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Technical Data | January 2018

3M™ Flux Field Directional Material EM15TF Series

Product Description

3M™ Flux Field Directional Material (FFDM) EM15TF Series is multi-layer construction consisting of a primary inner soft magnetic layer with protective Polyethylene Terephthalate (PET) cover film and an optional acrylic pressure sensitive adhesive or PET bottom film.

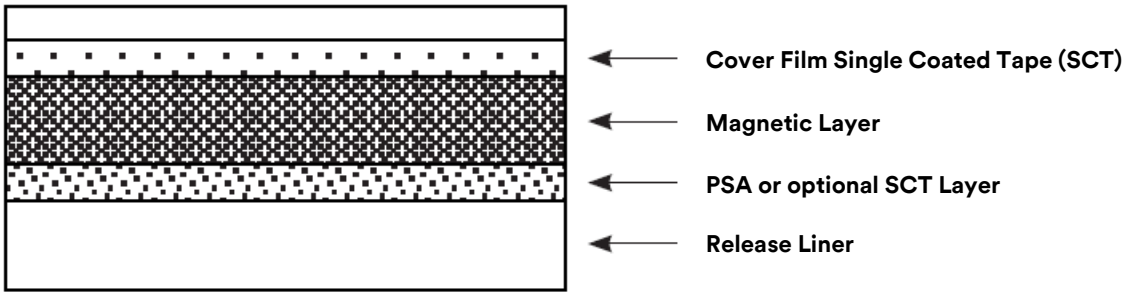
The EM15TF product is available in various ferrite layer thicknesses and provides for excellent Flux Field Directional Material (FFDM) performance for Wireless Power (WPC) and magnetic shielding applications. For WPC applications the EM15TF offer excellent permeability performance with low loss for a high effective Q factor.

3M FFDM EM15TF Series is typically available in either 125mm x 125mm sheets or only half size sheets that are 125mm x65mm. (Customized sizes and thicknesses are available based on product version. Such as 135mm x 75mm for some limited thickness options. Inquire with 3M for more details.)

Key Features

- High permeability and low loss magnetic material
- Thin overall construction
- Black PET protection tape cover film
- Pressure sensitive acrylic adhesive
- Supplied on a removable liner for ease of handling

3M™ Flux Field Directional Material EM15TF



3M™ Flux Field Directional Material EM15TF Series

Product Construction/Material Description

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

3M™ Flux Field Directional Material EM15TF Series				
	Thickness (mm)			
Product Number	Cover (tlt)	Magnetic	Adhesive (blt)	Total*
EM15TF-005-10BST-10BADH	0.01 BST	0.03	0.01	0.05**
EM15TF-007-10BST-10ADH	0.01 BST	0.05	0.01	0.07
EM15TF-008-10BST-10ADH	0.01 BST	0.06	0.01	0.08
EM15TF-010-10BST-10ADH	0.01 BST	0.08	0.01	0.1
EM15TF-012-10BST-10ADH	0.01 BST	0.1	0.01	0.12
EM15TF-017-10BST-10ADH	0.01 BST	0.15	0.01	0.17
EM15TF-022-10BST-10ADH	0.01 BST	0.2	0.01	0.22
EM15TF-026-30ADH-30ADH	0.03 ADH	0.2	0.03	0.26
EM15TF-026-30HAF-30HAF	0.030 HAF	0.2	0.030 HAF	0.26

*Typical tolerance is +/- 10%. If needed for product description, a Bottom Layer Type (blt) or Top Layer Tape(tlt) designation following the overall thickness value can be added to the existing product number.
For example: EM15TF-xxx-tlt-blt: blt = top layer type, blt = bottom layer type, overall thickness = xxx. The tlt, blt options are: BST = Black Single coated Tape, ADH = acrylic ADHesive tape, BADH = Black color acrylic ADHesive tape, HAF = Heat Activated Film adhesive: Example: EM15TF-005-10BST-10BADH with a Bottom side 0.01mm Black ADHesive(BADH) and Top side 0.01 Black Single coated Tape (BST)and 0.05mm overall thickness.
**Sheet size is limited to half size sheets due to thickness.

Applications

3M™ Flux Field Directional Materials (FFDM) EM15TF Series is typically used for the Wireless Power applications, magnetic shielding, or 13.56MHz RFID reader and tag applications.

