



# APTEK LABORATORIES, INC.

ISO 9001 / AS9100 Certified

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## TECHNICAL DATA & INFORMATION

### APTEK® 2711

Inorganic, thermally radiative, ESD paint

### PRODUCT DESCRIPTION

**APTEK 2711** is a white, rigid, mineral oxide filled, one component, room temperature curing, inorganic coating/paint designed for very high temperature space applications. **APTEK 2711** was developed for use as thermally conductive coating where excellent resistance to intense UV light exposure is required.

### KEY FEATURES AND BENEFITS

- JPL field-approved formulation; already on hardware in space
- Inorganic silicate binder provide coating with a service temperature  $\geq 700^{\circ}\text{C}$  ( $1300^{\circ}\text{F}$ ). This coating somewhat brittle and should only be used on rigid substrates
- Passes NASA outgassing per ASTM-E 595
- Inherently has sufficient surface conductivity for ESD applications on conductive surfaces
- Water-based formulation for safety. Formulated to sprayable viscosity for convenience

### HANDLING INFORMATION

1. **APTEK 2711** is a one component, ready-to-spray system; however, it may be thinned further with distilled water, if needed.
2. **SURFACE PREPARATION**
  - a. Substrate surface to be sprayed should be clean and dry and free from silicone, mineral, petroleum oils/greases, etc.
  - b. It is recommended that substrates be scrubbed with an abrasive cleaner. Then rinse with distilled water until a uniform "sheet" of water film appears on surface. Rinse in clean, anhydrous IPA, and allow to air dry for 15 minutes. Then bake for 15 minutes @  $65^{\circ}\text{C}$  in an air circulating oven.
3. **SURFACE PRIMING**
  - a. Priming of some surfaces may not be required. User to determine if needed.
  - b. Specimens should be cleaned/prepared by above procedure (or equivalent) within 2 hours prior to priming.
  - c. The best primer to use is **APTEK 2711** itself. Apply a thin coat ( $\leq 0.5$  mil) by rubbing **APTEK 2711** into the cleaned surface using a clean, dry, lint-free cloth. This rubbed in coating shall air dry until the water has evaporated and surface looks dry. This should occur within a few minutes but not more than 15 minutes.
4. **PAINT PREPARATION/APPLICATION**
  - a. Filler will settle upon storage. Homogenize prior to use by vigorously shaking the sealed container. Ceramic stirrer beads are embedded in the filler layer to aid in easy re-dispersion and rehomogenization.

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- b. Once uniform, pour freshly agitated **APTEK 2711** into spray gun reservoir. For best results, keep mixture in spray reservoir stirred or shaken during spraying procedure.
- c. Use dry air, free of oils, as pneumatic spraying medium at a suggested pressure setting of 18-22 psi. Adjust pressure as needed to achieve a fine mist.
- d. Recommended spray equipment is HVLP (high-volume, low-pressure) spray guns, such as a Devilbiss SRIPRO 65-35G-10 spot repair gun for lab and small volume use ([www.devilbiss.com](http://www.devilbiss.com)). The canister for this gun is 265ml. For larger production scale use, the Anest Iwata LPH400-164LV Gravity Gun ([www.anestiwata.com](http://www.anestiwata.com)) is preferred. The canister for this gun is 600ml.
- e. For best results, spray multiple thin coats to freshly primed surfaces to achieve a cured thickness of ~3-5 mils. It is recommended to wait for each coat to air-dry 5-10 minutes prior to spraying subsequent coats in order to not trap large amounts of water between coats.
- f. A uniform thickness draw-down blade applicator may be used to screed down the coating in lieu of a spray application for small specimen sizes.
- g. Estimated surface area coverage per quart is approx. 25 sq. ft. at 3-4 mils cured thickness.

### CURE SCHEDULE

7 days at @ RT

#### Notes:

1. Cure schedule is a guideline. User to determine actual cure for application.
2. Typically, paint air dries overnight and parts can be handled within 24-48 hours.
3. Lower % RH will speed up cure rate and higher % RH will tend to slow cure rate.

### TYPICAL PROPERTIES

(values not to be used for specification purposes)

<u>CHARACTERISTICS</u>	<u>2711</u>	<u>TEST METHOD</u>
Color	white to off-white	Visual
Specific Gravity	1.54	ASTM D-1475
Viscosity @ 25°C, cps	120	ASTM-D-1824
Flash point, °C	N/A	
Shelf life, months @ 22°C or cooler, (may refrigerate but do not freeze) in factory sealed containers	6	
<u>CURED PHYSICAL PROPERTIES</u>	<u>2711</u>	<u>TEST METHOD</u>
Solar absorption, $\alpha_s$ vs thickness	<u><math>\alpha_s</math>/mils</u> 0.20/2 0.185/3 0.17/4	ASTM E-903
Outgassing @ $10^{-6}$ torr, TML, % CVCM, %	0.50 0.02	ASTM E-595
Surface resistivity, on conductive surfaces ohms/sq, on 100 volts bias meter	$10^7$ to $10^9$	ETS-872A
Total normal emittance	0.93	ASTM E-408

**SAFETY AND FIRST AID**

**APTEK 2711** is a water-based, mineral filler, low viscosity coating which is safe to handle when used properly. Store the coating at 15-30°C in original factory sealed containers. In case of eye contact, flush with fresh clean water for at least 15 minutes; for skin contact wash thoroughly with soap and water. If swallowed, drink at least one pint of water and call a physician. Refer to MSDS for more details.

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