

## TECHNICAL DELIVERY SPECIFICATIONS FOR MAGNETS

Created by	R. Meier
Created on	21.02.2013
Last modified on	17.03.2022
Last modified by	Pascal Meier
Doc. no. / Version	Bo 1200 / Version 2.0
Associated documents	See Chapter 4

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## **2 PREAMBLE**

These "technical delivery specifications" are intended to provide an overview of the quality requirements and specifications for Bomatec Group magnets.

Likewise, the precise criteria for the definition, classification and evaluation of the quality characteristics associated with magnets are to be established.

## **3 SCOPE OF APPLICATION**

These "technical delivery specifications" apply to all magnets supplied by the Bomatec Group.

The "technical delivery specifications" apply in the event of missing or unclear diagram details regarding magnet enquiries, magnet orders and deliveries, and for the customer diagram.

In the aforementioned case, these "technical delivery specifications" are to be regarded as applicable documents.

We would like to note that we do not assume any guarantee for requirements beyond these "technical delivery specifications" which have not been agreed upon in writing by the customer.

## **4 NORMATIVE REFERENCES**

The "technical delivery specifications" contain dated or undated references to requirements from other publications. These normative references are cited at respective points in the text and the publications are listed below.

In the case of fixed references, subsequent alterations or revisions to this publication shall only be a part of these technical delivery specifications if they are incorporated as alternations or revisions.

In the case of undated references, the latest edition of the publication in question shall apply.

DIN ISO 2768-1

General tolerances; tolerances for linear and angular dimensions without individual tolerance indications.

DIN ISO 2768-2

General tolerances; geometrical tolerances for features without individual tolerances indications

DIN ISO 13715

Edges of undefined shape

DIN EN 60404-5

Magnetic materials - Part 5: Permanent magnet (magnetically hard) materials - Methods of measurement of magnetic properties

## 5 IMPLEMENTATIONS

### 5.1 Dimensional tolerances

For dimensions without tolerance specifications, DIN ISO 2768-1m applies (for mechanically produced parts).

If there are dimensions without tolerance specifications less than 0.5 mm, they are treated according to DIN ISO 2768-1m (as dimensions 0.5 - 3.0 mm).

### 5.2 Shape and geometric tolerances

According to DIN ISO 2768-2K (for mechanically produced parts).

Spanner flats, hexagons, slots, cross bores, etc. cannot be produced in alignment with each other if angle specifications are missing.

### 5.3 Angle tolerances

For all angles without tolerance specifications, a tolerance of  $\pm 2.0^\circ$  applies.

For chamfers with an edge length  $\leq 0.5$  mm, an angle tolerance of  $\pm 5.0^\circ$  applies.

For chamfers without a tolerance specification, the following length tolerances apply:

Nominal dimension up to 0.2 mm:  $\pm 0.1$  mm

Nominal dimension over 0.2 to 0.5 mm:  $\pm 0.2$  mm

Nominal dimension over 0.5 to 1.0 mm:  $\pm 0.3$  mm

Nominal dimension over 1.0 mm:  $\pm 0.4$  mm

### 5.4 Non-dimensioned workpiece edges

Applicable to all non-dimensioned workpiece edges:

Outside edges: - 0.0 to 0.5 mm

Inside edges: + 0.0 to 0.50 mm

Plastic-moulded magnets:

Edge designations such as "sharp-edged burr-free", "sharp-edged" and "burr-free" are assumed to be  $\pm 0.05$  mm according to DIN ISO 13715, i.e. there may be both a minimum stripping and a minimum burr.

In the area of the tool parting plane and the tool ventilation,  $\leq 0.1$  mm is permissible.

### 5.5 Surface finish

Flaking, edge chipping, splintering and porous areas do not affect the result of the surface finish evaluation.

### 5.6 Adhered particles / part cleanliness

Due to manufacturing processes and material properties, loose particles and magnetic dust can become attached to the surface of permanent magnets and magnet systems. This may particularly be the case with magnetised permanent magnets and is normal and, unless specifically specified, not a cause for complaint.

### 5.7 Magnetic properties

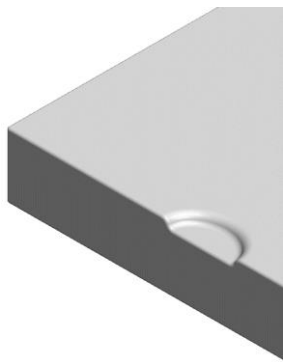
Unless otherwise agreed, the magnetic characteristics as described on our homepage and in our data sheets apply to our magnetic materials.

These values are tested using uncoated test specimens in accordance with the DIN EN 60404-5 standard.

