

Tecnoflon® NM Powder

Polymer Processing Aid

Tecnoflon® NM powder is a fluoroelastomer copolymer with outstanding properties to improve the processing of polyolefines. Tecnoflon® NM Powder has been developed particularly to improve the blown film extrusion of linear low density polyethylene (LLDPE) and other plastics. Tecnoflon® NM powder is usually prepared in form of masterbatch. Typical use levels are in the range between 100 and 1,000 ppm.

Benefits of Tecnoflon® NM powder in processing of polyolefines are:

- Elimination of melt fracture, and shift of sharkskin phenomena at higher shear rate
- Elimination/significant reduction of plate-out or die deposit
- Reduction of production start-up time
- Higher output rate at constant torque
- Faster color change time

All components of Tecnoflon® NM powder are in compliance with regulations on materials intended to come in contact with foodstuff according to FDA 21 CFR 177.1520.

Handling and safety

Normal care and precautions should be taken to avoid skin contact, eye contact and breathing of fumes. Smoking is prohibited in working areas. Wash hands before eating or smoking. For complete health and safety information, please refer to the safety data sheet.

Basic characteristics of the raw polymer are as follows

Property	Typical Value	Unit	Test Method
Fluorine content	66	%	Solvay Internal Method – NMR
Specific gravity	1.81	g/cm ³	ASTM D792
Color	White or off white		
Particle size	< 0.8 mm		
Anti-sticking agent	Calcium stearate (1% w/w)		

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Suggestions for application in processing of polyolefines

Fluoroelastomers are widely used in the processing of polyolefines at a level between 100 and 1,000 ppm. Tecnoflon® NM powder and polyolefines are incompatible materials in the molten state. During extrusion, the processing aids build a thin layer on the metal surface of the die. This film eases the flow of the main polymer used and acts as an external lubricant.

This action brings several benefits like:

- Increasing line speed without reaching critical shear rates for onset of surface defects
- Elimination or at least significant reduction of plate-out/die build-up
- Lower energy input at the same output rate
- More stable die head pressure resulting in stable extrusion process

The main observed defect in extrusion of linear-low density polyolefines are surface defects.

Surface defects, occurring at critical shear rate, are identified as sharkskin appearance.

Addition of Tecnoflon® NM powder improves processing of polyolefines by shifting towards higher critical shear rates by one/two decades the appearance of such defects. In addition to process benefits, also optical properties of the final product, in terms of total light transmission and haze, are enhanced.

Tecnoflon® NM powder addition in processing of polyolefines

Improvements in processing of HDPE, LDPE and LLDPE are obtained by use of convenient addition of Tecnoflon® NM powder in the polyolefine matrix at levels between 100 and 1,000 ppm. This is achieved through a masterbatch approach, where a concentrated blend between Tecnoflon® NM powder and polyolefine carrier is diluted into the desired final concentration level.

Masterbatches can be prepared by means of usual blending techniques, including twin-screw extruders, internal and continuous mixer equipments.

Tecnoflon® NM powder masterbatch may be used to prepare the final blend or as initial extrusion material to shorten the time required to reach stationary processing conditions. Better results in LLDPE for masterbatch preparation are reported for a ratio close to 98/2 LLDPE/ Tecnoflon® NM powder. This is considered a valid ratio for other polyolefine systems.

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