amf magnetics

‘Australia’s Leading Supplier of Permanent Magnets’

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COMPANY PROFILE

AMFmagnetics is Australia's leading supplier of permanent magnets, servicing customers in the aerospace, manufacturing, mining, automotive, engineering, electronics, craft, therapeutic, signage, display, shop-fitting and printing industries, both domestically and internationally.

The company was born out of the merger of Australia's two largest, specialist magnet suppliers **A MAGNETIC FORCE PTY LTD** and **AUSTRALIAN MAGNET TECHNOLOGY**.

A Magnetic Force was established in 1980 primarily supplying magnetic therapy products. As the business developed, industrial and flexible products were added until A Magnetic Force grew to become the largest supplier of magnetic products in Australia, with additional focus on the more technical grades of Neodymium and Samarium Cobalt Rare Earth magnets. The product range grew to include a full range of plastic and value-added products including magnetic and adhesive sheeting, tapes and patches, electromagnets, lifting magnets, pots and engineered products. The company remains the largest supplier of isotropic, anisotropic and multi-poled magnets to Australia's leading magnetic therapists, with product being exported globally.

Australian Magnet Technology was acquired by ***AMFmagnetics*** in 2003 in order to expand its operations in custom made, specialised scientific and engineering products. Established in 1989 AMT focuses on the technical requirements of engineering firms, industrial companies, universities and research institutions. This division specialises in short run prototyping and commercialisation of magnetic applications, harnessing the latest material and manufacturing technologies to continuously push the boundaries of magnetic science.

AMFmagnetics carries the largest stock range of magnets in Australia (Over 400 different sizes and grades of Neodymium, Samarium Cobalt, Alnico and Ferrite magnets).

In addition to these stock products, our exclusive supply partnerships with a number of Asia, Europe and America's leading magnet producers allow us to produce large and small lots of custom made magnets in the shortest time possible. These can be produced to exacting specifications and tolerances, utilizing the latest technology and grades, tailor made for critical applications.

Our technical team is always on hand to answer your questions and advise on the optimal magnet for your application, design issues, and performance tolerances. While our shipping department will manage every aspect of the logistics chain, from factory floor to your door, allowing us to ship goods (both local, interstate and international) efficiently, ensuring that your orders are expedited in the shortest possible time.

PRODUCTS

Ferrite Magnets

- Sintered (powder metallurgical) production process
- Chemical composition: $Sr_{0.6}Fe_2O_3$
- Relatively hard & brittle
- Good resistance to demagnetization
- Excellent resistance to corrosion
- Excellent temperature stability
- Abundant raw material providing excellent low cost option

Neodymium Magnets

- Sintered (powder metallurgical) production process
- Chemical composition: $Nd_2Fe_{14}B$
- Very hard & brittle
- Excellent resistance to demagnetization
- Poor resistance to corrosion
- Good temperature stability
- High performance material provides excellent cost to performance ratio

Samarium Cobalt Magnets

- Sintered (powder metallurgical) production process
- Chemical composition: $SmCo_5$ / Sm_2Co_{17}
- Extremely hard & brittle
- Very high resistance to demagnetization
- Excellent resistance to corrosion
- Outstanding temperature stability
- Limited raw material supply limits use to specialised applications

PRODUCTS

Alnico Magnets

- Sintered (powder metallurgical) or Cast production process
- Chemical composition: Al-Ni-Fe-Co
- Very hard & brittle
- Poor resistance to demagnetization
- Good resistance to corrosion
- Excellent temperature stability
- Low performance magnet offering good cost to performance ratio in specific applications

Injection Bonded Magnets

- Thermoplastic / magnetic powder injection moulding production process
- Chemical composition: NdFeB or SrFe powder / thermoplastic carrier
- Allows possibility of combining other components with magnet during production
- Excellent option when producing complicated shapes
- Good resistance to corrosion and chipping
- Allows very flexible magnetization options

Flexible Magnets

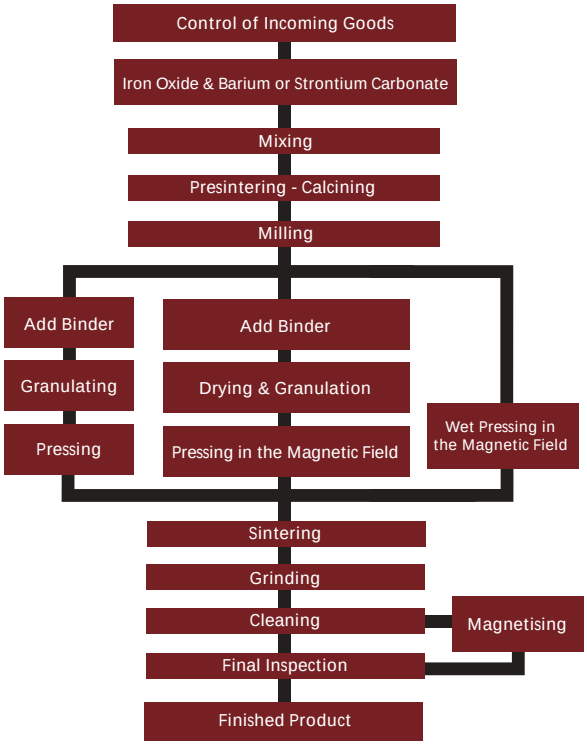
- Thermoplastic / magnetic powder calendaring / extrusion production process
- Chemical composition: SrFe powder / thermoplastic carrier
- Good resistance to demagnetization
- Good resistance to chemical agents / solvents
- Available in sheets / strips / profiles
- Can be stamped / slit / punched / laminated
- Varied applications across a broad range of industries

