC HEAT

TEMP. F	BTU LB-1 F-1	TEMP. F	BTU LB-1 F-1	TEMP. F	BTU LB-1 F-1	TEMP. F	BTU LB-1 F-1
78	0.25						

ELECTRICAL RESISTIVITY

TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM
68	11.8						

DENSITY

TEMP. F	LB CU IN-1	TEMP. F	LB CU IN-1	TEMP. F	LB CU IN-1	TEMP. F	LB CU IN-1
Room	0.067						
Data assumed to be room temperature.							

ASTM-ASME JOINT COMMITTEE ON EFFECT OF TEMPERATURE ON PROPERTIES OF METALS

(6)

MATERIAL	Magnesium Alloy--AZ63A				HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Al	Zn	Mn	Mg				
	5.3- 6.5	2.5- 3.5	0.15	Bal				
HEAT TREATMENT	Solution temperature: 730 F, Aging temperature: 375 F, Stabilizing temperature: 500 F, Casting temperature: Sand-1350-1550 F, chill-1200-1500 F.							
REFERENCE	"Materials in Design Engineering", Materials Selector, edited by H. R. Clauser, Vol 46, No. 4 (September, 1957).							
REMARKS	Melting temperature range: 850-1135 F.							

THERMAL CONDUCTIVITY

TEMP. F	STU NR-1 FT-2 F-1 FT	TEMP. F	STU NR-1 FT-2 F-1 FT	TEMP. F	STU NR-1 FT-2 F-1 FT	TEMP. F	STU NR-1 FT-2 F-1 FT
212-572	43.5						

COEFFICIENT OF LINEAR THERMAL EXPANSION

TEMP. RANGE, F	P-1 X 10 ⁶	TEMP. RANGE, F	P-1 X 10 ⁶	TEMP. RANGE, F	P-1 X 10 ⁶	TEMP. RANGE, F	P-1 X 10 ⁶
66-212	14						

SPECIFIC HEAT

TEMP. F	STU LB-1 F-1	TEMP. F	STU LB-1 F-1	TEMP. F	STU LB-1 F-1	TEMP. F	STU LB-1 F-1
78	0.25						

ELECTRICAL RESISTIVITY

TEMP. F	MICRON- CM			TEMP. F	MICRON- CM		
Room	11.5			Room	14.0		
As Cast				Solution treated			
Data assumed to be at room temperature.							

DENSITY

TEMP. F	LB CU IN-1	TEMP. F	LB CU IN-1	TEMP. F	LB CU IN-1	TEMP. F	LB CU IN-1
Room	0.067						
Data assumed to be at room temperature							

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

MATERIAL	Magnesium Alloy--AZ63A				HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Al	Zn	Mn	Mg				
	6.0	3.0	0.2	Bal				
FORM	Fabrication--S and PM Cast.							
HEAT TREATMENT	Temper-T4.							
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.							
REMARKS								

THERMAL CONDUCTIVITY

TEMP. F	STU NR-1 FT-2 F-1 FT	TEMP. F	STU NR-1 FT-2 F-1 FT	TEMP. F	STU NR-1 FT-2 F-1 FT	TEMP. F	STU NR-1 FT-2 F-1 FT
66	30.2						
Data calculated from electrical resistivity values.							

ELECTRICAL RESISTIVITY

TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM
66	14.0						

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

MATERIAL	Magnesium Alloy--AZ63A				HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Al	Zn	Mn	Mg				
	6.0	3.0	0.2	Bal				
FORM	Fabrication--S and PM Cast.							
HEAT TREATMENT	Temper-T5.							
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.							

THERMAL CONDUCTIVITY

TEMP. F	STU NR-1 FT-2 F-1 FT	TEMP. F	STU NR-1 FT-2 F-1 FT	TEMP. F	STU NR-1 FT-2 F-1 FT	TEMP. F	STU NR-1 FT-2 F-1 FT
68	37.7	100	39.0	200	42.8		
Data calculated from electrical resistivity values.							

ELECTRICAL RESISTIVITY

TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM
68	11.0	100	11.3	200	12.2		

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

MATERIAL	Magnesium Alloy--AZ63A				HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Al	Zn	Mn	Mg				
	6.0	3.0	0.2	Bal				
FORM	Fabrication--S and PM Cast.							
HEAT TREATMENT	Temper-T6.							
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.							

THERMAL CONDUCTIVITY

TEMP. F	STU NR-1 FT-2 F-1 FT	TEMP. F	STU NR-1 FT-2 F-1 FT	TEMP. F	STU NR-1 FT-2 F-1 FT	TEMP. F	STU NR-1 FT-2 F-1 FT
68	35.3	100	36.8	200	40.64		
Data calculated from electrical resistivity values.							

ELECTRICAL RESISTIVITY

TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM
68	11.8	100	12.1	200	12.9		

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

MATERIAL	Magnesium Alloy--AZ63A				HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Al	Zn	Mn	Mg				
	6.0	3.0	0.2	Bal				
FORM	Fabrication--S and PM Cast.							
HEAT TREATMENT	Temper-F.							
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.							
REMARKS								

THERMAL CONDUCTIVITY

TEMP. F.	BTU HR-1 FT-2 F-1 FT	TEMP. F.	BTU HR-1 FT-2 F-1 FT	TEMP. F.	BTU HR-1 FT-2 F-1 FT	TEMP. F.	BTU HR-1 FT-2 F-1 FT
68	34.1	200	39.2	400	46.4	500	49.6
100	35.6	300	41.4				
Data calculated from electrical resistivity values.							

ELECTRICAL RESISTIVITY

TEMP. F.	MICRON- CM	TEMP. F.	MICRON- CM	TEMP. F.	MICRON- CM	TEMP. F.	MICRON- CM
68	12.2	200	13.4	400	14.9	500	15.7
100	12.5	300	14.2				

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

(11)

MATERIAL	Magnesium Alloy--AZ61A				HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Al	Zn	Mn	Mg				
	5.8-7.2	0.4-1.5	0.15	Bal				
HEAT TREATMENT	Annealing temperature: 650 F, Stress relief temperature: (for extrusions) 500 F, Hot working temperature range: 450-650 F.							
REFERENCE	"Materials in Design Engineering", Materials Selector, edited by H. R. Clausen, Vol 46, No. 4 (September, 1957).							
REMARKS	Melting temperature range: 950-1140 F.							

THERMAL CONDUCTIVITY

TEMP. F.	BTU HR-1 FT-2 F-1 FT	TEMP. F.	BTU HR-1 FT-2 F-1 FT	TEMP. F.	BTU HR-1 FT-2 F-1 FT	TEMP. F.	BTU HR-1 FT-2 F-1 FT
68	16.0						
100	15.2	300	16.7				
212-650	16.0						

COEFFICIENT OF LINEAR THERMAL EXPANSION

TEMP. RANGE, F	F-1 X 10 ⁶	TEMP. RANGE, F	F-1 X 10 ⁶	TEMP. RANGE, F	F-1 X 10 ⁶	TEMP. RANGE, F	F-1 X 10 ⁶
65-212	14	65-750	16				

SPECIFIC HEAT

TEMP. F.	BTU LB-1 F-1	TEMP. F.	BTU LB-1 F-1	TEMP. F.	BTU LB-1 F-1	TEMP. F.	BTU LB-1 F-1
78	0.25						

ELECTRICAL RESISTIVITY

TEMP. F.	MICRON- CM	TEMP. F.	MICRON- CM	TEMP. F.	MICRON- CM	TEMP. F.	MICRON- CM
68	12.5						

DENSITY

TEMP. F.	LB CU IN-1	TEMP. F.	LB CU IN-1	TEMP. F.	LB CU IN-1	TEMP. F.	LB CU IN-1
950-1140	0.065						

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

(12)

MATERIAL	Magnesium Alloy--AZ81A				HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Al	Zn	Mn	Mg				
	7.6	0.7	0.2	Bal				
FORM	Fabrication--S and PM Cast.							
HEAT TREATMENT	Temper-T4.							
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.							
REMARKS								

THERMAL CONDUCTIVITY

TEMP. F.	BTU HR-1 FT-2 F-1 FT	TEMP. F.	BTU HR-1 FT-2 F-1 FT	TEMP. F.	BTU HR-1 FT-2 F-1 FT	TEMP. F.	BTU HR-1 FT-2 F-1 FT
68	28.3	200	33.4	400	40.6	500	44.3
100	29.8	300	37.0				
Data calculated from electrical resistivity values.							

