

Ferrite / Ceramic Magnets

These magnets are the best choice for low cost applications. They are excellent at resisting corrosion due to water. Their properties make them an excellent choice when used in motors, loudspeakers and clamping devices and for use with reed switches.



Chinese Standard - commonly used globally, especially in UK and EU

Typical Range of Values

Material	Br		Hc (Hcb)		Hci (Hcj)		BHmax	
	mT	kG	kA/m	kOe	kA/m	kOe	kJ/m ³	MGOe
Y8T	200-235	2.0-2.35	125-160	1.57-2.01	210-280	2.64-3.52	6.5-9.5	0.8-1.2
Y10T	200-235	2.0-2.35	128-160	1.61-2.01	210-280	2.64-3.52	6.4-9.6	0.8-1.2
Y20	320-380	3.2-3.8	135-190	1.70-2.39	140-195	1.76-2.45	18.0-22.0	2.3-2.8
Y22H	310-360	3.1-3.6	220-250	2.76-3.14	280-320	3.52-4.02	20.0-24.0	2.5-3.0
Y23	320-370	3.2-3.7	170-190	2.14-2.39	190-230	2.39-2.89	20.0-25.5	2.5-3.2
Y25	360-400	3.6-4.0	135-170	1.70-2.14	140-200	1.76-2.51	22.5-28.0	2.8-3.5
Y26H	360-390	3.6-3.9	220-250	2.76-3.14	225-255	2.83-3.20	23.0-28.0	2.9-3.5
Y26H-1	360-390	3.6-3.9	200-250	2.51-3.14	225-255	2.83-3.20	23.0-28.0	2.9-3.5
Y26H-2	360-380	3.6-3.8	263-288	3.30-3.62	318-350	4.00-4.40	24.0-28.0	3.0-3.5
Y27H	370-400	3.7-4.0	205-250	2.58-3.14	210-255	2.64-3.20	25.0-29.0	3.1-3.6
Y28	370-400	3.7-4.0	175-210	2.20-2.64	180-220	2.26-2.76	26.0-30.0	3.3-3.8
Y28H-1	380-400	3.8-4.0	240-260	3.02-3.27	250-280	3.14-3.52	27.0-30.0	3.4-3.8
Y28H-2	360-380	3.3-3.8	271-295	3.41-3.71	382-405	4.80-5.09	26.0-30.0	3.3-3.8
Y30	370-400	3.7-4.0	175-210	2.20-2.64	180-220	2.26-2.76	26.0-30.0	3.3-3.8
Y30BH	380-390	3.8-3.9	223-235	2.80-2.95	231-245	2.90-3.08	27.0-30.0	3.4-3.8
Y30H-1	380-400	3.8-4.0	230-275	2.89-3.46	235-290	2.95-3.64	27.0-32.0	3.4-4.0
Y30H-2	395-415	3.95-4.15	275-300	3.46-3.77	310-335	3.90-4.21	27.0-32.5	3.4-4.1
Y32	400-420	4.0-4.2	160-190	2.01-2.39	165-195	2.07-2.45	30.0-33.5	3.8-4.2
Y32H-1	400-420	4.0-4.2	190-230	2.39-2.89	230-250	2.89-3.14	31.5-35.0	4.0-4.4
Y32H-2	400-440	4.0-4.4	224-240	2.81-3.02	230-250	2.89-3.14	31.0-34.0	3.9-4.3
Y33	410-430	4.1-4.3	220-250	2.76-3.14	225-255	2.83-3.20	31.5-35.0	4.0-4.4
Y33H	410-430	4.1-4.3	250-270	3.14-3.39	250-275	3.14-3.46	31.5-35.0	4.0-4.4
Y34	420-440	4.2-4.4	200-230	2.51-2.89	205-235	2.58-2.95	32.5-36.0	4.1-4.5
Y35	430-450	4.3-4.5	215-239	2.70-3.00	217-241	2.73-3.03	33.1-38.2	4.2-4.8
Y36	430-450	4.3-4.5	247-271	3.10-3.41	250-274	3.14-3.44	35.1-38.3	4.4-4.8
Y38	440-460	4.4-4.6	285-305	3.58-3.83	294-310	3.69-3.90	36.6-40.6	4.6-5.1
Y40	440-460	4.4-4.6	330-354	4.15-4.45	340-360	4.27-4.52	37.5-41.8	4.7-5.3

