



Viton™ FreeFlow™ Z100 and Z110

Fluoroelastomers

Technical Information

Introduction

Viton™ FreeFlow™ Z100 and Z110 are process aids for polyolefins that reduce or eliminate melt fracture, lower extrusion pressure, reduce amperage and torque, and reduce die buildup. The two products differ only in the rheology of the fluoroelastomer component.

Both Z100 and Z110 take advantage of proprietary large-particle technology to provide a highly efficient process aid that performs effectively under a wide variety of extruder conditions and with formulations that cause other process aids to function marginally. Z100 and Z110 combine improved fluoroelastomer rheology with polyethylene glycol (PEG) as an interfacial agent to control the fluoroelastomer particle size delivered to the die. The resulting large particles of fluoroelastomer coat internal die surfaces more quickly and with lower dosage levels than do conventional process aids.

Z100 is best suited for the most aggressive mixing situations, such as:

- Direct dosage during production of gas phase LLDPE (1.0 MI or less)
- Low concentration masterbatches (typically, 2% process aid) in LLDPE carrier (5 MI or less)
- All extrusion processes (e.g., film, pipe) using 2 MI or less LLDPE and mLLDPE or HDPE, particularly with high pigment or anti-block loadings
- Extrusion under conditions that promote mixing, such as high backpressure (from narrow die gaps or tight screen packs), or high shear screw elements (e.g., Maddock tips)

Z110 is best suited for applications involving moderate mixing conditions, such as:

- Dosage during production of solution LLDPE (either direct or via masterbatch)

- High concentration masterbatches (2 to 4% process aid), particularly with LDPE carrier
- All extrusion processes (film, pipe, etc.) using 3 MI or more LLDPE, LLDPE/LDPE blends, or LLDPE/LDPE blends
- Extrusion under low shear mixing conditions

Both Z100 and Z110 can typically reduce PEG levels in films by a factor of 3, as compared to conventional PEG-based process aids, resulting from both the overall lower PPA dosing level and relatively low PEG content in the Z100/Z110. Reducing PEG levels in film can minimize surface contamination that can lead to printing or sealing problems.

Advantages

- Improved rates of conditioning during start-up of new formulations on clean dies or purged systems
- Improved performance on difficult lines, where other process aids require high levels
- Improved additive efficiency, particularly on lines where frequent formula changes are made or in formulas containing multiple additives
- Improved economics
- Extended running time between die cleanings
- Approved for many food contact uses* and suitable for potable water appliances**

* Manufacturer or marketer of products or articles in contact with food must meet applicable food contact regulations. Contact Chemours for details regarding suitability of Viton™ FreeFlow™ products in specific food contact applications.

**Appliance manufacturer or marketer is responsible for ensuring appliance meets requirements for potable water use.



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Formulation Guidelines

To assist in resin formulation, the following can be used as a general guide:

Elimination of Sharkskin Melt Fracture, ppm	
In standard film resins	300–600
In heavily filled or pigmented film	600–900
Reduction of Die Buildup, ppm	
	100–200

Levels are parts per million Viton™ FreeFlow™ Z100 or Z110

These numbers are intended to be starting points for formulation. The actual level required will depend on a multitude of factors.

Typical Physical Properties

Appearance	White, free-flowing powder
Packaging	20-kg bag
Shelf Life, yr	4*

*Normal storage conditions—dry, unopened, temperature below 27 °C (80 °F)

Safety and Handling

Viton™ FreeFlow™ Z100 and Z110 are considered safe materials to handle. They are stable at the temperatures at which polyolefins are formulated and processed. However, prior to the use of Viton™ FreeFlow™ Z100 or Z110 in polyolefins, review the Safety Data Sheet (SDS) and follow the recommendations in the Chemours technical bulletin, “Guide for Concentrate Preparation and Handling of Viton™ FreeFlow™ PPAs.”

For more information, visit Viton.com

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