ELECTRICAL RESISTIVITY

TEMP. F.	MICRON- CM	TEMP. F.	MICRON- CM	TEMP. F.	MICRON- CM	TEMP. F.	MICRON- CM
68	15.0	200	16.0	400	17.3	500	17.8
100	15.2	300	16.7				

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

(13)

MATERIAL	Magnesium Alloy--AZ81A				HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Al	Zn	Mn	Mg				
	7.6	0.7	0.2	Bal				
FORM	Fabrication--S and PM Cast.							
HEAT TREATMENT	Temper-F.							
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.							
REMARKS								

THERMAL CONDUCTIVITY

TEMP. F.	BTU HR-1 FT-2 F-1 FT	TEMP. F.	BTU HR-1 FT-2 F-1 FT	TEMP. F.	BTU HR-1 FT-2 F-1 FT	TEMP. F.	BTU HR-1 FT-2 F-1 FT
68	32.7						
Data calculated from electrical resistivity values.							

ELECTRICAL RESISTIVITY

TEMP. F.	MICRON- CM	TEMP. F.	MICRON- CM	TEMP. F.	MICRON- CM	TEMP. F.	MICRON- CM
68	12.8						

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

14

MATERIAL		Magnesium Alloy--AZ80A				HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Al	Zn	Mn	Mg					
	8.5	0.5	0.2	Bal					
FORM		Fabrication--extruded.							
HEAT TREATMENT		Temper-T5.							
REFERENCE		Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.							
REMARKS									

THERMAL CONDUCTIVITY

TEMP. F.	BTU HR-1 FT-2 F-1 FT	TEMP. F.	BTU HR-1 FT-2 F-1 FT	TEMP. F.	BTU HR-1 FT-2 F-1 FT	TEMP. F.	BTU HR-1 FT-2 F-1 FT
68	34.4	200	39.2	400	45.0	500	47.9
100	35.3	300	41.9				
Data calculated from electrical resistivity values.							

ELECTRICAL RESISTIVITY

TEMP. F.	MICRON- CM	TEMP. F.	MICRON- CM	TEMP. F.	MICRON- CM	TEMP. F.	MICRON- CM
68	12.2	100	13.5	400	15.4	500	16.3
100	12.5	200	14.4				

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

15

MATERIAL		Magnesium Alloy--AZ80A				HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Al	Zn	Mn	Mg					
	7.8-9.2	0.2-0.8	0.12	Bal					
HEAT TREATMENT		Annealing temperature 725 F, Stress relief temperature: (for extrusions) 400 F, Solution temperature: 750 F, Aging temperature: 350 F, Hot working temperature range: 275-375 F.							
REFERENCE		"Materials in Design Engineering", Materials Selector, edited by H. R. Clauser, Vol 46, No. 4 (September, 1957).							
REMARKS		Melting temperature range: 900-1115 F.							

THERMAL CONDUCTIVITY

TEMP. F.	BTU HR-1 FT-2 F-1 FT	TEMP. F.	BTU HR-1 FT-2 F-1 FT	TEMP. F.	BTU HR-1 FT-2 F-1 FT	TEMP. F.	BTU HR-1 FT-2 F-1 FT
212-752	43.5						

COEFFICIENT OF LINEAR THERMAL EXPANSION

TEMP. RANGE, F	P-1 X 10 ⁶	TEMP. RANGE, F	P-1 X 10 ⁶	TEMP. RANGE, F	P-1 X 10 ⁶	TEMP. RANGE, F	P-1 X 10 ⁶
65-212	14	65-750	16				

SPECIFIC HEAT

TEMP. F.	BTU LB-1 F-1	TEMP. F.	BTU LB-1 F-1	TEMP. F.	BTU LB-1 F-1	TEMP. F.	BTU LB-1 F-1
78	0.25						

ELECTRICAL RESISTIVITY

TEMP. F.	MICRON- CM	TEMP. F.	MICRON- CM	TEMP. F.	MICRON- CM	TEMP. F.	MICRON- CM
68	14.5						

DENSITY

TEMP. F.	LB CU IN-1	TEMP. F.	LB CU IN-1	TEMP. F.	LB CU IN-1	TEMP. F.	LB CU IN-1
900-1115	0.066						

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

16

MATERIAL		Magnesium Alloy--AZ80A				HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Al	Zn	Mn	Mg					
	8.5	0.5	0.2	Bal					
FORM		Fabrication--extruded.							
HEAT TREATMENT		Temper-F.							
REFERENCE		Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.							
REMARKS									

THERMAL CONDUCTIVITY

TEMP. F.	BTU HR-1 FT-2 F-1 FT	TEMP. F.	BTU HR-1 FT-2 F-1 FT	TEMP. F.	BTU HR-1 FT-2 F-1 FT	TEMP. F.	BTU HR-1 FT-2 F-1 FT
68	27.6	200	32.4	400	39.2	500	43.1
100	28.5	300	35.8				
Data calculated from electrical resistivity values.							

ELECTRICAL RESISTIVITY

TEMP. F.	MICRON- CM	TEMP. F.	MICRON- CM	TEMP. F.	MICRON- CM	TEMP. F.	MICRON- CM
68	15.6	200	16.6	400	18.0	500	18.3
100	15.8	300	17.3				

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

17

MATERIAL		Magnesium Alloy--AZ91A				HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Al	Zn	Mn	Mg					
	8.3-9.7	0.4-1.0	0.13	Bal					
FORM									
HEAT TREATMENT									
REFERENCE		"Materials in Design Engineering", Materials Selector, edited by H. R. Clauser, Vol 46, No. 4 (September, 1957).							
REMARKS		Melting temperature range: 875-1105 F.							

THERMAL CONDUCTIVITY

TEMP. F.	BTU HR-1 FT-2 F-1 FT	TEMP. F.	BTU HR-1 FT-2 F-1 FT	TEMP. F.	BTU HR-1 FT-2 F-1 FT	TEMP. F.	BTU HR-1 FT-2 F-1 FT
212-574	41.1						

COEFFICIENT OF LINEAR THERMAL EXPANSION

TEMP RANGE, F	P-1 X 10 ⁶	TEMP RANGE, F	P-1 X 10 ⁶	TEMP RANGE, F	P-1 X 10 ⁶	TEMP RANGE, F	P-1 X 10 ⁶
66-212	14						

SPECIFIC HEAT

TEMP, F	BTU LB-1 F-1	TEMP, F	BTU LB-1 F-1	TEMP, F	BTU LB-1 F-1	TEMP, F	BTU LB-1 F-1
78	0.25						

ELECTRICAL RESISTIVITY

TEMP, F	MICRON-CH	TEMP, F	MICRON-CH	TEMP, F	MICRON-CH	TEMP, F	MICRON-CH
Room	17.0 (1)						
(1) As cast. Data assumed to be at room temperature.							

DENSITY

TEMP, F	LB CU IN-1	TEMP, F	LB CU IN-1	TEMP, F	LB CU IN-1	TEMP, F	LB CU IN-1
875-1105	0.056						

ASTM-ASME JOINT COMMITTEE ON EFFECT OF TEMPERATURE ON PROPERTIES OF METALS

18

MATERIAL	Magnesium Alloy--AZ91A and B				HEAT NUMBER		
CHEMICAL COMPOSITION PER CENT	Al	Zn	Mn	Mg			
	9.0	0.6	0.2	Bal			
FORM	Fabrication--Die Cast.						
HEAT TREATMENT	Temper-F.						
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.						

