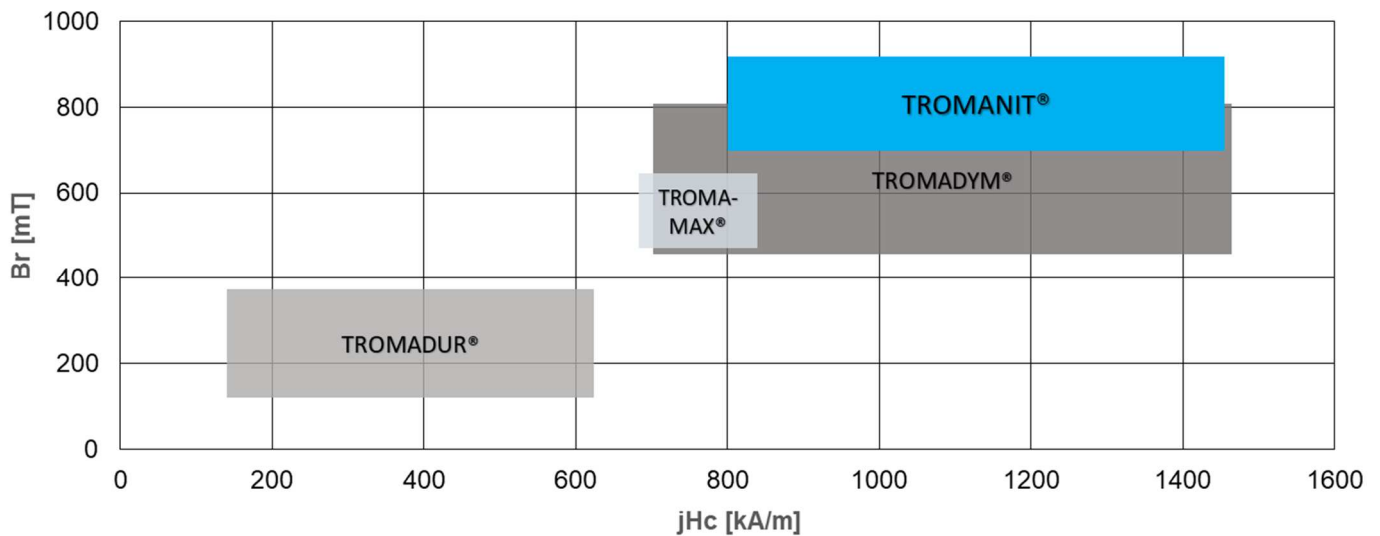




TROMANIT®

A new generation of plastic bonded permanent magnets with increased performance

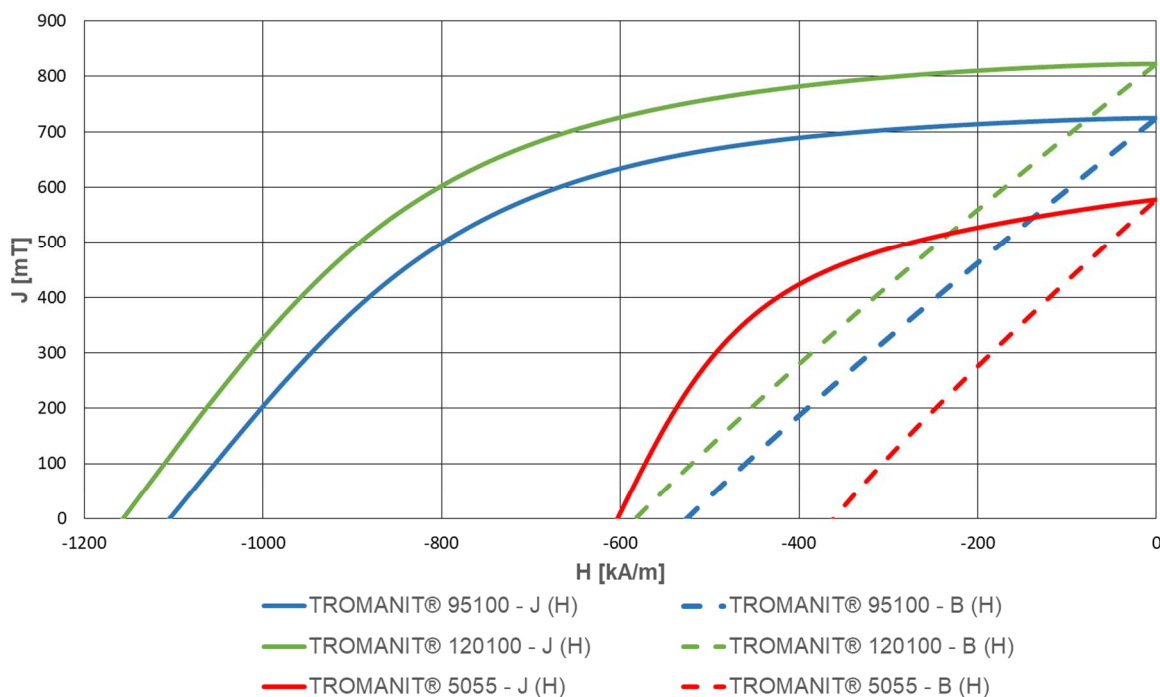


Magnetic performance comparison of Max Baermann portfolio with new material TROMANIT®

Material formulations are based on various polymers in combination with SmFeN particles.

