



LF 33-701 Low Temperature Lead Free Silver Conductor

Description: LF 33-701 silver conductor paste is a versatile, lead free, low firing temperature product (450-500°C) that can be used to metallize a variety of solar cells. It prints on TCO coated glass, amorphous and crystalline

silicon substrates and exhibits excellent adhesion and good contact formation. It is particularly well suited for use on thin film, amorphous and crystalline-based solar cells fabricated at low temperatures.

Typical Properties	
	LF 33-701
Viscosity (Pa.s) ¹ :	140-200
Solids Content	83-86%
Fineness of Grind:	<22/16 µm
Dried Thickness:	18-22 µm
Fired Thickness:	11-17 µm
Resistivity ² (milliohms/square):	< 3.5
SDrying:	150°C, 1-3 minutes
Firing ³ :	450 - 500°C
Time at Peak:	5-10 minutes
Recommended Thinner:	Not recommended

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

Notes:

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

² Milliohms/sq. @ 25 µm fired thickness.

³ Recommended set points °C in infrared firing furnace.

Product Advantages:

- RoHS compliant⁴
- Lead & Cadmium free⁵
- Low firing temperature conductor
- Exceptional adhesion strength
- Good contact formation
- Suitable for thin film, amorphous and crystalline solar cells

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Processing Recommendations

Printing: 280-325 mesh screen with a 12 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.

Thinning: Thinning is not recommended because 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 6 months.

Notes:

⁴Complies 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.

⁵Initial product composition was certified by SGS laboratories to be below the detection level for lead and cadmium. This conductor paste is not routinely analyzed for lead and cadmium content and is not the basis for product specification or warranty.

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