FM SHIELD™ MS-F / MS-FR Series
High Permeability, Thin and Flexible Magnetic Shielding Sheet

MS-F / MS-FR series are thin and flexible magnetic shielding sheets made of high permeability FINEMET® 3M tapes laminated with PET films.

FINEMET® is a registered trademark of Hitachi Metals, Ltd.
Metglas® is a registered trademark of Metglas®, Inc.
1. **Features**

FM SHIELD™ is a magnetic shielding sheet made of high permeability FINEMET® FT-3M ribbon laminated with PET film. The sheets are thin, light weight and flexible, and easy to handle. (Figure 1)

FM SHIELD™ have superior magnetic shielding effect especially in frequencies below several 100kHz. (Figure 2)

One layer can shield about 100 μT. Multiple layers allow shielding strong magnetic field. (Figure 3, 4)  
(Shielding effect can vary depending on shape, layers, shielding method, etc.)

Having small deterioration in shielding effect by bending, cutting and punching, FM SHIELD™ can be applied on curved surface and cut or punched in various shapes.

Long sheet type is suitable for large-scale magnetic shield such as shielding room.

2. **Structure**

![Structure of MS-F/MS-FR](image)

- PET film : 25μm
- Hot-melt adhesive : 25μm
- FINEMET® FT-3M tape : 18μm
- Hot-melt adhesive : 25μm
- PET film : 25μm
- Double-sided adhesive tape (Option) *

Total thickness : 0.12 mm

3. **Applications**

- For suppression of magnetic noise generated from inductors in electronic devices, such as personal computer, mobile phone, DVC, DSC, etc.
- For magnetic shielding of buildings or houses close to power lines or power distribution installation.
- For magnetic shielding of equipments that easily affected by geomagnetic field or fluctuating magnetic field.

**Examples**

- Cylindrical shielding box
- Shielding box

4. **Specifications**

<table>
<thead>
<tr>
<th>Type</th>
<th>Long sheet</th>
<th>Sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length</td>
<td>100 m</td>
<td>610 mm</td>
</tr>
<tr>
<td>Width</td>
<td>470 mm</td>
<td>460 mm</td>
</tr>
<tr>
<td>Product code</td>
<td>F1AH0535</td>
<td>F1AH0607</td>
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<tr>
<td>P/N</td>
<td>MS-FR 470-100M-T0</td>
<td>MS-F SD-460×610-T0</td>
</tr>
<tr>
<td>Thickness</td>
<td>0.12 mm</td>
<td></td>
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<tr>
<td>Magnetic flux density, $B_{900}$ (DC H=800A/m)</td>
<td>1.23 T</td>
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<tr>
<td>Maximum permeability, $\mu_{\text{max}}$ (DC)</td>
<td>70,000 T</td>
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<tr>
<td>Operating temperature range</td>
<td>-40～+80 °C</td>
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</tr>
</tbody>
</table>

*Double-sided adhesive tape is available for 610 mm × 460 mm sheet.*
5. Shielding Effect

Fig. 2 Shielding effect of magnetic wave vs. frequency
(Advantest method: 150×150mm sample)

Fig. 3 Shielding effect of magnetic field at 50Hz
(ASTM method: 470×470×470mm shielding box)

Fig. 4 Shielding effect of DC magnetic field
(ASTM method: 470×470×470mm shielding box)
**NOTICES**

1. When designing a component using this product and applying the designed components in any system, use this product only in the guaranteed range specified by Hitachi Metals, Ltd. Do not use the product beyond guaranteed values specified by Hitachi Metals, Ltd. Hitachi Metals, Ltd. will not be responsible for any damage or accident when this product is used beyond guaranteed values specified by Hitachi Metals, Ltd. Even when the product is used within the specification given by Hitachi Metals, take appropriate measures for system, such as failsafe, to avoid any accident resulting in any bodily injury and/or property damage. It is the responsibility of a user to take such measures.

2. This product is designed to be used for general electronic devices (e.g. office machinery, communication devices, measurement devices, household appliances, etc.). Performance and safety of this product for applications in the special fields which require particularly high reliability and quality, and whose application is potentially life threatening or could lead to physical harm in the event of malfunction is not confirmed. Such fields may include: space science, aviation, nuclear energy, combustion control, transportation, safety devices and medical equipment. Be sure to examine the performance and safety when the product is used for these applications, and take appropriate measures for system, such as failsafe, to avoid any accident resulting in any bodily injury and/or property damage. It is the responsibility of a user to take such measures.

3. Do not use this product in devices under massive radiation, such as neutron rays. This product is not a radiation-proof and may result in deterioration of this product.

4. In no event shall Hitachi Metals, Ltd. be responsible for any claim, loss or damages caused by defect in design by user.

5. The products and their specifications are subject to change without notice. Please check the latest catalog, technical documents or specifications before your final design, procurement or use of the products.

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