Sintered NdFeB Magnets’ Specifications

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## Table I Sintered NdFeB Magnets’ Grades and Their Magnetic Properties

<table>
<thead>
<tr>
<th>Grade</th>
<th>$B_r$ (kGs)</th>
<th>$H_{cb}$ (kOe)</th>
<th>$H_{cj}$ (kOe)</th>
<th>$(BH)_{max}$ (MGOe)</th>
<th>$T_w$ (°C)</th>
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</thead>
<tbody>
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<td>N52</td>
<td>14.2-14.8</td>
<td>1.42-1.48</td>
<td>$\geq 10.5$</td>
<td>$\geq 836$</td>
<td>$\geq 11$</td>
</tr>
<tr>
<td>N50</td>
<td>13.9-14.4</td>
<td>1.39-1.44</td>
<td>$\geq 10.8$</td>
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<tr>
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<td>13.6-14.1</td>
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<td>$\geq 923$</td>
<td>$\geq 12$</td>
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<td>$\geq 907$</td>
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<td>$\geq 796$</td>
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<tr>
<td>Grade</td>
<td>$B_r$</td>
<td>$H_{cb}$</td>
<td>$H_{cj}$</td>
<td>$(BH)_{max}$</td>
<td>$T_w$</td>
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<td>-------</td>
<td>------------</td>
<td>----------</td>
<td>----------</td>
<td>--------------</td>
<td>-------</td>
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<tr>
<td></td>
<td>kGs</td>
<td>T</td>
<td>kOe</td>
<td>kA/m</td>
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<td>1.17-1.22</td>
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<td>≥812</td>
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<td>1.13-1.18</td>
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<td>≥851</td>
<td>≥35</td>
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<td>N30AH</td>
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<td>≥812</td>
<td>≥35</td>
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</tr>
</tbody>
</table>

Note:
* The data in the above table were samples’ results tested at the temperature of 20 °C.
* The temperature coefficients of $B_r$ and $H_{cj}$ are $\alpha(B_r): -0.09~-0.12 \%/°C$ and $\beta(H_{cj}): -0.40~-0.60 \%/°C$, respectively.
* The above data are only for reference, magnets can be tailored according to customers’ personalized requirements.
## Table II  Sintered NdFeB Magnets’ Shapes, Magnetization Direction and Size Range

<table>
<thead>
<tr>
<th>Shape</th>
<th>Graphic Description</th>
<th>Magnetization Direction</th>
<th>Size Range</th>
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</thead>
<tbody>
<tr>
<td>Disc/Cylinder</td>
<td><img src="image" alt="Disc/Cylinder" /></td>
<td>Axially Magnetized</td>
<td>D: 1-100 mm</td>
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<td></td>
<td></td>
<td></td>
<td>T: 0.5-100 mm</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Disc/Cylinder" /></td>
<td>Diametrically Magnetized</td>
<td>D: 1-100 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>T: 0.5-100 mm</td>
</tr>
<tr>
<td>Ring</td>
<td><img src="image" alt="Ring" /></td>
<td>Axially Magnetized</td>
<td>OD: 4-100 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ID: 1-90 mm</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Ring" /></td>
<td>Diametrically Magnetized</td>
<td>OD: 4-100 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ID: 1-90 mm</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Ring" /></td>
<td>Radially Magnetized</td>
<td>OD: 24-200 mm</td>
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<tr>
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<td></td>
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<td>ID: 18-180 mm</td>
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<tr>
<td>Block/Rectangular</td>
<td><img src="image" alt="Block/Rectangular" /></td>
<td>Thickness Magnetized</td>
<td>L: 1-160 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>W: 1-100 mm</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Block/Rectangular" /></td>
<td>Diametrically Magnetized</td>
<td>OD-ID≥1 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L: 1-160 mm</td>
</tr>
<tr>
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<td></td>
<td></td>
<td>W: 3-100 mm</td>
</tr>
<tr>
<td>Arc/Segment</td>
<td><img src="image" alt="Arc/Segment" /></td>
<td>Diametrically Magnetized</td>
<td>OD-ID≥1 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L: 1-160 mm</td>
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**Note:**
* Other shapes of sintered NdFeB magnets can also be tailored according to customers’ specific requirements.
### Table III Sintered NdFeB Magnets’ Coating Types

