

**FINEMET®
EMC Components
[Catalog]**



**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® FT-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

1. 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)
2. FM SHIELD™ have superior magnetic shielding effect especially in frequencies below several 100kHz. (Figure 2)
3. One layer can shield about 100 μ T. Multiple layers allow shielding strong magnetic field. (Figure 3, 4)
(Shielding effect can vary depending on shape, layers, shielding method, etc.)
4. 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.
5. Long sheet type is suitable for large-scale magnetic shield such as shielding room.

2. Structure

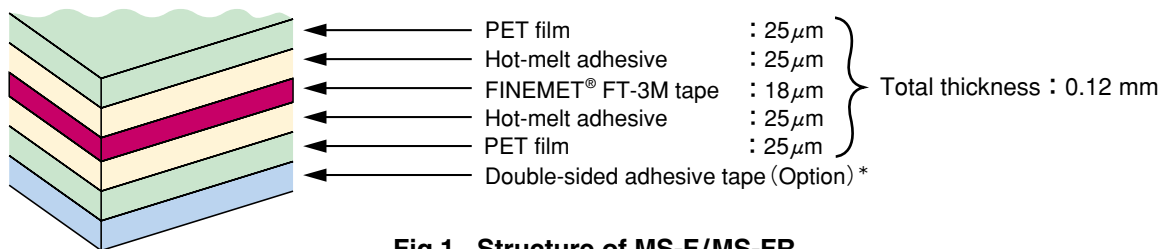


Fig.1 Structure of MS-F/MS-FR

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

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

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



For safety and the proper use, you are requested to confirm our product specifications or to implement the approval sheet for product specifications before ordering. This catalog and its contents are subject to change without notice.

5. Shielding Effect

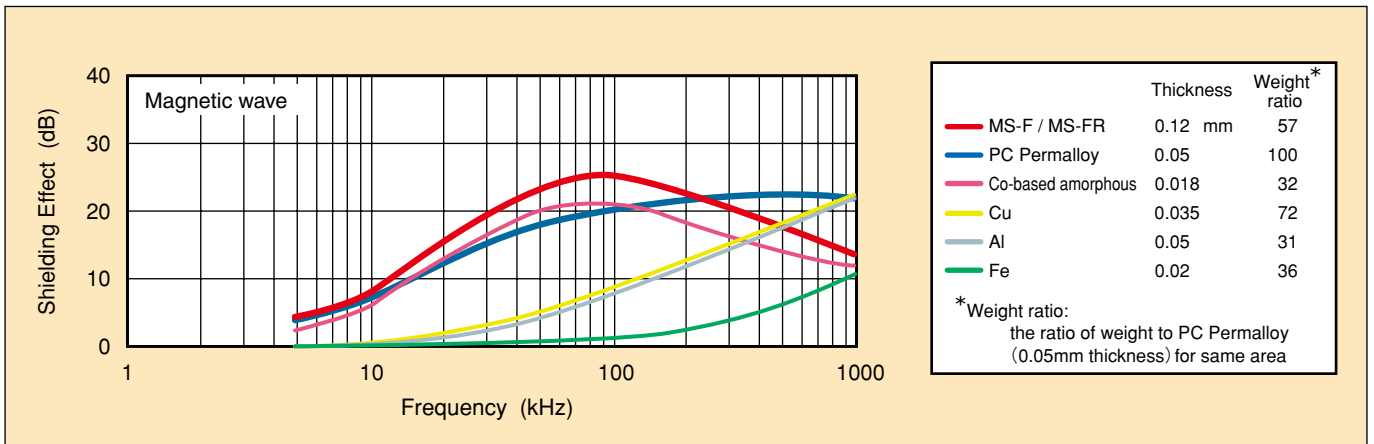


Fig.2 Shielding effect of magnetic wave vs. frequency
(Advantest method : 150×150mm sample)