ELECTRICAL RESISTIVITY

TEMP, F	MICRON-CH	TEMP, F	MICRON-CH	TEMP, F	MICRON-CH	TEMP, F	MICRON-CH
68	14.3	200	15.6	400	17.0	500	17.4
100	14.6	300	16.4				

ASTM-ASME JOINT COMMITTEE ON EFFECT OF TEMPERATURE ON PROPERTIES OF METALS

19

MATERIAL	Magnesium Alloy--AZ91C				HEAT NUMBER		
CHEMICAL COMPOSITION PER CENT	Al	Zn	Mn	Mg			
	8.7	0.7	0.2	Bal			
FORM	Fabrication--S and PM Cast.						
HEAT TREATMENT	Temper-T4.						
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.						

THERMAL CONDUCTIVITY

TEMP, F	BTU HR-1 FT-2 F-1 FT	TEMP, F	BTU HR-1 FT-2 F-1 FT	TEMP, F	BTU HR-1 FT-2 F-1 FT	TEMP, F	BTU HR-1 FT-2 F-1 FT
68	26.3						
Data calculated from electrical resistivity values.							

ELECTRICAL RESISTIVITY

TEMP, F	MICRON-CH	TEMP, F	MICRON-CH	TEMP, F	MICRON-CH	TEMP, F	MICRON-CH
68	16.2						

ASTM-ASME JOINT COMMITTEE ON EFFECT OF TEMPERATURE ON PROPERTIES OF METALS

20

MATERIAL	Magnesium Alloy--AZ91C				HEAT NUMBER		
CHEMICAL COMPOSITION PER CENT	Al	Zn	Mn	Mg			
	8.7	0.7	0.2	Bal			
FORM	Fabrication--S and PM Cast.						
HEAT TREATMENT	Temper-T6.						
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.						
REMARKS							

THERMAL CONDUCTIVITY

TEMP, F	BTU HR-1 FT-2 F-1 FT	TEMP, F	BTU HR-1 FT-2 F-1 FT	TEMP, F	BTU HR-1 FT-2 F-1 FT	TEMP, F	BTU HR-1 FT-2 F-1 FT
68	32.4	100	33.9	200	37.7		
Data calculated from electrical resistivity values.							

ELECTRICAL RESISTIVITY

TEMP, F	MICRON-CH	TEMP, F	MICRON-CH	TEMP, F	MICRON-CH	TEMP, F	MICRON-CH
68	12.9	100	13.2	200	14.0		

ASTM-ASME JOINT COMMITTEE ON EFFECT OF TEMPERATURE ON PROPERTIES OF METALS

21

MATERIAL	Magnesium Alloy--AZ91C				HEAT NUMBER		
CHEMICAL COMPOSITION PER CENT	Al	Zn	Mn	Mg			
	8.7	0.7	0.2	Bal			
FORM	Fabrication--S and PM Cast.						
HEAT TREATMENT	Temper-F.						
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.						
REMARKS							

THERMAL CONDUCTIVITY

TEMP, F	BTU HR-1 FT-2 F-1 FT	TEMP, F	BTU HR-1 FT-2 F-1 FT	TEMP, F	BTU HR-1 FT-2 F-1 FT	TEMP, F	BTU HR-1 FT-2 F-1 FT
68	31.0	200	35.8	400	42.6	500	46.7
100	32.2	300	39.2				
Data calculated from electrical resistivity values.							

ELECTRICAL RESISTIVITY

TEMP, F	MICRON-CH	TEMP, F	MICRON-CH	TEMP, F	MICRON-CH	TEMP, F	MICRON-CH
68	13.6	200	14.9	400	16.4	500	16.8
100	14.9	300	15.7				

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

22

MATERIAL	Magnesium Alloy--AZ92A				HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Al	Zn	Mn	Mg				
	8.3- 9.7	1.6- 2.4	0.10	Bal				
HEAT TREATMENT	Solution temperature: 750 F, Aging temperature: 420 F, Stabilizing temperature: 500 F, Casting temperature: and- 1350-1550 F, chill- 1200-1500 F.							
REFERENCE	"Materials in Design Engineering", Materials Selector, edited by H. R. Clauser, Vol 46, No. 4 (September, 1957).							
REMARKS	Melting temperature range: 830-1100 F.							

THERMAL CONDUCTIVITY

TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT
212-572	41.1						

COEFFICIENT OF LINEAR THERMAL EXPANSION

TEMP. RANGE, F	$P-1 \times 10^6$	TEMP. RANGE, F	$P-1 \times 10^6$	TEMP. RANGE, F	$P-1 \times 10^6$	TEMP. RANGE, F	$P-1 \times 10^6$
66-212	14						

SPECIFIC HEAT

TEMP. F	BTU LB-1 F-1	TEMP. F	BTU LB-1 F-1	TEMP. F	BTU LB-1 F-1	TEMP. F	BTU LB-1 F-1
78	0.25						

ELECTRICAL RESISTIVITY

TEMP. F	MICRON- CM	TEMP. F	MICRON- CM
Room	15.0	Room	17.0
As cast		Solution treated	
Data assumed to be at room temperature.			

DENSITY

TEMP. F	LB CU IN-1	TEMP. F	LB CU IN-1	TEMP. F	LB CU IN-1	TEMP. F	LB CU IN-1
Room	0.666						
Data assumed to be at room temperature.							

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

23

MATERIAL	Magnesium Alloy--AZ92A				HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Al	Zn	Mn	Mg				
	9.0	2.0	0.2	Bal				
FORM	Fabrication--S and PM Cast.							
HEAT TREATMENT	Temper-T4.							
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.							
REMARKS								

THERMAL CONDUCTIVITY

TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT
68	25.6						
Data calculated from electrical resistivity values.							

ELECTRICAL RESISTIVITY

TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM
68	16.8						

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

24

MATERIAL	Magnesium Alloy--AZ92A				HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Al	Zn	Mn	Mg				
	9.0	2.0	0.2	Bal				
FORM	Fabrication--S and PM Cast.							
HEAT TREATMENT	Temper-T5.							
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.							

THERMAL CONDUCTIVITY

TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT
68	33.6	100	35.1	200	38.7		
Data calculated from electrical resistivity values.							

ELECTRICAL RESISTIVITY

TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM
68	12.4	100	12.7	200	13.6		

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

25

MATERIAL	Magnesium Alloy--AZ92A				HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Al	Zn	Mn	Mg				
	9.0	2.0	0.2	Bal				
FORM	Fabrication--S and PM Cast.							
HEAT TREATMENT	Temper-T6.							
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.							

THERMAL CONDUCTIVITY

TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT
68	33.6	200	38.7	400	44.8	500	47.7
100	35.1	300	41.8				
Data calculated from electrical resistivity values.							

ELECTRICAL RESISTIVITY

TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM
68	12.4	200	13.6	400	15.5	500	16.4
100	12.7	300	14.6				

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

26

MATERIAL	Magnesium Alloy--AZ92A				HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Al	Zn	Mn	Mg				
	9.0	2.0	0.2	Bal				
FORM	Fabrication--S and PM Cast.							
HEAT TREATMENT	Temper-F.							
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.							
REMARKS								

THERMAL CONDUCTIVITY

TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT
68	30.2						
Data calculated from electrical resistivity values.							

ELECTRICAL RESISTIVITY

TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM
68	14.0						

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

27

MATERIAL	Magnesium Alloy--AM100A				HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Al	Zn	Mn	Mg				
	9.3- 10.7	0.3	0.10	Bal				
HEAT TREATMENT	Solution temperature: 790 F, Aging temperature: 400 F, Stabilizing temperature: 500 F, Casting temperature: sand- 1350-1550 F, chill-1200-1500 F.							
REFERENCE	"Materials in Design Engineering", Materials Selector, edited by H. R. Claessens, Vol 46, No. 4 (September, 1957).							
REMARKS	Melting temperature range: 865-1100 F.							

