

3M™ Boron Nitride Release Agents for Aluminium Extrusion

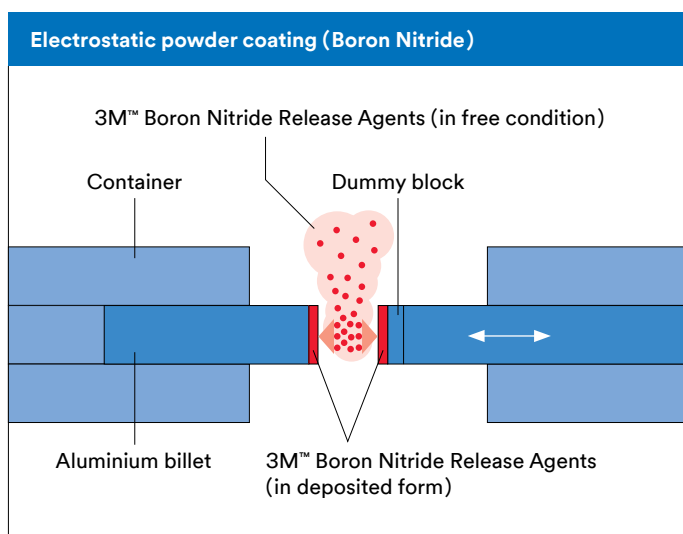
3M™ Boron Nitride products provide indispensable assistance at critical points in the extrusion process, ensuring a smooth process flow and producing immaculate profile surfaces.

3M Technical Ceramics developed the following release agents for the aluminium extrusion:

- 3M™ Boron Nitride Powder Grade P2
- 3M™ Boron Nitride Suspension WP
- 3M™ Boron Nitride Spray Extrusion

Advantages

- Outstanding release properties and lubrication
- Improved safety and cleanliness in the press area: no open gas flames
- Economical powder consumption
- Optimized binder improves adhesion on hot surface
- Reduced coating frequency: shorter downtimes
- Increased productivity
- Optimized product quality
- Long lasting corrosion protection of mold
- Not harmful to health



Properties

Extrusion starts from cylindrical aluminum billets. The individual billet sections are heated to 450 °C and forced through the die by means of a stem to form hollow or solid profiles. At this processing temperature, aluminum alloys tend to stick. It is therefore essential to apply a release agent or lubricant between the aluminum billet and dummy block.

Conventional release agents, such as oils, greases and carbon black contaminate the product and are difficult to use. Hexagonal boron nitride from 3M Technical Ceramics offers excellent properties as release agent and lubricant and is easy to apply.

Applications

In the extrusion process, 3M™ Boron Nitride products provide indispensable assistance, ensuring a smooth process flow and producing immaculate profile surfaces:

- Electrostatically applied 3M™ Boron Nitride Powder Grade P2 is the ideal release agent between the aluminum dummy block and billet.
- 3M™ Boron Nitride Spray Extrusion coated surface of the die bearing ensures maximum precision and a clean appearance on the profile surface.
- 3M™ Boron Nitride Suspension WP can be used as released agent on the preheated aluminum billet by spraying as an alternative to 3M™ Boron Nitride Powder Grade P2.
- 3M™ Boron Nitride Suspension WP on the shear blade prevents sticking and ensures a perfect cut at the end of the extrusion cycle.

The improvements in productivity and quality can benefit extrusion operations.

Specification 3M™ Boron Nitride Powder Grade P2

Typical Material Properties	Symbol / Unit	3M™ Boron Nitride Powder Grade P2
Chemical formula		BN
Crystalline structure		hexagonal
Specific weight	[g / cm ³]	2.25
Electrical resistance	[Ω cm]	> 10 ¹²
Purity (B+N)	[%]	> 98.5
Oxygen (O ₂)	[%]	< 1.5
Boron oxide (B ₂ O ₃)	[%]	< 0.5
Carbon (C)	[%]	< 0.1
Metallic impurities	[%]	< 0.2
Mean grain size d ₅₀ (primary particles)	[μm]	7
Specific surface area (BET)	[m ² /g]	5–15
Application temperature	[°C]	900 in air

Formula 3M™ Boron Nitride Spray Extrusion

- ≤10 % 3M™ Boron Nitride Powder (Spray)
- Binder: Bentonite
- Solvent: Ethanol
- Propellant: Propane and butane

Formula 3M™ Boron Nitride Suspension WP

- ≤12 % 3M™ Boron Nitride Powder
- Binder: inorganic
- Liquid phase: water

Availability

- 3M™ Boron Nitride Powder Grade P2 is available in 2 kg plastic bags
- 3M™ Boron Nitride Spray Extrusion is filled in 500 ml spray cans
- 3M™ Boron Nitride Suspension WP is available in polyethylene canisters of 10 kg capacity

Storage

- Store in a dry place at a temperature between +5 °C and 25 °C
- Containers must be tightly closed
- Guidelines for the storage of flammable liquids must be followed

Shelf life

- Minimum one year after delivery in originally sealed packaging
- Unsealed packaging needs to be used immediately

Safety

Because of the ethanol content of 3M™ Boron Nitride Spray Extrusion, this product is highly flammable and thus a hazardous substance in terms of the Ordinance on Hazardous Substances. The processing regulations and safety measures applicable to dealing with flammable liquids must be strictly followed. For more information please refer to safety data sheet (available on request).

Product is manufactured and sold by 3M Technical Ceramics, Zweigniederlassung der 3M Deutschland GmbH.

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