Ferrite Magnets

Typical Physical Properties

Parameter		
Curie Temperature	°C	450
Max. Operating Temperature	°C	250
Hardness	Hv	480-580
Density	g/cm^3	4.8-4.9
Relative Recoil Permeability	μ_{rec}	1.05-1.20
Saturation Field Strength	kOe	10
	kA/m	800
Temperature Coefficient of Br	%/°C	- 0.2
Temperature Coefficient of iHc	%/°C	0.3
Tensile Strength	N/mm^2	<100
Transverse Rupture Strength	N/mm^2	300

Production Flow Diagram



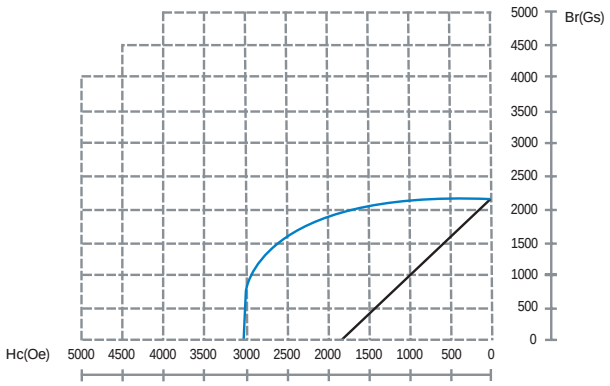
Typical Magnetic Properties

Material	Iso/ Anisotropic	Remanence		Coercivity		Intrinsic Coercivity		Max. Energy Product	
		Br(mT)	Br(Gs)	bHc(kA/m)	bHc(Oe)	iHc(kA/m)	iHc(Oe)	(BH)max(KJ/m^3)	(BH)max(MGOe)
Y10	Isotropic	200-235	2,000-2,350	125-160	1,570-2,010	210-280	2,640-3,520	6.5-9.5	0.8-1.2
Y25	Anisotropic	360-400	3,600-4,000	135-170	1,700-2,140	140-200	1,760-2,510	22.5-28.0	2.8-3.5
Y30	Anisotropic	370-400	3,700-4,000	175-210	2,200-2,640	180-220	2,260-2,770	26.0-30.0	3.3-3.8
Y30BH	Anisotropic	380-400	3,800-4,000	230-275	2,890-3,460	235-290	2,950-3,650	27.0-32.5	3.4-4.1
Y33	Anisotropic	410-430	4,100-4,300	220-250	2,770-3,140	225-255	2,830-3,210	31.5-35.0	4.0-4.4
Y35	Anisotropic	400-420	4,000-4,200	160-190	2,010-2,380	165-195	2,070-2,450	30.0-33.5	3.8-4.2

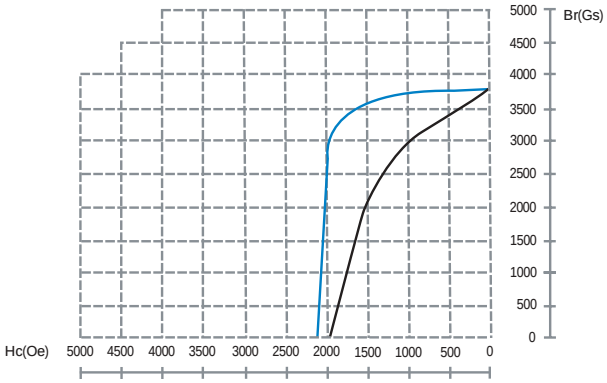
Typical Demagnetization Curves

1 = f(H) B = f(H)

