CERAMIC POWDERS

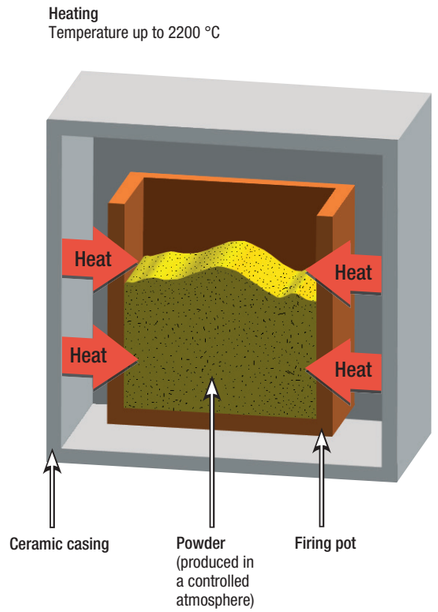
Kennametal specializes in the highly flexible production process that yields powders to meet a customer's required specifications!

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

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

KENNAMETAL®

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 (TiB_2)
- Titanium Oxide — Boric Oxide
- Titanium Oxide — Boron Carbide

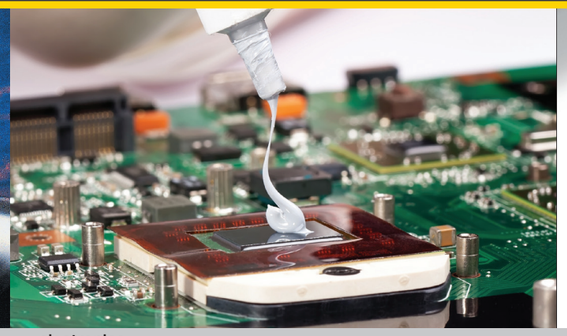
Boron Carbide (B4C)
- Boric Acid — Carbon

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

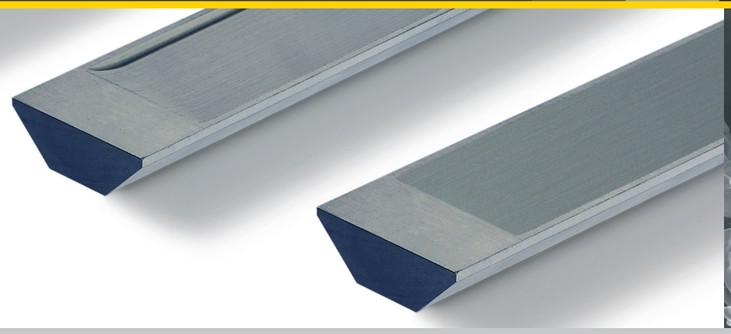
- High electrical resistivity.
- Good thermal conductivity.
- High temperature stability.
- Oxidation-resistant:
  - — Up to 850 °C in air.
  - — Up to 1400 °C under vacuum.
  - — Up to 2200 °C under inert atmosphere.
- High chemical inertness.
- Corrosion resistant against many molten metals.
- Excellent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

Applications

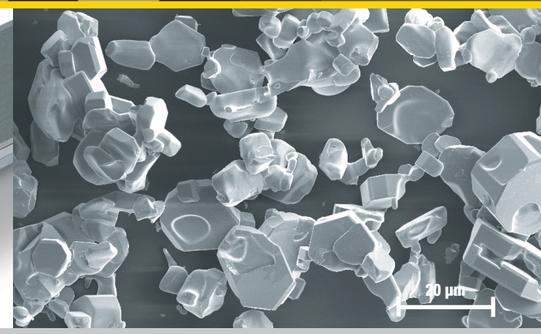
- Electrical insulator.
- Release agent.
- High-temperature lubricant.
- Hexagonal BN used to manufacture CBN.
- Additive in cosmetics.
- Filler for silicone and resins to improve thermal conductivity.

Short name	Crystal Structure		Typical Chemical Properties						Typical Physical Properties			
	Structure	Crystal Size µm	O%	C%	B%	Ca%	B2O3	Moisture	BET	TD	D50	D90
M120	Hexagonal	<2	<2	<0.1	>42.5	/	<1.2	<0.7	10~20	0.17-0.3	4~6	<14
B150	Hexagonal	<2	<1.5	<0.1	>42.5	/	0.5-1	<0.7	8~20	0.17~0.3	4~6	10~14
P050	Hexagonal	>2	<1.5	<0.05	>42.5	/	<0.4	0.3~0.4	4~6	0.1~0.2	5~10	10~20
C020	Hexagonal	10	<1.5	<0.03	>42.5	<0.2	<0.5	<0.5	<5	0.3~0.6	15~20	50~70

NOTE: All powders are customizable per individual specifications.



evaporator boats



Titanium Diboride (TiB_2) — 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.

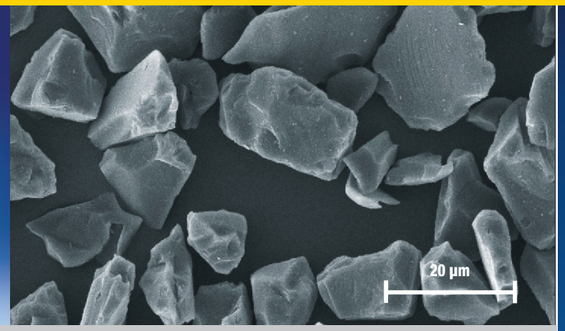
grade	typical chemical properties (wt %)				typical physical properties			applications
	N (typical)	B_2O_3 (SOL)	C	moisture	D90 (µm)	BET (m^2/g)	tap density (g/cm^2)	
G5.5	<0.8	<1.5	<0.1	—	<13	<1,5	<2,2	HP-powders

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 (B_4C) — 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_2O_3 (SOL)	C	B	O
RM B_4C	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

CERAMIC POWDERS

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