

## PELCO<sup>®</sup> High Performance Ceramic Adhesive, 1 Pint Product No. 16026



### Description:

PELCO<sup>®</sup> High Performance Ceramic Adhesive is a dispersion of Aluminum Oxide in an inorganic silicate aqueous solution. It is specially formulated for bonding and sealing ceramics, metals, and quartz for applications demanding electrical and thermal insulation at high continuous service temperature and low VOC's for ultra high vacuum. It also performs at cryogenic temperatures. It provides both low electrical and thermal conductivity. Its volume resistance is  $10^9$  ohms @RT. Its Dielectric Strength 256 volts per mil @RT. Surfaces to be coated should be clean but wet thoroughly to ensure good adhesion.

### Advantages:

- One component system. - No mixing required.
- Inorganic system – No hydrocarbons No VOC's.
- High service temperature. – Up to 1650 °C (3000 °F), strength improves with temperature.
- Low temperature capability. - Not effected by cryogenic temperatures
- High electrical and thermal resistance
- Good mechanical strength.
- Excellent resistance to acids and alkali.
- Excellent moisture resistance.
- Suitable for ultra high vacuum applications.
- Refrigeration not required.
- High viscosity paste – viscosity can be reduced by adding water.
- Water soluble before cure – solubility is reduced the higher the temperature it is exposed to.
- Bond integrity will depend on joint design and differential thermal expansion between substrate, sample, and adhesive paste.

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**TED PELLA, INC.**

Microscopy Products for Science and Industry

P.O. Box 492477, Redding, CA 96049-2477, U.S.A.

Telephone: 530-243-2200; 800-237-3526 (U.S.A. or Canada) • FAX: 530-243-3761

Email: sales@tedpella.com • Web Site: <http://www.tedpella.com>

## Typical Properties (as supplied)

Filler: Alumina

Binder: Inorganic Silicate

Diluent: Water

Color: White

Consistency: smooth, flowing paste – viscosity can be reduced by adding water.

Alumina content by weight: >60%

Density: 2.3 g/cc

Soluble in water: up to 260°C (500 °F) exposure

Shelf life: 6 months minimum after receipt of paste – can be increased by adding 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

Apply adhesive paste to each surface in a thin coat using a brush, spatula or dispenser. Wet the surface thoroughly to ensure good 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 1 to 4 hours, then heat Cure for 2 hour cure at 93°C (200 °F) to achieve final electrical and mechanical properties. Blistering may occur if the glue line is too thick or heating too rapid.

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: 2-8 mils dried (25-100µm.)

Volume resistance: is  $10^9$  ohms @RT,  $10^5$  ohms @538°C (1000 °F)

Dielectric Strength: 256 volts per mil @RT, 100 volts per mil @538°C (1000 °F)

Thermal Conductivity: ~15 W/m°K.

Torque strength: 6 ft-lbs

CTE:  $7.6 \times 10^{-6}$  in/in/°C, ( $4.2 \times 10^{-6}$  in/in/°F)

Moisture Resistance: Excellent after firing above 370°C (700 °F)

Alkali Resistance: Good after firing above 370°C (700 °F)

Acid Resistance: Excellent after firing above 370°C (700 °F)