THERMAL CONDUCTIVITY

TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT
212-572	40.7						

COEFFICIENT OF LINEAR THERMAL EXPANSION

TEMP RANGE, F	$P^{-1} \times 10^6$	TEMP RANGE, F	$P^{-1} \times 10^6$	TEMP RANGE, F	$P^{-1} \times 10^6$	TEMP RANGE, F	$P^{-1} \times 10^6$
68-212	14						

SPECIFIC HEAT

TEMP. F	BTU LB-1 F-1	TEMP. F	BTU LB-1 F-1	TEMP. F	BTU LB-1 F-1	TEMP. F	BTU LB-1 F-1
78	0.25						

ELECTRICAL RESISTIVITY

TEMP. F	MICRON- CM			TEMP. F	MICRON- CM		
Room	15.0			Room	17.0		
As cast				Solution treated			
Data assumed to be at room temperature.							

DENSITY

TEMP. F	LB CU IN-3	TEMP. F	LB CU IN-3	TEMP. F	LB CU IN-3	TEMP. F	LB CU IN-3
Room	0.066						
Data assumed to be at room temperature.							

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

28

MATERIAL	Magnesium Alloy--AM100A			HEAT NUMBER				
CHEMICAL COMPOSITION PER CENT	Al	Mn	Mg					
	10.0	0.2	Bal					
FORM	Fabrication--S and PM Cast.							
HEAT TREATMENT	Temper-T4.							
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.							
REMARKS								

THERMAL CONDUCTIVITY

TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT
68	25.1						
Data calculated from electrical resistivity values.							

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

29

MATERIAL	Magnesium Alloy--AM100A			HEAT NUMBER				
CHEMICAL COMPOSITION PER CENT	Al	Mn	Mg					
	10.0	0.2	Bal					
FORM	Fabrication S and PM Cast.							
HEAT TREATMENT	Temper-T6.							
REFERENCE	Unpublished data, obtained from the Dow Metal Products Company, A Division of The Dow Chemical Company.							
REMARKS								

THERMAL CONDUCTIVITY

TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT
68	33.6	200	38.5	400	44.5	500	47.2
100	35.1	300	41.6				
Data calculated from electrical resistivity values.							

ELECTRICAL RESISTIVITY

TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM
68	12.4	200	13.7	400	15.6	500	16.6
100	12.7	300	14.7				

MATERIAL	Magnesium Alloy--AM100A			HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Al	Mn	Mg				
	10.0	0.2	Bal				
FORM	Fabrication--S and PM Cast.						
HEAT TREATMENT	Temper-T61.						
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.						
REMARKS							

COEFFICIENT OF LINEAR THERMAL EXPANSION

TEMP RANGE, F	$\rho^{-1} \times 10^6$	TEMP RANGE, F	$\rho^{-1} \times 10^6$	TEMP RANGE, F	$\rho^{-1} \times 10^6$	TEMP RANGE, F	$\rho^{-1} \times 10^6$
58	36.5						
Data calculated from electrical resistivity values.							

ELECTRICAL RESISTIVITY

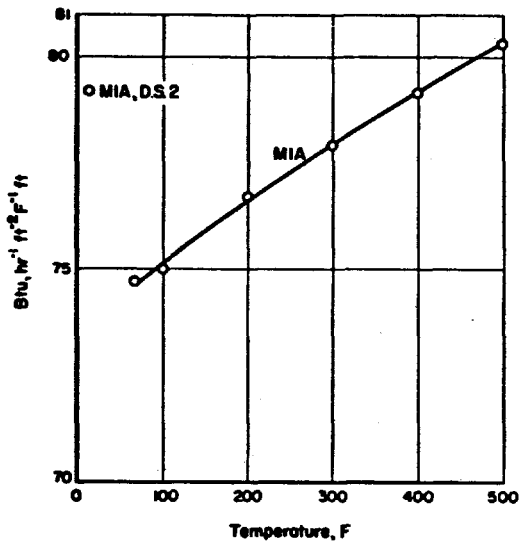
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MATERIAL	Magnesium Alloy--AM100A				HEAT NUMBER			
CHEMICAL COMPOSITION PER CBT	Al	Mn	Mg					
	10.0	0.2	Bal					
FORM	Fabrication--S and PM Cast.							
HEAT TREATMENT	Temper-F.							
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.							
REMARKS								

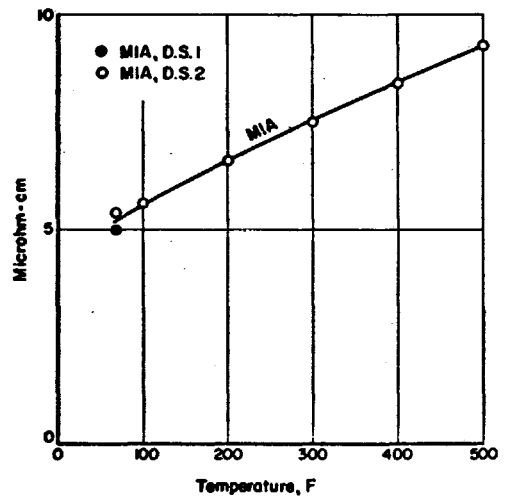
THERMAL CONDUCTIVITY

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MAGNESIUM-MANGANESE ALLOYS



THERMAL CONDUCTIVITY OF MAGNESIUM-MANGANESE ALLOYS



ELECTRICAL RESISTIVITY OF MAGNESIUM-MANGANESE ALLOYS

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

1

MATERIAL		MAGNESIUM ALLOY--MLA						HEAT NUMBER	
CHEMICAL COMPOSITION PER CENT	Mn	Mg							
	1.20 min	Bal							
FORM									
HEAT TREATMENT									
REFERENCE									

THERMAL CONDUCTIVITY

TEMP. F	STU HR-1 FT-3 P-1 FT	TEMP. F	STU HR-1 FT-3 P-1 FT	TEMP. F	STU HR-1 FT-3 P-1 FT	TEMP. F	STU HR-1 FT-3 P-1 FT
212-372	72.6						

COEFFICIENT OF LINEAR THERMAL EXPANSION

TEMP. RANGE, F	P-1 X 10 ⁶	TEMP. RANGE, F	P-1 X 10 ⁶	TEMP. RANGE, F	P-1 X 10 ⁶	TEMP. RANGE, F	P-1 X 10 ⁶
65-212	16	65-250	16				

ELECTRICAL RESISTIVITY

TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM
68	3.0						

DENSITY

TEMP. F	LB CU IN-1	TEMP. F	LB CU IN-1	TEMP. F	LB CU IN-1	TEMP. F	LB CU IN-1
Room	0.064						
Data assumed to be room temperature.							

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

2

MATERIAL		MAGNESIUM ALLOY--MLA						HEAT NUMBER	
CHEMICAL COMPOSITION PER CENT	Mn	Mg							
	1.5	Bal							
FORM									
HEAT TREATMENT									
REFERENCE									

