

3M Advanced Materials Division

3M™ Boron Nitride Cooling Fillers Processing Guide

Silicone Rubbers

3M BN cooling fillers are excellent for formulating silicone rubbers - wide-meshed silicone polymers requiring unique blends of temperature resistance, electrical insulation, elasticity and resistance to chemicals and oils. Silicone rubbers are widely used in Automotive, Commercial Transportation, Energy and Electronics as well as Manufacturing Machinery.

Typical 3M BN cooling fillers grades for silicone rubbers

These grades of 3M BN cooling filler agglomerates (CFA) are regular in shape for high through-plane thermal conductivity and low viscosity.

Grade	Description
CFA50M	Mix (M) of agglomerates, platelets and boron nitride clusters. Excellent for potting resins and encapsulation of electronic devices.
CFA75	Soft agglomerates for high filler loadings and isotropic thermal conductivities. Used for finished products with thin bond lines of 100-150µm .
CFA100	Soft agglomerates for high filler loadings and isotropic thermal conductivities. Used for finished products with bond lines 150-200 µm.
CFA150	Soft agglomerates for high filler loadings and isotropic thermal conductivities. Used for finished products with bond lines above 200 µm.
CFA250S	Boron nitride platelets spray-dried with inorganic binder to spherical (S) granulates for high flowability and dosing velocities during feeding.

Mixing

To achieve a homogeneous formulation, 3M BN cooling fillers should be added as the last filler to the silicone compound, before the crosslinker and the catalyst. Harsh mixing conditions should be avoided not to degrade the agglomerates. Shear mixers, speed mixers, centrifugal mixers and kneaders can be used depending on the viscosity of the mixture.

Compound parameters

To maximize thermal conductivity and overall performance, temperature and shear stress are the most important parameters for silicone rubber compounds. Temperature can have a strong impact on pot life processability and should be watched. Generally, a vacuum must be used during or after mixing to minimize air bubbles.

Safety

3M™ Boron Nitride Cooling Filler 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 BN CF 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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