The EM15TF FFDM redirects the magnetic fluxes of an application so that conductive surfaces nearby do not induce eddy currents within the conductor, which opposes the field responsible for their creation. The FFDM reduces the magnetic field on the surface of the conductor to such a degree that interactions between a primary Transmitting coil (Tx) and Receiving coil (Rx) are improved versus with no FFDM present. By inserting 3M FFDM EM15TF Series between the receiving coil antenna (Rx) and a nearby conductive surface, it is possible to largely prevent the occurrences of the eddy currents. This makes it possible to mount the antenna on or near metal surfaces. Many factors determine true Tx to Rx performance, such as antenna size, sensitivity, field intensity, modulation algorithm and environment.

As shown in Fig. 2, just inserting 3M FFDM EM15TF Series can increase communication distance. To maximize the performance, it is necessary to take into account the fact that the inductance of antenna may be increased by 3M FFDM EM15TF Series and optimize the associated device electronics.

3M™ Flux Field Directional Material EM15TF Series

Typical Physical Properties and Performance Characteristics

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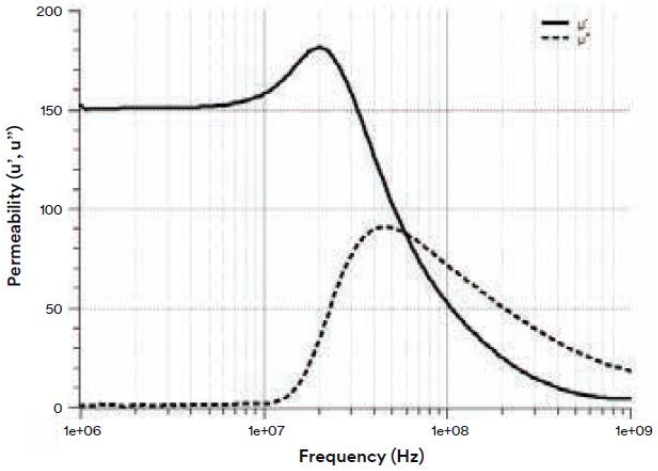

Figure 1: Real and Imaginary part of Permeability with Frequency.

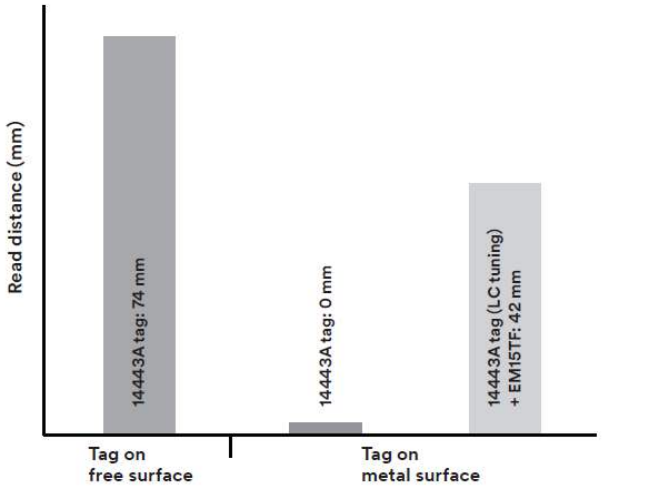

Figure 2: Data Communication Length between Reader and ISO 14443A Type.

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3M™ Flux Field Directional Material EM15TF	
Property	**Method***
Type of Absorber Material	Sintered Ferrite Sheet
Magnetic Permeability*	150 (at 3 MHz)
Standard Size (mm)	125 x 125
Resistivity** (Ω meter)	10^4
Operating Temperature (°C)	-30 ~ +85

*This value was measured with Agilent E4991A RF Impedance/Material Analyzer. (Fig. 1)
**Tested in accordance with ASTM D257 test method.

Storage and Shelf Life

The shelf life of 3M™ Flux Field Directional Materials EM15TF Series is 12 months from the date of manufacture when stored in the original packaging materials and stored at 21°C (70°F) and 50% relative humidity.

3M™ Flux Field Directional Material EM15TF Series

Certificate of Analysis (COA)

The 3M Certificate of Analysis (COA) for this product is established when the product is commercially available from 3M. The commercially available product will have a COA specification established. The COA contains the 3M specifications and test methods for the products performance limits that the product will be supplied against. The 3M product is supplied to 3M COA test specifications and the COA test methods. Inquire with 3M for the COA for this product.

The TDS data contains preliminary data and is not the COA specification limits and/or test methods that may be used for COA purposes.

Final product specifications and testing methods will be outlined in the products Certificate of Analysis (COA) that is provided once the product is approved by 3M for general commercialization and development work is completed.

Safety Data Sheet: Consult Safety Data Sheet before use.

Regulatory: For regulatory information about this product, contact your 3M representative.

Technical Information: The technical information, recommendations and other statements contained in this document are based upon tests or experience that 3M believes are reliable, but the accuracy or completeness of such information is not guaranteed.

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