

## NanoSlic<sup>®</sup> NS 250 Fixture Coating

**NanoSlic NS 250** is a revolutionary hydrophobic and oleophobic coating specifically designed to protect conformal coating fixtures, keep-out covers and glue and epoxy fixtures to prevent other coatings from adhering. NS 250 dramatically reduces clean-up time from coating operations.

### ATTRIBUTES

- Outstanding Anti-Stick Properties
- For all types of conformal coatings, glues and epoxies
- Permanent
- Superior Adhesion
- Does not generate electrostatic charge
- No effect on fixture-to-board clearances

### TECHNOLOGY

**NS 250** is based on revolutionary **NanoSlic technology**. The advanced ceramic chemistry chemically bonds to the fixture surfaces while forming a hydrophobic/oleophobic layer at the air interface. NanoSlic 250 has a robust, abrasion resistant surface that repels other coatings, water, oil based or UV curable. NS 250 stands up to repeat cleaning.

### PRE-CLEAN

Metallic surfaces should be cleaned well with NanoSlic Preclean Solution and then rinsed well with DI water. Plastics, composites and other materials may need to be cleaned with Isopropyl Alcohol (IPA) and dried. Residual coatings may need to be physically or chemically removed. Aluminum fixtures should be sandblasted. Be sure that no lint, dust or other contamination remains prior to application of the coating.

### APPLICATION

**NS 250** can be spray applied, dip coated or wiped on with a lint free cloth, depending on specific design considerations. For Fixture applications, atomized spray is preferred. Coating should be done in a dust free area. In all cases, a consistent thickness and streak free layer should be achieved. NanoSlic will obtain properties in the range of 2-4 microns dry film.

### CURING

**NanoSlic 250** will dry to tack free in 30 minutes. Do not disturb the coating or re-coat during this time. The coating will fully cure in 48 hours at room temperature. With this schedule a 9H hardness will be

achieved. Curing can be accelerated by drying in an oven. Additional data on cure schedules is available. In all cases the coating should not be put into an oven until drying at room temperature for 45 minutes.

Typical schedule is as follows:

1. Application
2. Room temperature dry @ 30-70%RH 45 minutes
3. Oven, 1 hour @ 50-100°C (122°F-212°F)
  - a. Hardness: 7H
4. Overnight Cure
  - a. Hardness 9H

### TEST RESULTS

Physical Properties	Values
Appearance	Clear Gloss
Specific Gravity @ 23°C	1.02 g/cm <sup>3</sup>
Viscosity @ 23°C (73°F)	1.96 cP
Nonvolatile content	28%
Static contact angle, water	105 Degrees
Static contact angle, n- hexadecane	64 Degrees
Abrasion resistance, ASTM D2486, Isopropyl Alcohol	>2000
Abrasion resistance, ASTM D2486, IPA Based Flux	>2000
Pencil Hardness	9H
Temp Performance	Continuous 177°C (350° F) Intermittent 235°C (450°F)

### ENVIRONMENTAL

NanoSlic coating solvents are not classified as VOCs and have been determined not to add to global warming. They use no Perfluorooctanoic acid (PFOA), a toxic substance currently being investigated by the EPA.

### Cleaning Fixture After Use

Fixtures can be cleaned by scraping the surface with a plastic or wooden scraper. Do not use metal or anything abrasive to clean with. For best results a high-pressure water wash cabinet can be used.



**NS 250 FIXTURE APPLICATION GUIDELINES**

*Note:* Fixtures that have been previously coated with silicone based conformal coatings may be difficult to clean and may prevent adequate adhesion of NS 250 to the substrate.

TOOLS NEEDED:	
1.	<b>Razor edge</b>
2.	<b>Blast cabinet</b>
3.	<b>Air compressor</b>
4.	<b>Nitrile or latex Gloves</b>
5.	<b>Nylon bristle brush</b>
6.	<b>Jet dryer</b>
7.	<b>Spray booth</b>
8.	<b>Spray Gun</b>
9.	<b>Paint filter</b>
10.	<b>Clean container</b>
11.	<b>Ionizing gun</b>
12.	<b>UV lamp</b>

**Cleaning:**

1. Disassemble all removable parts of fixture. This includes plates or pieces that would not normally be removed. Solvents and oils may get trapped underneath and leach out later.

2. If applicable, scrape off the larger portions of debris or remnant coatings that remain on the surface of the fixture using a razor edge or another similar tool.

3. Aluminum fixtures should be run through a blast cabinet, using a medium grain media, to remove the remaining debris off the surface of the fixture. This will also create a profile surface for improved adhesion. All composite materials may skip this procedure unless there is residual material that needs to be removed.

4. Use compressed air to blow off any sand or dust remaining on the fixture.

*Note:* Wear nitrile or latex gloves from this point forward.

