

# Data sheet article R-60-06-30-N

## Technical data and application safety

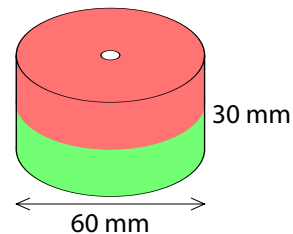
Webcraft GmbH  
 Industriepark 206  
 78244 Gottmadingen, Germany

Phone: +49 7731 939 839 2  
 Fax: +49 7731 939 839 9

www.supermagnete.de  
 support@supermagnete.de

### 1. Technical information

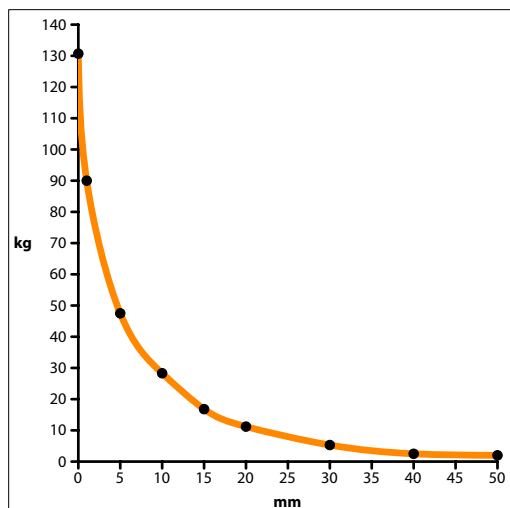
Article	R-60-06-30-N	
Shape	Ring	
Outer diameter	60 mm	
Inner diameter	6 mm	
Height	30 mm	
Tolerance in size	+/- 0,1 mm	
Direction of magnetisation	axial (parallel to height)	
Material	NdFeB (Neodymium Iron Boron)	
Type of coating	Nickel (Ni-Cu-Ni)	
Strength	approx. 120 Kg	approx. 1220 N
Weight	638,2077	
Manufacturing method	sintered	
Magnetisation (Grade)	N45	
Max. working temperature	80 °C	
Curie temperature	310 °C	
Residual magnetism Br	13200-13700 G	1.32-1.37 T
Coercive field strength bHc	10.8-12.5 kOe	860-995 kA/m
Coercive field strength iHc	≥12 kOe	≥955 kA/m
Energy product (BxH)max	43-45 MGOe	342-358 kJ/m <sup>3</sup>



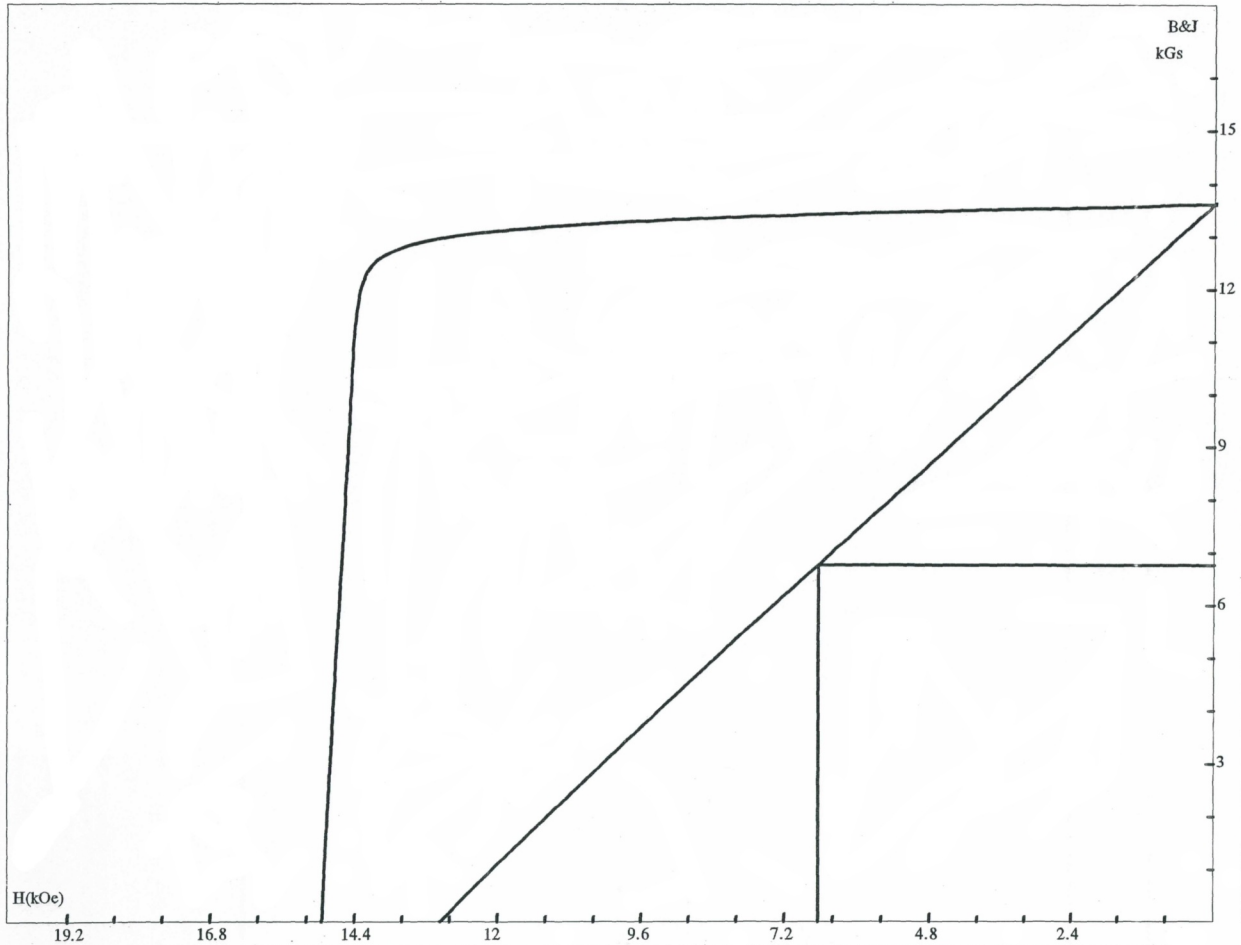
Free of harmful substances according to RoHS Directive 2002/95/EC.  
 Exempt from registration according to REACH.