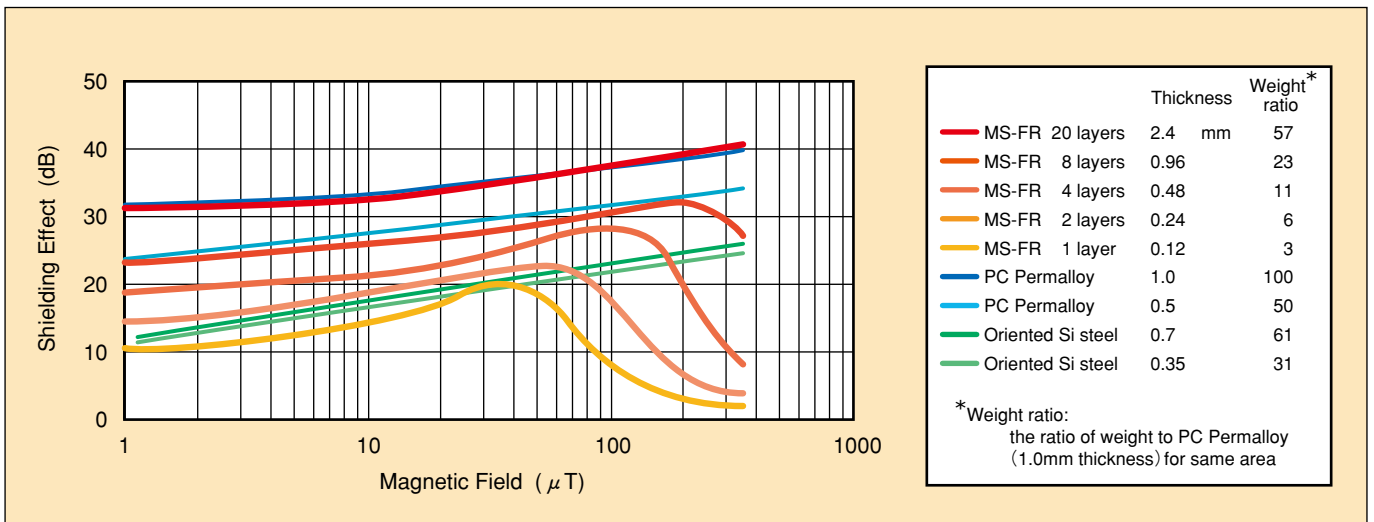


Fig. 3 Shielding effect of magnetic field at 50Hz
(ASTM method : 470×470×470mm shielding box)

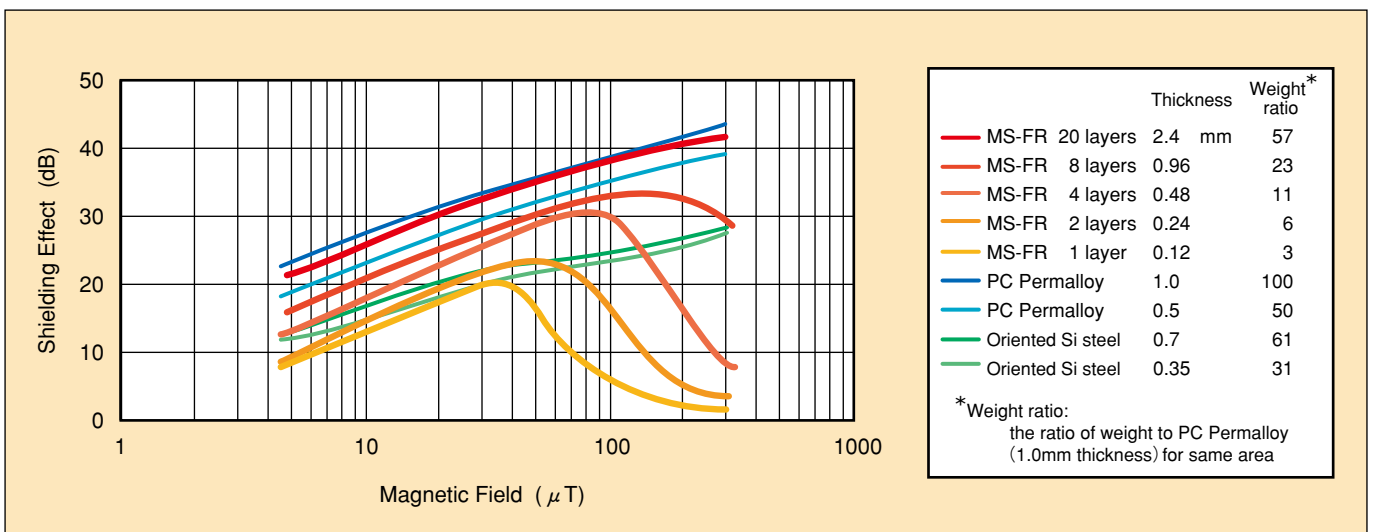




Fig. 4 Shielding effect of DC magnetic field
(ASTM method : 470×470×470mm shielding box)





NOTICES


 **WARNING** This is a hazard warning sign. Please observe the following items in order to avoid possible injury or death.

