# Turbo-Coat™ HV Acrylic Conformal Coating
## Product# 2109

### Product Description

Techspray's new Turbo-Coat™ HV Acrylic Conformal Coating is a high viscosity version of our popular Turbo-Coat. This coating is tested and approved in Asymtek and PVA selective spray systems, both atomized and airless models.

Turbo-Coat is designed to speed up board production throughput without additional investment of expensive UV systems or other capital equipment. Conformal coating cure time is often considered a production bottleneck for PCB assembly operations. Turbo- Coat HV dries tack-free in under 10 minutes, allowing manufactures to handle boards in 1/2 the time of the leading acrylic coating!

Turbo-Coat Thinner is available to reduce the viscosity to fit ideal process parameters. Turbo-Coat, Turbo-Coat HV, and Turbo-Coat Thinner are all HAPs (Hazardous Air Pollutants) free, so do not contain common coating solvents like Toluene, Xylene, and MEK. This makes these coating more user friendly and safe.

Turbo-Coat HV uses the same acrylic resin as the original Turbo-Coat, so coatings can be mixed-and-matched through the process, e.g. using the faster curing Turbo-Coat in the rework area, Turbo-Coat HV in the assembly area, and Turbo-Coat pen for QC touch-up.

### Features / Benefits

- Dry to Touch in Under 10 Minutes!
- Designed for selective sprayers
- Low toxicity
- No Toluene, Xylene or MEK
- Meets IPC-CC-830B
- UL94 V-0 – nonflammable final coat
- UV indicator for black light inspection

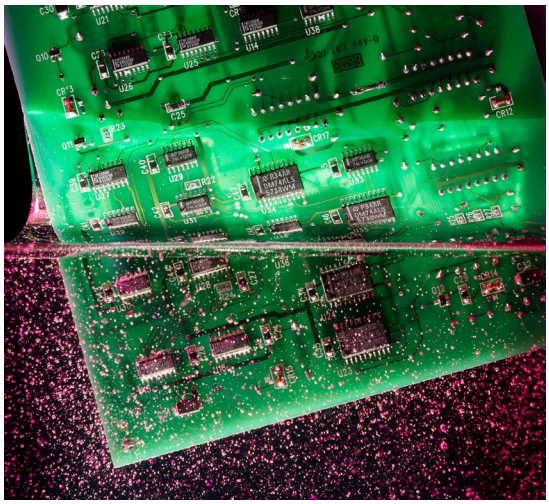
### Applications

Electronic Assemblies for...
- Automotive
- Aviation
- Consumer Electronics
- Appliances
- Industrial Meters & Control

### Thinning/Removal

Techspray® coatings can be thinned to meet production requirements using Conformal Coating Thinner (2105). Conformal Coating Remover (2510) is also available for rework and repair, although coating is often just burnt through in the soldering process for spot repairs.

Techspray coatings contain Opti/Scan to allow quality control inspection of coverage and evenness of the coating on a PCB. A board can be passed under a standard, low-cost long-wave UV (black) light, and the coated areas glow. The brighter the glow, the thicker the coating.



### Typical Product Data and Physical Properties

| | |
|---|---|
| **Physical State:** | Liquid |
| **Odor:** | Sweet ester odor |
| **Color:** | Clear, colorless |
| **Percent Volatile:** | 75.5 at 68ºF (25ºC) |
| **Vapor pressure:** | 1.12 mmHg @ 20ºC |
| **Vapor density:** | >1 (Air=1) |
| **Boiling Point:** | Not Determined |
| **Flashpoint and method:** | 41ºF (5ºC) |
| **Solubility in water:** | Negligible |
| **Evaporation rate:** | >1 (n-Butyl Acetate=1) |
| **Density:** | 0.91 at 68ºF (25ºC) |
| **Viscosity #1:** | 52 to 60 Centipoise at 68ºF (25ºC) |
| **VOC:** | 7.200% by weight |
| **Shelf life:** | 2 years |

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### Usage Instructions

*For industrial use only. Read SDS carefully prior to use. Before applying Turbo-Coat™ conformal coating, clean circuit boards to remove contamination and allow to dry. Cleaning is recommended for optimal adhesion, and may be performed with Techspray G3, E-LINE™ and Precision-V defluxers.*

**Spray Application:** Apply top to bottom, allowing coating to flow evenly around components. Repeat application 3 additional times from varying directions to prevent component shadowing. Then allow board to cure. If additional thickness is desired, apply additional coatings. When using liquid spray with automatic dispensing equipment, adjustments may be required in application rate and viscosity.