American Standard - also used in UK

Typical Values

Material	Br		Hc (Hcb)		Hci (Hcj)		BHmax	
	mT	kG	kA/m	kOe	kA/m	kOe	kJ/m ³	MGOe
C1	230	2.30	148	1.86	258	3.50	8.36	1.05
C5	380	3.80	191	2.40	199	2.50	27.0	3.40
C7	340	3.40	258	3.23	318	4.00	21.9	2.75
C8 / C8A	385	3.85	235	2.95	242	3.05	27.8	3.50
C8B	420	4.20	232	2.91	236	2.96	32.8	4.12
C9	380	3.80	280	3.52	320	4.01	26.4	3.32
C10	400	4.00	280	3.52	284	3.57	30.4	3.82
C11	430	4.30	200	2.51	204	2.56	34.4	4.32
C12	400	4.00	290	3.65	318	4.00	32.0	4.00

European Standard (IEC 60408-1)

Values (min/typical)

Material	Br		Hc (Hcb)		Hci (Hcj)		BHmax	
	mT	kG	kA/m	kOe	kA/m	kOe	kJ/m ³	MGOe
HF8/22	200/220	2.00/2.20	125/140	1.57/1.76	220/230	2.76/2.89	6.5/6.8	0.8/1.1
HF20/19	320/333	3.20/3.33	170/190	2.14/2.39	190/200	2.39/2.51	20.0/21.0	2.5/2.7
HF20/28	310/325	3.10/3.25	220/230	2.76/2.89	280/290	3.52/3.64	20.0/21.0	2.5/2.7
HF22/30	350/365	3.50/3.65	255/265	3.20/3.33	290/300	3.64/3.77	22.0/23.5	2.8/3.0
HF24/16	350/365	3.50/3.65	155/175	1.95/2.20	160/180	2.01/2.26	24.0/25.5	3.0/3.2
HF24/23	350/365	3.50/3.65	220/230	2.76/2.89	230/240	2.89/3.01	24.0/25.5	3.0/3.2
HF24/35	360/370	3.60/3.70	260/270	3.27/3.39	350/360	4.40/4.52	24.0/25.5	3.0/3.2
HF26/16	370/380	3.70/3.80	155/175	1.95/2.20	160/180	2.01/2.26	26.0/27.0	3.2/3.4
HF26/18	370/380	3.70/3.80	175/185	2.20/2.33	180/190	2.26/2.39	26.0/27.0	3.3/3.4
HF26/24	370/380	3.70/3.80	230/240	2.89/3.01	240/250	3.01/3.14	26.0/27.0	3.3/3.4
HF26/26	370/380	3.70/3.80	230/240	2.89/3.01	260/270	3.27/3.39	26.0/27.0	3.3/3.4
HF26/30	385/395	3.85/3.95	260/270	3.27/3.39	300/310	3.77/3.89	26.0/27.0	3.3/3.4
HF28/26	385/395	3.85/3.95	250/265	3.14/3.33	260/275	3.27/3.45	28.0/30.0	3.5/3.8
HF28/28	385/395	3.85/3.95	260/270	3.27/3.39	280/290	3.50/3.60	28.0/30.0	3.5/3.8
HF30/26	395/405	3.95/4.05	250/260	3.14/3.33	260/270	3.27/3.39	30.0/31.5	3.8/3.9
HF32/17	410/420	4.10/4.20	160/170	2.01/2.14	165/175	2.07/2.20	32.0/33.0	4.0/4.1
HF32/22	410/420	4.10/4.20	215/225	2.70/2.83	220/230	2.76/2.89	32.0/33.0	4.0/4.1
HF32/25	410/420	4.10/4.20	240/250	3.01/3.14	250/260	3.14/3.27	32.0/33.0	4.0/4.1

Quick Cross Reference Guide

C5=Feroba2=Fe2=Y30=HF26/18, C8/C8A=Feroba3=Fe3=Y30H-1.