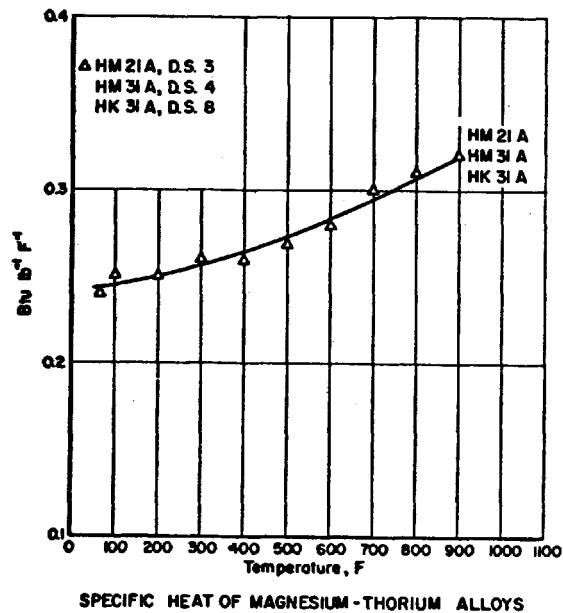
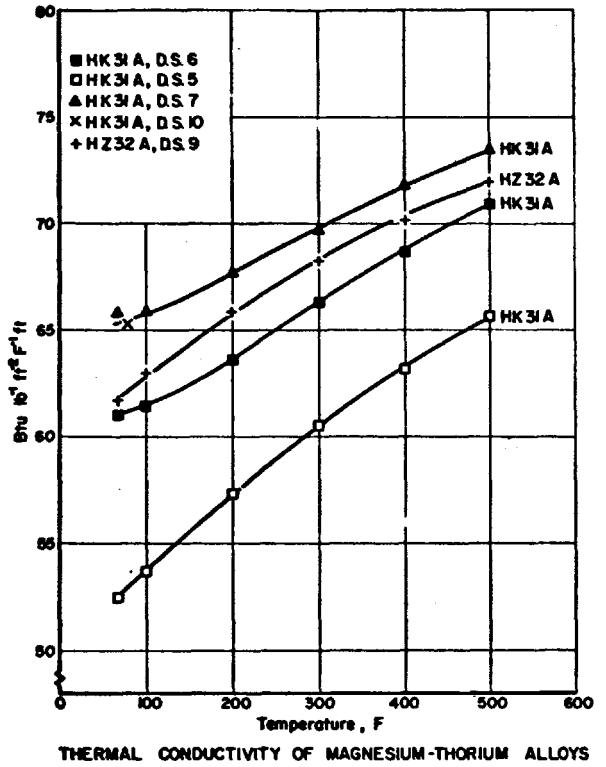
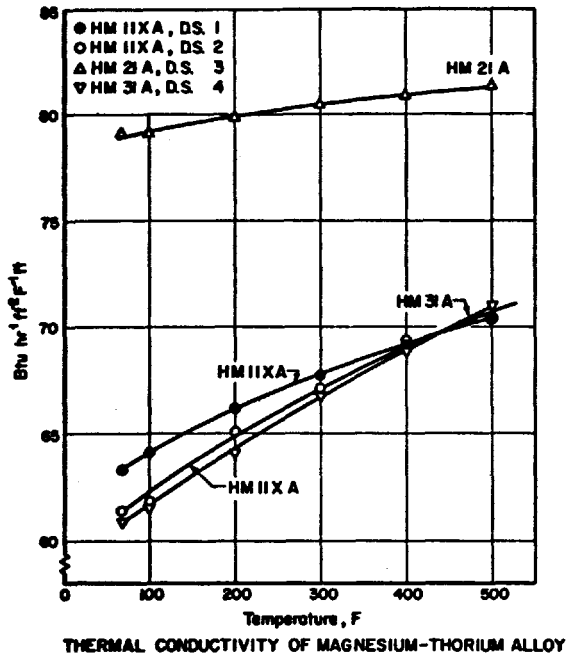
THERMAL CONDUCTIVITY

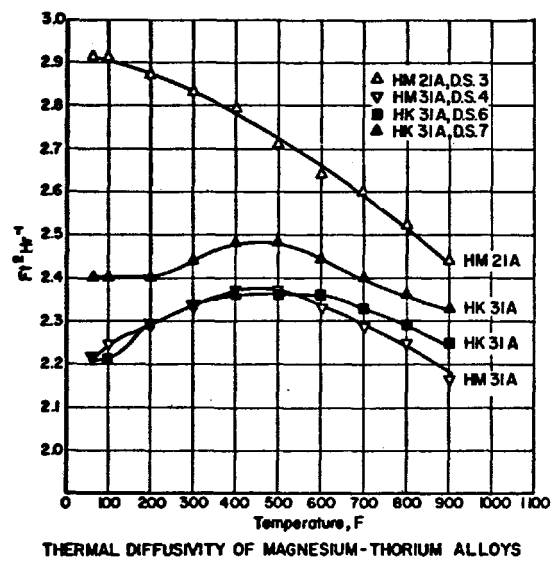
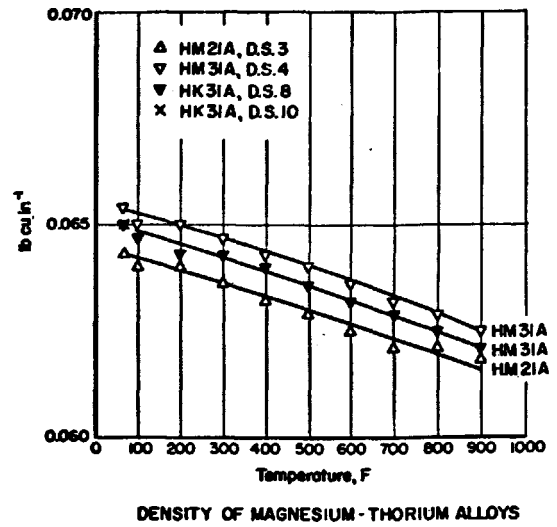
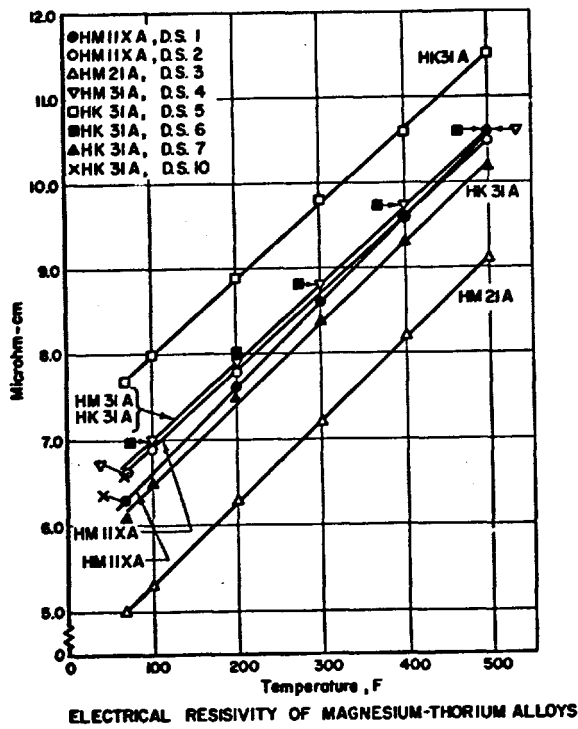
TEMP. F	STU HR-1 FT-3 P-1 FT	TEMP. F	STU HR-1 FT-3 P-1 FT	TEMP. F	STU HR-1 FT-3 P-1 FT	TEMP. F	STU HR-1 FT-3 P-1 FT
68	74.7	200	76.7	400	79.1	500	80.3
100	75.0	300	77.9				
Data calculated from electrical resistivity values.							

ELECTRICAL RESISTIVITY

TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM
68	5.4	200	6.6	400	8.4	500	9.3
100	5.6	300	7.5				

MAGNESIUM-THORIUM ALLOYS





ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

1

MATERIAL	Magnesium Alloy--HM11XA			HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Mn	Th	Mg				
	1.2	1.2	Bal				
FORM	Fabrication--Die Cast.						
HEAT TREATMENT	Temper-T5.						
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.						

THERMAL CONDUCTIVITY

TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT
68	63.6	200	66.3	400	69.2	500	70.4
100	64.1	300	67.7				
Data calculated from electrical resistivity values.							

ELECTRICAL RESISTIVITY

TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM
68	6.3	200	7.6	400	9.6	500	10.6
100	6.6	300	8.6				

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

2

MATERIAL	Magnesium Alloy--HM11XA			HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Mn	Th	Mg				
	1.2	1.2	Bal				
FORM	Fabrication--Die Cast.						
HEAT TREATMENT	Temper-F.						
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.						

THERMAL CONDUCTIVITY

TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT
68	61.4	200	65.1	400	69.4	500	71.4
100	61.9	300	67.2				
Data calculated from electrical resistivity values.							

ELECTRICAL RESISTIVITY

TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM
68	6.6	200	7.8	400	9.6	500	10.5
100	6.9	300	8.7				

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

3

MATERIAL	Magnesium Alloy--HM21A			HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Th	Mn	Mg				
	2.0	0.5	Bal				
FORM	Fabrication--Rolled.						
HEAT TREATMENT	Temper-T8.						
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.						

THERMAL CONDUCTIVITY

TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT
68	72.1	200	72.8	400	80.8	500	81.3
100	79.1	300	80.3				
Data calculated from electrical resistivity values.							