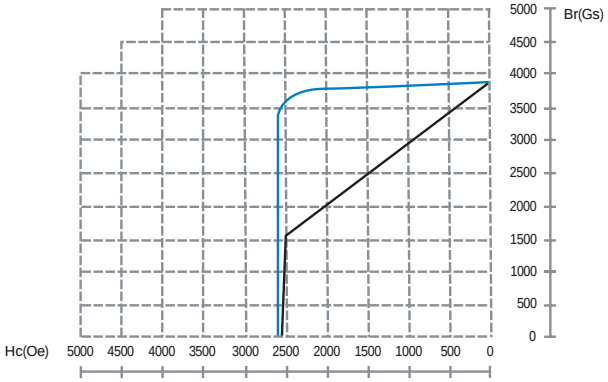
Y10 Isotropic Ferrite Grade



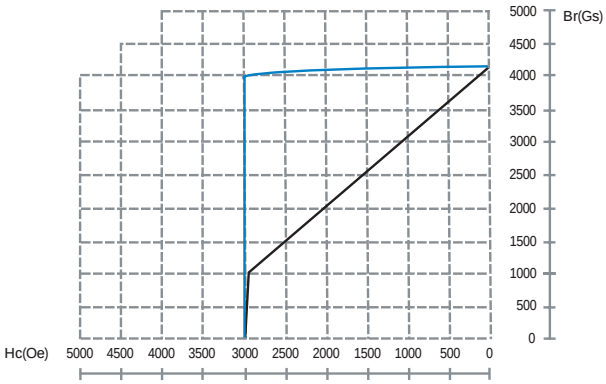
Y25 Anisotropic Ferrite Grade



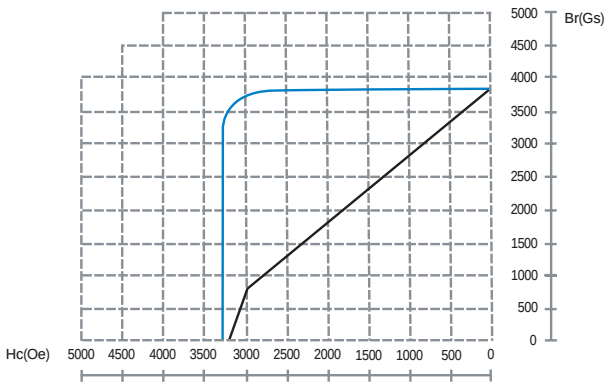
Y30 Anistotropic Ferrite Grade



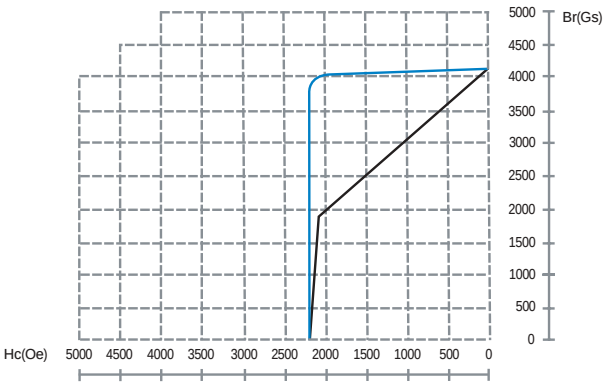
Y33 Anisotropic Ferrite Grade



Y30 Anistotropic Ferrite Grade



Y35 Anisotropic Ferrite Grade

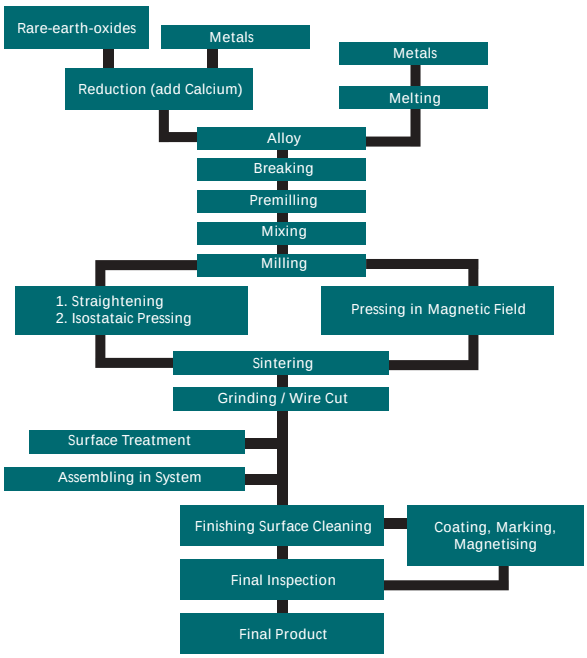


Neodymium Magnets

Typical Physical Properties

Parameter		
Curie Temperature	^{o}C	310-370
Maximum Operating Temp.	^{o}C	80-180
Hardness	Hv	560-580
Resistivity	$\mu\Omega$.cm	160
Density	g/cm^3	7.4
Relative Recoil Permeability	μrec	1.05
Saturation Field Strength	kOe	30-40
	kA/m	2,400-3,200
Temperature Coefficient of Br	%/^{o}C	-0.12 ~-0.10
Temperature Coefficient of iHc	%/^{o}C	-0.6

Production Flow Diagram



Surface Treatments

Type	Information
Metallic	Zinc, Nickel, Nickel+Nickel, Nickel+Tin, Nickel+Copper+Nickel, Gold
Organic	Epoxy, Nickel+Epoxy coating
Temporary	Surface Passivation

Dimension Range / Nominal Tolerance

Ring	Outer Dia.	Inner Dia.	Thickness
Maximum	200mm	180mm	50.00mm
Minimum	2.60mm	1.80mm	0.50mm
Tolerance	+/-0.1mm	+/-0.1mm	+/-0.1mm

Disc	Diameter	Thickness
Maximum	200mm	50.00mm
Minimum	1.20mm	0.50mm
Tolerance	+/-0.1mm	+/-0.1mm

Block	Length	Width	Thickness
Maximum	200.00mm	80.00mm	50.00mm
Minimum	2.0mm	1.50mm	0.50mm
Tolerance	+/-0.1mm	+/-0.1mm	+/-0.1mm

Segment & other irregular shapes

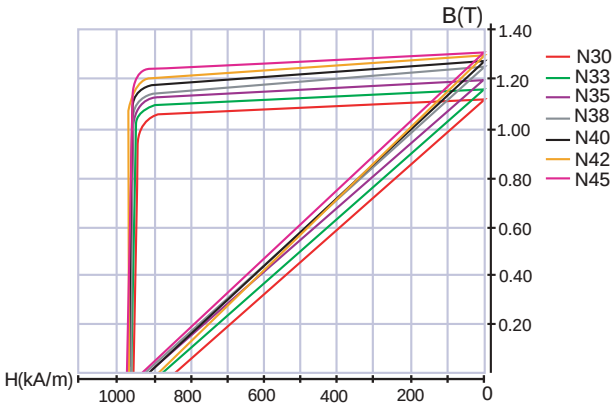
Can be manfactured according to customer's sample or blue print

