

Description: 99-007 is a screen printable ink designed for use in fabrication of very thick transparent films of TiO₂. These films can be employed as the anti-reflective coating (ARC) on single crystal and polycrystalline photovoltaic devices. The ink is applied to the solar cell surface by standard screen printing techniques. The printed films are fired in air through infrared or fast fire belt furnaces. Fired thickness of the TiO₂ films will be 800 – 1200 angstroms depending on printer setup. The index of refraction of the films varies between 1.9 – 2.1 depending on thickness and processing. Since reflective minima and maxima wavelengths depend on the index of refraction and the thickness of a transparent film, the achievement of a deep blue color in the finished film is an indication that proper thickness has been realized for minimum reflectance in the center of the visible spectrum.

Processing Recommendations

Printing: 325 mesh screen with 8 μm – 12 μm emulsion thickness is recommended.

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

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, dry place away from direct sunlight. Properly stored material will have a shelf life in excess of 6 months.

Typical Properties	
	99-007
Viscosity (poise) ¹ :	80 – 120
Screen Mesh:	325 mesh
Emulsion Thickness:	8 – 12 μm
Wet Film Thickness:	31 – 35 μm
Drying Profile:	250 – 300°C, 60 seconds
Peak Firing Temp:	475 – 550°C
Time at Peak:	1 - 5 minutes
Fired Film Thickness:	800 – 1,200 Angstroms
Index of Refraction:	1.9 – 2.1
Color of Fired Film:	Blue
Recommended Thinner	0800

Notes:

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

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