SPECIFIC HEAT

TEMP. F	BTU LB-1 F-1	TEMP. F	BTU LB-1 F-1	TEMP. F	BTU LB-1 F-1	TEMP. F	BTU LB-1 F-1
68	0.24*	300	0.26*	600	0.28	800	0.31
100	0.25*	400	0.26*	700	0.30	900	0.32
200	0.25	500	0.27				
* Extrapolated.							

ELECTRICAL RESISTIVITY

TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM
68	5.0	200	6.3	400	8.2	500	9.1
100	5.3	300	7.2				

DENSITY

TEMP. F	LB CU IN-1	TEMP. F	LB CU IN-1	TEMP. F	LB CU IN-1	TEMP. F	LB CU IN-1
68	0.0643	300	0.0636	600	0.0625	800	0.0621
100	0.0640	400	0.0632	700	0.0621	900	0.0618
200	0.0640	500	0.0629				
Data calculated using density at 68 F and Thermal Expansion.							

DIFFUSIVITY

TEMP. F	FT2 HR-1	TEMP. F	FT2 HR-1	TEMP. F	FT2 HR-1	TEMP. F	FT2 HR-1
68	2.91	300	2.83	600	2.64	800	2.52
100	2.91	400	2.79	700	2.6	900	2.51
200	2.87	500	2.71				
Data calculated from density, specific heat, and thermal conductivity							

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

4

MATERIAL	Magnesium Alloy--HM31A			HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Th	Mn	Mg				
	3.0	1.5	Bal				
FORM	Fabrication--Extruded.						
HEAT TREATMENT	Temper-F.						
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.						
REMARKS							

THERMAL CONDUCTIVITY

TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT
68	60.9	200	64.1	400	68.9	500	70.9
100	61.7	300	66.8				
Data calculated from electrical resistivity values.							

SPECIFIC HEAT

TEMP. F	BTU LB-1 F-1	TEMP. F	BTU LB-1 F-1	TEMP. F	BTU LB-1 F-1	TEMP. F	BTU LB-1 F-1
68	0.24*	300	0.26*	600	0.28	800	0.31
100	0.25*	400	0.26*	700	0.30	CCC	0.33
200	0.25*	500	0.27*				

* Extrapolated.

ELECTRICAL RESISTIVITY

TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM
68	6.6	200	7.9	400	9.7	500	10.6
100	7.0	300	8.8				

DENSITY

TEMP. F	LB CU IN-1	TEMP. F	LB CU IN-1	TEMP. F	LB CU IN-1	TEMP. F	LB CU IN-1
68	0.0654	300	0.0647	600	0.0636	800	0.0629
100	0.0650	400	0.0643	700	0.0632	900	0.0625
200	0.0650	500	0.0640				

Data calculated using Density at 68 F and Thermal Expansion.

DIFFUSIVITY

TEMP. F	FT ² HR-1	TEMP. F	FT ² HR-1	TEMP. F	FT ² HR-1	TEMP. F	FT ² HR-1
68	2.21	300	2.33	600	2.33	800	2.25
100	2.25	400	2.37	700	2.29	900	2.17
200	2.29	500	2.37				

Data calculated from density, specific heat and thermal conductivity.

**ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS**

5

MATERIAL	Magnesium Alloy--HK31A			HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Th	Zr	Mg				
	3.0	0.7	Bal				
FORM	Fabrication--S and PM Cast.						
TREATMENT	Temper-T6.						
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.						
REMARKS							

THERMAL CONDUCTIVITY

TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT
68	52.5	200	57.3	400	63.1	500	65.6
100	53.7	300	60.5				

Data calculated from electrical resistivity values.

ELECTRICAL RESISTIVITY

TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM
68	7.7	200	8.9	400	10.6	500	11.5
100	8.0	300	9.8				

**ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS**

6

MATERIAL	Magnesium Alloy--HK31A			HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Th	Zr	Mg				
	3.0	0.7	Bal				
FORM	Fabrication--Rolled.						
TREATMENT	Temper-O.						
REFERENCE	Unpublished data obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.						

THERMAL CONDUCTIVITY

TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT
68	61.0	200	63.6	400	68.7	500	70.9
100	61.4	300	66.3				

Data calculated from electrical resistivity values.

ELECTRICAL RESISTIVITY

TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM
68	6.6	200	8.0	400	9.7	500	10.6
100	7.0	300	8.8				

DIFFUSIVITY

TEMP. F	FT ² HR-1	TEMP. F	FT ² HR-1	TEMP. F	FT ² HR-1	TEMP. F	FT ² HR-1
68	2.21	300	2.33	600	2.36	800	2.29
100	2.21	400	2.36	700	2.33	900	2.25
200	2.29	500	2.36				

Data calculated from density, specific heat, and thermal conductivity.

**ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS**

7

MATERIAL	Magnesium Alloy--HK31A			HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Th	Zr	Mg				
	3.0	0.7	Bal				
FORM	Fabrication--Rolled.						
TREATMENT	Temper-H24.						
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.						

THERMAL CONDUCTIVITY

TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT
68	65.6	200	67.7	400	71.8	500	73.5
100	65.8	300	69.7				

Data calculated from electrical resistivity values.

ELECTRICAL RESISTIVITY

TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM
68	6.1	200	7.5	400	9.3	500	10.2
100	6.5	300	8.4				

DIFFUSIVITY

TEMP. F	FT ² HR-1	TEMP. F	FT ² HR-1	TEMP. F	FT ² HR-1	TEMP. F	FT ² HR-1
68	2.40	100	2.44	500	2.44	800	2.36
100	2.40	400	2.48	700	2.40		
200	2.40	500	2.48				
Calculated from density, specific heat, and thermal conductivity.							

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

8

MATERIAL			Magnesium Alloy--HK31A			HEAT NUMBER		
CHEMICAL COMPOSITION PER CENT	Th	Zr	Mg					
	3.0	0.7	Bal					
FORM								
HEAT								
TREATMENT								
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.							
REMARKS								

SPECIFIC HEAT

TEMP. F	BTU LB-1 F-1	TEMP. F	BTU LB-1 F-1	TEMP. F	BTU LB-1 F-1	TEMP. F	BTU LB-1 F-1
68	0.24*	300	0.26*	600	0.28	800	0.31
100	0.25*	400	0.26*	700	0.29	900	0.32
200	0.25*	500	0.27				
* Extrapolated.							

DENSITY

TEMP. F	LB CU IN-1	TEMP. F	LB CU IN-1	TEMP. F	LB CU IN-1	TEMP. F	LB CU IN-1
68	0.0650	300	0.0643	600	0.0632	800	0.0625
100	0.0647	400	0.0640	700	0.0629	900	0.0621
200	0.0643	500	0.0636				
Data calculated using density at 68 F and Thermal Expansion.							

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

9

MATERIAL		Magnesium Alloy--HZ32A				HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Th	Zn	Zr	Mg					
	3.0	2.1	0.7	Bal					
FORM		Fabrication--S and PM Cast.							
HEAT									
TREATMENT		Temper-T5.							
REFERENCE		Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.							
REMARKS									

THERMAL CONDUCTIVITY

TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT
68	61.7	200	65.8	400	70.2	500	72.1
100	62.9	300	69.2				
Data calculated from electrical resistivity values.							

