

3M Advanced Materials Division

3M™ Boron Nitride Cooling Filler Flakes

Product Description

3M Boron Nitride Cooling Filler Flakes (CFF) are powders of flake agglomerate of crystalline boron nitride platelets.

Particle mean size ranges from 160 to 450 μm.

Features and Benefits

- Excellent heat spreading
- Excellent heat transfer
- Ideal as secondary filler to boost thermal conductivity
- Maintains high thermal conductivity under high-shear compounding
- Optimized through-plane thermal conductivity

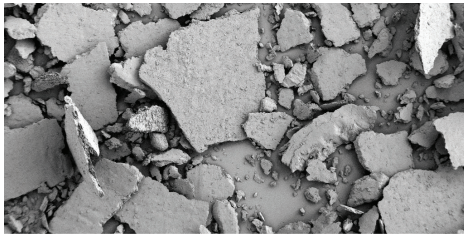
Typical Applications

- Gap Fillers
- Potting Resins
- Adhesives and greases
- TIM Foils and pads
- Housings

3M™ Boron Nitride Cooling Filler Flakes - Grade Profiles

CFF 500-3 and 200-3

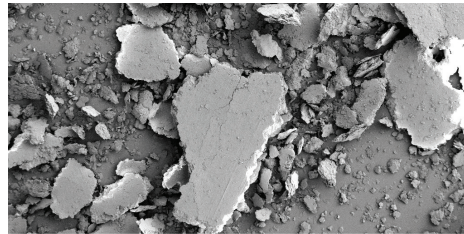
For injection molded and potting resin parts with high through-plane thermal conductivity. Boost thermal conductivity of compounds as secondary filler.



SEM micrograph: Grade CFF 500-3

CFF 500-15 and 200-15

For potting resin parts with high through-plane thermal conductivity. Boost thermal conductivity of compounds as secondary filler, preferred for lowest viscosities.



SEM micrograph: Grade CFF 500-15

Typical Physical Properties

(Not for specification purposes)

| | |
|-------------------------------|--------|
| O | <0.7% |
| C | <0.2% |
| B ₂ O ₃ | <0.1% |
| BN | >98.5% |

BN content is calculated as (100% minus B₂O₃, O, C, Si, Al, Fe, Ca, without loss on drying)

Powder Characteristics (Not for specification purposes)

| Grade | Particle Size Distribution | | | Bulk Density, DIN (g/cm ³) | Surface Area (m ² /g) |
|------------|----------------------------|-----------|------------|--|----------------------------------|
| | d(0.1) μm | d(0.5) μm | d(0.97) μm | | |
| CFF 500-3 | 140–260 | 300–530 | – | 0.25–0.5 | <7.5 |
| CFF 200-3 | 5–120 | 140–240 | <450 | 0.3–0.6 | <10 |
| CFF 500-15 | 20–150 | 160–400 | – | 0.5–0.7 | <3.0 |
| CFF 200-15 | 5–55 | 65–210 | <450 | 0.5–0.75 | <3.0 |

Bulk density determined according to ISO 23145-2 (DIN density)

Particle size distribution measured by laser light scattering (Mastersizer 2000, dry, 0.1 bar)

For calculation purpose: Density of bulk hBN 2.25 g/cm³

Regulatory

The substance boron nitride (CAS No. 10043-11-5, EC No. 233-136-6) which comprises the 3M™ Boron Nitride Cooling Fillers products (all grades) is designated as Active on the TSCA Inventory and complies with all REACH obligations (directives 1907/2006/EC) of manufacturers/importers/downstream users.

The flakes products contain less than 0.1 wt% diboron trioxide (CASRN 1303-86-2), an unavoidable impurity which is a Substance of Very High Concern (SVHC) according to Article 59 of REACH. To the best of 3M's knowledge, 3M™ Boron Nitride Cooling Filler products do not contain at greater than 0.1% by weight any other substances on the candidate SVHC list. This declaration reflects the substances on the candidate SVHC list, effective June 2023.

Expertise in Production and Customer Service

With over 50 years of boron nitride manufacturing experience in our German Center of Excellence, our experienced specialists will work with you to optimize your polymer performance. With our broad portfolio offering, 3M engineers will assist you in selecting the correct grade for your application.

Packaging

3M Boron Nitride Cooling Filler Flakes are available in 25kg drums. Samples also available in 1kg packages.

Processing and handling

Factors such as melt temperature, compounding technique, injection rate and more can have a significant effect on the thermal and electrical insulative properties of parts made with boron nitride cooling fillers. That's why we have developed processing guidelines to help. Guidelines and additional processing information can be found at [3M.com/thermalmanagement](https://www.3m.com/thermalmanagement).

Refer to the 3M Boron Nitride Cooling Filler Safety Data Sheet for additional safety information.

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Issued: 07/2023