

## More universal

The advanced development of iglidur® G  
**iglidur® G1**



### When to use it?

- When a universal all-round bearing is required
- When low moisture absorption is fundamental
- For low to medium speeds
- For pivoting and rotational movements



### When not to use?

- When high shock, impact and edge loads occur  
*iglidur® G*
- When lowest wear is required  
*iglidur® W300*
- When the ultimate media resistance is required  
*iglidur® X*
- For underwater applications  
*iglidur® H370*

# Bearing technology | Plain bearing | iglidur® G1



Ø  
4.0 – 50.0mm



Also available  
as:



Bar stock,  
round bar  
Page 657



Bar stock,  
plate  
Page 683



tribo-tape liner  
Page 691



Piston rings  
Page 581



Two hole  
flange  
bearings  
Page 603



Moulded  
special parts  
Page 624



igubal®  
spherical balls  
Page 841

## More universal The advanced development of iglidur® G

The most successful plastic bearing in the world – iglidur® G – improved all round: iglidur® G1, the new standard.

- Double service life at high loads
- Up to 4 times less wear at low loads
- Continuous operating temperatures up to +180°C
- Press-fit up to +120°C (iglidur® G: up to +80°C)
- Moisture absorption reduced by 50%

### Typical application areas

- Mechanical engineering
- Automation
- Sports and leisure
- Automotive industry
- Mechatronics

Descriptive technical specifications				
Wear resistance at +23°C	-	<div style="width: 100%; height: 10px; background-color: #0070C0;"></div>		+
Wear resistance at +90°C	-	<div style="width: 100%; height: 10px; background-color: #0070C0;"></div>		+
Wear resistance at +150°C	-	<div style="width: 100%; height: 10px; background-color: #0070C0;"></div>		+
Low coefficient of friction	-	<div style="width: 100%; height: 10px; background-color: #0070C0;"></div>		+
Low moisture absorption	-	<div style="width: 100%; height: 10px; background-color: #0070C0;"></div>		+
Wear resistance under water	-	<div style="width: 100%; height: 10px; background-color: #0070C0;"></div>		+
High media resistance	-	<div style="width: 100%; height: 10px; background-color: #0070C0;"></div>		+
Resistant to edge pressures	-	<div style="width: 100%; height: 10px; background-color: #0070C0;"></div>		+
Suitable for shock and impact loads	-	<div style="width: 100%; height: 10px; background-color: #0070C0;"></div>		+
Resistant to dirt	-	<div style="width: 100%; height: 10px; background-color: #0070C0;"></div>		+

Online product finder  
[www.igus.eu/igidur-finder](http://www.igus.eu/igidur-finder)

Online service life calculation  
[www.igus.eu/igidur-expert](http://www.igus.eu/igidur-expert)

## Technical data

General properties		Testing method	
Density	g/cm <sup>3</sup>	1.58	
Colour		grey	
Max. moisture absorption at +23°C and 50% r.h.	% weight	0.2	DIN 53495
Max. moisture absorption	% weight	1.7	
Coefficient of friction, dynamic, against steel	μ	0.10 – 0.29	
pv value, max. (dry)	MPa · m/s	0.60	
Mechanical properties			
Flexural modulus	MPa	11,486	DIN 53457
Flexural strength at +20°C	MPa	178	DIN 53452
Compressive strength	MPa	115	
Max. recommended surface pressure (+20°C)	MPa	91	
Shore D hardness		81	DIN 53505
Physical and thermal properties			
Max. application temperature long-term	°C	+180	
Max. application temperature short-term	°C	+220	
Min. application temperature	°C	-40	
Thermal conductivity	W/m · K	0.25	ASTM C 177
Coefficient of thermal expansion (at +23°C)	K <sup>-1</sup> · 10 <sup>-5</sup>	3.7	DIN 53752
Electrical properties			
Specific contact resistance	Ωcm	> 10 <sup>9</sup>	DIN IEC 93
Surface resistance	Ω	> 10 <sup>9</sup>	DIN 53482

Table 01: Material properties

The requirement profile is demanding: comprehensive advanced development of the successful all-round classic iglidur® G. This has been achieved especially in terms of moisture absorption, thermal properties and consistently improved wear resistance. Only with shock, impact and edge loads, the robustness of iglidur® G could not quite be achieved.