### 2. Adhesive force diagram




Adhesive force in relation to the air gap between magnet and steel plate.



### 3. Demagnetisation curve N45





### 4. Safety tips


<p><b>Warning</b></p> 	<p><b>Contusions</b></p> <p>Big magnets have a very strong attractive force.</p> <ul style="list-style-type: none"> <li>• Unsafe handling could cause jamming of fingers or skin in between magnets. This may lead to contusions and bruises.</li> <li>• Powerful, very large magnets could cause bone fractures.</li> </ul> <p>Wear heavy protective gloves when handling larger magnets.</p>
<p><b>Warning</b></p> 	<p><b>Pacemaker</b></p> <p>Magnets could affect the functioning of pacemakers and implanted heart defibrillators.</p> <ul style="list-style-type: none"> <li>• A pacemaker could switch into test mode and cause illness.</li> <li>• A heart defibrillator may stop working.</li> </ul> <ul style="list-style-type: none"> <li>• If you wear these devices keep sufficient distance to magnets: <a href="http://www.supermagnete.de/eng/faq/distance">www.supermagnete.de/eng/faq/distance</a></li> <li>• Warn others who wear these devices from getting too close to magnets.</li> </ul>
<p><b>Warning</b></p> 	<p><b>Heavy objects</b></p> <p>Too heavy loads, symptoms of fatigue as well as material defect could cause a magnet or magnetic hook to loosen from the surface that it was attached to.</p> <p>Falling objects could lead to serious injuries.</p> <ul style="list-style-type: none"> <li>• The indicated adhesive force applies only to ideal conditions. Allow for a high safety cushion.</li> <li>• Don't use magnets in places where people could sustain injuries in case of material failure.</li> </ul>


<p><b>Warning</b></p> 	<p><b>Metal splinters</b></p> <p>Magnets are brittle. Colliding magnets could crack. Sharp splinters could be catapulted away for several meters and injure your eyes.</p>
	<ul style="list-style-type: none"> <li>• Avoid the collision of magnets.</li> <li>• Wear safety glasses when handling larger magnets.</li> <li>• Make sure that nearby people are also protected or keep their distance.</li> </ul>


## 5. Handling and storing


<p><b>Caution</b></p> 	<p><b>Magnetic field</b></p> <p>Magnets produce a far-reaching, strong magnetic field. They could damage TVs and laptops, computer hard drives, credit and ATM cards, data storage media, mechanical watches, hearing aids and speakers.</p>
	<ul style="list-style-type: none"> <li>• Keep magnets away from devices and objects that could be damaged by strong magnetic fields.</li> <li>• Please refer to our table of recommended distances: <a href="http://www.supermagnete.de/eng/faq/distance">www.supermagnete.de/eng/faq/distance</a></li> </ul>


<p><b>Caution</b></p> 	<p><b>Combustibility</b></p> <p>When machining magnets, the drilling dust could easily ignite.</p>
	<p>Stay away from machining magnets or use appropriate tools and sufficient cooling water.</p>


