PolyFR™

FLAME RETARDANT COMPOUNDS

PROCESSING GUIDELINES

Processing Guidelines for PolyFR™ Non-Halogenated Compounds & Concentrates
Polypropylene and Polyethylene Formulations

Drying

In order to achieve a very smooth extrusion, it is highly recommended that the PolyFR™ compound or concentrate be dried in a desiccant dryer with a dew point of -40 C or lower prior to use. The recommended moisture content is 0.02% or lower. Optimum surface is achieved around .005% moisture
but .02% is sufficient for most applications.

Under normal conditions this moisture level is achieved by drying 2-4 hrs @ 70-80 C.

Melt Temperature

Control of the melt temperature is necessary to achieve a smooth extrusion, proper physical properties, and good flame retardant performance. As melt temperature increases product surface appearance tends to degrade, even at low moisture content. Therefore, we recommend that the melt temperature of the compound should not exceed 205 C, and preferably at 185-195 C.

Suggested process settings:

The following should be used as a guideline for setting barrel temperatures:

Zone 1 (feedthroat)	155-165 C
Zone 2	165-175 C
Zone 3	175-185 C
Die	180-190 C

A general purpose screw with a compression ratio around 2.7 has provided good results. Any mixing sections (such as Maddox, etc.) and barrier screw designs will provide increased mixing, but also will raise melt temperatures, so this has to be considered when choosing barrel temperature settings. Also screen packs will help remove any impurities from the melt, but will provide increased backpressure, also increasing the melt temperature. Thus, a course 20/40/20 screen pack configuration is recommended. If excessive melt temperatures are found with current screw and die configurations, a flat or reverse-profile setup could be explored.

Various set-ups (pressure, tubing, semi-pressure, etc.) can be used successfully. Reducing shear in the crosshead/tooling is important as well. Unrestricted flow channels generally provide a good process set-up without over shearing the material. Dies with low-lands are recommended versus dies with long land lengths, as they increase the chance of sharkskin or melt fracture.