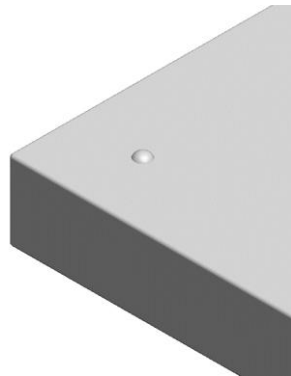
### 5.8 Mechanical damage to permanent magnets

Sintered materials are brittle. Mild mechanical damage to the magnet may therefore occur. Fine hairline cracks and flaking cannot be ruled out. This damage is normal and has no significant effect on the mechanical stability of the magnet. Unless otherwise specified, this damage is not a cause for complaint as long as the manufacturer's in-house specification is adhered to. This can be made available upon request. With coated magnets, all areas must be completely coated. The contact points of magnets with epoxy coating (ED coating) are excluded.

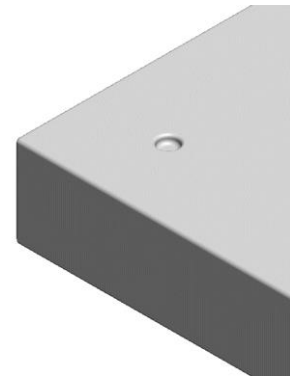
Examples:



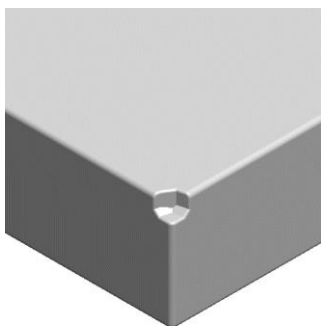
*Ausbrüche / chips*



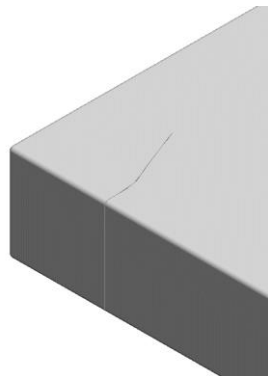
*Einschlüsse / inclusions*



*Lunker / voids*



*Eckausbrüche / broken corners*



*Risse / cracks*



*Kratzer / scratches*

### 5.9 Shrinkage

So long as the magnetic and mechanical properties/requirements are not impaired, shrinkage cavities are permissible in our permanent magnets.

### 5.10 Corrosion-protection passivated magnets

The Bomatec Group guarantees corrosion protection on its passivated magnets for 6 months from the production date.

Passivation is short-term protection for transport and storage (under normal Central European environmental conditions of  $T \leq 30^{\circ}\text{C}$  and relative humidity  $< 70\%$ ), which effectively protects the magnets against environmental influences such as temporarily increased humidity.

Reliable long-term protection against corrosion can only be achieved by a coating.

### 5.11 Packaging / transport damage

The packaging, including outer packaging, must be chosen to ensure protection against transport damage and contamination. Without a specific agreement with the customer, we select standard packaging that provides good protection against damage. Article-specific packaging may have to be defined with the customer, depending on the magnet. If the customer rejects specific packaging proposals that safely protect the product against transport damage and contamination, the customer must accept that transport damage and contamination of the goods may occur. These damages will not be covered by the Bomatec Group.

## 6 TESTING

All tests carried out on the magnets by the Bomatec Group and our suppliers are in accordance with the state of the art.

Test procedures used by the customer and which have not been agreed upon with the Bomatec Group do not entitle the customer to charge the Bomatec Group in the event of quality-related complaints.

Compliance with quality assurance agreements, supplier guidelines, etc. can only be assured if mutually concluded in writing and in the version valid at the time that the contract is concluded.

The Bomatec Group presumes that incoming goods inspections are to take place at the customer's premises.

## 7 SAFETY NOTES

At [www.bomatec.com](http://www.bomatec.com) and in an appendix to each packing slip you will find detailed instructions for handling permanent magnets.

CE: Our products do not fall under the various directives of the CE Regulation and are therefore not accordingly marked.

## 8 HAZARDOUS MATERIAL-FREE

All our magnet products are guaranteed to comply with the following guidelines:

### REACH Declaration of Conformity

Our products and their packaging do not contain above 0.1 mass percent of any substance on the candidate list (current status) according to Article 59 (1) of Regulation (EC) No 1907 / 2006.

### RoHS Declaration of Conformity (according to ISO/IEC 17050-1)

Our products comply with the latest and current version of RoHS Directive 2011/65/EU and 2015/863/EU (on the restriction of the use of certain hazardous substances in electrical and electronic equipment incl. the exemptions according to the respectively applicable 2011/65/EU, Annex III and 2015/863/EU).