Typical Magnetic Properties

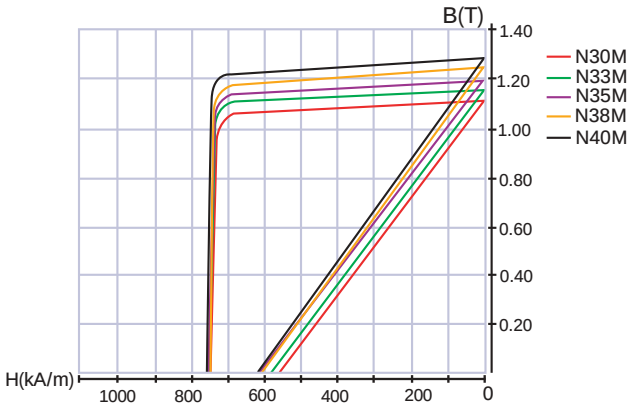
Grade	Maximum Operating Temperature	Remanence				Coercivity		Intrinsic Coercivity		Max. Energy Product			
		Br(T)		Br(kGs)		bHc(kA/m)	bHc(Oe)	iHc(kA/m)	iHc(Oe)	(BH)max(KJ/m)		(BH)max(MGOe)	
		Max.	Min.	Max.	Min.					Max.	Min.	Max.	Min.
N30	<=80	1.17	1.09	11.7	10.9	>=796	>=10.0	>=955	>=12	255	223	32	28
N33	<=80	1.22	1.14	12.2	11.4	>=836	>=10.5	>=955	>=12	279	247	35	31
N35	<=80	1.25	1.18	12.5	11.8	>=859	>=10.8	>=955	>=12	294	263	37	33
N38	<=80	1.30	1.23	13.0	12.3	>=859	>=10.8	>=955	>=12	318	286	40	36
N40	<=80	1.32	1.26	13.2	12.6	>=836	>=10.5	>=955	>=12	334	302	42	38
N42	<=80	1.35	1.30	13.5	13.0	>=836	>=10.5	>=955	>=12	350	318	44	40
N45	<=80	1.38	1.32	13.8	13.2	>=836	>=10.5	>=875	>=11	366	334	46	42
N48	<=80	1.43	1.37	14.3	13.7	>=836	>=10.5	>=875	>=11	390	358	49	45
N50	<=80	1.46	1.40	14.6	14.0	>=836	>=10.5	>=875	>=11	406	374	51	47
N30M	<=100	1.17	1.09	11.7	10.9	>=812	>=10.2	>=1,114	>=14	255	223	32	28
N33M	<=100	1.22	1.14	12.2	11.4	>=851	>=10.7	>=1,114	>=14	279	247	35	31
N35M	<=100	1.25	1.18	12.5	11.8	>=875	>=11.0	>=1,114	>=14	294	263	37	33
N38M	<=100	1.30	1.23	13.0	12.3	>=915	>=11.5	>=1,114	>=14	318	286	40	36
N40M	<=100	1.32	1.26	13.2	12.6	>=939	>=11.8	>=1,114	>=14	334	302	42	38
N42M	<=100	1.35	1.30	13.5	13.0	>=955	>=12.0	>=1,114	>=14	350	318	44	40
N45M	<=100	1.38	1.32	13.8	13.2	>=971	>=12.2	>=1,114	>=14	366	334	46	42
N27H	<=120	1.11	1.02	11.1	10.2	>=780	>=9.8	>=1,353	>=17	231	199	29	25
N30H	<=120	1.17	1.09	11.7	10.9	>=812	>=10.2	>=1,353	>=17	255	223	32	28
N33H	<=120	1.22	1.14	12.2	11.4	>=851	>=10.7	>=1,353	>=17	279	247	35	31
N35H	<=120	1.25	1.18	12.5	11.8	>=875	>=11.0	>=1,353	>=17	294	263	37	33
N38H	<=120	1.30	1.23	13.0	12.3	>=915	>=11.5	>=1,353	>=17	318	286	40	36
N41H	<=120	1.32	1.26	13.2	12.6	>=939	>=11.8	>=1,273	>=16	334	302	42	38
N44H	<=120	1.37	1.30	13.7	13.0	>=963	>=12.1	>=1,273	>=16	358	326	45	41
N27SH	<=150	1.11	1.02	11.1	10.2	>=780	>=9.8	>=1,592	>=20	231	199	29	25
N30SH	<=150	1.17	1.09	11.7	10.9	>=812	>=10.2	>=1,592	>=20	255	223	32	28
N33SH	<=150	1.22	1.14	12.2	11.4	>=851	>=10.7	>=1,592	>=20	279	247	35	31
N35SH	<=150	1.25	1.18	12.5	11.8	>=875	>=11.0	>=1,592	>=20	294	263	37	33
N39SH	<=150	1.30	1.23	13.0	12.3	>=923	>=11.6	>=1,592	>=20	318	286	40	36
N42SH	<=150	1.34	1.28	13.4	12.8	>=955	>=12.0	>=1,512	>=19	342	310	43	39
N25UH	<=180	1.07	0.98	10.7	9.8	>=732	>=9.2	>=1,989	>=25	215	183	27	23
N28UH	<=180	1.13	1.04	11.3	10.4	>=780	>=9.8	>=1,989	>=25	239	207	30	26
N30UH	<=180	1.17	1.09	11.7	10.9	>=812	>=10.2	>=1,989	>=25	255	223	32	28
N33UH	<=180	1.22	1.14	12.2	11.4	>=851	>=10.7	>=1,989	>=25	279	247	35	31
N35UH	<=180	1.25	1.18	12.5	11.8	>=875	>=11.0	>=1,989	>=25	294	263	37	33
N25EH	<=200	1.07	0.98	10.7	9.8	>=732	>=9.2	>=2,387	>=30	215	183	27	23
N28EH	<=200	1.13	1.05	11.3	10.5	>=780	>=9.8	>=2,387	>=30	239	207	30	26
N30EH	<=200	1.17	1.09	11.7	10.9	>=812	>=10.2	>=2,387	>=30	255	223	32	28

