

## PELCO<sup>®</sup> High Temperature Carbon Paste, 50g Product No. 16057



### Description:

PELCO<sup>®</sup> High Temperature Carbon Paste is a dispersion of Carbon flakes in an inorganic silicate aqueous solution. The PELCO<sup>®</sup> High Temperature Carbon Paste is aimed for applications where a conductive cement is needed which withstand temperatures up to 2000°C (3632°F). This paste is ideally suited for mounting specimens on hot stages for SEM, FESEM, XPS, ESCA, SIMS, AUGER systems. Also for applications where silver migration or a reaction with silver or nickel flakes could be a problem, this product would be an excellent alternative. It is specially formulated for applications demanding ultra high continuous service temperature and/or low VOC's for ultra high vacuum applications but it also performs at cryogenic temperatures. It provides moderate electrical and thermal conductivity. Its sheet resistance is 4.60 ohms/sq/mil (25µm). Its thermal conductivity is estimated to be 1 W/m<sup>2</sup>K. Surfaces to be coated should be clean and free of grease.

### Advantages:

- One component system. - No mixing required.
- Inorganic system – No hydrocarbons No VOC's.
- High service temperature. – Up to 2000 °C (3600 °F), strength improves with temperature.
- Low temperature capability. - Not effected by cryogenic temperatures but bond integrity will depend on joint design and differential thermal expansion between substrate, sample, and paste.
- moderate electrical and thermal conductivity.
- Suitable for ultra high vacuum applications.
- Refrigeration not required.
- Thin paste (20,000 – 25,000 cP) – viscosity can be reduced by adding water.
- Water soluble after initial cure – solubility is reduced the higher the temperature it is exposed to.

## Typical Properties (as supplied)

Filler: Carbon

Binder: Inorganic Silicate

Diluent: Water

Color: Dark Grey/Black

Viscosity: 20,000 – 25,000 cP @ 25°C

Consistency: smooth, flowing paste – viscosity can be reduced by adding no more than 10% water by weight.

Recommended thickness: 2-8 mils (25-100µm.) applied as a glue line or coating.

Carbon content by weight: 50-60%

Density: 1.6 g/cc

Shelf life: 6 months minimum after receipt of paste – can be increased by adding not more than 10% water and/or removing skin that can form on the top layer.

Storage: Store at room temperature in tightly sealed container. Do not freeze.

## Application

Mix thoroughly. Apply adhesive paste to each surface in a thin coat using a brush, spatula or dispenser.

Abrade and clean surface for best results. Prewetting the surfaces may improve adhesion. Maintain a uniform bond line of 2-8 mils. Apply even pressure (clamp if possible), and wipe away excess material before drying.

Good mechanical strength is achieved within a matter of minutes at room temperature. Successive coats may be applied after curing.

## Cure Schedule (bond time/temperature)

Air set for 2 to 4 hours, then step heat Cure for 2 hour cure at 93°C (200 °F) then 2 hour cure at 260°C (500 °F) to achieve final electrical and mechanical properties. Blistering may occur if the glue line is too thick or heating too rapid.

If the second step cure is not performed then the matrix can pick up moisture. Strength improves with temperature and it becomes almost insoluble if exposed to temperatures above 260°C (500 °F).

Adhesive must be cured before use at elevated or cryogenic temperatures.

## Typical Properties (when cured)

Recommended thickness: 0.5-1.5 mils dried (12.5-37.5µm.)

Sheet resistance: 6.5 ohms/sq/mil (25µm) after air dry. 4.6 ohms/sq/mil (25µm) after step heat cure.

Estimated Thermal Conductivity: 1 W/m<sup>2</sup>K.

Soluble in water: up to 260°C (500 °F) exposure. Will still soften in water but may require abrasion to remove.

Bond strength: Moderate but brittle.