

KOEROX™

Hybrid Injection Molded Ferrite/NdFeB

PLASTIC-BONDED HYBRID MATERIALS, INJECTION MOLDED

In the manufacture of thermoplastic-bonded magnets the process parameters are primarily determined by the method of plastic bonding. The simultaneous use of hard ferrite and NdFeB makes it possible to create a wide variety of plastic-bonded permanent magnets.

As ferrite and NdFeB have similar magnetic characteristics, the material mix can be selected to produce tailor-made magnets to meet the specific technical and cost requirements of a particular application. This is particularly important in view of the fact that the remanence level of injection-molded ferrite and NdFeB magnets differ by a factor of two. By mixing the materials, previously inaccessible applications can be developed. The ferrite component is typically oriented and magnetized during molding. The isotropic NdFeB can also be magnetized during molding, or externally if the pole configuration is unfavorable. By varying the type of magnet powder, the ratio of the mix and the total fill factor, a wide range of modifications can be achieved. The Koerox HI Data table shows a selection of these hybrid variants by way of example.

The different temperature coefficients of the two components result in more complex and technically very interesting properties compared with straight ferrite or NdFeB magnets. For example, the reversible temperature-dependence of a system property can be improved.

The specific mechanical and chemical properties of these hybrid magnets need to be taken into account in the design phase. The large differences in grain size distribution between the two types of magnet powder result in differing properties depending on the ratio of the mix. Users are advised to consult the manufacturer at an early point in the design process.

These new hybrid materials are manufactured under the tradename Koerox HI because as a rule the (high-fill, oriented) hard ferrite component is decisive as a basis for a competitive solution.

Koerox™ HI

Hybrid Injection Molded Ferrite/NdFeB

Product	1)	(BH) _{max}				Br				H _{cB}				Intrinsic Coercivity H _{cJ}				Relative Permeability	Density g/cm ³ typ.
		kJ/m ³		MGOe		mT		G		kA/m		Oe		kA/m		Oe			
		typ.	min.	typ.	min.	typ.	min.	typ.	min.	typ.	min.	typ.	min.	typ.	min.	typ.	min.	typ.	
Koerox H I 19 PA	a	18.50	16.00	2.32	2.01	315	295	3150	2950	215	190	2702	2388	280	250	3519	3142	1.05	3.80
Koerox H I 22 PA	a	22.40	19.80	2.81	2.49	345	325	3450	3250	220	195	2765	2450	300	270	3770	3393	1.15	3.90
Koerox H I 28 PA	a	28.00	25.00	3.52	3.14	390	370	3900	3700	245	200	3079	2513	320	280	4021	3519	1.05	4.00

1) i = Isotropic
a = Anisotropic

PA = Polyamide (Nylon)
PS = Polyphenylene Sulfide (PPS)

Figure 1: Demagnetization curves B(H)

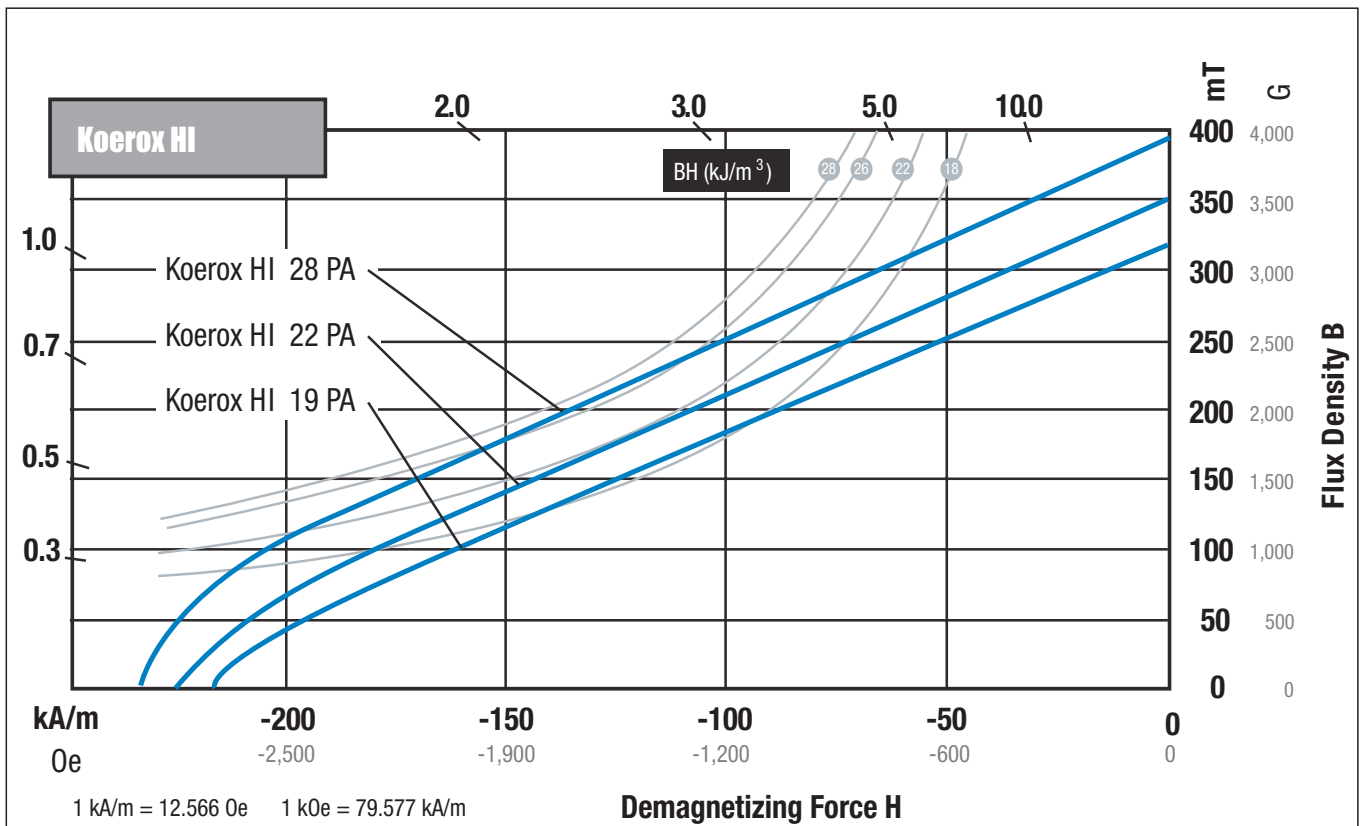


Figure 2: Demagnetization curves B(H) at room temperature (RT), 80°C, 120°C and 150°C