### Moisture absorption

Under standard climatic conditions, the moisture absorption of iglidur® G1 plain bearings is approximately 0.2% weight. The saturation limit in water is 1.7% weight. This must be taken into account for these types of applications.

### Vacuum

In vacuum, any present moisture is released as vapour. Use in vacuum is only possible with dehumidified iglidur® G1 bearings.

### Radiation resistance

Plain bearings made from iglidur® G1 are resistant up to a radiation intensity of  $3 \cdot 10^2$  Gy.

### Resistance to weathering

iglidur® G1 plain bearings have not yet been tested for their resistance to weathering. Please consult igus® if you're planning to use them outdoors.

### Mechanical properties

With increasing temperatures, the compressive strength of iglidur® G1 plain bearings decreases. Diagram 02 shows this inverse relationship. However, at the long-term maximum temperature of +180°C the permissible surface pressure is around 40MPa. The maximum recommended surface pressure is a mechanical material parameter. No conclusions regarding the tribological properties can be drawn from this.

Diagram 03 shows the elastic deformation of iglidur® G1 at radial loads. The plastic deformation is minimal up to a pressure of approximately 100MPa. However, it is also dependent on the service time.

**Surface pressure, page 41**



-40°C up to  
+180°C



91MPa



HB



RoHS



ISO  
35474

## Permissible surface speeds

iglidur® G1 has been developed for low to medium surface speeds. The maximum values shown in table 03 can only be achieved at low pressures. At the given speeds, friction can cause a temperature increase to maximum permissible levels. In practice, though, this level is rarely reached due to varying application conditions.

**Surface speed, page 44**

## Temperature

The ambient temperatures strongly influence the properties of plain bearings. The temperatures prevailing in the bearing system also have an influence on the wear. With increasing temperatures, the wear increases and this effect is significant when temperatures rise over +120°C. For temperatures over 120°C an additional securing of the bearings in the housing is required.

**Application temperatures, page 49**

**Additional securing, page 49**

## Friction and wear

The coefficient of friction  $\mu$  of a plain bearing among other factors is influenced by the surface speed and the load (diagrams 04 and 05).

**Coefficient of friction and surfaces, page 47**

**Wear resistance, page 50**

## Shaft materials

The friction and wear are also dependent, to a large degree, on the shaft material. Shafts that are too smooth, increase both the coefficient of friction and the wear of the bearing. For iglidur® G1 a ground surface with an average surface finish  $R_a = 0.8\mu\text{m}$  is recommended. Diagram 06 shows results of testing different shaft materials with plain bearings made from iglidur® G1. It can be observed that iglidur® G1 achieves good to very good wear results with all shaft materials. The results for stainless steel types are most likely slightly lower. Diagram 07 compares the wear in rotating and pivoting applications. As with many of the iglidur® materials, wear rate is better in pivoting applications.

**Shaft materials, page 52**

## Installation tolerances

iglidur® G1 plain bearings are standard bearings for shafts with h tolerance (recommended minimum h9). The bearings are designed for press-fit into a housing machined to a H7 tolerance. After being assembled into a nominal size housing, in standard cases the inner diameter automatically adjusts to the F10 tolerances. For particular dimensions the tolerance differs depending on the wall thickness (please see product range table).

**Testing methods, page 57**

Chemicals	Resistance
Alcohols	+ up to 0
Diluted acids	0 up to -
Diluted alkalines	+
Fuels	+
Greases, oils without additives	+
Hydrocarbons	+
Strong acids	-
Strong alkalines	0

All information given at room temperature [+20°C]

**Table 02: Chemical resistance**

**Chemical table, page 1636**

	Rotating	Oscillating	linear
long-term m/s	1.3	1.0	5.0
short-term m/s	2.5	1.8	6.0

**Table 03: Maximum surface speeds**

	Dry	Greases	Oil	Water
Coefficient of friction $\mu$	0.10 - 0.29	0.09	0.04	0.04

**Table 04: Coefficient of friction against steel ( $R_a = 1\mu\text{m}$ , 50HRC)**

	Housing	Plain bearing	Shaft
$\varnothing d1$ [mm]	H7 [mm]	F10 [mm]	h9 [mm]
0 - 3	+0.000	+0.010	+0.006 +0.046 -0.025 +0.000
> 3 - 6	+0.000	+0.012	+0.010 +0.058 -0.030 +0.000
> 6 - 10	+0.000	+0.015	+0.013 +0.071 -0.036 +0.000
> 10 - 18	+0.000	+0.018	+0.016 +0.086 -0.043 +0.000
> 18 - 30	+0.000	+0.021	+0.020 +0.104 -0.052 +0.000
> 30 - 50	+0.000	+0.025	+0.025 +0.125 -0.062 +0.000
> 50 - 80	+0.000	+0.030	+0.030 +0.150 -0.074 +0.000
> 80 - 120	+0.000	+0.035	+0.036 +0.176 -0.087 +0.000
> 120 - 180	+0.000	+0.040	+0.043 +0.203 +0.000 +0.100