5. Rinse fixture thoroughly with water.

6. After rinsing, spray the fixture using NanoSlic Pre-Clean solution (NS50). Scrub with hands or nylon bristle brush.

7. Let soak for 1 minute.

8. Thoroughly rinse the fixture of all excess cleaning agent and any remaining debris leftover.

9. Using a jet dryer or clean, dry, compressed air, dry the fixture completely. There should be no water marks anywhere on the fixture.

*Note:* If using compressed air, be sure there is no oil or moisture contaminants coming through the air line.

10. Evaluate the hardware removed from the fixture. Larger metal pieces can follow the same cleaning process as stated above. Smaller screws, springs, and other similar parts should be placed in a heated ultrasonic bath filled with isopropyl alcohol and cleaned for at least 5 minutes at a temperature of 50 C. Once removed from the bath, allow parts to dry completely.

**Coating Application:**

11. Place the cleaned fixture in the spray booth in such a way that coating can be easily applied to all desired areas/sides all in one coating application. This can be accomplished by hanging the fixture within the spray booth. Tooling holes should be available to hang the fixture during this process. If there are no holes to hang the fixture, drill 2 - 4mm holes along the shortest edge line. (Get permission from authorized individual where necessary.) This will allow for easy mounting.

12. Mix the NS 250 solution by shaking the bottle vigorously by hand to re-suspend particulates.

13. Assemble spray gun making sure the gun is clean.

14. Making sure the NS 250 is stirred well, pour enough to complete the job through a paint filter into a clean vessel that will be used to refill the gun. Be sure to use a 120 micron or lower paint filter/strainer.



15. Fill the gun reservoir. It is suggested to not fill the reservoir more than 50%. When refilling, make sure the material in the vessel is mixed well. If mixture separates, remix.

16. Use an ionizing gun, spray the entire fixture and surrounding areas within the spray booth to prevent particulates from being attracted to the fixture.

17. Attach air hose to the spray gun. Without spraying the fixture, spray a few times away from fixture to make sure the coating is coming out evenly and in the desired plane.

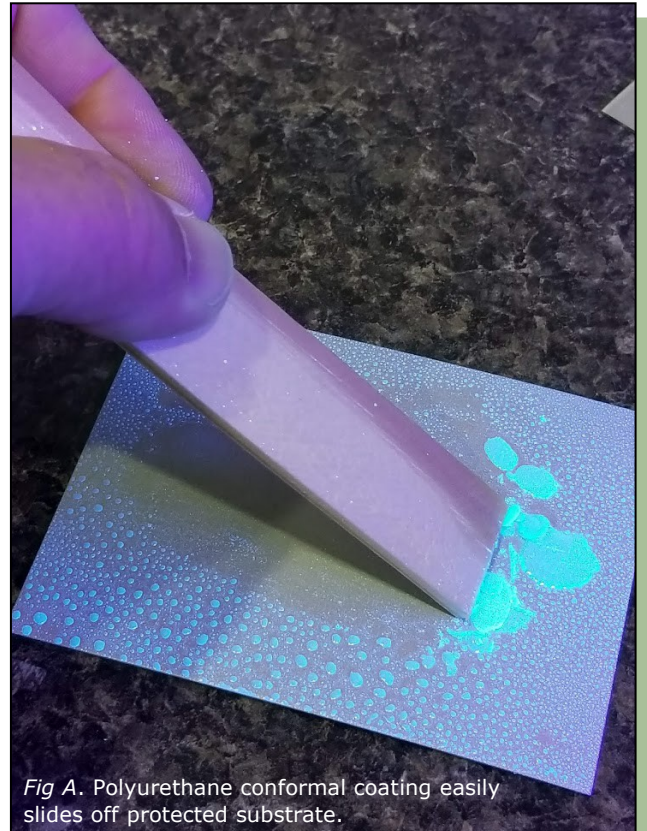
18. Coat all desired sides of the fixture. Make sure to apply thin coats to prevent runs and drips. Using a UV lamp source, inspect all parts and components to ensure all surfaces are coated. Once finished, immediately move the fixture to a clean area to dry at ambient temperature and relative humidity 30% - 70%.

19. Allow total of 24 hours for room temperature cure before reassembling (and shipping.) Alternatively, use oven cure per schedule on TDS

20. The coating will be very thin and hard to see. Perform post inspections looking for imperfections and uniformity of the coating using UV light.

#### Curing:

21. Coating can be air cured and will be 7H - 9H hard in 24 hours. Wait a total of 48 hours before using fixture that is air cured. NanoSlic continues to cure for as much as 1 week when just air cured. An accelerated cure is shown on page 1. As an option cure at 85°C (185°F) for 8 hours to making the coating it's most resistant to chemical attack.



*Fig A. Polyurethane conformal coating easily slides off protected substrate.*