Typical Demagnetization Curves

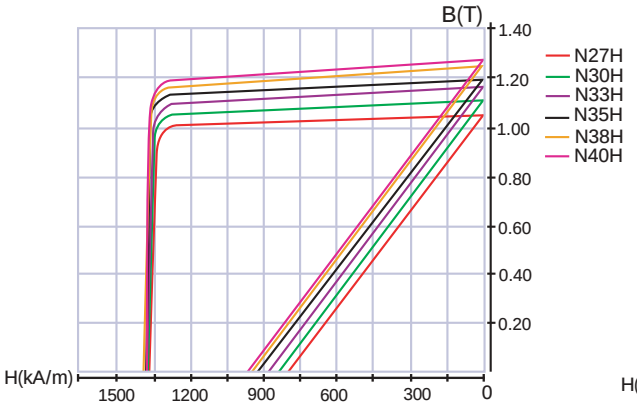
N Grade Demagnetization Curve



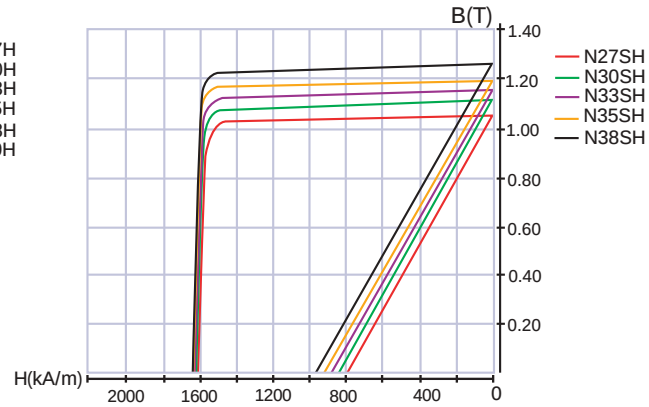
NM Grade Demagnetization Curve



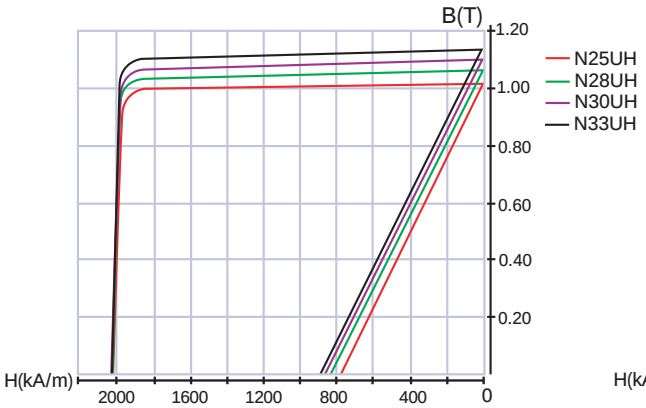
NH Grade Demagnetization Curve



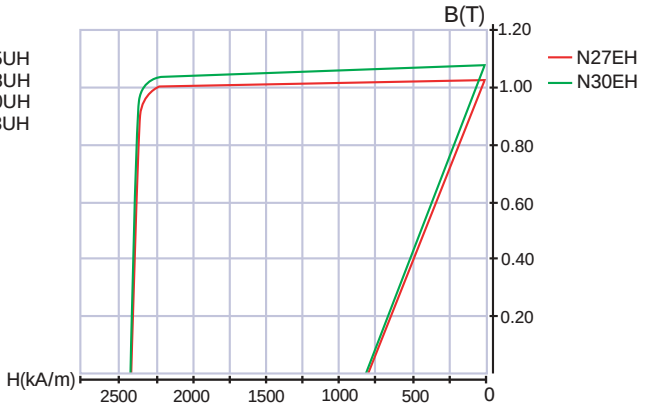
NSH Grade Demagnetization Curve



NUH Grade Demagnetization Curve



NEH Grade Demagnetization Curve

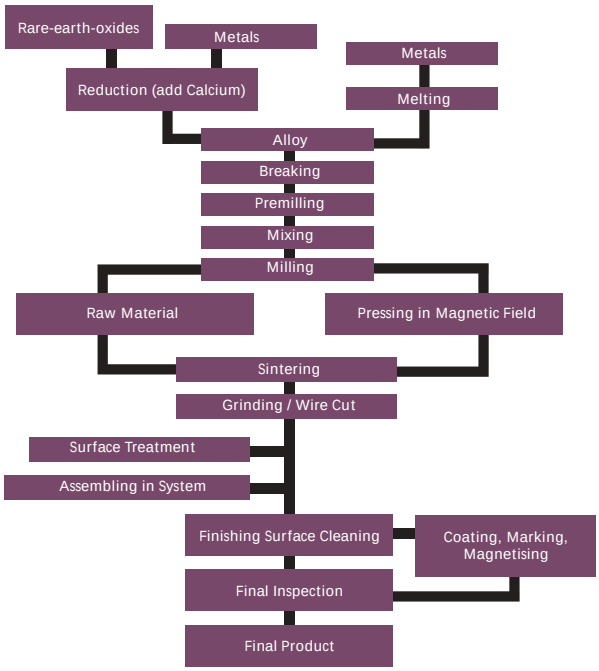


Samarium Cobalt Magnets

Typical Physical Properties

Parameter		
Curie Temperature	°C	700-800
Max. Operating Temperature	°C	250
Resistivity	μΩ.cm	50-90
Hardness	Hv	450-600
Density	g/cm^3	8.0-8.5
Relative Recoil Permeability	μrec	1.10
Saturation Field Strength	kOe	> 37.5
	kA/m	> 3,000
Temperature Coefficient of Br	%/°C	- 0.05~-0.03
Temperature Coefficient of iHc	%/°C	- 0.25~-0.19

Production Flow Diagram



Typical Magnetic Properties

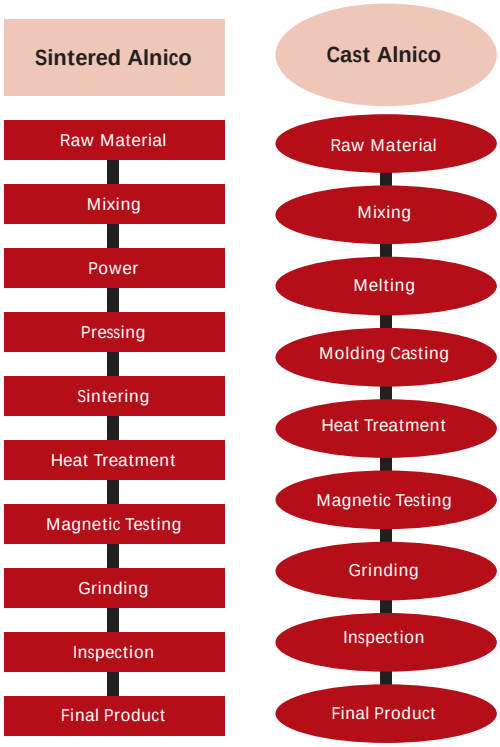
Material	Grade	Remanence		Coercivity		Intrinsic Coercivity		Max. Energy Product	
		Br(mT)	Br(kGs)	bHc(kA/m)	bHc(kOe)	iHc(kA/m)	iHc(kOe)	(BH)max(KJ/m)	(BH)max(MGOe)
$SmCo_5$	S16	750-800	7.5-8.0	557-637	7.0-8.0	>=1,989	>=25	111-143	14-18
