

# Technical Information

GF12

Performance Coatings

## Special Glasses

**Headquartered in Mayfield Heights, Ohio, USA, Vibrantz is a world leading producer of Performance Materials, with operations in 20 countries across Europe, Asia and the Americas.**

We apply core technologies in organic and inorganic chemistry to develop leading market positions in a diverse range of industries.

Our mission is "to achieve market leadership through a customer-focused and highly creative organization, committed to delivering top quality products and outstanding services to customers worldwide".

Our materials are used to add value to, and to improve the performance of products in a variety of end markets including building and renovation, home appliances, cookware, giftware and tableware, transportation, household furnishings, leisure, electronics, and industrial products.

We are among the world's leading suppliers of ceramic glazes and colors, glass decoration, speciality glasses, porcelain enamel coatings, auxiliary materials, and pigments. We pioneered the development of forehearth color technology for coloring of glass.

Our global commitment to quality, reliability, innovation, and personal customer care is founded on over 80 years of experience in serving the changing needs of the industry, from our international network of manufacturing plants and service centres. Our commitment to quality management has been recognized with the award of ISO 9001 accreditation to all of our global manufacturing and research facilities.

**Meeting the needs of the Color World calls for great foresight, flexibility, and innovation ...**

Our global presence is a strong competitive advantage. Technical, marketing, and management personnel are in continuous contact with customers in every major region. Multinational customers can be assured of standard products and consistent quality wherever they have operations.

We coordinate our R&D activities globally and use our international talent to ensure that product specifications and performance are designed to satisfy the specific requirements demanded by regional markets.

Vibrantz views the growing worldwide concern for the environment as an opportunity to develop improved products and also to participate in Chemical Industry efforts to address public concern. Environmental concerns are a major driving force behind the evolution of our lead- and cadmium-free technology and our low VOC decoration systems.

The markets we cover are extremely service-intensive. Vibrantz has established regional color matching, blending/pasting, and technical support facilities, to provide the level of service demanded by our customers in all time zones.

### **Think of us as a High Performance Partner to manufacturers around the world ...**

...Helping to create and enhance many of the products you use and enjoy every day of your life.

## Pigments and Special Products

Our innovative, high-quality products are used by the ceramic, electric, and automotive industries, as well as by the plastic and paint industries. ISO 9001 certification and audits ensure the very highest standards, while our active participation in the international Responsible Care Program underlines our commitment to the world we live in.

## Special glasses, our capabilities

The Pigments and Special Products business unit has long-standing know-how with regard to special glasses, frits, and glazes for decorative and functional applications. We gladly develop glasses according to your request, or melt them according to your requirements.

## Research, development, analytics

In co-operation with our research and development department, we supply a solid basis for the development of innovative products, which are then tailored to suit your application.

Our analytical department is excellently equipped, and is capable of testing and characterizing:

- particle size (sieves, laser-granulometer, microscopy),
- specific surfaces (BET),
- density (helium-pycnometer),
- diffraction index (microscopy),
- softening behaviour (heating microscope),
- thermal characteristics (DSC, HT-DTA, TGA),
- expansion behaviour (dilatometer)
- absorption behaviour (photospectrometer),
- viscosity of pastes (several viscosimeters),

- chemical composition (XRFA, AAS, ICP, wet chemical analysis),
- acid resistance (various methods),
- application tests.

This gives us the opportunity to develop specific new products and to investigate them systematically.

## **Melting**

Various melting units are at our disposal. With the help of these units, we are able to melt glasses of widely differing compositions adjusted for specific applications. We melt glasses for you in

- continuous troughs of various sizes,
- rotary kilns of various sizes,
- ceramic or platinum crucibles,
- induction melting units.

According to the required properties of the glass, the melting duration, atmosphere, and cooling conditions can be systematically varied.

## **Milling**

After fritting, the glasses can be milled with the help of

- dry ball mills,
- wet ball mills (water or alcohol),
- jet mills,
- attritor mills,
- beating mills,
- rocker mills, or
- roller mills.

We offer particle size distributions between several micrometres and a few millimetres.

## **Conditioning**

### *Granulating*

If desired, we deliver our special glasses in granulated form. In this case, the milled glass is prepared in a uniform particle size, as requested, from 50 µm to a few mm.

### *Sieving*

We sieve the crushed or milled glasses into the desired fractional amounts.

### *Silanization*

The surface of the glasses can be silanized according to the desired application.

### *Spherification*

Depending on the application and the glass, it is possible to produce glasses in the shape of a sphere.

### *Electrostatic preparation*

For electrostatic dry applications on to ceramic or glass surfaces, we offer the appropriately prepared products.

## Application examples

### Glasses as sintering aid for

- grinding wheels,
- welding electrodes,
- temperature control rings, and as
- additives for ceramic substrates to decrease firing temperature,
- additives in metallizing pastes.

### Glasses as sealing material

- for airtight joining of metal and ceramic,
- for sealing probes,
- for encapsulating waste.

### Glasses as filler material

- for improving mechanical and tribological properties,
- for obtaining certain physical properties,
- for composites.

### Glasses as coatings with adjusted physical properties like

- diffraction index
- transmission at certain wave lengths (IR,UV,XR, etc),
- dielectric constant,
- electrical resistance,
- degree of crystallization,
- phase separation.

### Glasses as lubricants

- for drawing tubes,
- for hot pressing.

Our competent staff is always ready to help you find the ideal glass for your application.

Please summarize your requirements on the enclosed fax form. You will then receive a proposal for a suitable glass, along with personalized advice.

If you have any questions concerning our current product range, data sheets provided for each individual product will give you detailed information on the composition and properties of our glasses.

The information and recommendations contained herein are based on data we believe to be reliable and does not imply any warranty or performance guarantee, as conditions and methods of use of our products are beyond our control. The data herein is determined using Vibrantz's standard test methods. Hazard and safety information with respect to this product is available in the applicable SDS. Vibrantz will not be liable under any circumstance for consequential or incidental damages, including but not limited to, lost profits resulting from the use of our products.