

3M Advanced Materials Division

# 3M™ Dynamar™ Polymer Processing Additive FX 9613

## Features and Benefits

- Reduces or eliminates melt fracture
- Ideal for use in low melt index LLDPE and high molecular weight HDPE resins
- Improves extrusion processing of polyolefin resins
- Excellent thermal stability for high temperature processing
- Reduces or eliminates die build-up
- Lowers apparent melt viscosity

## Product Description

3M™ Dynamar™ Polymer Processing Additive FX 9613 is a free flowing granular form of a fluoropolymer processing aid designed for use at low levels to improve the processing of thermoplastics. At the low use levels (typically 400 –1000 ppm) necessary to improve processing, it does not alter or detract from the mechanical properties associated with high strength plastics.

Dynamar FX 9613 exhibits exceptional commercial utility in low melt index film grade polyolefins such as linear low-density polyethylene (LLDPE) and higher molecular weight, high-density polyethylene (HMW-HDPE) resins.

## Typical Physical Properties (Not for specification purposes.)

Property	3M™ Dynamar™ Polymer Processing Additive FX 9613
Form	Granular
Partitioning agent	10% Inorganic
Color	Off-White
Particle size	Less than 10 Mesh
Bulk density	51 lb/ft <sup>3</sup> (0.8 g/cm <sup>3</sup> )
Typical use levels	400 – 1000 ppm

It can also be used at low levels to reduce extruder die build-up when processing low-density polyethylene (LDPE), ethylene vinyl acetate (EVA) and other polyolefin resins.

Dynamar FX 9613 lowers apparent melt viscosity and permits processors to use high strength resins which otherwise could not be processed on available equipment. With the aid of Dynamar FX 9613, fabricators can produce films and other articles of improved strength and quality.

As a polymer processing additive (PPA), Dynamar FX 9613 can reduce or eliminate melt fracture and can reduce extruder torque. Through optimization of the extrusion process, the use of Dynamar FX 9613 may also allow an increase in output and yield films with enhanced and balanced bi-directional physical properties and improved clarity and gloss.

## Incorporation Procedure

To be effective, Dynamar FX 9613 can be melt blended into the host resin at any of the following stages prior to conversion into extruded products:

- Resin Producer
  - Direct addition (See 3M™ Dynamar™ PPA: Direct Addition During Resin Manufacture Guidelines)
  - Use a concentrate containing FX 9613 and let down to an appropriate level
- Concentrate Producer
  - See 3M™ Dynamar™ PPA Concentrate Preparation Guidelines
- End User
  - Source resin containing FX 9613 from a resin producer
  - Source a concentrate containing 2–3% FX 9613 and let down to an appropriate level

## Food Contact/FDA Regulatory Status

This 3M product may be used at levels up to 2000 parts per million (ppm) as a polymer processing additive for all polymers intended for use in contact with all food types described in Table 1 of 21 C.F.R. 176.170(c) under Conditions of Use A through H described in Table 2 of 21 C.F.R. 176.170(c).

3M makes no recommendation about the suitability of this product in the user's intended application. It is user's responsibility to determine whether its use of 3M products in a particular application is suitable and will comply with applicable laws and regulations.

## Storage and Handling

3M™ Dynamar™ FX 9613, when stored in a clean dry environment at temperatures below 27°C (80°F), has an extended shelf life of two years. Please refer to the Safety Data Sheet for details on handling.

## Safety/Toxicology

To avoid potential hazards (including the evolution of toxic vapors) associated with processing this material, please read and follow the information provided in these documents available to you through your 3M sales representative:

- Product Label
- Safety Data Sheet
- 3M™ Dynamar™ PPA Concentrate Preparation Guidelines
- 3M™ Dynamar™ PPA Direct Addition During Resin Manufacture
- 3M™ Dynamar™ PPA Evaluation Guidelines

You should also read and follow all directions from suppliers of other ingredients that you intend to use in conjunction with 3M Dynamar PPA material.

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