**Dip Application:** Using automatic equipment or hand immersion technique, slowly immerse PCB into the coating and remove slowly. Use an average rate of approximately 1 foot per minute. After allowing the board to cure, process may be repeated to achieve desired thickness.

**Brush Application:** Evenly apply coating to areas desired at thickness required. Allow time for curing before reapplying to achieve a thick coating. Use WonderMASK to protect components during conformal coating process. After application, cured Fine-L-Kote™ may be removed using Techspray Conformal Coating Removal Pen (2510-N or 2510-P).

### Coverage

| | |
|---|---|
| (1 mil dry film) | 1 gal. liquid = 391ft$^2$ (36.3M$^2$) |

### Cure Profile

| | |
|---|---|
| **Accelerated Cure:** | 55 minutes @ 131°F / 55°C |
| **Ambient Cure:** | 15 hours @ 74°F / 23°C (ambient temp) |
| **Tack-Time (dry to touch):** | 9 minutes @ 74°F / 23°C (ambient temp) |

Cure time depends on a number of factors, including the method and thickness of application. Dilution will also change the cure profile. 131°F / 55°C is recommended as the best accelerated temperature to optimize leveling, providing the smoothest possible finish. A faster cure may be achieved, but should be thoroughly tested first.

### Test Data

**Application**

| | Test Method* | 2108 Test Results |
|---|---|---|
| **Application Method** | | Spray system, dip, or brush |
| **Cure time** | TS-053 | <15 hours |
| **Accelerated cure time** | TS-054 | 55 min @55ºC |
| **Dry time to touch** | TS-055 | 9 min |
| **Quality inspection method of coverage** | | UV (long-wave black) light |
| **Removal method** | | Alkane, Acetone or Acetate, Solder iron burn through |

**Characteristics**

| As Supplied: | Test Method | 2108 Test Results |
|---|---|---|
| Visual appearance | TS-050 | Clear |
| Density (25 C) | TS-019-1 | 0.91 |
| Viscosity (25 C) | Instrument (Brookefield RVT) guide | 53 to 60 Centipoise |
| Solids % | TS-015 | 24-26 |
| Flash point | ASTM D-56 (TAG CC) | 5ºC (41ºF) |
| Vapor pressure (20 C) (VOC composite) | Calculated | 1.12 mmHg |
| Initial boiling point | TS-051 | Not Determined |
| Stability (30-day test @ 37 C/100 F) | TS-052 | Stable |
| Stability (30-day test @ 6.1 C/21 F) | TS-052-1 | Stable |
| Resin T g | provided by supplier | 50-55C |
| Resin mol wt | provided by supplier | 60,000 |

**Certified Testing -** *pending, stated results based on 2108, which contains the same resin*

| As Cured - Physical | Test Method | 2108 Test Results |
|---|---|---|
| Dielectric strength | ASTM D-149, IPC-TM-650 2.5.6.1, Rev. A | 1000 volts |
| Adhesion | ASTM D-3359 | 5B |
| Film hardness | ASTM D-3363 | 2B |
| Film thickness (1 dip) | ASTM D-1005 | 1 mil (0.001") |
| **UL Qualification** | **Test Method** | **2108 Test Results** |
| Coating flammability | UL94/746E | V-0 |
| **IPC-CC-830B Qualification** | **Test Method** | **2108 Test Results** |
| Appearance | IPC-CC-830B 3.5.2 | pass |
| Fluorescence | IPC-CC-830B 3.5.3 | pass |
| Flammability | IPC-CC-830B 3.5.6 | pass |
| Fungus resistance | IPC-TM-650 2.6.1.1 | pass |
| Flexibility | IPC-TM-650 2.4.5.1 | pass |
| Dielectric withstand voltage | IPC-TM-650 2.5.7.1 | pass |
| Moisture & insulation resistance | IPC-TM-650 2.6.3.4 | pass |
| Thermal shock | IPC-TM-650 2.6.7.1 | pass |
| Temperature humidity ageing | IPC-TM-650 2.6.11.1 | pass |

