- polymer bonded NdFeB magnets Neofer p -

	Orga	Date	Identification code	Index	Description of the change
Revised by	334	08.07.2008	H. Krzywinski	5	Sections 3., 4. , 5., 6., 7. and 9. revised
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1. Application and purpose

These technical terms of delivery are considered to be a drawing supplement and consequently part of the contract. All the values and agreements stated in component drawings and specifications take priority over these technical terms of delivery.
The areas of application are: Compression molded Neofer p magnets as well as Neofer p magnets manufactured by injection molding.

2. Definitions

Not magnetized: Residual magnetism due to the production process is permitted.
The scope and the testing procedure need to be agreed with the customer in individual cases.

Non-magnetic: No residual magnetism permitted.
Testing with steel balls according to testing instruction No. 8.

3. Characteristic material properties

Neofer p magnets are subject to a temperature coefficient of flux density and of physical coercive field strength of:

$TK_{Br} \cong$ - 0.1 %/K; $TK_{HcJ} \cong$ - 0.4 %/K

These temperature coefficients determine the reversible losses in the material.
At higher temperatures, irreversible losses occur due to both the material and the geometry.
The NdFeB alloy is highly susceptible to corrosion. Injected Neofer p magnets are largely protected by the binder's polymer film. Under unfavorable conditions of installation (presence of damp), the injection points should also be sealed. Compression molded Neofer p magnets should always possess surface protection.

4. Geometrical dependency

Small volumes with large surface areas cool down faster inside the cavity than larger parts. The injection pressure and reciprocating force cannot be completely formed. Consequently, the specific density of the magnets may fall short of the minimum values.
The remanence flux density is directly correlated with the specific density.

4.1 Minimum volumes/minimum dimensions for polymer bonded Neofer p magnets

DIN IEC 60404-8-1 refers to the interdependency between magnetic values and the magnet geometry.
The minimum magnetic values apply only to magnets with a cross-section which remains unchanged along the axis of magnetization, with a volume of between 1 cm^2 and 200 cm^2 and with an extent of at least 8 mm in all spatial dimensions.
If these dimensions are not achieved then the maximum deviations set out below are permitted:

B_r	=	10 % less than the minimum catalog value
H_{cB}	=	10 % " " "
H_{cJ}	=	10 % " " "
$(BH)_{max}$	=	15 % " " "

5. Permitted deficiencies for injection molded Neofer p magnets

5.1 Self-chafing
Permitted within the limits of tolerance.

5.2 Shrink marks / Waist formation / Swelling
Permitted outside of the limits of tolerance.

5.3 Flash formation
≤ 0.1 mm permitted within the mold parting line and the mold venting areas.

5.5 Blow holes
Permitted provided that mechanical and magnetic requirements are not impaired.

5.6 Residual material overhanging in injection area

5.7 Seam lines
Material-dependent seam lines are permitted.

5.8 Representation
Due to the relatively large amount of incorporated magnetic material, the mold contour is not represented in detail.

6. Corrosion / coating

Rare earth magnets have a tendency to corrode. The presence of the binder gives polymer-bonded magnets a certain level of protection which, however, does not correspond to corrosion protection in the technical sense. Due to the process involved, magnets produced using injection molding techniques are covered with a thin binder film except at the injection point itself. In dry, non-aggressive environments, this film slows down but does not prevent oxidation. In the case of compression-molded magnets, discoloration due to film rust formation appears within a period of a few weeks to a few months. This does not generally result in a measurable weakening of the magnetic properties but does impair the adherence and visual appearance of the magnet and, in advanced form, may lead to contamination.

In damp, acidic or aggressive atmospheres which are aggravated by the influence of temperature, unprotected polymer-bound magnets are subjected to decay coupled with a weakening of the magnetic properties. This can be countered by applying a polyurethane varnish or similar coating to the magnets. The possibility of damage to the varnish cannot be excluded, i.e. 100% protection cannot be achieved by means of coating, in particular in the case of bulk products.

Ideally, application-specific corrosion tests should be conducted within the relevant application and process for each design, production process and application.

During processing, all contact of the magnets with chemically active chemicals that promote oxidation should be excluded. It is also recommended that gloves be worn when handling magnets.

It is necessary to take account of environmental influences during storage. Storage in sealed, airtight, dry containers, possibly together with desiccant bags, has proved to be effective in the case of polymer-bonded magnets.

7. Safety instructions

Detailed information about the handling of permanent magnets is available on our homepage: www.magnetfabrik.de, under Downloads "Safety instructions".

8. Health risk on contact with food and drinking water

We **always** recommend avoiding direct contact between food or drinking water and injection or compression molded Neofer p magnets since metal ions from unprotected areas (cast-on or surface impairments) may be released in aqueous environments. See also section 6 on corrosion!

9. Hazardous substances

Our statement regarding Hazardous substances (ROHS & REACH) is provides on our homepage: www.magnetfabrik.de/ in the download documents.

As part of the initial sampling documentation, the material data sheet can be attached on request, from which the composition of the product can be taken.

For customized products, an entry is usually made in the International Material Data System (IMDS). Information about an entry is provided automatically via the customer's USER ID in the IMDS.