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

10

MATERIAL		HK31A-H24				HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Th	Zr	Mn	Mg					
	2.5	0.45							
	4.0	1.0	0.15	Bal					
FORM		Sheet--0.064 in.							
HEAT									
TREATMENT									
REFERENCE	Weiss, V., Schaeffer, G. T., Saule, A. and Sachs, G. "Thermal Cycling Under Constant Load to Low Temperatures of Aluminum and Magnesium Alloys."								
REMARKS									

THERMAL CONDUCTIVITY

TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT
77	65.3						

COEFFICIENT OF LINEAR THERMAL EXPANSION

TEMP RANGE, F	F-1 X 10 ⁶	TEMP RANGE, F	F-1 X 10 ⁶	TEMP RANGE, F	F-1 X 10 ⁶	TEMP RANGE, F	F-1 X 10 ⁶
68-(-328)	5.9-14.1	68-212	14.5	68-392	15.0		

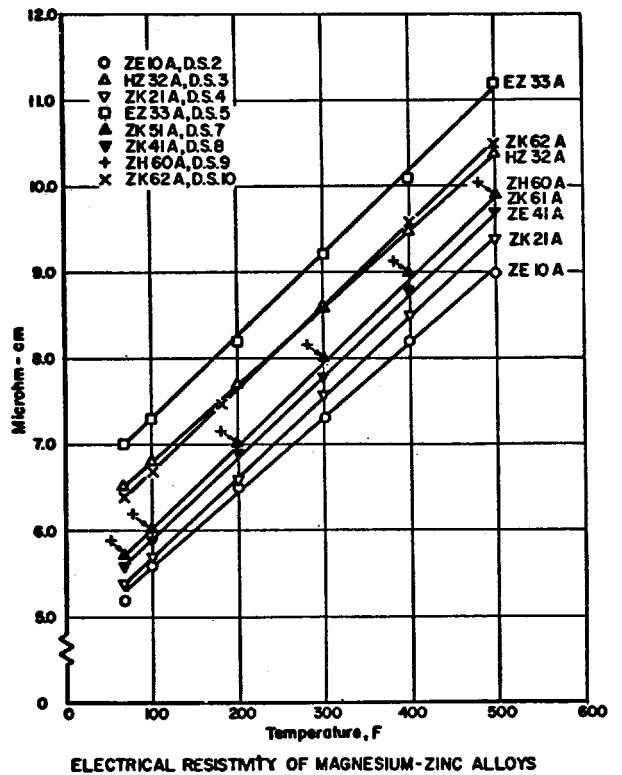
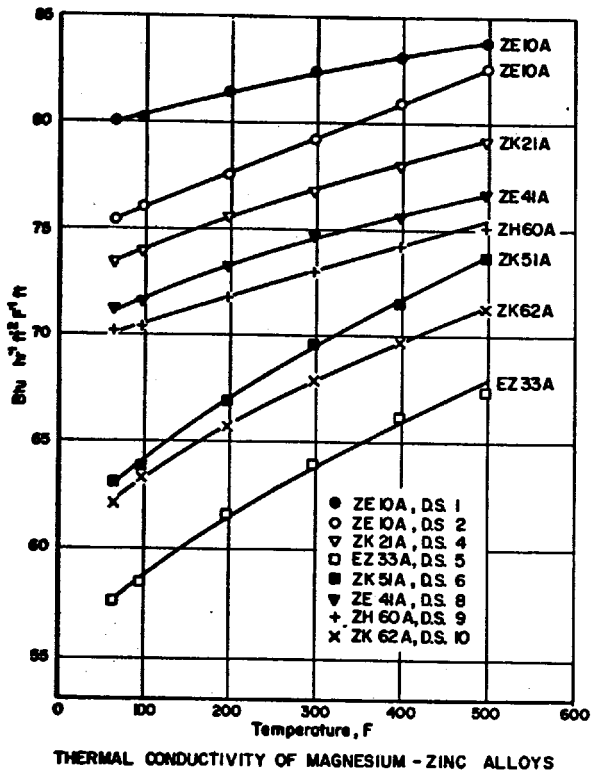
ELECTRICAL RESISTIVITY

TEMP. F	MICROHM- CM	TEMP. F	MICROHM- CM	TEMP. F	MICROHM- CM	TEMP. F	MICROHM- CM
68	6.3						

DENSITY

TEMP. F	LB CU IN-1	TEMP. F	LB CU IN-1	TEMP. F	LB CU IN-1	TEMP. F	LB CU IN-1
Room	0.065						
Data assumed to be at room temperature.							

MAGNESIUM-ZINC ALLOYS



ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

1

MATERIAL	Magnesium Alloy--ZE10A				HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Zn	TRE*	Mg					
	1.2	0.2	Bal					
	* "mischmetal"							
FORM	Fabrication--Rolled.							
HEAT TREATMENT	Temper-0.							
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.							

THERMAL CONDUCTIVITY

TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT
68	80.1	200	81.5	400	83.2	500	83.9
100	80.3	300	82.5				
Data calculated from electrical resistivity values.							

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

2

MATERIAL	Magnesium Alloy--ZE10A				HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Zn	TRE*	Mg					
	1.2	0.2	Bal					
	* "mischmetal"							
FORM	Fabrication--Rolled.							
HEAT TREATMENT	Temper-H24.							
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.							

THERMAL CONDUCTIVITY

TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT
68	75.5	200	77.6	400	81.0	500	82.7
100	76.0	300	79.3				
Data calculated from electrical resistivity values.							

ELECTRICAL RESISTIVITY

TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM
68	5.2	200	6.5	400	8.2	500	9.0
100	5.6	300	7.1				

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

3

MATERIAL	Magnesium Alloy--HZ32A				HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Th	Zn	Mg					
	3.0	2.1	Bal					
FORM	Fabrication--S and PM Cast.							
HEAT TREATMENT	Temper-T5.							
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.							

ELECTRICAL RESISTIVITY

TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM
68	6.5	300	8.6	400	9.5	500	10.4
100	6.8	200	7.7				

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

4

MATERIAL	Magnesium Alloy--ZK21A				HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Zn	Zr	Mg					
	2.3	0.6	Bal					
FORM	Fabrication--Extruded.							
HEAT TREATMENT	Temper-F.							
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.							

THERMAL CONDUCTIVITY

TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT
68	73.5	200	75.7	400	78.1	500	79.1
100	74.0	300	76.9				
Data calculated from electrical resistivity values.							

ELECTRICAL RESISTIVITY

TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM
68	5.4	200	6.6	400	8.5	500	9.4
100	5.7	300	7.6				

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

5

MATERIAL	Magnesium Alloy--EZ33A				HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	TRE*	Zn	Zr	Mg				
	3.0	2.6	0.65	Bal				
	* "mischmetal"							
FORM	Fabrication--S and PM Cast.							
HEAT TREATMENT	Temper-T5.							
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.							

THERMAL CONDUCTIVITY

TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT
68	57.6	200	61.7	400	66.3	500	67.5
100	58.5	300	64.1				
Data calculated from electrical resistivity values.							

ELECTRICAL RESISTIVITY

TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM
68	7.0	200	8.2	400	10.1	500	11.2
100	7.3	300	9.2				

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

6

MATERIAL	Magnesium Alloy--ZK51A				HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Zn	Zr	Mg					
	4.6	0.7	Bal					
FORM	Fabrication--S and PM Cast.							
HEAT TREATMENT	Temper-T5.							
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.							

THERMAL CONDUCTIVITY

TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT
68	63.1	200	67.0	400	71.6	500	73.8
100	63.9	300	69.7				
Data calculated from electrical resistivity values.							

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

7

MATERIAL	Magnesium Alloy--ZK51A			HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Zn	Zr	Mg				
	4.6	0.7	Bal				
FORM	Fabrication--extruded.						
HEAT TREATMENT	Temper-T5.						
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.						
REMARKS							

ELECTRICAL RESISTIVITY

TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM
68	5.7	200	7.0	400	9.0	500	9.9
100	6.0	300	8.0				

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

8

MATERIAL	Magnesium Alloy--ZE41A			HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Zn	TRE*	Zr	Mg			
	4.6	1.2	0.7	Bal			
	* "mischmetal"						
FORM	Fabrication--S and PM Cast.						
HEAT TREATMENT	Temper-T5.						
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.						
REMARKS							

COEFFICIENT OF LINEAR THERMAL EXPANSION

TEMP. RANGE, F	F-1 X 10 ⁶	TEMP. RANGE, F	F-1 X 10 ⁶	TEMP. RANGE, F	F-1 X 10 ⁶	TEMP. RANGE, F	F-1 X 10 ⁶
68	71.3	200	73.3	400	75.7	500	76.9
100	71.6	300	74.8				
Data calculated from electrical resistivity values.							

