MgO for Microwave Dielectric

Advanced Ceramics · **CAS 1309-48-4** · **Grade M411**

1. PRODUCT DESCRIPTION

Developed for next-generation wireless infrastructure, this ultra-pure grade serves as the base material for microwave dielectric ceramics operating at 2-20 GHz (4G/5G base stations). Its controlled particle size (D50 1-2μm) and narrow distribution enable dense sintering at 1400-1600°C, achieving >98% theoretical density without exaggerated grain growth. The resulting ceramics exhibit exceptional dielectric properties: Q×f values exceeding 100,000 GHz (quality factor × frequency product indicating low energy loss) and temperature coefficient of resonant frequency (τf) near zero (-10 to +10 ppm/°C). Ultra-low alkali content (<10 ppm Na+K) prevents frequency drift caused by ion migration under electric fields.

2. TYPICAL PROPERTIES

PROPERTY	TYPICAL VALUE
MgO Content	≥ 99.95%
Specific Surface Area	5-10 m²/g
D50	1-2 μm
Dielectric Constant	9.8

Typical values, not a purchase specification. A batch-specific Certificate of Analysis is issued for every shipment. Confirm acceptance limits for your application with us before ordering.

3. MATERIAL CONSTANTS

PROPERTY	VALUE	SOURCE
True density	3.58 g/cm³	Literature value
Melting point	2,852 °C	Literature value
Mohs hardness	5.5	Literature value
Refractive index	1.736	Literature value

4. TYPICAL APPLICATIONS AND KEY PROPERTIES

- Enables Q×f >100,000 GHz (minimizes signal loss in filters)
- Ultra-high Purity (99.95% MgO, <10 ppm alkali metals)
- Narrow Particle Distribution (D50 1-2μm, σ<0.5) for uniform sintering
- Stable Dielectric Constant (εr=9.8±0.1) across temperature range

5. HANDLING NOTES

- **Dispersion.** Dry-blend or side-feed depending on loading; avoid moisture pickup before compounding.
- **Storage.** MgO is hygroscopic — reseal opened bags and use within the recommended period.
- **Dosage.** Confirm the addition level against your compound formulation; over-dosage can scorch or affect cure.
- **Safety.** Dust mask and eye protection when handling powder. See the SDS for full information.

6. PACKAGING AND STORAGE

ITEM	DETAIL
Packaging	25 kg PP woven bag with PE liner; larger packaging on request
Storage	Cool, dry, sealed — keep away from acids and moisture
Shelf life	24 months in unopened original packaging
Loading port	Tianjin (Xingang) / Qingdao

7. REGULATORY STATUS

ITEM	STATUS
REACH SVHC	Base material screened — no SVHC above 0.1 % w/w (SGS SHAEC2008188708). Treated grades can be tested on request.
RoHS (EU) 2015/863	Base material compliant (SGS NGBEC25004227002 / CZXEC1900477942). Treated grades on request.
Quality system	ISO 9001:2015 — certificate 21726Q00302R001, valid to 2029-04-15