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3M Advanced Materials Division

3M™ Boron Nitride Cooling Filler Platelets

Product Description

3M Boron Nitride Cooling Filler Platelets (CFP) are powders of highly crystalline boron nitride single platelets.

Particle mean size ranges from 0.5 to 14 µm.

Features and Benefits

- Increases thermal conductivity while maintaining electrical insulation
- Compatible with standard polymers
- Low density

Typical Applications

- Adhesives
- Coatings
- Prepregs
- TIM foils
- Electronic overmoldings
- Housings
- Greases
- Heat sinks
- Gap fillers

Typical Physical Properties

(Not for specification purposes)

	CFP 001	CFP 003E	CFP 003	CFP 003SF	CFP 006	CFP 0075	CFP 009	CFP 012
O	≤ 1.2%	≤ 1.1%	≤ 1.0%	≤ 1.1%	≤ 0.5%	≤ 0.5%	≤ 0.5%	≤ 0.5%
C	≤ 0.06%	≤ 0.06%	≤ 0.06%	≤ 0.06%	≤ 0.06%	≤ 0.06%	≤ 0.06%	≤ 0.06%
B_2O_3	≤ 0.2%	< 0.1%	< 0.1%	≤ 0.2%	< 0.1%	< 0.1%	< 0.1%	< 0.1%
BN	≥ 98.0%	≥ 98.0%	≥ 98.0%	≥ 98.0%	>98.5%	>98.5%	>98.5%	>98.5%

BN content is calculated as (100% minus B_2O_3, O, C, Si, Al, Fe, Ca, without loss on drying)

Powder Characteristics

(Not for specification purposes)

Grade	Particle Size Distribution			Bulk Density, Scott (g/cm³)	Bulk Density, DIN (g/cm³)	Surface Area (m²/g)
	d(0.1) µm	d(0.5) µm	d(0.9) µm			
CFP 001	n.a.	0.5**	0.8**	<0.14	–	<30
CFP 003E	0.5-2.5	1.3-8.8	n.a.***	–	<0.3	<15
CFP 003	1–2	2–5	8.5–22.5	<0.15	–	<18
CFP 003SF	0.5–2	2–6	6–14	–	<0.15	<20
CFP 006	1.5–3	4.5–8	10–20	<0.2	–	<8.5
CFP 0075	2–3.5	6–8.5	12–25	<0.22	–	<5.5
CFP 009	2–3.5	6–12	14–32	<0.22	–	<5.5
CFP 012	2–4.5	8–14	20–40	<0.25	–	<4.5

Bulk density determined according to ASTM B329/ISO 3923-2 (Scott density) and according to ISO 23145-2 (DIN density)

Particle size distribution measured by laser light scattering (Mastersizer 2000, dispersion in ethanol)

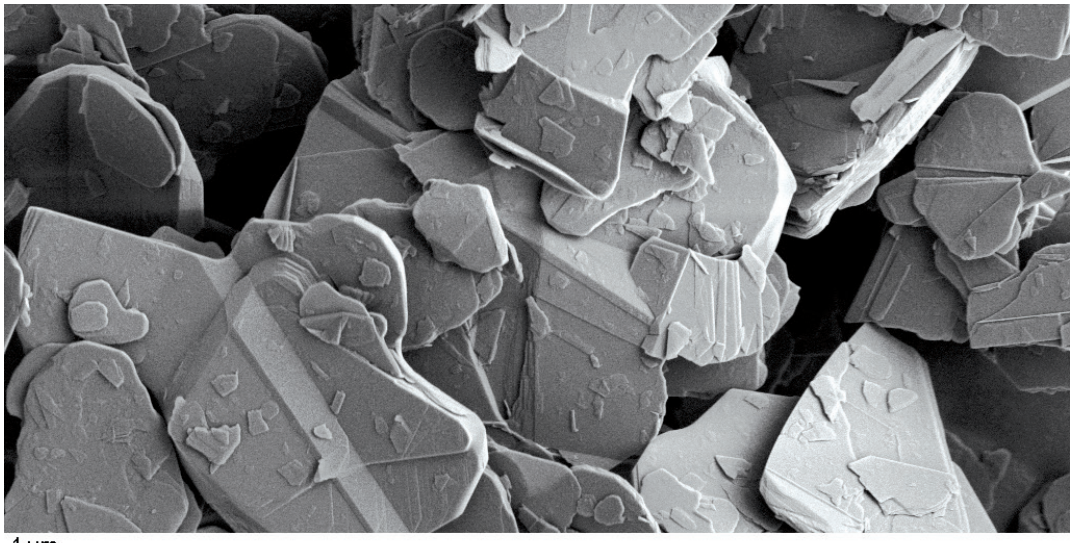
** Data determined by means of SEM pictures