<table>
<thead>
<tr>
<th>Coating</th>
<th>Thickness (μm)</th>
<th>SST (hr)</th>
<th>PCT (hr)</th>
<th>$T_w$ (°C)</th>
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<tbody>
<tr>
<td>Zn (Zinc)</td>
<td>5-15</td>
<td>&gt;24</td>
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<td>≤160</td>
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<td>C-Zn (Colored Zinc)</td>
<td>5-15</td>
<td>&gt;48</td>
<td>-</td>
<td>≤160</td>
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<tr>
<td>Electroless Nickel</td>
<td>10-30</td>
<td>&gt;96</td>
<td>&gt;72</td>
<td>≤230</td>
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<tr>
<td>NiCuNi (Nickel Copper Nickel)</td>
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<td>&gt;48</td>
<td>&gt;48</td>
<td>≤230</td>
</tr>
<tr>
<td>NiCu + Black Nickel</td>
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<td>&gt;48</td>
<td>&gt;72</td>
<td>≤230</td>
</tr>
<tr>
<td>NiCuNi + Tin</td>
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<td>&gt;48</td>
<td>&gt;48</td>
<td>≤160</td>
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<tr>
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<td>&gt;48</td>
<td>≤230</td>
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<td>Epoxy</td>
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<td>&gt;72</td>
<td>&gt;48</td>
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<td>Teflon</td>
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<td>&gt;48</td>
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<td>&gt;96</td>
<td>&gt;72</td>
<td>≤230</td>
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<td>Parylene</td>
<td>0.2-5</td>
<td>&gt;96</td>
<td>-</td>
<td>≤230</td>
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Note:

* Salt spray test (SST) was conducted at 35 °C with 5% NaCl solution.
* Pressure cooker test (PCT) was conducted at 120 °C, 2 atm and 100% RH.

### Table IV Some Physical Properties of Sintered NdFeB Magnets

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>Value</th>
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<tbody>
<tr>
<td>Density ($\rho$)</td>
<td>g/cm$^3$</td>
<td>7.4-7.7</td>
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<tr>
<td>Curie Temperature ($T_c$)</td>
<td>°C</td>
<td>310-370</td>
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<td>Recoil Permeability ($\mu_{rec}$)</td>
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<tr>
<td>Vickers Hardness (HV)</td>
<td>MPa</td>
<td>500-600</td>
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<tr>
<td>Bending Strength ($\sigma_{ab}$)</td>
<td>MPa</td>
<td>200-400</td>
</tr>
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<td>Compressive Strength ($\sigma_{bc}$)</td>
<td>MPa</td>
<td>1000-1100</td>
</tr>
<tr>
<td>Tensile Strength ($\sigma_b$)</td>
<td>MPa</td>
<td>80-90</td>
</tr>
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<td>Resistivity ($\rho$)</td>
<td>$\mu\Omega\cdot$m</td>
<td>1.4-1.6</td>
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<td>Thermal Conductivity ($\lambda$)</td>
<td>W/(m·K)</td>
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<td>Young's Modulus (E)</td>
<td>GPa</td>
<td>150-200</td>
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<td>Thermal Expansivity // Magnetization ($\alpha_{//}$)</td>
<td>$10^6$/°C</td>
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<tr>
<td>Thermal Expansivity ⊥ Magnetization ($\alpha_{\perp}$)</td>
<td>$10^6$/°C</td>
<td>1-3</td>
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Note:

* The above data are only for reference, specific magnets may have different values.