**Final results for 2109 pending. Results based on 2108, which uses the same resin. All other specification testing is complete.*

# Turbo-Coat™ HV Acrylic Conformal Coating
## Product# 2109

**Chemical Compatibility – Industrial Chemicals**

| INDUSTRIAL CHEMICALS | EFFECT | CAS # |
|---|---|---|
| Methanol | Soften | 67-56-1 |
| Ethanol | Dissolution | 64-17-5 |
| IPA | Dissolution | 67-63-0 |
| 70% IPA | Dissolution | 67-63-0 |
| 50% Ethanol | No effect | 64-17-5 |
| DPM | Dissolution | 34590-94-8 |
| Glycol ether EB | Dissolution | 111-76-2 |
| THF | Dissolution | 109-99-9 |
| Acetone | Dissolution | 67-64-1 |
| n-propyl acetate | Dissolution | 109-60-4 |
| t-butyl acetate | Dissolution | 540-88-5 |
| Hexane | Dissolution | 110-54-3 |
| Heptane | Soften | 142-82-5 |
| Cyclopentane | Dissolution | 287-92-3 |
| Cyclohexane | Dissolution | 110-82-7 |
| T oluene | Dissolution | 108-88-3 |
| Trans-dce | Dissolution | 156-60-5 |

**Chemical Compatibility – Household Chemicals**

| HOUSEHOLD CHEMICALS | EFFECT | EXAMPLE OF US BRAND NAME |
|---|---|---|
| 5% Acetic acid | No effect | Heinz Vinegar |
| 0.1N Hydrochloric acid | No effect | Lime-A-Way Toilet Bowl Cleaner |
| 50% Nitric acid | No effect | |
| Parson's solution | No effect | Windex |
| 0.1N Potassium hydroxide | No effect | 10% Liquid Plumber |
| 45% Potassium hydroxide | No effect | Liquid Plumber |
| d-limonene | Dissolution | Orange Glo |
| Chlorox neat | No effect | Chlorox |
| Chlorox 1:1 | No effect | 50% Chlorox |
| Chlorox 1:4 | No effect | 20% Chlorox |
| Pine-Sol Lemon | No effect | Pine-Sol Lemon |
| Pro 409 | No effect | 409 Professional |

*In most cases, Techspray corporate test methods (TS designation) correspond to standard ASTM Copies of Techspray corporate test methods are available upon request.*

## Packaging and Availability

Turbo-Coat HV:

**2109-P** 1 Pint Liquid
**2109-G** 1 Gallon Liquid
**2109-5G** 5 Gallon Liquid
**2109-54G** 54 Gallon Liquid

## Environmental Policy

Techspray® is committed to developing products to ensure a safer and cleaner environment. We will continue to meet and sustain the regulations of all federal, state and local government agencies.

## Resources

Techspray® products are supported by global sales, technical and customer services resources.

For additional technical information on this product or other Techspray® products in the United States, call the technical sales department at 800-858-4043, email tsales@techspray.com or visit our web site at: www.techspray.com.

Important Notice to Purchaser/User: The information in this publication is based on tests that we believe are reliable. The results may vary due to differences in tests type and conditions. We recommend that each user evaluate the product to determine its suitability for the intended application. Conditions of use are outside our control and vary widely. Techspray's only obligation and your only solution is replacement of product that is shown to be defective when you receive it. In no case will Techspray® be liable for any special, incidental, or consequential damages based on breach of warranty, negligence or any other theory.

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