*** Can include soft agglomerates with 50-100 µm

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

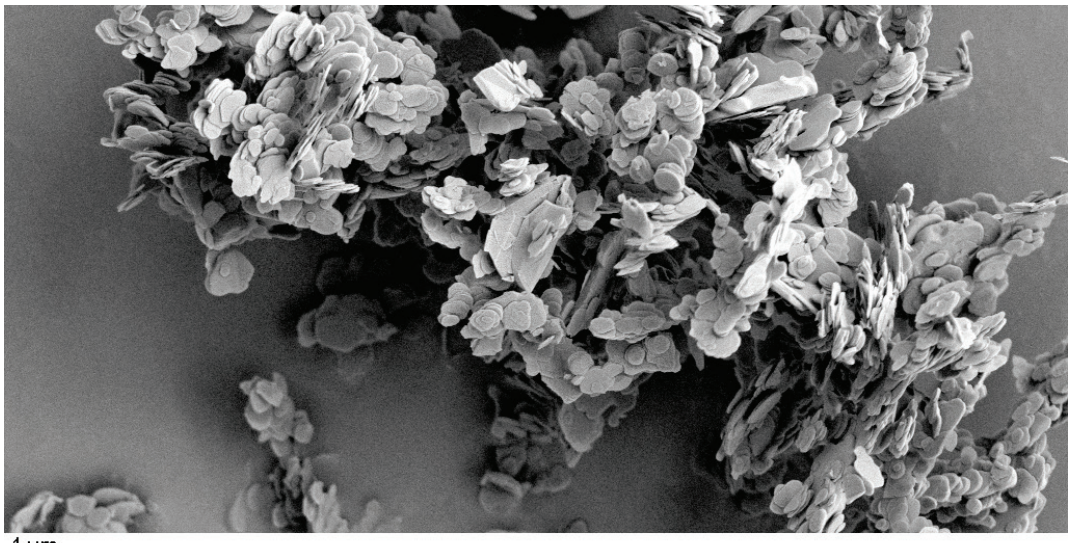
3M™ Boron Nitride Cooling Filler Platelets - Grade Profiles

CFP 003E, 003, 006, 0075, 009 and 012
Optimal all-purpose grades for injection molded and potting resin parts.



SEM micrograph: Grade CFP 0075

CFP 001 and 003SF
Preferred for thin films <25 µm and fibers, fine channels and windings. 3M CFP 003SF platelets have a controlled top size.



SEM micrograph: Grade CFP 003SF

Regulatory

The substance boron nitride (CAS No. 10043-11-5, EC No. 701-292-9) 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.

3M Boron Nitride Cooling Filler Platelets CFP 001 and CFP 003SF

The products may 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. To the best of 3M's knowledge, 3M Boron Nitride Cooling Filler products do not contain at greater than 0.1% by weight of any other substances on the candidate SVHC list. This declaration reflects the substances on the candidate SVHC list, effective June 2023.

All other 3M Boron Nitride Cooling Filler Grades

The products contain less than 0.1% by weight boron oxide (CASRN 1303-86-2), an unavoidable impurity which is a Substance of Very High Concern (SVHC) substance identified 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 of any other substances on the candidate SVHC list. This declaration reflects the substances on the candidate SVHC list, effective January 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.

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.

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

Packaging

3M Boron Nitride Cooling Filler Platelets are available in 10kg or 20kg drums, depending on grade. Samples also available in 1kg packages.

Product (Standard drums)	**10 kg**	**20 kg**
CFP 001	X	
CFP 003E		X
CFP 003		X
CFP 003SF	X	
CFP 006		X
CFP 0075		X
CFP 009		X
CFP 012		X

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