**Table 05: Important tolerances for plain bearings according to ISO 3547-1 after press-fit**

## Technical data

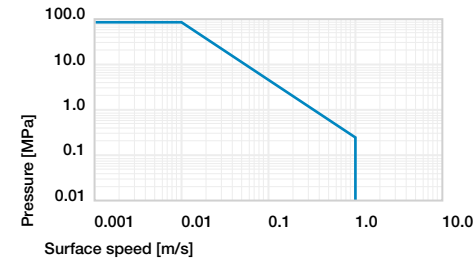


Diagram 01: Permissible pv values for iglidur® G1 plain bearings with a wall thickness of 1mm, dry operation against a steel shaft, at +20°C, mounted in a steel housing

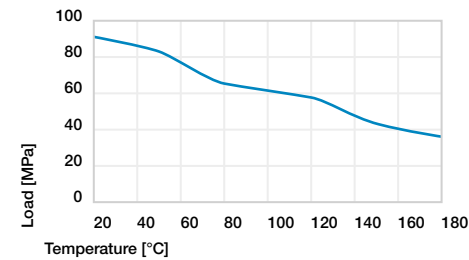


Diagram 02: Maximum recommended surface pressure as a function of temperature (91MPa at +20°C)

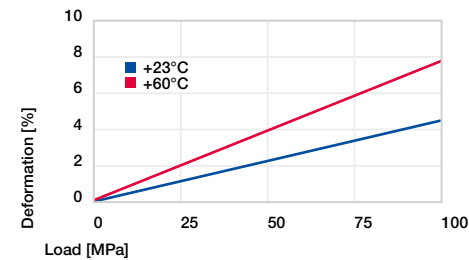


Diagram 03: Deformation under pressure and temperature

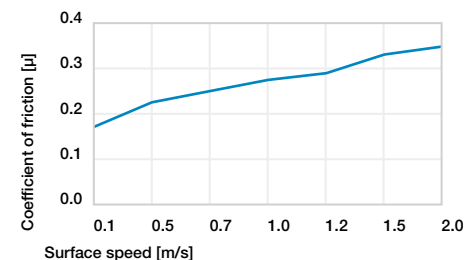


Diagram 04: Coefficient of friction as a function of the surface speed, p = 1MPa

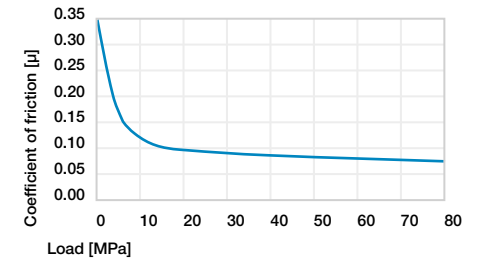


Diagram 05: Coefficient of friction as a function of the load, v = 0.01m/s

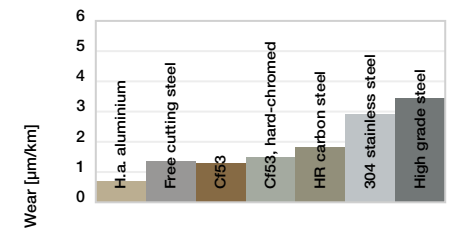


Diagram 06: Wear, rotating with different shaft materials, pressure, p = 1MPa, v = 0.3m/s

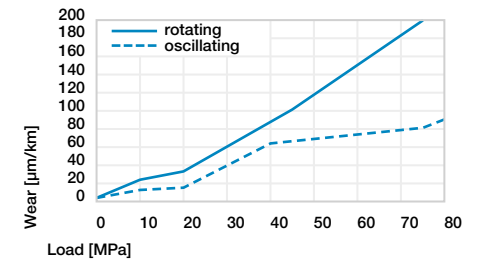
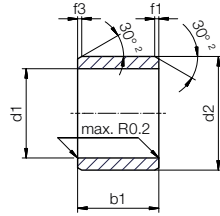


