

3M Advanced Materials Division

3M™ Boron Nitride Cooling Filler Agglomerates

Product Description

3M Boron Nitride Cooling Filler Agglomerates (CFA) are powders of soft bulk agglomerates of crystalline boron nitride platelets.

Particle size ranges from 22 to 220 µm.

Features and Benefits

- Provide better through-plane conductivity than platelets and flakes
- Excellent isotropic heat transfer capabilities
- Excellent adaption to flexible matrix materials
- Optimal combination of thermal conductivity & viscosity for easy processing
- Soft material therefore less abrasive on processing equipment

Typical Applications

- TIM pads
- TIM foils
- Electronic overmoldings
- Gap fillers
- Potting resin
- Greases

Typical Physical Properties

(Not for specification purposes)

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

* Agglomerates CFA 250S: O ≤10.0%

** Agglomerates CFA 250S: BN ≥80.0%, contains an inorganic binder

Powder Characteristics

(Not for specification purposes)

Grade	Particle Size Distribution			Bulk Density, DIN (g/cm³)	Surface Area (m²/g)
	d(0.1) µm	d(0.5) µm	d(0.9) µm		
CFA 50M	5–10	15–30	35–70	0.1–0.4	<3.5
CFA 75	5–16	25–55	75–115	0.25–0.4	<3.5
CFA 100	10–35	50–80	95–145	0.25–0.4	<3.0
CFA 125	15–40	75–120	170–220	0.25–0.5	<3.0
CFA 150	20–80	120–200	240–360	0.3–0.55	<3.0
CFA 250S	8–20	40–100	120–210	0.3–0.6	<4.5

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

3M™ Boron Nitride Cooling Filler Agglomerates - Grade Profiles

CFA 50M

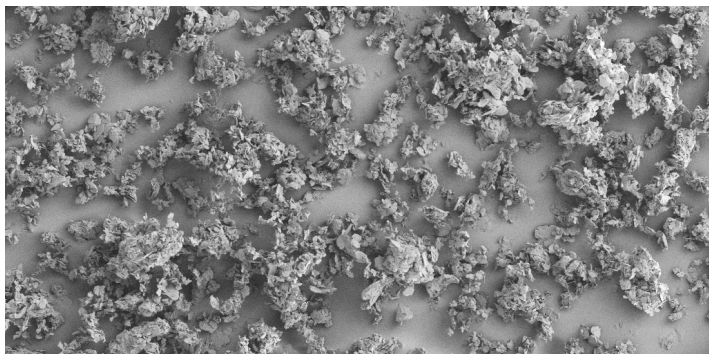
Mix (M) of agglomerates, platelets and boron nitride clusters. Excellent for potting resins and encapsulation of electronic devices.



SEM micrograph: Grade CFA 50M

CFA 75

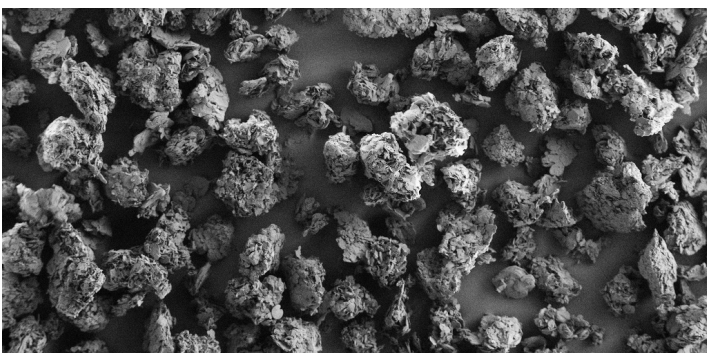
Soft agglomerates for high filler loadings and isotropic thermal conductivities. Used in potting resins and conformable TIM foils or pads with thin bond line 100-150µm.



SEM micrograph: Grade CFA 75

CFA 100

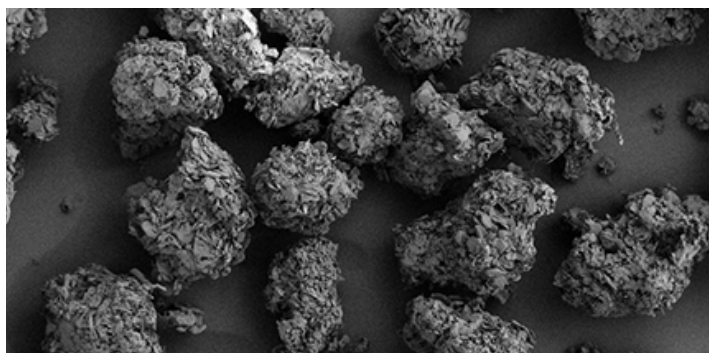
Soft agglomerates for high filler loadings and isotropic thermal conductivities. Better fit for potting resins and conformable TIM foils or pads with thin bond line 150-200µm.



SEM micrograph: Grade CFA 100

CFA 125

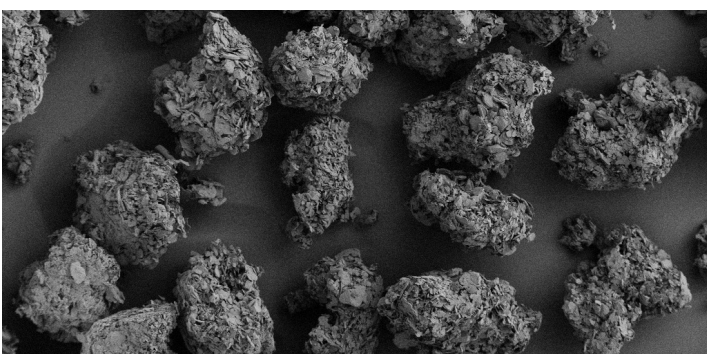
Soft agglomerates deliver the same uses and benefits as CFA 150, but can be used for materials with thinner bond lines from 150-250 µm.



SEM micrograph: Grade CFA 125

CFA 150

Soft agglomerates for high filler loadings and isotropic thermal conductivities. Used in potting resins and conformable TIM pads with bond line above 200µm.



SEM micrograph: Grade CFA 150

CFA 250S

Boron nitride platelets spray-dried with inorganic binder to spherical (S) granulates for high flowability and dosing velocities during feeding. Ideal for TIM pads.



SEM micrograph: Grade CFA 250S

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.

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.

The agglomerates 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.

Packaging

3M Boron Nitride Cooling Filler Agglomerates are available in 20kg 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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