



# Alnico

Aluminium, Nickel, Cobalt also referred to as Alnico (Alcomax and Hycomax) is manufactured by traditional foundry casting or sintering techniques and was developed in the 1930's. Its principal applications are for triggering of proximity switches such as reeds and hall effects. Other applications include, instrumentation, high temperature 'pot', holding magnets, horseshoe designs for lifting, entry door locks, NDT, magnetic fluid seals, and ferrous separation including sump plugs.

This material offers the best temperature coefficient (0.02% per degree centigrade) of all permanent magnets, thus making it an ideal choice when a constant field over a wide (-270°C to +500°C) temperature range is required.

The high nickel content results in good stability against corrosion and oxidation, this metallic composition is also a good electrical conductor, however being coarse-grained, hard and brittle, it cannot be drilled or conventionally machined and should not be used as a structural component.

Alnico is a low coercive force material and where possible should be magnetised after assembly. Its performance can be easily reduced by poor handling or exposure to other magnetic fields. Again, because of low coercivity to reach optimum performance, Rod magnets should have a magnetic length of approximately five times the diameter when used in open circuit applications. For example, a rod magnet of 5mm diameter should be 25mm magnetic length.

Because of the Cobalt content within the magnet composition Alnico magnets are often not low cost solutions.

Cast Alnico Grades								
Grade	MMPA	Br	Hcb	(BH) <sub>max</sub>	Curie	Max Working	T <sub>c</sub> of Br	T.C. α(Hcj)
		mT/Gs	kA/m /Oe	kJ/m <sup>3</sup> /MGOe	°C	°C	%/°C	%/°C
		Typ	Typ	Typ	Typ	Typ	Typ	Typ
LN10	ALNICO3 isotropic	800/8000	40/500	10/1.25	750	550	-0.02	-0.03~+0.03
LNG10		800/8000	44/550	10/1.25	750	550	-0.02	-0.03~+0.03
LNG12	ALNICO2 isotropic	700/7000	44/550	12/1.50	800~850	550	-0.02	-0.03~+0.03
LNG13		880/8800	48/600	13/1.63	800~850	550	-0.02	-0.03~+0.03
LNG16	ALNICO4	800/8000	48/600	16/2.00	800~850	550	-0.02	-0.03~+0.03
LNG18		900/9000	48/600	18/2.25	800~850	550	-0.02	-0.03~+0.03
LNG37	ALNICO5 (Alcomax III)	1200/12000	48/600	37/4.63	800~850	550	-0.02	-0.03~+0.03
LNG40		1230/12300	48/600	40/5.00	800~850	550	-0.02	-0.03~+0.03
LNG44		1250/12500	52/650	44/5.50	800~850	550	-0.02	-0.03~+0.03
LNG48	ALNICO5DG	1280/12800	56/700	48/6.00	800~850	550	-0.02	-0.03~+0.03
LNG52		1300/13000	56/700	52/6.50	800~850	550	-0.02	-0.03~+0.03
LNG56	ALNICO5-7	1300/13000	58/720	56/7.00	800~850	550	-0.02	-0.03~+0.03
LNG60		1330/13300	60/750	60/7.50	800~850	550	-0.02	-0.03~+0.03
LNGT28	ALNICO6	1000/10000	56/700	28/3.50	800~850	550	-0.02	-0.03~+0.03
LNGT30		1100/11000	56/700	30/3.75	800~850	550	-0.02	-0.03~+0.03
LNGT18	ALNICO8 (Hycomax III)	580/5800	80/1000	18/2.25	800~850	550	-0.02	-0.03~+0.03
LNGT32		800/8000	100/1250	32/4.00	800~850	550	-0.02	-0.03~+0.03
LNGT38		800/8000	110/1380	38/4.75	800~850	550	-0.02	-0.03~+0.03
LNGT44		850/8500	115/1450	44/5.50	800~850	550	-0.02	-0.03~+0.03
LNGT48	ALNICO8HE	900/9000	120/1500	48/6.00	800~850	550	-0.02	-0.03~+0.03
LNGT60	ALNICO9	900/9000	110/1380	60/7.50	800~850	550	-0.02	-0.03~+0.03
LNGT72		1050/10500	112/1400	72/9.00	800~850	550	-0.02	-0.03~+0.03
LNGT80		1080/10800	120/1500	80/10.00	800~850	550	-0.02	-0.03~+0.03
LNGT88		1100/11000	115/1450	88/11.00	800~850	550	-0.02	-0.03~+0.03
LNGT96		1150/11500	118/1480	96/12.00	800~850	550	-0.02	-0.03~+0.03
LNGT36J	ALNICO8HC	700/7000	140/1750	36/4.50	800~850	550	-0.02	-0.03~+0.03
LNGT48J		800/8000	145/1820	48/6.00	800~850	550	-0.02	-0.03~+0.03
LNGT52J		850/8500	140/1750	52/6.50	800~850	550	-0.02	-0.03~+0.03

Sintered Alnico Grade								
Grade	MMPA	Br	Hcb	(BH)max	Curie	Max Working	T.C. α(Br)	T.C. α(Hcj)
		mT/Gs	kA/m /Oe	kJ/m3/MGOe	°C	°C	%/°C	%/°C
		Typ	Typ	Typ	Typ	Typ	Typ	Typ
FLN8 *	S.ALNICO3	500/5000	40/500	8/1.00	760	450	-0.02	-0.03~+0.03
FLNG12*	S.ALNICO2	650/6500	48/600	12/1.50	800~850	450	-0.02	-0.03~+0.03
FLNGT18	S.ALNICO7	600/6000	90/1130	18/2.20	800~850	450	-0.02	-0.03~+0.03
FLNG34	S.ALNICO5	1200/12000	48/600	34/4.25	800~850	450	-0.02	-0.03~+0.03
FLNGT28	S.ALNICO6	1050/10500	56/700	28/3.50	800~850	450	-0.02	-0.03~+0.03
FLNGT38	S.ALNICO8	800/8000	110/1300	38/4.75	800~850	450	-0.02	-0.03~+0.03
FLNGT42	S.ALNICO8	850/8500	120/1500	42/5.25	800~850	450	-0.02	-0.03~+0.03
FLNGT33J	S.ALNICO8HC	700/7000	140/1750	33/4.13	800~850	450	-0.02	-0.03~+0.03
Note: Curie temperature and temperature coefficient are for reference, but not as inspection base								
* Isotropic Grades								

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