C1=Y10T / Y8T, C7=Y26H-2, C8B=Y33, C9=Y30H-2, C10=Y33H, C11=Y34, C12=Y30H-2.

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Physical Characteristics

Characteristic	Symbol	Unit	Value
Density	D	g/cc	4.9 to 5.1
Vickers Hardness	Hv	D.P.N	400 to 700
Compression Strength	C.S	N/mm ²	680-720
Coefficient of Thermal Expansion	C//	10 ⁻⁶ /°C	15
	C.L	10 ⁻⁶ /°C	10
Specific Heat Capacity	c	J/kg°C	795-855
Electrical Resistivity	ρ	μ Ω.cm	1x10 ¹⁰
Thermal Conductivity	k	W/cm°C	0.029
Modulus of Elasticity	λ / E	Pa	1.8x10 ¹¹
Compression Strength	C.S.	Pa	895x10 ⁶
Tensile Strength	σ _{UTS} or S _U	Pa	34x10 ⁶
Flexural Strength	σ	Pa	62x10 ⁶
Hardness		Mohs	7
Poisson's Ratio	ν		0.28
Curie Temperature	Tc	°C	450

Maximum and Minimum Working Temperatures

(Note - this varies with the magnetic working point!)

The maximum recommended operating temperature is +250 to +300 degrees C.

The minimum operating temperature varies with the magnet shape and magnetic circuit.

It could be as low as -60 degrees C but may be as high as 0 (zero) degrees C.

Corrosion Resistance

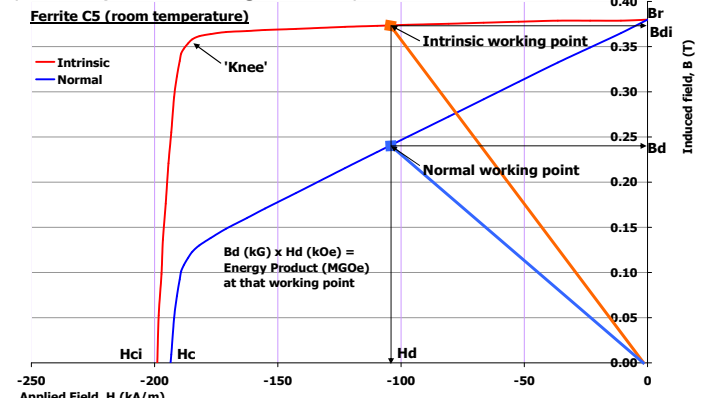
Ferrite magnets are essentially made from oxides of iron and Strontium and Barium. They cannot corrode in water. They are sometimes regarded as being 'magnetic rust'. Corrosion resistance is therefore excellent.

Temperature coefficients

Rev.Temp.Coef. of Induction (Br), α, %/°C	Rev.Temp.Coef. of Intrinsic Coercivity (Hci), β, %/°C
-0.2	(+) 0.27

Example of a BH curve

(second quadrant demagnetisation)



Additional Notes

Ferrite / Ceramic magnets are permanent magnets. They have no relationship to soft magnetic ferrites. Soft magnetic ferrites such as used in transformer cores have totally different magnetic properties. The magnet shape, magnetic circuit and temperature affects the operation of the magnet. When determining suitability, use the Intrinsic curve during analysis (not the Normal curve). Maximum performance is obtained by keeping the intrinsic working point above the 'knee'. In ferrite magnets the Hci actually increases with rising temperature (a benefit in electric motors). So at higher temperatures their resistance to demagnetising increases. But demagnetisation is possible in colder temperatures (e.g. freezing conditions) but a high working point reduces this risk. Ferrite magnets have excellent corrosion resistance - they do not rust or degrade when in water. Anisotropic grades (direction of magnetisation locked in structure) are stronger than isotropic grades. Isotropic (unoriented) grade: e.g. C1; Anisotropic (oriented) grades: e.g. C5, C7, C8. Tolerances: +/- 3% is common, +/- 0.25mm is also commonly used (tolerances depend on shape). If in any doubt, please contact us for technical assistance. www.buntingeurope.com sales@buntingeurope.com We reserve the right to change any of the above information without notice and cannot accept any responsibility or liability for errors or problems caused by using any of the above information.