 **CAUTION** This caution sign indicates the possibility of bodily injury or property damage due to improper handling. Please observe the following items in order to avoid possible bodily injury and property damage.

1. Design and Use

 **WARNING** 1) 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 application in particular 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 guaranteed. Such fields may include: space science, aviation, nuclear energy, fire control, transportation, safety equipment, and medical equipment. Please be sure to carefully check performance and safety when the product is used for these applications, and take appropriate measures for systems, such as fail-safes, in order to avoid any accidents which may result in bodily injury and/or property damage. It is the responsibility of the user to take these measures.

 **WARNING** 2) 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 the guaranteed values specified by Hitachi Metals, Ltd. Hitachi Metals, Ltd. will not be responsible for any damages or accidents resulting from use of this product beyond the guaranteed values specified by Hitachi Metals, Ltd. Even when the product is used within the specifications given by Hitachi Metals, please take appropriate measures for systems, such as fail-safes, in order to avoid any accidents which may result in bodily injury and/or property damage. It is the responsibility of the user to take these measures.

 **WARNING** 3) This product may overheat due to magnetic conversion depending on the environment. Please be sure to take appropriate measures for systems, such as fail-safes, in order to avoid any accidents which may result in bodily injury and/or property damage. It is the responsibility of the user to take these measures.


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

5) In no event shall Hitachi Metals, Ltd. be responsible for any claims, loss, or damages caused by defect in design through the fault of the user.

2. Handling

1) Do not drop the product. The impact of the drop may alter the magnetic properties.


2) Keep the product away from high-powered magnets. The product is likely to be pulled by magnetic force and be damaged from the shock.

 **CAUTION** 3) The material (metal alloy ribbon) of the product is extremely thin with very sharp edges, which can cut your hands or fingers. If the metal portion is exposed, do not handle with bare hands.

4) Do not use or store the product where it may be damaged by impact/direct shock. The product contains thin metal alloy, with relatively low impact resistance. The metal alloy could fracture, and its magnetic properties could deteriorate due to the impact.

5) Overlapped parts of the metal ribbons are not adhered together. If overlapping ribbons are in the end of the product, the metal ribbons may come apart.

6) Metal powder and/or weld may come off from the end, which may cause circuits to short in peripherals, or cause injuries to your hands, fingers, eyes, etc.

 **CAUTION** 7) Multiple bends or bends with high curvature may break their protection sheets, and metal powder and/or weld may come off from the damaged part(s) which may cause circuits to short in peripherals, or cause injuries to your hands, fingers, eyes, etc. Multiple bends or bends with high curvature may also deteriorate the magnetic properties of the product. If multiple bends or bends with high curvature are required, please consult us in advance.

3. Environment

Do not use the product under the following conditions:

- 1) In liquids, such as water, oil, chemicals, organic solvents, etc.;
- 2) In locations subjected to direct sunlight, open air, and/or dust;
- 3) In environments with corrosive atmospheres, such as salt air, Cl₂, H₂S, NH₃, NO_x, SO₂, O₃, etc.;
- 4) In locations subjected to high temperatures and/or high humidity;
- 5) In locations near flammable gases;
- 6) In locations near heat-generating equipment.

4. Storage

In order to avoid negatively affecting the performance of the product, do not store it where water or other liquids splash directly, or in damp places.

5. Disposition

- 1) When disposing of the product, dispose of it as industrial waste.
- 2) Disposition, reprocessing, or other additional processes shall be arranged at your own expense.

6. Products and Use

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

7. Rights and licenses

No warranties, rights, or licenses in connection with any patents, trademarks, copyrights, or any other intellectual property rights shall be, expressly or implied, given or granted to any party by Hitachi Metals, Ltd. under this catalog.

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