SMC - Data sheet

Iron Core Material-Somaloy®

- soft magnetic material
- high purity iron powder
- high natural saturation
- electrically insulated surface

Advantages

- 3D-shape with strong resistance
- substitution of laminated cores for motors
- higher effectiveness – higher frequencies from 2 KHz
- 3D flux properties

Result in 3D-material with

- high magnetic saturation
- low eddy current loss
- sufficient strength

Applications

- brushless DC motor
- linear motor
- transverse flux motor
- claw pole motor
- ignition coil
- fuel injection valves

Benefit

- cost reduction by size and weight reduction
- high torque and power density solutions
- unique 3D extended design approach
- efficient volume production of components
- simplified winding arrangements
- permanent magnet and winding reduction
- suitable for automated assembly

Somaloy® is a registered trademark of Höganäs AB, Sweden.
Properties of Soft Magnetic Composite Material

<table>
<thead>
<tr>
<th>Material</th>
<th>Resistivity μΩ*m</th>
<th>TRS MPa</th>
<th>B@ 10000 A/m (T)</th>
<th>B@ 4000 A/m (T)</th>
<th>Permeability μ_max</th>
<th>Density g/cm³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Somaloy® 500-1P</td>
<td>70</td>
<td>50</td>
<td>1.51</td>
<td>1.26</td>
<td>500</td>
<td>7.37</td>
</tr>
<tr>
<td>Somaloy® 700-1P</td>
<td>400</td>
<td>40</td>
<td>1.56</td>
<td>1.31</td>
<td>540</td>
<td>7.45</td>
</tr>
<tr>
<td>Somaloy® 700-3P</td>
<td>600</td>
<td>120</td>
<td>1.57</td>
<td>1.31</td>
<td>770</td>
<td>7.52</td>
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<tr>
<td>Somaloy® 1000-3P</td>
<td>70</td>
<td>140</td>
<td>1.63</td>
<td>1.42</td>
<td>850</td>
<td>7.56</td>
</tr>
</tbody>
</table>

For further material data please consult www.hoganas.com.

Core Loss at 1 T (W/kg)

<table>
<thead>
<tr>
<th>Material</th>
<th>5x5 mm / 100 Hz</th>
<th>5x5 mm / 400 Hz</th>
<th>5x5 mm / 1000 Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Somaloy® 500-1P</td>
<td>13</td>
<td>54</td>
<td>156</td>
</tr>
<tr>
<td>Somaloy® 700-1P</td>
<td>9.9</td>
<td>43</td>
<td>126</td>
</tr>
<tr>
<td>Somaloy® 700-3P</td>
<td>10</td>
<td>45</td>
<td>132</td>
</tr>
<tr>
<td>Somaloy® 1000-3P</td>
<td>10</td>
<td>46</td>
<td>144</td>
</tr>
</tbody>
</table>

*Magnetic Properties Measured according to CEI/IEC 60404-6:2003 on ring sample (OD55 ID45 H5 mm).

Prototypes

We can offer prototype material in the following dimensions:
- Ø 10 x 1 ... 20 mm
- Ø 16 x 1 ... 30 mm
- Ø 55 x 2 ... 30 mm
- Ø 90 x 2 ... 55 mm
- Ø 120 x 2 ... 50 mm

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