ELECTRICAL RESISTIVITY

TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM
68	5.6	200	6.9	400	8.8	500	9.7
100	5.9	300	7.8				

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

9

MATERIAL	Magnesium Alloy--ZK60A			HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Zn	Zr	Mg				
	5.7	0.6	Bal				
FORM	Fabrication--extruded.						
HEAT TREATMENT	Temper-T5.						
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.						
REMARKS							

THERMAL CONDUCTIVITY

TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT
68	70.2	200	71.8	400	74.3	500	75.2
100	70.4	300	73.1				
Data calculated from electrical resistivity values.							

ELECTRICAL RESISTIVITY

TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM
68	5.7	200	7.0	400	9.0	500	9.9
100	6.0	300	8.0				

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

10

MATERIAL	Magnesium Alloy--ZH52A			HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	Zn	Th	Zr	Mg			
	5.7	1.8	0.7	Bal			
FORM	Fabrication--S and PM Cast.						
HEAT TREATMENT	Temper-T5.						
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.						
REMARKS							

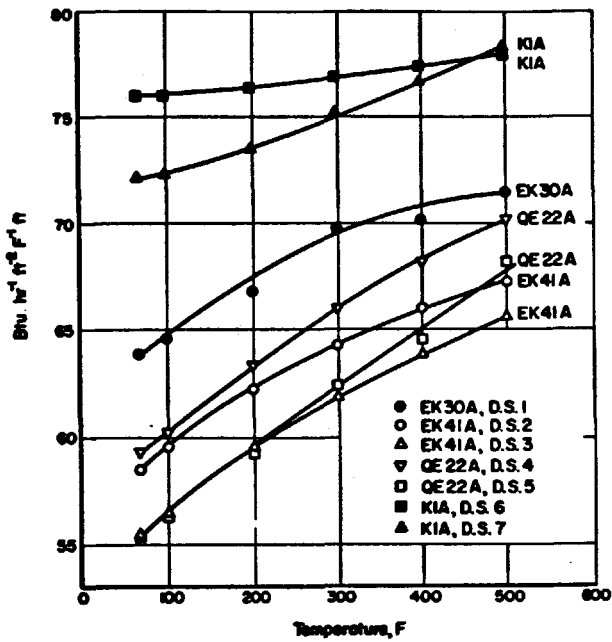
THERMAL CONDUCTIVITY

TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT
68	62.4	200	65.8	400	69.9	500	71.4
100	63.4	300	68.0				
Data calculated from electrical resistivity values.							

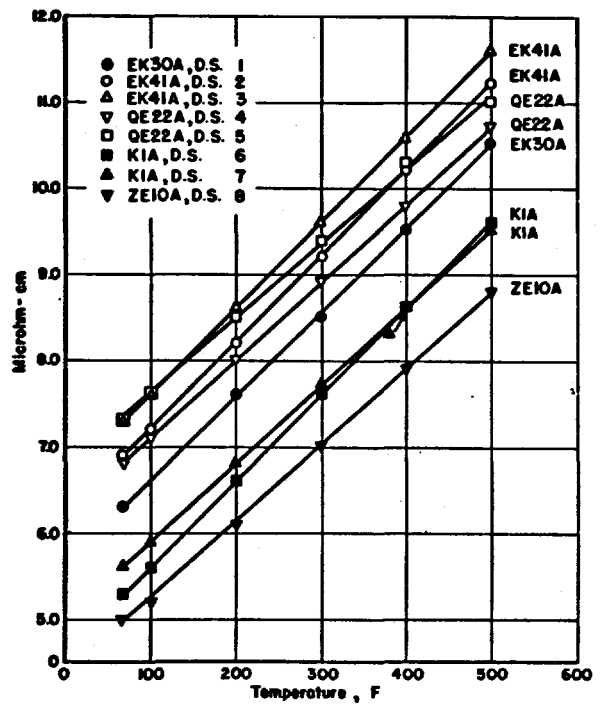
ELECTRICAL RESISTIVITY

TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM
68	6.4	200	7.7	400	9.6	500	10.5
100	6.7	300	8.6				

MAGNESIUM-ZIRCONIUM ALLOYS



THERMAL CONDUCTIVITY OF MAGNESIUM-ZIRCONIUM ALLOYS



ELECTRICAL RESISTIVITY OF MAGNESIUM-ZIRCONIUM ALLOYS

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

1

MATERIAL	Magnesium Alloy--EK30A			HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	TRE*	Zr	Mg				
	3.4	0.3	Bal				
	* "mischmetal"						
FORM	Fabrication--S and PM Cast.						
HEAT TREATMENT	Temper-T6.						
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.						

THERMAL CONDUCTIVITY

TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT
68	63.9	200	66.8	400	70.2	500	71.4
100	64.6	300	68.7				
Data calculated from electrical resistivity values.							

ELECTRICAL RESISTIVITY

TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM
68	6.3	200	7.6	400	9.5	500	10.5
100	6.6	300	8.5				

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

2

MATERIAL	Magnesium Alloy--EK41A			HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	TRE*	Zr	Mg				
	4.0	0.55	Bal				
	* "mischmetal"						
FORM	Fabrication--S and PM Cast.						
HEAT TREATMENT	Temper-T5.						
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.						

THERMAL CONDUCTIVITY

TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT
68	58.3	200	62.2	400	66.0	500	67.2
100	59.5	300	64.3				
Data calculated from electrical resistivity values.							

ELECTRICAL RESISTIVITY

TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM
68	6.9	200	8.2	400	10.2	500	11.2
100	7.2	300	9.2				

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

3

MATERIAL	Magnesium Alloy--EK41A			HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	TRE*	Zr	Mg				
	4.0	0.55	Bal				
	* "mischmetal"						
FORM	Fabrication--S and PM Cast.						
HEAT TREATMENT	Temper-T6.						
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.						

THERMAL CONDUCTIVITY

TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT
68	55.4	200	59.5	400	63.9	500	65.6
100	56.4	300	61.9				
Data calculated from electrical resistivity.							

ELECTRICAL RESISTIVITY

TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM
68	7.3	200	8.6	400	10.5	500	11.6
100	7.6	300	9.5				

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

4

MATERIAL	Magnesium Alloy--QE22A			HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	TRE*	Zr	Mg				
	2.0	0.6	Bal				
	* "mischmetal"						
FORM	Fabrication--S and PM Cast.						
HEAT TREATMENT	Temper-T6.						
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.						

THERMAL CONDUCTIVITY

TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT
68	59.3	200	63.4	400	68.2	500	70.2
100	60.2	300	66.0				
Data calculated from electrical resistivity values.							

ELECTRICAL RESISTIVITY

TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM	TEMP. F	MICRON- CM
68	6.8	200	8.0	400	9.8	500	10.7
100	7.1	300	8.9				

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

5

MATERIAL	Magnesium Alloy--QE22A			HEAT NUMBER			
CHEMICAL COMPOSITION PER CENT	TRE*	Zr	Mg				
	2.0	0.6	Bal				
	* "mischmetal"						
FORM	Fabrication--S and PM Cast.						
HEAT TREATMENT	Temper-F.						
REFERENCE	Unpublished data, obtained from The Dow Metal Products Company, A Division of The Dow Chemical Company.						
REMARKS							

THERMAL CONDUCTIVITY

TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT	TEMP. F	BTU HR-1 FT-2 F-1 FT
68	55.4	200	59.5	400	64.6	500	68.2
100	56.4	300	62.4				
Data calculated from electrical resistivity values.							

6

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

Thermal Conductivity

ELECTRICAL RESISTIVITY

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

THERMAL CONDUCTIVITY

ELECTRICAL RESISTIVITY

ASTM-ASME JOINT COMMITTEE ON EFFECT OF
TEMPERATURE ON PROPERTIES OF METALS

ELECTRICAL RESISTIVITY

TEMP., F	MICROVISA- CM	TEMP., F	MICROVISA- CM	TEMP., F	MICROVISA- CM	TEMP., F	MICROVISA- CM
68	5.0	200	5.1	400	7.9	500	8.8
100	5.2	300	7.0				