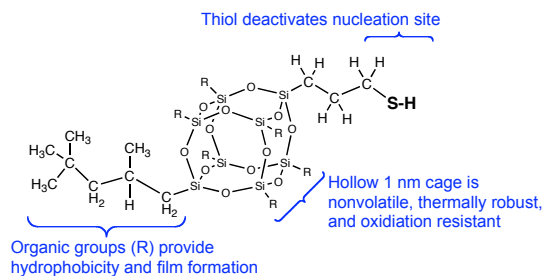


## POSS® Short-Stop Conformal Coating with Tin Whisker Suppressant

POSS® Short-Stop utilizes Nanostructured® chemical technology to achieve a clear, tough, hydrophobic coating that mitigates potential damage from conductive solder whiskers and tin plating. POSS® Short-Stop is a one-step, spray-applied, whisker suppression and conformal coating system that affords reliability and spot re-work without recoating of the entire board.

### How Whisker Suppression Works

Tin whisker suppression is achieved through the use of non-volatile, and thermally stable mercapto POSS cages which are directly incorporated into a polyimide conformal coating. The thiol group serves to protonate tin oxide bonds and subsequent formation of metal-sulfur linkages. The 1.5 nm diameter of the cages afford relief of mechanical stress directly at or near the metal grains. This process enables elimination of compressive stress and reduces whisker nucleation prospects.



### About the Conformal Coating and Whisker Barrier

A clear and colorless POSS® polyimide is utilized to coat the board and its components against environmental damage including moisture and UV degradation. The mechanically tough polyimide also provides a physical barrier to whiskers. Long whiskers cannot pierce the coating and buckle underneath it thereby protecting against electrical shorts from whiskers. A 0.5 mil (12 µm) thick coating of POSS Short-Stop is sufficient to serve as a physical barrier and polyimide is an excellent electrical insulation material. POSS® Short-Stop has high adhesion to metals, composites, and most plastic surfaces.

Tensile Strength	Tensile Modulus	Elongation	Tg	CTE	50% UV Cut-Off	Moisture Permeation
74 MPa	2.13 Gpa	8.0 %	266 °C	68 µm/m/°C	377 nm @ 12 µm	0.38 g/cm/m <sup>2</sup> day

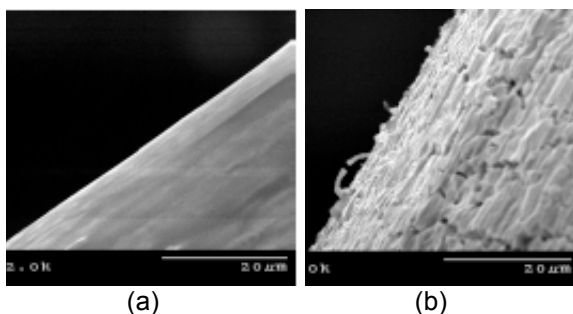
After application the POSS® Short-stop shows < 0.01 wt% volatiles. POSS® Short-stop is not degraded by contact with common fuels, hexane, alcohols, ethyl acetate solvents.

### Application Method

1. A moderately clean surface is desired.
2. Shake the can and spray the surface.  
Touch dry in 5 minutes. Thoroughly dry in 30 minutes.
3. Apply second spray if needed.  
Typically 0.5 mil (12.5 microns) coating is obtained after 2-3 passes.

\*A spray can of POSS Short-stop covers approximately 6.7 ft<sup>2</sup> (.62 m<sup>2</sup>) at 0.5 mil (12 µm) thickness.

To remove coating, wet the surface with methyl ethyl ketone and wipe it clean.



(a) Coated solder surface after 30 days, (b) Uncoated solder surface after 30 days. (SEM photos courtesy: Vista Engineering, www.vistaeng.com)