

# DuPont 7740

SILVER CONDUCTOR

## Technical Data Sheet

### Product Description

DuPont 7740 is designed for applying thick layers of silver onto ceramic substrates. It is intended for use in circuits carrying high current, where both thermal and electrical conductivity are key design features. The paste is applied by screen printing and then fired in a furnace at 850°C, to form power device mounting sites, pads for components and lead attachment, and interconnection tracks.

### Product Benefits

- Excellent Thermal and Electrical conductivity
- Optimized for printing thick tracks and large areas
- Ability to produce substrates with varying thickness of silver
- Compatible with Thick Film Resistors

### Processing

#### Thinner

DuPont 7740 conductor is optimized for screen printing and thinning is not normally required. DuPont 4553 may be used sparingly for slight adjustments to viscosity or to replace evaporation losses.

#### Substrates

Properties are based on tests carried out using 96% Alumina substrates. Substrates of other compositions and from various manufacturers may result in variations in performance.

#### Printing

DuPont 7740 conductor should be thoroughly mixed before use. This is best achieved by slow, gently hand stirring with a clean burr-free spatula (flexible plastic) for <1 minute. Printing should be carried out in a clean, well ventilated area. Optimum printing characteristics of DuPont 7740 are generally achieved in the room temperature range of 20°C - 23°C. It is therefore, important that the material, in its container, is at this temperature prior to commencement of printing.

### Composition Properties

Test	Properties
Viscosity[Pa.s] [Brookfield HBT, SC4-14-6R, 10rpm, 25°C]	110-180
Thinner	DuPont 4553

### Fired Conductor Properties

Fired Thickness (µm) (80 mesh stainless steel screens)	approx 55
Sheet Resistance (mΩ/sq) [@55µm fired thickness]	0.38

### Other Information

Thermal Conductivity (W/mK)	200
Coverage (cm <sup>2</sup> /g) [at 55µm fired thickness]	15

This table shows anticipated typical physical properties for DuPont 7740 based on specific controlled experiments in our labs and are not intended to represent the product specifications, details of which are available upon request.

Screen mesh selection depends on the film thickness required. A 165 -200 mesh screen can be used to maximize the print thickness for the first layer of 7740 (30-40 µm). Areas where increased thickness is needed should be overprinted with a subsequent layer or layers to build up the thickness. A coarser mesh screen can be used to process the subsequent layers. When selecting the screen mesh, resolution and/or surface roughness requirements for the application should be considered. A 105 mesh screen can be used to achieve the maximum recommended print thickness of the subsequent layers (approx. 60 µm fired per layer). It is also advisable to "step in" the dimension of overprinted layers from the edge of the underlying layer to maximize the surface planarity.

The DuPont 7740 thickness should be built up using sequential print/dry/fire processing, since co-firing of layers may be detrimental to density and adhesion of the fired film. A build sequence which incorporates three layers of DuPont 7740 (165 mesh P/D/F, 105 mesh P/D/F, 105 mesh P/D/F) will provide the recommended maximum total thickness of 170  $\mu\text{m}$ .

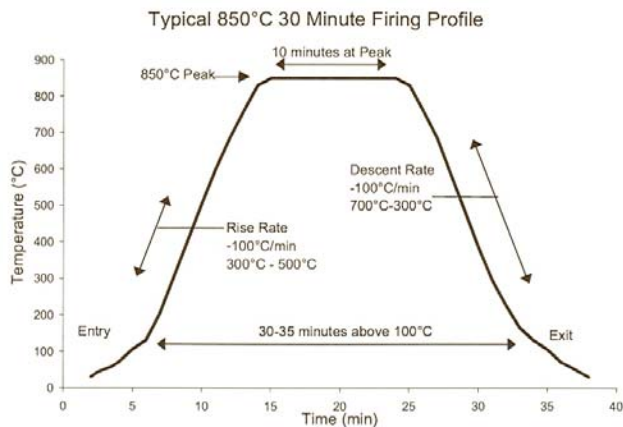
The TCE difference between a thick metal layer and alumina may lead to some bowing when large area substrates are printed on one side only. The degree of bowing is greater with thinner substrates, thicker metallization or larger print area

### Drying

Allow prints to level at room temperature for 2-5 minutes. Dry for 15 minutes at 150°C in a well ventilated oven, or using a belt drier.

### Firing

Fire in a well ventilated belt or conveyor furnace, in air with a 30 minute cycle to a peak temperature of 850°C for 10 minutes.



### Storage and Shelf Life

Containers should be stored, tightly sealed, in a clean, stable environment at room temperature (<25°C). Shelf life of material in unopened containers is six months from date of shipment. Some settling of solids may occur and compositions should be thoroughly mixed prior to use.

### Safety and Handling

For Safety and Handling information pertaining to this product, read the Material Safety Data Sheet (MSDS).



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