BBA AG
Schachenallee 29 / Postfach
CH-5001 Aarau
Tel. +41 62 836 90 40
Fax +41 62 824 61 40
www.bba.ch • info@bba.ch

Material information

Hard Ferrite (HF)											
Description		Remanence		Energy product		Coercivity		Coercivity		Working temp.*	Temp. coeff.
		Br (mT)		(BxH) max. (kJ/m³)		Hcb (kA/m)		Hcj (kA/m)		Tmax.	to Br
Material (selection)	DIN / IEC 60404-8-1	typ.	min.	typ.	min.	typ.	min.	typ.	min.	°C	%/°C
HF isotropic	8/22	220	*215	8.5	*8,0	140	*135	230	220	250	-0.2
HF anisotropic	24/16	365	350	25.5	24.0	175	155	180	160	250	-0.2
HF anisotropic	24/23	365	350	25.5	24.0	220	210	240	230	250	-0.2
HF anisotropic	28/16	395	385	30.0	28.0	170	160	170	160	250	-0.2
HF anisotropic	28/26	395	385	30.0	28.0	255	240	275	260	250	-0.2
HF anisotropic	31/22	420	410	33.0	31.0	225	215	230	220	250	-0.2
HF anisotropic	34/34	440	425	36.7	34.0	333	314	360	340	250	-0.2
* Transverse to the pressing direction											

Useful information

Hard ferrite magnets are the most economical and most widely used permanent magnets in the world. They consist of about 90% iron oxide and 10% barium or strontium oxide. They have excellent magnetic stability. The coercive force is high in relation to the remanence, which requires a large magnetic surface.

Hard ferrite magnets can be made isotropic or anisotropic. Isotropic magnets have approximately the same magnetic values in all directions and can be magnetized in all directions. Anisotropic magnets are exposed to a magnetic field during the pressing process and thereby obtain a preferred direction. They have good magnetic properties only in this preferred direction and can only be magnetized in this direction. Anisotropic magnets achieve significantly higher magnetic values than isotropic magnets.

Hard ferrite magnets behave mechanically like ceramic and porcelain, they are sensitive to impact and bending loads. Due to their ceramic character, hard ferrite magnets are resistant to weather influences and to many chemicals such as e.g. solvents, alkalis and weak acids.

Because of their great hardness hard ferrite magnets must be machined with diamond tools.

Changing temperatures cause a changed of the magnetic behavior in isotropic and anisotropic hard ferrite magnets. As the temperature increases, the remanence drops by 0.2% per 1°C and the coercivity increases by as much as 0.3% per 1°C. As the temperature decreases, the remanence increases and the coercive force drops to the same extent. As a result, magnets and magnet systems with a low operating point can suffer a permanent magnetization loss.

The surface of hard ferrite magnets can be varnished or flocked in various ways. A galvanic treatment is conditionally possible.

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Process flow