

Application Note

Frit Inks for Rigorous Environmental Conditions Screen Printed Glass

The high durability of glass screen printed with frit makes it ideal for marine display/cluster gauge applications where corrosive salt spray and fog are a continuous environmental threat, as well as other outdoor environments where organic inks may degrade and impede performance.

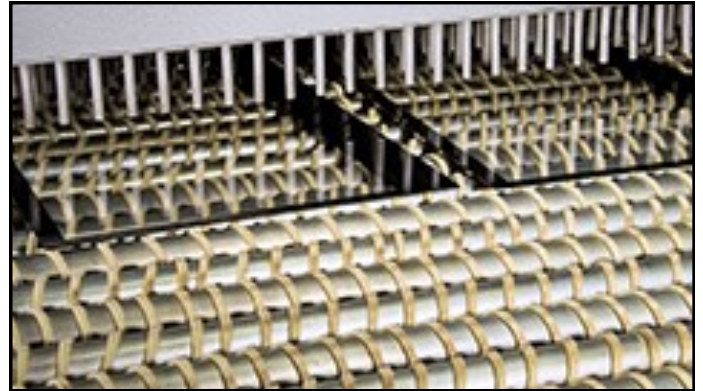
The frit itself is made up of three parts (see below) which helps the adhesion of the ink to the glass substrate during the heat tempering process, creating a permanent and environmentally rigorous screen print. The fritted graphics essentially become part of the glass itself.

Frit Ink Composition:

- Colored glass/ceramic frit particles
- Resin that holds the frit in place prior to the firing/tempering process
- Liquid/chemical medium that allows the ink to be applied

Frit Application:

Ceramic frit inks can be applied to clear, etched, tinted or patterned glass substrates. The glass is then elevated in temperature in a tempering oven to fuse the glass to the ceramic ink. Ceramic frit can also be applied to some high-performance coated glass but not others. Our knowledgeable Application Engineers are available to help you select the appropriate combination of coated material and screen print for your application specific requirements.



Frit Ink Screen Printed Glass Undergoing Heat Tempering

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Additional Benefits of Utilizing a Frit Ink Are:

- Not affected by moisture, oil, soaps, chemicals or detergents
- Retains its original appearance throughout the life of the glass
- Scratch and abrasion resistant
- Frit, once applied, will meet operating temperatures similar to the substrate melting points (Contact Factory for Specifics).

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- Ideal choice for soda lime glass as well as an excellent ink for SCHOTT Borofloat® due to its high melting point and typically use Borofloat® in high temperature environments
- Frit, once applied, will meet operating temperatures similar to the substrate melting points (Contact Factory for Specifics).

Frit Ink Specifications for Abrisa Technologies

Screen Printing:

- Colors: black and white are standard but custom Pantone colors are available
- Minimum glass thickness for the frit process is 3mm (0.118")
- Maximum glass thickness for the frit process is 25.4mm (1")
- Minimum glass dimensions: 25.4mm x 25.4mm (1" x 1")
- Maximum glass dimensions: 609.6mm x 609.6mm (24" x 24")
- Printed Feature Resolution: can print as fine as 0.305 mm (0.012")
- Ink Thickness: Single pass 25 – 60 µm

All screen printing at Abrisa Technologies is performed on either a semi-automatic or automated printer within a Class 1000 or 10,000 cleanroom. The platform selected is dependent upon specification requirements.

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Glass Fabrication



Coating Deposition



CNC Machining



Strengthening - Chemical & Heat



Screen Printing of Graphics



Abrisa Technologies, a member of HEF Photonics, is a globally recognized technology glass fabrication and optical thin film coating company with expertise in high volume manufacturing and engineering capabilities, delivering Total Solutions that provide excellent performance, fitness-for-use and economies of scale.

Our US based, state-of-the-art ISO 9001:2015 and ITAR registered facilities include Abrisa Industrial Glass in Santa Paula, CA and ZC&R Coatings for Optics in Torrance CA. These two divisions produce solutions from cut-to-order coated glass components to custom complex and ready-to-install fabricated, strengthened, optically coated, electronically enabled and branded sub-assemblies.

Our Total Solutions serve a variety of markets including Micro-Electronics, Defense and Avionics, Display, Industrial Automation, Optical Sensors, Imaging, Photonics, Medical & Dental, Life Science and more.



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