

FX 99-033 Boron Diffusion Source

Description: FX 99-033 is a screen printable boron diffusion source designed for use by the photovoltaic industry. The typical industrial solar cell consists of a front n-type junction diffused approximately 0.2-0.4 micron into the silicon wafer followed by a silicon nitride coating and back surface field (BSF). FX 99-033 has been

designed at a concentration whereby a single print through a 200 mesh screen followed by rapid thermal processing through an infrared furnace will create a high quality BSF. The glassy surface residue created by the firing step can be cleaned from the surface by immersion in a dilute (10%) solution of hydrofluoric acid (HF).

Typical Properties	
FX 99-033	
Viscosity (Pa.s) ¹ :	3–5
Wet Deposit (mg/square cm):	1.8–2.4
Drying Profile ² :	250–300°C, < 60 seconds
Peak Firing Temp ² :	900–1000°C
Time at Peak:	5–10 minutes
Recommended Thinner	0800

All properties are target values and are not meant to represent product specifications

Notes:

¹Viscosity as measured on Brookfield model HBT cone/plate viscometer; 9.6 reciprocal seconds, 1.565° cone, 25°C.

²Recommended set points °C in infrared firing furnace

Product Advantages:

- Single print/rapid IR thermal processing creates high quality BSF
- RoHS compliant³
- Lead & Cadmium free⁴

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Processing Recommendations

Printing: It is recommended that the paste temperature be between 20–25°C prior to printing, and it is advisable to control the ambient room temperature within $\pm 2^\circ$ to insure consistent printing results. The printing area should be clean and well-ventilated.

Screen: 200–260 mesh screen with a 12–20 μm emulsion thickness is recommended.

Drying: The ink can be dried in an Infrared or conventional dryer under a wide range of conditions. Inks are typically dried in an IR dryer with set points of 250–300°C in less than 60 seconds.

Compatibility: Ferro has tested this material according to the recommended processing conditions described here, however, it is imperative that customers evaluate the material in their manufacturing process and conditions to insure suitability for their intended use. Ferro technical personnel can help facilitate testing, and can assist with integration into customer manufacturing processes.

Thinning: Thinning is not recommended, since the paste is supplied at the correct viscosity for application. Contact your local Ferro Representative for appropriate solvent details, should thinning become necessary to replace solvent lost through evaporation.

Paste Storage & Shelf Life: The paste should be stored in tightly capped containers in a cool (5–30°C) dry place away from direct sunlight. When properly stored, unopened material will have a shelf life of up to 3 months.

Notes:

³Complies with EU Directives on Restriction of the use of Hazardous Substances (RoHS; 2002/95/EC) and Waste from Electrical and Electronic Equipment (WEEE; 2002/96/EC). Current exemptions allow lead contained in the glass system of thick film materials used in electronic components. In anticipation of future amendments and more stringent environmental regulations, Ferro continues to expand its range of Lead Free⁵ materials.

⁴Initial product composition was certified by SGS laboratories to be below the detection level for lead and cadmium. This paste is not routinely analyzed for lead and cadmium content and is not the basis for product specification or warranty.

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