

SCHOTT Technical Glass Powders

Product information

Glass powders offer a broad variety of characteristics depending on:

- Glass composition
- Grain sizes and their distribution
- Further processing technique.

More than one hundred SCHOTT standard glass types as well as different dry and wet grinding methods including SCHOTT patented technologies are utilized and result in a wide range of glass powder products. SCHOTT translates specific physical and chemical requirements into tailor-made solutions for a variety of applications in the electronic and hermetic packaging field.

Advantages

- 125 years of melting experience ensure excellent purity and a consistently high quality level
- Large assortment of standard and custom-made glass formulations
- State-of-the-art grinding technologies to ensure application-specific grain size distributions and purity of powders
- Lead-free solutions for all major applications
- Full support from sample quantities to mass production

Glass Compositions and Applications

Passivation glasses protect the sensitive p/n junctions of semiconductors and can serve as hermetic packaging at the same time:

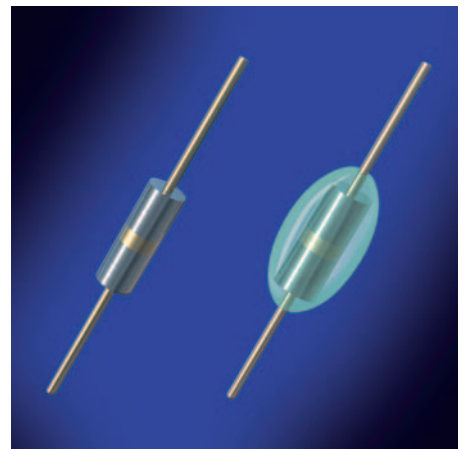
- Sinter glass diodes and rectifiers
- Wafer passivation, i.e. diodes and thyristors
- High-voltage varistors

Sealing glasses with defined coefficients of thermal expansion and processing temperatures of 800°C to 1000°C are used to hermetically join together metals and other materials. They meet the requirements of both, matched and compression seals in applications such as:

- Glass-to-metal seals
- Solid oxide fuel cells (SOFC)
- Flash lights
- High-temperature sensors

Solder glasses with particularly low softening points (below 550°C) allow the joining of different materials (e.g. glass, ceramics or metals) without thermally damaging the component. To ensure stress-free and hermetic sealing, the coefficient of thermal expansion (CTE) is closely matched to the sealing partners:

- Opto-electronic packaging (window and lens caps)
- MEMS packaging
- Sealing of display devices



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Grain sizes of SCHOTT Technical Glass Powders

| Type | Description | Size | Grain size | |
|------|--|-------|----------------------|----------------------|
| | | | d ₅₀ [μm] | d ₉₉ [μm] |
| K | Standard grind | K1 | 30 ± 10 | ≤ 150 |
| | | K2 | 16 ± 4 | ≤ 100 |
| | | K3 | 10 ± 2 | ≤ 63 |
| | | K4 | 7 ± 1 | ≤ 40 |
| | | K5 | 5 ± 1 | ≤ 40 |
| | | K6 | 3 ± 1 | ≤ 40 |
| FK | Special grind with low abrasion level | FK3.5 | 3.5 ± 1 | ≤ 20 |
| | | FK2.5 | 2.5 ± 0.5 | ≤ 15 |
| | | FK2.0 | 2.0 ± 0.25 | ≤ 15 |
| | | FK1.5 | 1.5 ± 0.25 | ≤ 10 |
| SM | Special grind with narrow distribution | SM3.5 | 3.5 ± 1 | ≤ 13 |

*Grain sizes are defined by the absolute size of the grains as well as grain size distribution:
d₅₀ = 50 % of measured grains are equal or smaller than the specified value
d₉₉ = 99 % of measured grains are equal or smaller than the specified value*

Individual grain size availability depends on the glass composition.

Further Processing of Glass Powders by SCHOTT

Glass powders can be further processed into paste, granulate or sintered preforms:

Glass pastes consist of glass powder mixed with organic binder and solvent. Featuring a defined viscosity, they are ready to be screen-printed or dispensed for sealing and over-glazing purposes.

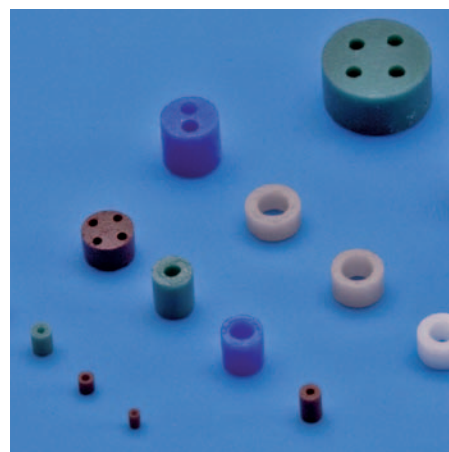
Ready-to-Press granulates are agglomerates of glass powder held together by an organic binder. Due to their relatively round shape, they easily “flow” into pressing tools for further processing into preforms. Granulates can be supplied in various colors by adding pigments during the process.

Sintered preforms are pressed and sintered glass beads, “pearls”, rods or spacers in various shapes. They are mostly used for the production of hermetic glass-to-metal seals.

For more information on these and other glass powder applications visit us at [www](http://www.us.schott.com) (see below) or contact us directly:

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70037 ENGLISH-USA 09/09/05 all/jab Printed in Germany
 No responsibility can be taken for the accuracy of this information. Despite the fact that all reasonable care was taken in presenting and keeping this information up to date, SCHOTT neither accepts legal responsibilities nor guarantees the completeness, accuracy and up-to-dateness of the information presented here. Date issued: March 2009

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