SmFeN compounds offer a variety of advantages over other rare earth compounds:

- Increased magnetic performance due to high magnetic anisotropy [energy product > 100 kJ/m³]
- The monocrystalline structure of the particles facilitates wettability and gives very good rust resistance
- Reduced flux density loss due to heat storage [approx. 6 % loss after 1000 h at 125 °C]
- Environmentally friendly and cost-effective alternative



Demagnetization curves for three TROMANIT® compounds

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Detailed Information

TROMANIT® - SmFeN-Compounds

TROMANIT® compounds are highly filled polymers with SmFeN particles. These particles are composed of a samarium, iron and nitrogen alloy, which gives them their characteristic magnetic strength. SmFeN compounds offer the highest magnetic performance in bonded magnets, whilst providing excellent thermal stability. They can be processed by conventional injection moulding process with the same freedom of design as other bonded magnet materials. Their anisotropic nature allows them to be oriented and partially magnetized in the mould. Depending on the design and desired magnetic performance, an additional pulse magnetization step may be required. An example of four different formulations is shown in Figure 1.

Material		Binder	Br [mT]	jHc [kA/m]	bHc [kA/m]	(BH) _{max} [kJ/m³]
TROMANIT®5055	isotropic	PA12	580	360	600	55
TROMANIT®95100	anisotropic	PA12	730	1100	530	100
TROMANIT®120100	anisotropic	PA12	825	1150	580	125
TROMANIT®9090	anisotropic	PPS	700	1000	500	95

Figure 1: Example of magnetic properties for four TROMANIT® compounds

Compared to other rare earth materials, they don't contain elements of high environmental concern such as neodymium and dysprosium. They are also easier to extract and therefore more cost effective with less price volatility.

A unique feature of the compound is the spherical monocrystalline structure of the filler material. This, combined with a special material formulation, results in improved rust resistance. Depending on the polymer matrix, water resistant compounds are also available.

Due to the chemical composition, TROMANIT® materials have a reduced flux density loss compared to other high magnetic performance materials (Figure 2).

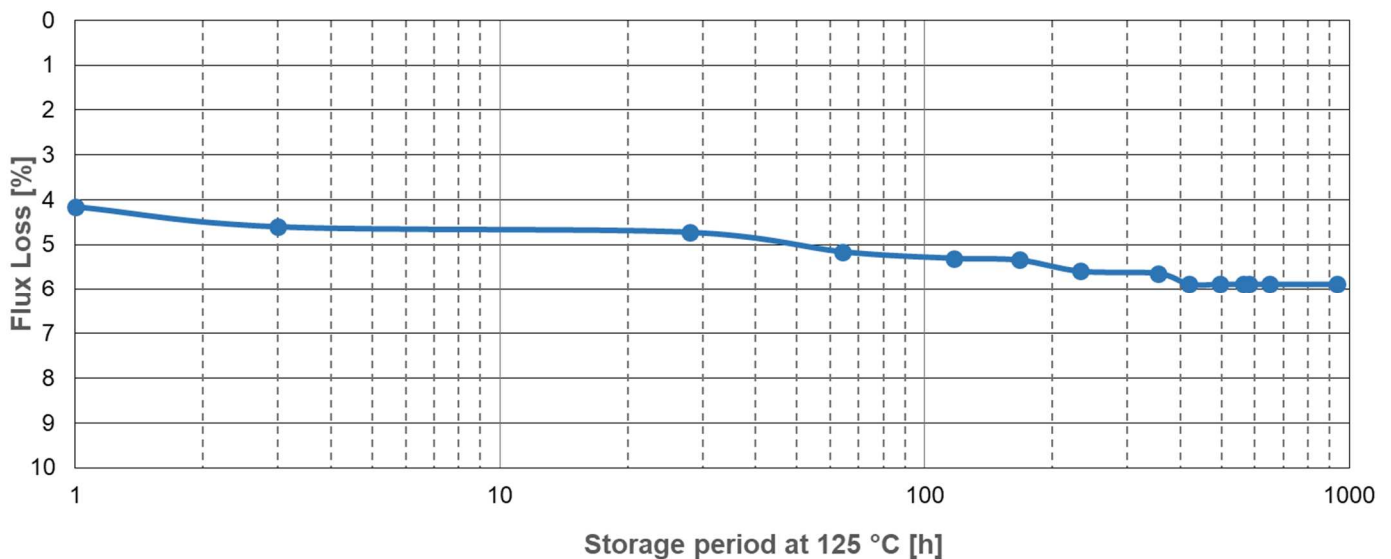


Figure 2: Time dependent flux density loss of a TROMANIT® compound for TROMANIT®95100.

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