	S18	800-930	8.0-9.3	597-677	7.5-8.5	>=1,432	>=18	127-159	16-20
	S20	850-980	8.5-9.8	597-677	7.5-8.5	>=1,273	>=16	143-175	18-22
Sm_2Co_{17}	S180	900-1,030	9.0-10.3	597-677	7.5-8.5	>=1,194	>=15	127-159	16-20
	S22A	900-1,030	9.0-10.3	613-693	7.7-8.7	>=1,989	>=25	159-191	20-24
	S22B	900-1,030	9.0-10.3	613-693	7.7-8.7	>=1,432	>=18	159-191	20-24
	S240	980-1,080	9.0-10.8	636-716	8.0-9.0	>=1,432	>=18	175-207	22-26
	S26A	1,000-1,130	10.0-11.3	676-756	8.5-9.5	>=1,194	>=15	191-223	24-28
	S26B	1,000-1,130	10.0-11.3	676-756	8.5-9.5	>=796	>=10	191-223	24-28
	S280	1,030-1,130	10.3-11.3	716-796	9.0-10.0	>=1,432	>=18	207-239	26-30
	S270	1,000-1,100	10.0-11.0	357-516	4.5-6.5	>=413	>=5.2	183-223	24-28
	S300	1,100-1,200	11.0-12.0	438-517	5.5-6.5	>=454	>=5.7	223-255	28-32

Alnico Magnets

Typical Physical Properties

Parameter		
Curie Temperature	^{o}C	860
Max. Operating Temperature	^{o}C	525-550
Resistivity	$\mu\Omega$.cm	47-54
Hardness	Hv	520-630
Density	g/cm^3	6.9-7.30
Relative Recoil Permeability	μrec	1.70-4.70
Saturation Field Strength	kOe	2.7-6.3
	kA/m	215-500
Temperature Coefficient of Br	$\%/^{o}C$	- 0.025~-0.02
Temperature Coefficient of iHc	$\%/^{o}C$	+0.01~+0.03

