



*product information*

## Fluon® LM-ETFE Resins

### DESCRIPTION

Fluon® LM-ETFE is a modified ethylene/tetrafluoroethylene (ETFE) polymer. Fluon LM-ETFE is different than most other ETFE materials in that it has a lower melting point (225°C versus 260°C for most ETFE), better chemical resistance and thermal stability, improved optical clarity, better flexibility, and a higher limiting oxygen index (40% versus 31%). It is processable by conventional extrusion and injection molding techniques. Rotomolding and rotolining grades are also available.

### BENEFITS

- High resistance to heat
- Excellent chemical resistance
- Good physical toughness
- Low smoke and flame characteristics: Fluon LM-ETFE is rated 94 V-0 by Underwriters Laboratories Inc.
- Outstanding resistance to weather and aging
- Good dielectric properties
- Non-stick characteristics

### APPLICATIONS

- Film and sheets
- Valves, fittings, and housings
- Tubing and pipe
- Wire & cable
- Filter media
- Vessel linings

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# Fluon<sup>®</sup> LM ETFE Resins

## FLUON<sup>®</sup> ETFE GRADES AVAILABLE

Grade	Melt Flow Rate	Application
LM-730A	20 – 30	General purpose extrusion / injection molding
LM-720A	10 – 20	General purpose extrusion / injection molding; Better stress crack resistance over LM-730A
LM-740A	30 – 40	General purpose extrusion / injection molding; higher flow than LM-730A
LM-2300N	-	Rotomolding and rotolining

Melt flow rate tested according to ASTM D-3159

## PROCESSING

Fluon LM-ETFE fluoropolymer resins can be processed by conventional melt-processable resin techniques including extrusion, injection molding, blow molding, compression molding, transfer molding, and rotolining/rotomolding. It is strongly recommended that process equipment exposed to molten resin be made of corrosion-resistant metals such as Monel<sup>®</sup>, Inconel<sup>®</sup>, or Hastelloy<sup>®</sup>.

Extruder barrels should be long relative to diameter (24/1 up to 30/1 and beyond) and heaters should have the capacity to heat material to approximately 340°C. Temperature controllers should be of the proportional-integral-derivative (PID) type to insure precise temperature control. Extruder screws with 3/1 compression ratio, a relatively long feed zone, and ½ to 3 turn transition zone are recommended. Reciprocating screw injection molding machines are preferred.

Your AGC Chemicals Americas, Inc. technical service representative can provide specific recommendations for process equipment and process conditions.

## HANDLING PRECAUTIONS

Heating Fluon products in excess of 750°F (399°C) can produce toxic fumes. It is, therefore, necessary to provide local exhaust ventilation in areas where Fluon products are exposed to high temperatures. Avoid breathing fumes or contaminating smoking tobacco with fumes, powder, or dust.

Thermal decomposition of this product will generate hydrogen fluoride, which is corrosive. Corrosion resistance materials are required for prolonged contact with molten resin.

For additional information and handling instructions read AGC Chemicals Americas, Inc. Material Safety Data Sheet. It is also recommended that the user consult the latest edition of the “Guide to the Safe Handling of Fluoropolymer Resins” published by the Fluoropolymers Division of the Society of the Plastics Industry (SPI) for important handling and ventilation recommendations. Both publications are available from your AGC Chemicals Americas representative.

# Fluon<sup>®</sup> LM ETFE Resins

## FLUON<sup>®</sup> LM-ETFE TYPICAL PROPERTIES

Property	Units	Test Method	LM-720A	LM-730A	LM-740A
Melt Flow Rate	grams/10 minutes	D-3159	15	25	35
Melting Point	°C	D-3159	225	225	225
Specific Gravity		D-792	1.78	1.78	1.78
Hardness	Shore D	D-2240	65	65	65
Tensile Strength (23°C)	psi	D-638	6,235	5,800	5,510
Tensile Elongation (23°C)	%	D-638	380	400	420
Tensile Strength (200°C)	psi	D-638			660
Tensile Elongation (200°C)	%	D-638			880
Flexural Modulus (23°C)	psi	D-790	104,000	104,000	104,000
Heat Deflection Temp. (66 psi)	°C	D-648			
Heat Deflection Temp. (264psi)	°C	D-648			
Notched Izod Impact (23°C)	ft-lb/in	C-256			
Embrittlement Temperature	°C	D-764	-103	-103	-103
CLTE (0 – 100°C)	in/in/°F	D-696	6.9 x 10 <sup>-5</sup>	6.9 x 10 <sup>-5</sup>	6.9 x 10 <sup>-5</sup>
Water Absorption (24 hours)	%	D-570			
Dielectric Constant (1 mHz at 23°C)		D-150	2.4	2.4	2.4
Volume Resistivity	Ω-cm	D-257			
Dielectric Strength (10 mil film)	volts/mil	D-149			
Heat of Combustion	BTU/lb	D-240			
Specific Heat	cal/g-°C				
Oxygen Index	%	D-2863	40	40	40
Flame Rating		UL-94	V-0	V-0	V-0
Upper Service Temperature	°C	UL-746			
MIT Flex Life	cycles	D-2176	200,000	150,000	100,000

NOTE: The data listed here represents typical values for the stated grades of Fluon<sup>®</sup> LM-ETFE. This information should be used as a guide only and not to establish specification limits or design criteria. AGC Chemicals Americas assumes no obligation or liability for any advice furnished by us or for results obtained with respect to this product. All such advice is provided free of charge and the buyer assumes sole responsibility for results obtained in reliance thereon.

# Fluon<sup>®</sup> LM ETFE Resins

## STORAGE & HANDLING

The properties of Fluon LM-ETFE are not impacted by storage time. Storage and handling facilities should be designed to minimize contact with airborne contamination and the formulation of condensation on the resin. Fluoropolymers are not hygroscopic and will not typically need to be dried prior to use. However, masterbatches used to pigment fluoropolymers may contain materials that do absorb water and should be dried prior to use.

## FREIGHT CLASSIFICATION

Fluon LM-ETFE when shipped by rail or express is classified "Plastics, Synthetic, O.T.L., NOIBN." Resin shipped by truck is classified "Plastics, Materials O.T.F.C.E. or S. Granules."

## ASTM CLASSIFICATIONS

Fluon LM-ETFE grades LM-720A, LM-730A and LM-740A are ASTM D-3159 type IV, grade 1. Your AGC Chemicals Americas Inc. representative can advise you of the ASTM classifications of the other LM-ETFE materials.

## UL YELLOW CARDS

Fluon LM-ETFE resins are listed under the *QMFZ2.GuideInfo Plastics - Component* section in the Underwriters Laboratories, Inc. certification directory. See File E54077 under Asahi Glass Co LTD for specific information on ETFE resins. Copies of UL Yellow Cards for Fluon LM-ETFE resins are available online from the UL Online Certifications Directory at <http://database.ul.com/>.

### For more information and samples contact

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