Diagram 07: Wear for oscillating and rotating applications with shaft material Cf53 hardened and ground steel, as a function of the load

# Bearing technology | Plain bearing | iglidur® G1

## Sleeve bearing (form S)



<sup>2)</sup> Thickness < 0.6mm: Chamfer = 20°

Chamfer in relation to d1

d1 [mm]	Ø 1–6	Ø 6–12	Ø 12–30	Ø > 30
f1/f3 [mm]	0.3	0.5	0.8	1.2



Dimensions according to ISO 3547-1 and special dimensions



Order example: **G1SM-0405-04** – no minimum order quantity.

**G1** iglidur® material **S** Sleeve bearing **M** Metric **04** Inner Ø d1 **05** Outer Ø d2 **04** Total length b1

d1	d1	d2	b1	Part No.
[mm]	Tolerance <sup>3)</sup>	[mm]	[mm]	
4.0		5.5	4.0	<b>G1SM-0405-04</b>
4.0		5.5	6.0	<b>G1SM-0405-06</b>
5.0	+0.010	7.0	5.0	<b>G1SM-0507-05</b>
5.0	+0.058	7.0	10.0	<b>G1SM-0507-10</b>
6.0		8.0	6.0	<b>G1SM-0608-06</b>
6.0		8.0	8.0	<b>G1SM-0608-08</b>
6.0		8.0	10.0	<b>G1SM-0608-10</b>
8.0		10.0	8.0	<b>G1SM-0810-08</b>
8.0		10.0	10.0	<b>G1SM-0810-10</b>
8.0		10.0	12.0	<b>G1SM-0810-12</b>
10.0	+0.013	12.0	8.0	<b>G1SM-1012-08</b>
10.0	+0.071	12.0	10.0	<b>G1SM-1012-10</b>
10.0		12.0	12.0	<b>G1SM-1012-12</b>
10.0		12.0	15.0	<b>G1SM-1012-15</b>
10.0		12.0	20.0	<b>G1SM-1012-20</b>
12.0		14.0	10.0	<b>G1SM-1214-10</b>
12.0		14.0	12.0	<b>G1SM-1214-12</b>
12.0		14.0	15.0	<b>G1SM-1214-15</b>
12.0		14.0	20.0	<b>G1SM-1214-20</b>
13.0		15.0	10.0	<b>G1SM-1315-10</b>
13.0		15.0	20.0	<b>G1SM-1315-20</b>
14.0	+0.016	16.0	15.0	<b>G1SM-1416-15</b>
14.0	+0.086	16.0	20.0	<b>G1SM-1416-20</b>
14.0		16.0	25.0	<b>G1SM-1416-25</b>
15.0		17.0	15.0	<b>G1SM-1517-15</b>
15.0		17.0	20.0	<b>G1SM-1517-20</b>
15.0		17.0	25.0	<b>G1SM-1517-25</b>
16.0		18.0	15.0	<b>G1SM-1618-15</b>
16.0		18.0	20.0	<b>G1SM-1618-20</b>

d1	d1	d2	b1	Part No.
[mm]	Tolerance <sup>3)</sup>	[mm]	[mm]	
16.0		18.0	25.0	<b>G1SM-1618-25</b>
18.0	+0.016	20.0	15.0	<b>G1SM-1820-15</b>
18.0	+0.086	20.0	20.0	<b>G1SM-1820-20</b>
18.0		20.0	25.0	<b>G1SM-1820-25</b>
20.0		23.0	10.0	<b>G1SM-2023-10</b>
20.0		23.0	15.0	<b>G1SM-2023-15</b>
20.0		23.0	20.0	<b>G1SM-2023-20</b>
20.0		23.0	25.0	<b>G1SM-2023-25</b>
20.0		23.0	30.0	<b>G1SM-2023-30</b>
22.0		25.0	15.0	<b>G1SM-2225-15</b>
22.0		25.0	20.0	<b>G1SM-2225-20</b>
22.0		25.0	25.0	<b>G1SM-2225-25</b>
22.0		25.0	30.0	<b>G1SM-2225-30</b>
24.0		27.0	15.0	<b>G1SM-2427-15</b>
24.0		27.0	20.0	<b>G1SM-2427-20</b>
24.0	+0.020	27.0	25.0	<b>G1SM-2427-25</b>
24.0	+0.104	27.0	30.0	<b>G1SM-2427-30</b>
25.0		28.0	15.0	<b>G1SM-2528-15</b>
25.0		28.0	20.0	<b>G1SM-2528-20</b>
25.0		28.0	25.0	<b>G1SM-2528-25</b>
25.0		28.0	30.0	<b>G1SM-2528-30</b>
28.0		32.0	20.0	<b>G1SM-2832-20</b>
28.0		32.0	25.0	<b>G1SM-2832-25</b>
28.0		32.0	25.0	<b>G1SM-2832-30</b>
30.0		34.0	20.0	<b>G1SM-3034-20</b>
30.0		34.0	25.0	<b>G1SM-3034-25</b>
30.0		34.0	30.0	<b>G1SM-3034-30</b>
30.0		34.0	40.0	<b>G1SM-3034-40</b>