Production Flow Diagram



Typical Magnetic Properties

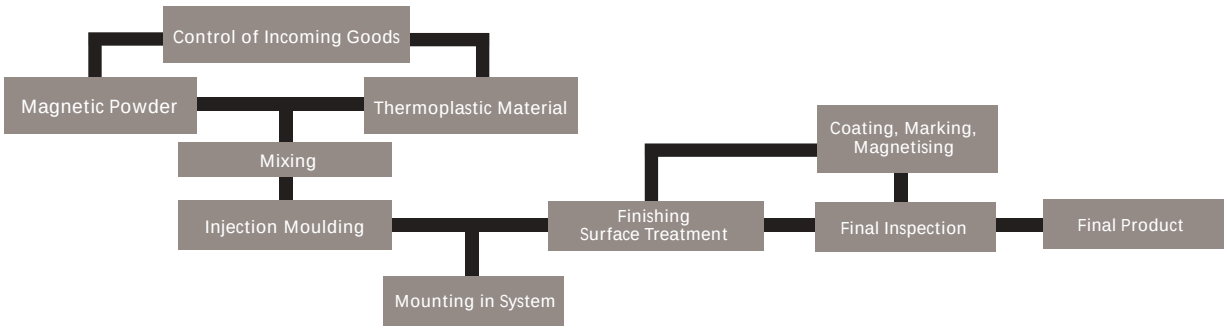
Cast / Sintered	Grade	Remanence Br(Gs)	Coercivity bHc(Oe)	Intrinsic Coercivity iHc(Oe)	Max. Energy Product (BH)max(MGOe)
Cast	Alnico 5	12,800	640	640	5,5
	Alnico 5DG	13,300	670	670	6,5
	Alnico 5-7	13,500	740	740	7,5
	Alnico 6	10,500	780	800	3,9
	Alnico 8	8,200	1,650	1,860	5,3
Sintered	Alnico 5	10,900	620	630	3,9
	Alnico 6	9,400	790	820	2,9
	Alnico 8	7,400	1,500	1,690	4,0

Injection Bonded Magnets

Typical Physical Properties

Parameter		Bonded Ferrite Magnets				Bonded NdFeB Magnets				
		PBF-10	PBF-11	PBF-13	PBF-15	PBN-6	PBN-8	PBN-10	PBN-12	PBN-8H
Curie Temperature	^{o}C	450				310	310	310	310	310
Maximum Operating Temperature	^{o}C	120				140	140	110	130	125
Density	g/cm^3	3.4 - 3.7				5.8 - 6.2	5.8 - 6.2	5.8 - 6.2	6.2 - 6.4	5.8 - 6.2
Relative Recoil Permeability	μ_{rec}	1.3				1.15	1.15	1.22	1.22	1.15
Saturation Field Strength	kOe kA/m	10 800				>25 >=2,000	>25 >=2,000	>25 >=2,000	>25 >=2,000	>40 >=3,200
Temperature Coefficient of Br	$\%/^{o}C$	-0.2				-0.13	-0.13	-0.07 ~ -0.105	-0.13	-0.07 ~ -0.105

Production Flow Diagram



Typical Magnetic Properties

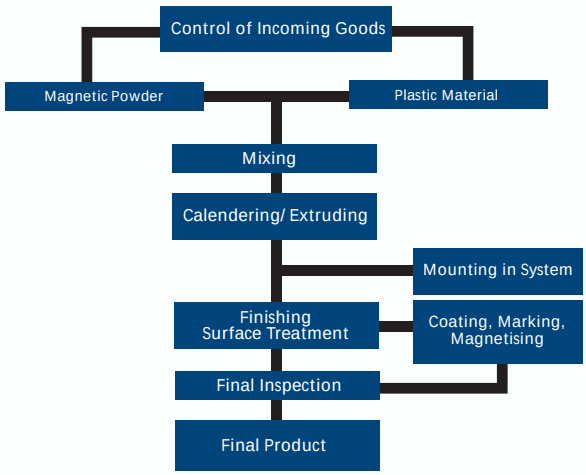
Material	Grade	Remanence		Coercivity		Intrinsic Coercivity		Max. Energy Product	
		Br(mT)	Br(Gs)	bHc(kA/m)	bHc(Oe)	iHc(kA/m)	iHc(kOe)	(BH)max(KJ/m^3)	(BH)max(MGOe)
Injection Bonded Ferrite Magnets	PBF-10	220-240	2,200-2,400	145-165	1,800-2,060	190-225	2,375-2,810	9.0-10.6	1.13 - 1.33
	PBF-11	230-250	2,300-2,500	160-185	2,000-2,310	225-260	2,810-3,250	10.0-12.0	1.25 - 1.50
	PBF-13	250-270	2,500-2,700	175-195	2,180-2,440	200-230	2,500-2,875	11.5-14.5	1.44 -1.82
	PBF-15	270-290	2,700-2,900	175-195	2,180-2,440	200-230	2,500-2,875	14.5-16.5	1.82 - 2.07
Bonded NdFeB Magnets	PBN-6	520-600	5,200-6,000	304-360	3,800-4,500	640-800	8,000-10,000	40-56	5 - 7
	PBN-8	600-650	6,000-6,500	360-440	4,500-5,500	640-960	8,000-12,000	56-72	7 - 9
	PBN-10	650-700	6,500-7,000	360-464	4,500-5,800	640-960	8,000-12,000	72-80	9 - 10
	PBN-12	700-760	7,000-7,600	424-480	5,300-6,000	640-880	8,000-11,000	80-96	10-12
	PBN-8H	550-620	5,500-6,200	400-488	5,000-6,000	960-1,280	12,000-16,000	48-72	6-9