<p><b>Caution</b></p> 	<p><b>Nickel allergy</b></p> <p>Many of our magnets have coatings that contain nickel.</p>
	<ul style="list-style-type: none"> <li>• Some people have an allergic reaction when they come into contact with nickel.</li> <li>• Nickel allergies could develop from constant contact with nickel-plated objects.</li> <li>• Avoid constant skin contact with nickel-plated magnets.</li> <li>• Avoid contact with magnets if you already have a nickel allergy.</li> </ul>

<p><b>Notice</b></p> 	<p><b>Influence on people</b></p> <p>According to the current level of knowledge, magnetic fields of permanent magnets do not have a measurable positive or negative influence on people. It is unlikely that permanent magnets constitute a health risk, but it cannot be ruled out entirely.</p>
	<ul style="list-style-type: none"> <li>• For your own safety, avoid constant contact with magnets.</li> <li>• Store large magnets at least one metre away from your body.</li> </ul>


<p><b>Notice</b></p> 	<p><b>Splintering of coating</b></p> <p>Most of our magnets have a thin nickel-copper-nickel coating to protect them from erosion. This coating could splinter or crack due to collision or large pressure. This makes them vulnerable to environmental influences like moisture and they could oxidise.</p>
	<ul style="list-style-type: none"> <li>• Separate big magnets, especially spheres, with a piece of cardboard.</li> <li>• Avoid collisions of magnets as well as repeated mechanical exposure (e.g. blows, bashes).</li> </ul>


<p><b>Notice</b></p> 	<p><b>Oxidation, corrosion, rust</b></p> <p>Untreated magnets oxidise quickly and disintegrate.</p> <p>Most of our magnets have a nickel-copper-nickel coating to protect them from corrosion. This coating provides some protection against corrosion, but it is not robust enough for continuous outdoor use.</p>
	<ul style="list-style-type: none"> <li>• Use magnets only in the dry indoors or protect them against environmental influences.</li> <li>• Avoid damages to the coating.</li> </ul>

<p><b>Notice</b></p> 	<p><b>Temperature stability</b></p> <p>Magnets can withstand only a limited maximum temperature. Depending on the magnet material it ranges anywhere between 80 and 200 °C. Most of our magnets lose part of their adhesive force permanently at a temperature of 80 °C.</p>
	<ul style="list-style-type: none"> <li>• Don't use magnets in places where they are exposed to extreme heat.</li> <li>• If you use an adhesive, don't harden it with hot air.</li> </ul>

<p><b>Notice</b></p> 	<p><b>Mechanical treatment</b></p> <p>Magnets are brittle, heat-sensitive and oxidise easily.</p> <ul style="list-style-type: none"> <li>• When drilling or sawing a magnet with improper tools, the magnet may break.</li> <li>• The emerging heat may demagnetise the magnet.</li> <li>• The magnet will oxidise and disintegrate due to the damaged coating.</li> </ul>
	<p>Avoid machining magnets if you do not have the necessary machines and experience. Let us provide you with an offer for a custom-made order instead: <a href="http://www.supermagnete.de/eng/custom_form.php">www.supermagnete.de/eng/custom_form.php</a></p>

## 6. Transportation tips

<p><b>Caution</b></p> 	<p><b>Airfreight</b></p> <p>Magnetic fields of improperly packaged magnets could influence airplane navigation devices. In the worst case it could lead to an accident.</p>
	<ul style="list-style-type: none"> <li>• Airfreight magnets only in packaging with sufficient magnetic shielding.</li> <li>• Please refer to the respective regulations: <a href="http://www.supermagnete.de/eng/faq/airfreight">www.supermagnete.de/eng/faq/airfreight</a></li> </ul>

<p><b>Caution</b></p> 	<p><b>Postage</b></p> <p>Magnetic fields of improperly packaged magnets could cause disturbances in sorting machines and damage fragile goods in other packages.</p>
	<ul style="list-style-type: none"> <li>• Please refer to our shipping tips: <a href="http://www.supermagnete.de/eng/faq/shipping">www.supermagnete.de/eng/faq/shipping</a></li> <li>• Use a large box and place the magnet in the middle surrounded by lots of padding material.</li> <li>• Arrange magnets in a package in a way that the magnetic fields neutralise each other.</li> <li>• If necessary, use sheet iron to shield the magnetic field.</li> <li>• There are stricter rules for airfreight: Refer to the warning notice "Airfreight".</li> </ul>

## 7. Disposal tips

Small amounts of used neodymium magnets can be thrown out with the regular trash. Larger amounts of magnets need to be recycled as scrap metal.

## 8. Statutory provisions

Our goods are not intended for use in or export to the USA, Canada or Japan. Using our goods in the direct or indirect production of items intended for export to the above-mentioned countries is therefore strictly prohibited.

**TARIC-Code:** 8505.11.00.99

For more information about magnets please review [www.supermagnete.de/faq.php](http://www.supermagnete.de/faq.php).

**Last update:** 23/11/2011