

SOLUTIONS

CERAMIC POWDERS



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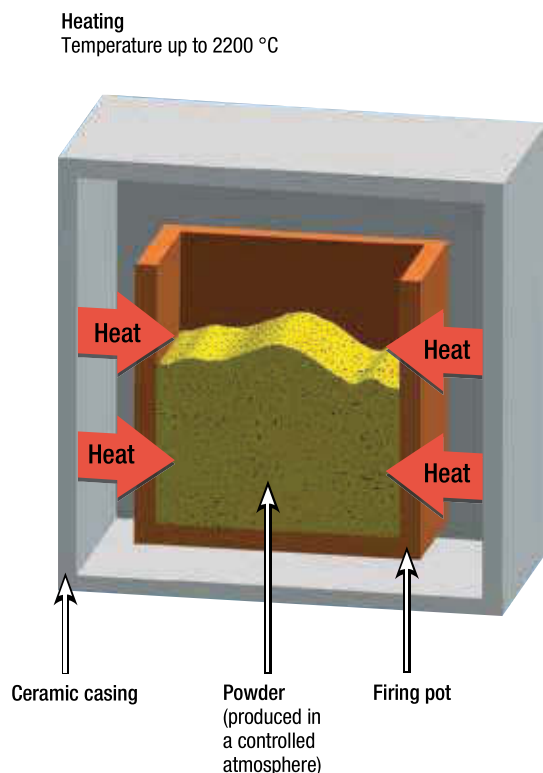
Kennametal specializes in the highly flexible production process that yields powders to meet a customer's required specifications!

Kennametal has the expertise in the field of non-oxide ceramic powders and shapes.

Our **Center of Competence (CoC)** for powders is in Newport, United Kingdom, and has more than 25 years of experience.



Non-Oxide Powders — Black and White



Manufacturing Process of Ceramic Powders

Major raw materials used:

Boron Nitride (BN)

- Boric Acid — Melamine
- Boric Acid — Ammonia

Titanium Diboride (TiB₂)

- Titanium Oxide — Boric Oxide
- Titanium Oxide — Boron Carbide

Boron Carbide (B₄C)

- Boric Acid — Carbon

Raw materials are mixed to produce uniform blends, which are reacted at temperatures up to 2200 °C under controlled atmosphere. After milling and final inspection of chemical and physical properties, the powders are packed for shipment.

Kennametal UK has achieved the international quality standard ISO 9001:2008.

We use the knowledge gained by manufacturing powders for our own use — and also work closely with our global customers — to produce optimum powders for a specific application.



cubic diamond



electronics

Boron Nitride — The White Graphite

Characteristics

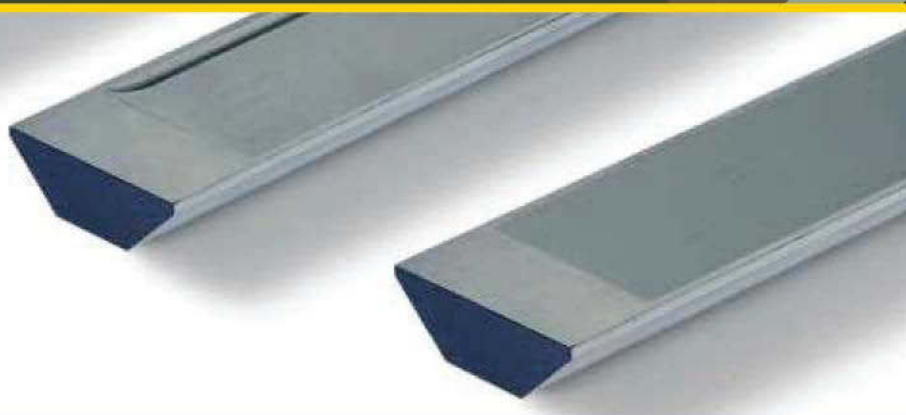
- High electrical resistivity.
- Good thermal conductivity.
- High temperature stability.
- Oxidation-resistant:
 - Up to 850 °C in air.
 - Up to 1400 °C under vacuum.
 - Up to 2200 °C under inert atmosphere.
- High chemical inertness.
- Corrosion resistant against many molten metals.
- Excellent lubricant.
- Non-toxic.