<sup>3)</sup> After press-fit. *Testing methods, page 57*

## Product range

d1	d1	d2	b1	Part No.
[mm]	Tolerance <sup>3)</sup>	[mm]	h13 [mm]	
32.0		36.0	20.0	<b>G1SM-3236-20</b>
32.0		36.0	30.0	<b>G1SM-3236-30</b>
32.0		36.0	40.0	<b>G1SM-3236-40</b>
35.0		39.0	20.0	<b>G1SM-3539-20</b>
35.0	+0.025	39.0	30.0	<b>G1SM-3539-30</b>
35.0	+0.125	39.0	40.0	<b>G1SM-3539-40</b>
35.0		39.0	50.0	<b>G1SM-3539-50</b>
40.0		44.0	20.0	<b>G1SM-4044-20</b>
40.0		44.0	30.0	<b>G1SM-4044-30</b>
40.0		44.0	40.0	<b>G1SM-4044-40</b>

d1	d1	d2	b1	Part No.
[mm]	Tolerance <sup>3)</sup>	[mm]	h13 [mm]	
40.0		44.0	50.0	<b>G1SM-4044-50</b>
45.0		50.0	20.0	<b>G1SM-4550-20</b>
45.0		50.0	30.0	<b>G1SM-4550-30</b>
45.0		50.0	40.0	<b>G1SM-4550-40</b>
45.0	+0.025	50.0	50.0	<b>G1SM-4550-50</b>
50.0	+0.125	55.0	20.0	<b>G1SM-5055-20</b>
50.0		55.0	30.0	<b>G1SM-5055-30</b>
50.0		55.0	40.0	<b>G1SM-5055-40</b>
50.0		55.0	50.0	<b>G1SM-5055-50</b>
50.0		55.0	60.0	<b>G1SM-5055-60</b>

<sup>3)</sup> After press-fit. *Testing methods, page 57*



Available from stock

Detailed information about delivery time online.

[www.igus.eu/24](http://www.igus.eu/24)



Online ordering

Including delivery times, prices, online tools

[www.igus.eu/G1](http://www.igus.eu/G1)



Ordering note

Our prices are scaled according to order quantities, current prices can be found online.

Discount scaling

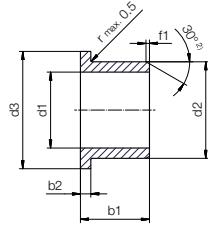
1 – 9	50 – 99	500 – 999
10 – 24	100 – 199	1,000 – 2,499
25 – 49	200 – 499	2,500 – 4,999

No minimum order value.

No low-quantity surcharges.

Free shipping within Germany for orders above €150.

## Flange bearing (form F)



<sup>2)</sup> Thickness < 0.6mm: Chamfer = 20°

### Chamfer in relation to d1

d1 [mm]	Ø 1–6	Ø 6–12	Ø 12–30	Ø > 30
f1 [mm]	0.3	0.5	0.8	1.2



Dimensions according to ISO 3547-1 and special dimensions



Order example: **G1FM-0608-04** – no minimum order quantity.

