

3M Advanced Materials Division

3M™ Boron Nitride Cooling Fillers

Processing Guide

Extrusion compounding for injection molding

3M BN cooling fillers are excellent as an additive in thermoplastic polymers to help enhance the thermal conductivity of injection molded plastic parts. They can be used with melted polymers such as HDPE, TPE, PP, PA and PC.

Typical 3M BN Cooling Filler grades for injection molding

Grade	Type	Description
CFA50M	Agglomerate	Mix (M) of agglomerates, platelets and boron nitride clusters. Excellent for potting resins and encapsulation of electronic devices.
CFF200-3 CFF500-3	Flake	Higher through-plane thermal conductivity. Boosts thermal conductivity of compounds as secondary filler.
CFP006 – CFP012	Platelet	Optimal all-purpose grades for injection molded parts.
CFP012P	Powder	Spray-dried boron nitride platelets for excellent processability, flowability and high dosing velocities

Additional grades may be used depending on processing conditions

Mixing

When using 3M BN cooling fillers flakes and agglomerates, 3M recommends low shear and soft compounding at low rotational speeds. Kneading blocks are not recommended for flakes and agglomerates but may be used with platelets.

For best results, add 3M BN cooling fillers as the last ingredient in the sequence after achieving a homogenous mix of all other components. A stable feedstock temperature is essential. 3M BN cooling fillers should be added using a side feeder. If filler content surpasses 30 vol% wt, use a second side feeder. Common equipment such as twin-screw extruders, single-screw extruders and planetary extrusion can be used.

Compound parameters

The base polymer and fillers strongly influence the optimum parameters for extrusion. With 3M BN cooling fillers, it is important to create a homogeneous mix by setting the right temperatures. A vacuum is recommended to avoid air bubbles as they can lower thermal conductivity.

Safety

3M™ Boron Nitride Cooling Fillers Platelets grades 001 and 003 SF contain diboron trioxide (CASRN 1303-86-2) as an impurity at levels which may exceed 0.1 % by weight. Diboron trioxide is listed as a Substance of Very High Concern (SVHC) identified according to Article 59 of REACH. All other 3M BN cooling fillers products contain less than 0.1 wt% diboron trioxide. See product SDS for information about exposure controls and personal protective equipment.

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