PLASTIFORM® 1037
Permanent Magnet Material

Energy product 1.0 MGOe flexible permanent magnet product

- Machinability permits simple and inexpensive shaping and assembly processing
- Resilience prevents chipping, cracking or shattering
- Close dimensional and magnetic tolerances allow substantial cost reductions

Description

PLASTIFORM® Permanent Magnet Materials are rubber barium ferrite composites manufactured in sheets, strips and individually cut pieces. Magnetic properties are generated by preferentially orienting ferromagnetic barium ferrite in a stable binder. It is highly anisotropic and possesses an unusually strong resistance to demagnetization.

1037 material is a specially formulated magnet product designed for use in latch and similar applications. The high degree of conformability exhibited by this material allows it to match various pole piece configurations and yields optimum performance when sandwiched between pole pieces.

Features and benefits

The physical and magnetic properties of 1037 material combine to offer a variety of features including:

Flexibility and resiliency—Design innovations and automated manufacturing techniques are more practical with PLASTIFORM® flexible magnets, which do not chip or shatter like hard and brittle ceramic barium ferrite materials.

Ease of fabrication—PLASTIFORM® magnets offer inherently low tooling costs and can be readily machined, cut, slit, punched, drilled or milled into simple or intricate shapes.

High magnetic strength—The ferrite particles in PLASTIFORM® magnets are oriented as they are processed, providing magnetic properties equal to, or exceeding, those of conventional isotropic ceramic ferrite magnets.

Cost reductions—Greater design latitude and more efficient production methods made possible by its unique properties contribute to reduced costs in many stages of product development.

Applications

Uses for this magnet product range from novelties to industrial applications, such as magnetic separator equipment and freezer door latches. Many of these uses require specialized fabrication of the magnet material, a demand which 1037 is eminently well suited to meet.

Because PLASTIFORM® magnet material successfully combines high coercive force and residual induction with flexibility and ease of fabrication, it is currently being used in a wide range of mechanical applications. Among these are:

Magnetic printing press cylinders
Tool and part racks
Magnetic couplers
Moveable partition supports
Metal storage bin identification label holders
Magnetic jigs and fixtures
Novelties

Availability

PLASTIFORM® permanent magnets are fabricated in accordance with customer specification. The material can be produced in virtually any size and shape. The material is available in either magnetized or nonmagnetized condition. It can be magnetized with one or more poles on each surface and in a pattern that meets with the application needs.

PLASTIFORM® Quality

PLASTIFORM® is manufactured using up-to-date statistical methods and documented statistical data. Customers can rely on the proven quality of PLASTIFORM® bonded magnetic materials for a variety of applications.

Typical Physical Properties

Properties	Typical Values*	
	CGS/U.S. Units	SI Units
Density[1] (at 23°C)	0.134 lbs/in^3	3.71 g/cm^3
Hardness[2] (at 23°C)	55 Shore D	55 Shore D
Tensile Strength[3] (at 23°C)	640 psi	440 N/cm^3
Thermal Coefficient of Thickness Expansion (4° to 120°C)	9.8 x 10^{-6} mil/mil per °F	18 x 10^{-5} cm/cm per °C
Maximum Continuous Operating Temperature	200°F	95°C

*All values shown are typical and not intended for specification purposes. Specification values will be provided upon request.
Test Methods
[1] ASTM D-297
[2] ASTM D-2240
[3] ASTM D-412

PLASTIFORM® 1037 Magnet Material

Typical effect of temperature on magnetic strength

In many applications, the operating temperature of a magnet may be much higher or lower than the average room temperature. The effect of temperature on the magnetic properties of PLASTIFORM® materials should be considered where such conditions exist.

The residual magnetism (Br) of PLASTIFORM® magnets will decrease at approximately 0.1% per degree Fahrenheit above 70°F (0.19% per degree centigrade above 21.1°C) and will increase at 0.1% per degree Fahrenheit below 70°F (0.19% per degree centigrade below 21.1°C). The magnet becomes weaker as the temperature is raised and stronger as the temperature is lowered. The value of the coercive force (Hc) also changes, but this is significant only where a high demagnetizing field may be applied at low temperatures, such as in DC motor applications.

Changes due to temperatures are not permanent, but are reversible. Consequently, the original magnetic values are recovered upon return to room temperature. Both ceramic and flexible barium ferrite magnets are subject to this effect.

Technical assistance

Arnold's engineering and technical staff personnel are available to assist in suggesting magnet sizes and types for proposed applications. Design advice will be provided regarding methods of achieving optimum product performance, such as pole pieces, backing plates, channels or other assemblies.

Typical Magnetic Properties

Properties	Typical Values*	
	CGS/U.S. Units	SI Units
Maximum Energy Product (BdHd max) (at 23°C)	1.08 MGOe	8.6 kJ/m³
Residual Induction[1] (Br) (at 23°C)	2150 Gauss	215 mT
Coercive Force[1] (Hc) (at 23°C)	1650 Oersteds	1315 kA/m
Coercive Force Intrinsic[1] (Hci) (at 23°C)	2150 Oersteds	1710 kA/m
Recoil Permeability (at 23°C)	1.08	1.08
Reversible Temperature Coefficient of Inductivity (Br)(20-120°C)	– 0.105% per °F	– 0.19% per °C
Reversible Temperature Coefficient of Coercivity (Hci)(20-120°C)	0.12% per °F	0.22% per °C
Peak Magnetizing Force Required	10000 Oersteds	8000 kA/m

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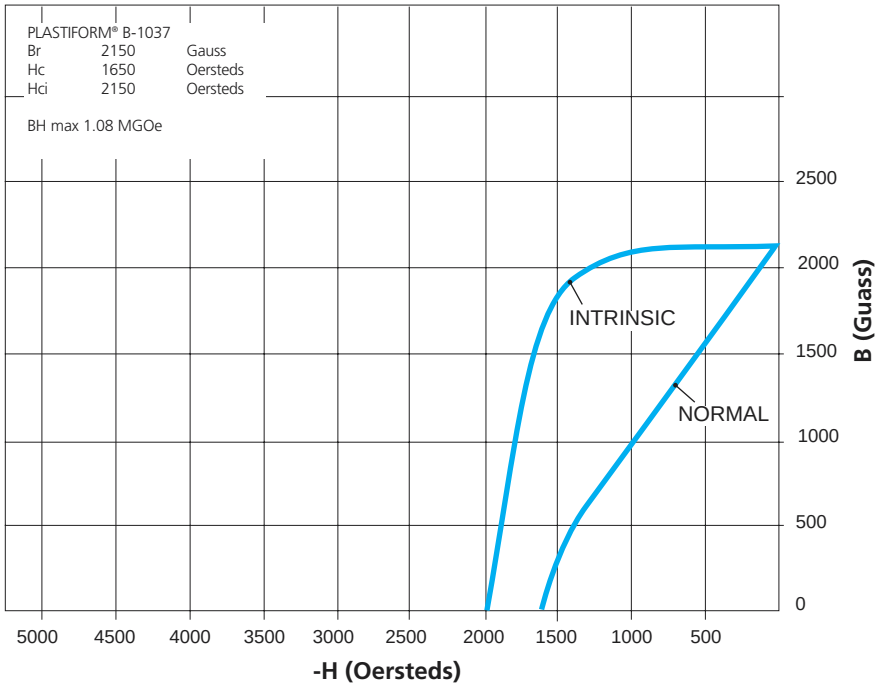
Test Method
[1]Pole-coil Hysteresigraph

Typical Demagnetization Curve*



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