Flexible Magnets

Typical Physical Properties

Parameter		
Tensile Strength	Kg/cm^2	20<f<100
Elongation	%	60<I<300
Hardness	Hv	95+/-5
Density	g/cm^3	3.70+/-0.2
Saturation Field Strength	kA/m	800
	kOe	10
Flexibility	No crack when twisting around a testing bar dia.20-dia.60	
Twist	No crack with 180º twist	

Production Flow Diagram



Binder Selection

Binder Type	Information
CPE	Most commom & economy material, good fabrication properties
NBR	Good resistance to organic solvent such as thinners & petroleum. For motors & sensors which uses flexbile magnets.

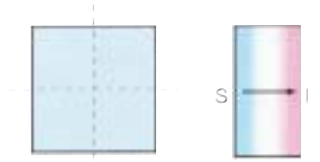
Coating Selection

Type	Information
PVC	Suitable for various kinds of printing method.
Self-adhesive tape	Available in pressure sensitive and foam backing.

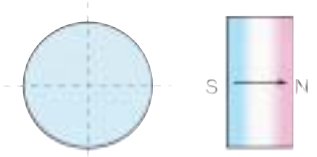
Typical Magnetic Properties

Material	Iso/ Anisotropic	Remanence		Coercivity		Intrinsic Coercivity		Max. Energy Product	
		Br(mT)	Br(Gs)	bHc(kA/m)	bHc(Oe)	iHc(kA/m)	iHc(Oe)	$(BH)max(KJ/m^3)$	(BH)max(MGOe)
Flex-7L	Isotropic	165+/-10	1,650+/-100	108+/-8	1,350+/-100	132+/-8	1,650+/-100	5.2+/-0.4	0.65+/-0.05
Flex-7H	Isotropic	170+/-10	1,700+/-100	112+/-8	1,400+/-100	136+/-8	1,700+/-100	5.6+/-0.4	0.70+/-0.05
Flex-10	Semi-aniso	220+/-5	2,200+/-50	136+/-8	1,700+/-100	160+/-8	2,000+/-100	8.0+/-0.4	1.00+/-0.05
Flex-12	Anisotropic	245+/-5	2,450+/-50	140+/-8	1,750+/-100	148+/-8	1,850+/-100	11.2+/-0.4	1.40+/-0.05
Flex-12BH	Anisotropic	247.5+/-2.5	2,475+/-25	168+/-8	2,100+/-100	224+/-8	2,800+/-100	12.0+/-0.4	1.50+/-0.05

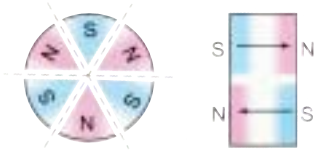
DIRECTIONS OF MAGNETIZATION



Oriented through thickness

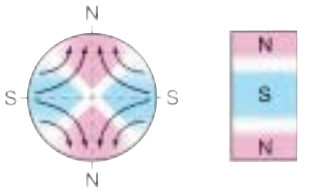


Axially oriented

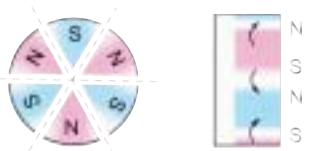


Axially oriented in segments

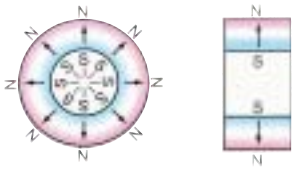
Oriented laterally multipole on one face



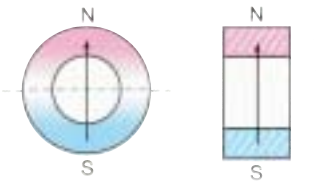
Multipole oriented in segments on outside diameter*



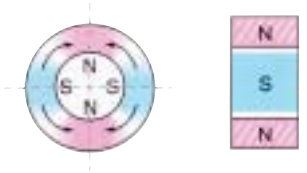
Multipole oriented in segments on one face



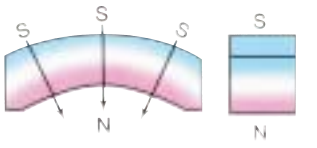
Radially oriented*



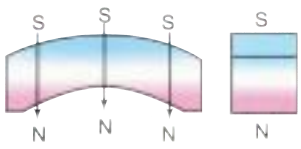
Oriented through diameter*



Multipole oriented in segments on inside diameter*



Radially oriented



Diametrical oriented

All available as isotropic or anisotropic material.

*Only available in isotropic and certain anisotropic materials only.

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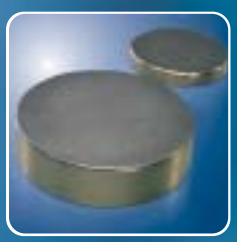

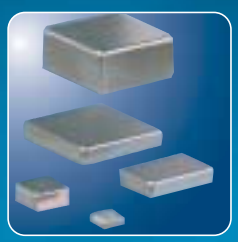


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