TABLE II-1
TYPICAL MAGNETIC PROPERTIES AND CHEMICAL COMPOSITION OF ALNICO MATERIALS

MMPA Brief Designation	Original MMPA Class	IEC Code Reference	Chemical Composition*					Magnetic Properties							
			Al	Ni	Co	Cu	Ti	Max. Energy Product $(BH)_{max}$ (MGOe)	(kJ/m^3)	Residual Induction B_r (gauss)	(mT)	Coercive Force H_c (oersteds)	(kA/m)	Intrinsic Coercive Force H_{ci} (oersteds)	(kA/m)
ISOTROPIC CAST ALNICO															
1.4/0.48	Alnico 1	R1-0-1	12	21	5	3	-	1.4	11.1	7200	720	470	37	480	38
1.7/0.58	Alnico 2	R1-0-4	10	19	13	3	-	1.7	13.5	7500	750	560	45	580	46
1.35/0.50	Alnico 3	R1-0-2	12	25	-	3	-	1.35	10.7	7000	700	480	38	500	40
ANISOTROPIC CAST ALNICO															
5.5/0.64	Alnico 5	R1-1-1	8	14	24	3	-	5.5	43.8	12800	1280	640	51	640	51
6.5/0.67	Alnico 5DG	R1-1-2	8	14	24	3	-	6.5	57.7	13300	1330	670	53	670	53
7.5/0.74	Alnico5-7	R1-1-3	8	14	24	3	-	7.5	59.7	13500	1350	740	59	740	59
3.9/0.80	Alnico 6	R1-1-4	8	16	24	3	1	3.9	31.0	10500	1050	780	62	800	64
5.3/1.9	Alnico 8	R1-1-5	7	15	35	4	5	5.3	42.2	8200	820	1650	131	1860	148
5.0/2.2	Alnico 8HC	R1-1-7	8	14	38	3	8	5.0	39.8	7200	720	1900	151	2170	173
9.0/1.5	Alnico 9	R1-1-6	7	15	35	4	5	9.0	71.6	10600	1060	1500	119	1500	119
ISOTROPIC SINTERED ALNICO															
1.5/0.57	Alnico 2	R1-0-4	10	19	13	3	-	1.5	11.9	7100	710	550	44	570	45
ANISOTROPIC SINTERED ALNICO															
3.9/0.63	Alnico 5	R1-1-10	8	14	24	3	-	3.9	31.0	10900	1090	620	49	630	50
2.9/0.82	Alnico 6	R1-1-11	8	15	24	3	1	2.9	23.1	9400	940	790	63	820	65
4.0/1.7	Alnico 8	R1-1-12	7	15	35	4	5	4.0	31.8	7400	740	1500	119	1690	134
4.5/2.0	Alnico 8HC	R1-1-13	7	14	38	3	8	4.5	35.8	6700	670	1800	143	2020	161

Note: Balance iron for all alloys

TABLE II-4
PHYSICAL PROPERTIES OF ALNICO MATERIALS

MMPA Brief Designation	Original MMPA Class	IEC Code Reference	Density		Tensile Strength		Transverse Modulus of Rupture		Hardness (Rockwell C)	Coefficient of Thermal Expansion 10^{-6}per °C	Electrical Resistivity Ohm-cm x 10^{-6} (at 20°C)
			lbs/in^3	g/cm^3	psi	Pa x 10^6	psi	Pa x 10^6			
1.4/0.48	Alnico 1	R1-0-1	0.249	6.9	4,000	28	14,000	97	45	12.6	75
1.7/0.58	Alnico 2	R1-0-4	0.256	7.1	3,000	21	7,000	48	45	12.4	65
1.35/0.50	Alnico 3	R1-0-2	0.249	6.9	12,000	83	23,000	158	45	13.0	60
5.5/0.64	Alnico 5	R1-1-1	0.264	7.3	5,400	37	10,500	72	50	11.4	47
6.5/0.67	Alnico 5 DG	R1-1-2	0.264	7.3	5,200	36	9,000	62	50	11.4	47
7.5/0.74	Alnico5-7	R1-1-3	0.264	7.3	5,000	34	8,000	55	50	11.4	47
3.9/0.80	Alnico 6	R1-1-4	0.265	7.3	23,000	158	45,000	310	50	11.4	50
5.3/1.9	Alnico 8	R1-1-5	0.262	7.3	10,000	69	30,000	207	55	11.0	53
5.0/2.2	Alnico 8HC	R1-1-7	0.262	7.3	10,000	69	30,000	207	55	11.0	54
9.0/1.5	Alnico 9	R1-1-6	0.262	7.3	7,000	48	8,000	55	55	11.0	53
1.5/0.57	Alnico 2	R1-0-4	0.246	6.8	65,000	448	70,000	483	45	12.4	68
3.9/0.63	Alnico 5	R1-1-10	0.250	6.9	50,000	345	55,000	379	45	11.3	50
2.9/0.82	Alnico 6	R1-1-11	0.250	6.9	55,000	379	100,000	689	45	11.4	54
4.0/1.7	Alnico 8	R1-1-12	0.252	7.0	50,000	345	55,000	379	45	11.0	54
4.5/2.0	Alnico 8HC	R1-1-13	0.252	7.0			55,000	379	45	11.0	54

NOTE: Alnico permanent magnet materials lack ductility, and are inherently extremely brittle. They should not be designed for use as structural components. Measurement of properties such as hardness and tensile strength is not appropriate or feasible on commercial materials but values are shown above for comparison. This data, determined experimentally under controlled laboratory conditions, is a composite of information available from industry and research sources.

TABLE II-5
THERMAL PROPERTIES OF ALNICO MATERIALS

Brief Designation	Original MMPA Class	IEC Code Reference	Reversible Temperature Coefficient % Change per °C			Curie Temperature		Max. Service Temperature	
			Near B_r	Near Max. Energy Prod.	Near H_c	°C	°F	°C	°F
1.5/0.57	Alnico 2	R1-0-4	-0.03	-0.02	-0.02	810	1490	450	840
5.5/0.64	Alnico 5	R1-1-1	-0.02	-0.015	+0.01	860	1580	525	975
3.9/0.80	Alnico 6	R1-1-4	-0.02	-0.015	+0.03	860	1580	525	975
5.3/1.9	Alnico 8	R1-1-5	-0.025	-0.01	+0.01	860	1580	550	1020
5.0/2.2	Alnico 8HC	R1-1-7	-0.025	-0.01	+0.01	860	1580	550	1020
9.0/1.5	Alnico 9	R1-1-6	-0.025	-0.01	+0.01	860	1580	550	1020

NOTE: The above data is a composite of information available from industry and research sources.