Applications

- Electrical insulator.
- Release agent.
- High-temperature lubricant.
- Hexagonal BN used to manufacture CBN.
- Additive in cosmetics.
- Filler for silicone and resins to improve thermal conductivity.

grade	typical chemical properties (wt %)				typical physical properties			applications
	N (typical)	B ₂ O ₃ (SOL)	C	moisture	D90 (µm)	BET (m ² /g)	tap density (g/cm ³)	
CB15	55	<0,15	<0,05	<0,20	30–50	5–10	0,28–0,45	cosmetics
B150	54	<1.5	<0.10	<0.70	10–14	10–20	0.17–0.28	hot-press grade, coating

NOTE: All powders are customizable per individual specifications.



evaporator boats



Titanium Diboride (TiB₂) — Hard and Conductive

Characteristics

- High electrical conductivity.
- High chemical inertness.
- Excellent hardness.
- Corrosion resistant against many molten metals.
- Non-toxic.

Applications

- Hot pressing powder.
- Additive in refractories.
- Major component in intermetallic composites.
- Basic material for armor plates.
- High-performance brake pads.

grade	typical chemical properties (wt %)				typical physical properties			applications
	N (typical)	B ₂ O ₃ (SOL)	C	moisture	D90 (μm)	BET (m ² /g)	tap density (g/cm ³)	
G5.5	<0.8	<1.5	<0.1	—	<13	<1,5	<2,2	HP-powders

NOTE: All powders are customizable per individual specifications.

Sprays and Paints

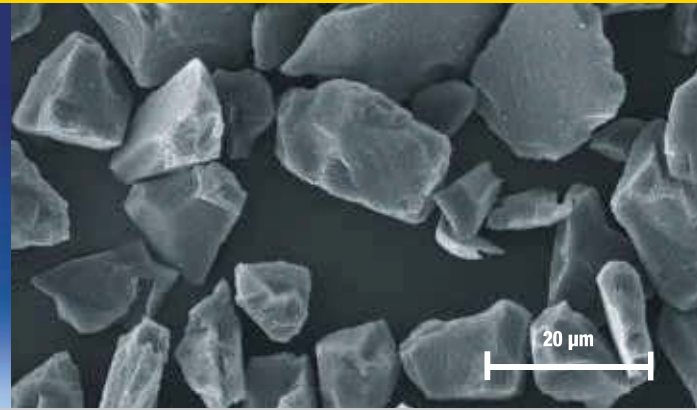
Applications

- Release agent for the metal and metallizing industry.
- Protective layer for variable applications and for the sintering industry.
- Coating for lower friction and higher chemical inertness.
- Dry lubricant, also in vacuum.





nozzles



Boron Carbide (B₄C) — Our Hardest Material

Characteristics

- Hardest material other than diamonds.
- Low specific weight.
- High neutron absorption.
- High temperature stability.

Applications

- Abrasive.
- Shotblast nozzles.
- Lightweight personal armor.
- Lapping.

Typical Chemical Properties

grade	N (typical)	B ₂ O ₃ (SOL)	C	B	O
RM B ₄ C	0,03	0,10	20,91	78,40	0,15



shotblast nozzles

Our standard production program conforms to FEPA:

microgrits	
grit designation	median grain size in µm ds50-value
F230	53.0 +/- 3.0
F240	44.5 +/- 2.0
F280	36.5 +/- 1.5
F320	29.2 +/- 1.5
F360	22.8 +/- 1.5
F400	17.3 +/- 1.0
F500	12.8 +/- 1.0
F600	9.3 +/- 1.0
F800	6.5 +/- 1.0
F1000	4.5 +/- 0.8
F1200	3.0 +/- 0.5
F1500	2.0 +/- 0.4
F2000	1.2 +/- 0.3



CERAMIC POWDERS

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