**G1** iglidur® material **F** Flange bearing **M** Metric **06** Inner Ø d1 **08** Outer Ø d2 **04** Total length b1

d1	d1 Tolerance <sup>3)</sup>	d2	d3 <sup>3)</sup>	b1	b2	Part No.
[mm]		[mm]	[mm]	[mm]	[mm]	
6.0	+0.010 +0.058	8.0	12.0	4.0	1.00	<b>G1FM-0608-04</b>
6.0		8.0	12.0	8.0	1.00	<b>G1FM-0608-08</b>
8.0	+0.013 +0.071	10.0	15.0	5.5	1.00	<b>G1FM-0810-05</b>
8.0		10.0	15.0	7.5	1.00	<b>G1FM-0810-07</b>
8.0		10.0	15.0	9.5	1.00	<b>G1FM-0810-09</b>
10.0		12.0	18.0	7.0	1.00	<b>G1FM-1012-07</b>
10.0		12.0	18.0	9.0	1.00	<b>G1FM-1012-09</b>
10.0		12.0	18.0	12.0	1.00	<b>G1FM-1012-12</b>
10.0	+0.016 +0.086	12.0	18.0	17.0	1.00	<b>G1FM-1012-17</b>
12.0		14.0	20.0	7.0	1.00	<b>G1FM-1214-07</b>
12.0		14.0	20.0	9.0	1.00	<b>G1FM-1214-09</b>
12.0		14.0	20.0	12.0	1.00	<b>G1FM-1214-12</b>
12.0		14.0	20.0	17.0	1.00	<b>G1FM-1214-17</b>
14.0		16.0	22.0	12.0	1.00	<b>G1FM-1416-12</b>
14.0		16.0	22.0	17.0	1.00	<b>G1FM-1416-17</b>
15.0		17.0	23.0	9.0	1.00	<b>G1FM-1517-09</b>
15.0		17.0	23.0	12.0	1.00	<b>G1FM-1517-12</b>
15.0		17.0	23.0	17.0	1.00	<b>G1FM-1517-17</b>
16.0	+0.020 +0.104	18.0	24.0	12.0	1.00	<b>G1FM-1618-12</b>
16.0		18.0	24.0	17.0	1.00	<b>G1FM-1618-17</b>
18.0		20.0	26.0	12.0	1.00	<b>G1FM-1820-12</b>
18.0		20.0	26.0	17.0	1.00	<b>G1FM-1820-17</b>
18.0		20.0	26.0	22.0	1.00	<b>G1FM-1820-22</b>
20.0		23.0	30.0	11.5	1.50	<b>G1FM-2023-11</b>
20.0		23.0	30.0	16.5	1.50	<b>G1FM-2023-16</b>
20.0		23.0	30.0	21.5	1.50	<b>G1FM-2023-21</b>
25.0		28.0	35.0	11.5	1.50	<b>G1FM-2528-11</b>
25.0		28.0	35.0	16.5	1.50	<b>G1FM-2528-16</b>

<sup>3)</sup> After press-fit. *Testing methods, page 57*

## Product range

d1	d1 Tolerance <sup>3)</sup>	d2	d3 <sup>3)</sup>	b1	b2	Part No.
[mm]		[mm]	[mm]	[mm]	[mm]	
25.0	+0.020 +0.104	28.0	35.0	21.5	1.50	<b>G1FM-2528-21</b>
30.0		34.0	42.0	16.0	2.00	<b>G1FM-3034-16</b>
30.0		34.0	42.0	26.0	2.00	<b>G1FM-3034-26</b>
35.0	+0.025 +0.125	39.0	47.0	16.0	2.00	<b>G1FM-3539-16</b>
35.0		39.0	47.0	26.0	2.00	<b>G1FM-3539-26</b>
40.0		44.0	52.0	30.0	2.00	<b>G1FM-4044-30</b>
40.0		44.0	52.0	40.0	2.00	<b>G1FM-4044-40</b>
45.0		50.0	58.0	50.0	2.00	<b>G1FM-4550-50</b>



### Available from stock

Detailed information about delivery time online.

[www.igus.eu/24](http://www.igus.eu/24)



### Online ordering

Including delivery times, prices, online tools

[www.igus.eu/G1](http://www.igus.eu/G1)



### Ordering note

Our prices are scaled according to order quantities, current prices can be found online.

### Discount scaling

1 – 9	50 – 99	500 – 999
10 – 24	100 – 199	1,000 – 2,499
25 – 49	200 – 499	2,500 – 4,999

No minimum order value.

No low-quantity surcharges.

Free shipping within Germany for orders above €150.