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3M™ Flux Field Directional Material EM80KM-xxx-1

Product Description

3M™ Flux Field Directional Material (FFDM) EM80KM is a multi-layer construction material consisting of a primary inner soft magnetic foil layer with a protective PET cover film and an acrylic pressure sensitive adhesive.

The key features of the 3M FFDM EM80KM include:

- High permeability magnetic foil
- Approximately 80,000 permeability maximum
- Thin overall construction
- Black PET protection tape cover film
- Pressure sensitive acrylic adhesive
- Supplied on a removable liner for ease of handling

The 3M FFDM EM80KM is useful for many applications where the manipulation of a flux field is desired. Typical applications include:

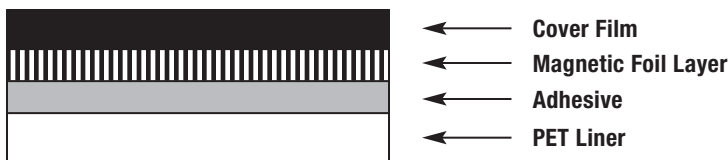
- Wireless power FFDM to optimize power transfer efficiency between a primary sending coil and a receiving coil
- Magnetic shielding at low frequencies
- Power or current line shielding of RF noise signal

3M FFDM EM80KM is available in standard 120 mm x 420 mm sheets

30 mm and 50 mm width roll package is available. Please consult your 3M local support to see where roll product format is available. Customized options can also be reviewed.

Note 1: 30 mm and 50 mm roll width reflects the magnetic material layer width in a roll. The overall roll width that includes the cover film is typically about 5 mm wider. The cover film extends past the width of magnetic material to aid converting and handling. Plan the die cut process accordingly for end use design. The full width of rolls are approximately 35 mm and 55 mm width with cover film.

Product Construction



Structure	3M™ Flux Field Directional Material				
		EM80KM-003-1	EM80KM-005-1	EM80KM-006-1	EM80KM-011-1
Cover Film Type (Note 1)	Black Colored PET	0.007 mm	0.02 mm	0.025 mm	0.03 mm
Magnetic Type	Soft Magnetic Foil	0.02 mm	0.02 mm	0.02 mm	0.02 mm
Adhesive Type	Acrylic	0.005 mm	0.01 mm	0.01 mm	0.06 mm
Total Thickness		0.032 mm	0.05 mm	0.055 mm	0.11 mm
Liner (Note 2)	Clear PET	0.025 mm	0.036 mm	0.036 mm	0.036 mm

Note 2: Release liner type and thickness for the 3M FFDM EM80KM can be changed to different versions for custom configurations to aid assembly or converting. Please review options with your 3M local support.



Typical Physical Properties and Performance Characteristics

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

Surface Resistivity (Top/Bottom Side)	Min. $1 \times 10^5 \Omega$
Maximum Permeability*	80,000
Magnetic Flux Density*	Min. 1.3 T
Temperature Range	-25~110°C

*These values are measured with a Torodial shaped sample: 3M test method.

Application Ideas

The 3M™ Flux Field Directional Material (FFDM) EM80KM is a magnetic material designed to interact and influence an Electro-Magnetic (EM) field. The EM field could be generated for various reasons and in many applications it is desired to focus the EM field across a specific volumetric area, such as a secondary EM field pick-up coil or antenna.

The 3M FFDM material is designed to efficiently couple to the EM field and redirect and focus the field as desired in a given application.

The 3M FFDM material performance is based on several application considerations:

- 1) Permeability of the 3M FFDM material at the frequency range or frequency peak of the intended application can affect the performance. Permeability of the 3M FFDM material varies with frequency and is a measure of how well the EM material may couple with the EM field and impact performance.
- 2) Thickness of the 3M FFDM product. Single or multi-layer designs can be used to optimize an application's performance.
- 3) End use application orientation and location affects the 3M EM product's interaction with an EM field.

As an initial design, it is suggested to test the 3M FFDM product at the greatest thickness allowed (1x, 2x, 3x layers, etc.), largest XY dimension, multiple locations or multiple parts to determine a potential maximum performance level associated with the material. Once a baseline level of performance is established, the 3M FFDM material thickness, XY shape, location, etc. can be reduced or changed to determine the minimum material needed to meet a specification. The desire to test first the 3M FFDM with the thickest and/or largest footprint design is to establish that an FFDM material solution is reasonable and also to understand a maximum associated performance. After an acceptable level of performance has been demonstrated through use of the FFDM, it is also suggested that the designer consider that other article design changes could now be considered because of the use of the FFDM. Other article design change could include overall thinner/smaller designs, improved end product target specifications, etc.

The 3M FFDM EM80KM has potential to be used for:

- Shield DC and low frequency magnetic field.
- Wireless power system power transfer efficiency improvement
- Potential devices include mobile phone, computers, tablets, measurement and sensor
- Protect magnetic flux sensitive device such as hall sensor and flux gate from external low frequency magnetic field
- Assembly of magnet coil for wireless charging system
- Electronic equipment protection for automobile applications
- 3M EM80KM FFDM has low loss around 100kHz
- 3M EM80KM FFDM has higher eddy current losses around 200kHz

Regulatory

For regulatory information about this product, refer to our website at 3M.com.

For Additional Information

To request additional product information or to arrange for sales assistance, call toll free 1-800-251-8634. Address correspondence to: 3M, Electronics Markets Materials Division, 3M Center, Building 225-3S-06, St. Paul, MN 55144-1000. Our fax number is 651-778-4244 or 1-877-369-2923. In Canada, phone: 1-800-364-3577. In Puerto Rico, phone: 1-787-750-3000. In Mexico, phone: 52-70-04-00.

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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60-5002-0522-8

