

## Liquid Nano Coating



### Product Highlights

- Adheres to plastic, metal, glass, ceramic, PTFE, PCBs
- No VOCs
- Short processing times
- Chemically resistant
- **RoHS, REACH, WEEE compliant**
- Repels oil and water
- Resistant to Isopropyl Alcohol
- Heat cure optional
- Masking optional
- Cost effective alternative to traditional coatings
- Easy to apply
- Solder through repairable
- Easily reworkable

### Product Uses

- Fluidic Devices
- Micro Motors
- Inkjet Print Heads
- Biomedical Devices
- Ball Bearing Tracks
- LED assemblies
- Printed Circuit Boards
- MEMS
- Metal Mesh

### Biocompatibility

NANOCOAT200 dried film is biocompatible (not harmful to living tissue).

### Specifications

Chemistry	C6 fluoro-carbon
Color and Clarity	Colorless or yellow liquid, lightly turbid to clear
Density (of liquid)	1.48 g/ml
Density (of dried film)	1.5 g/ml
Dielectric Constant	3.0 (at 30% RH, 1kHz)
Dissipation Factor	0.02 (at 30% RH, 1kHz)
Dielectric Breakdown Strength	3000 V/mil (at 35% RH)
Concentration	0.2% to 10% in fluoro-solvent
Viscosity	2% Polymer Coating ~ 0.82cP +/- 5% 4% Polymer Coating ~ 1.85cP +/- 5% 10% Polymer Coating ~ 5.75cP +/- 5%
Silicone Content	Silicone Free, does not contain silicone
Shelf Life	> 2 years
Application Options	Dipping, spraying, brushing, syringe-dispensing
Dry Time	5-30 seconds
Cure Time	No cure required, optional room temperature for 24 hours or 10 minutes at 60°C
Minimum Operating Temperature (of dried film)	-65°C (-85°F)
Maximum Operating Temperature (of dried film)	175°C (347°F)
Boiling Point	80°C
Thickness	0.1-0.6 µm (depending on concentration and application method)

## Orderable Part Numbers

Part Numbers		Polymer Percentage	UV Tracer Present	Film Thickness
NANOCOAT200-2-500ML	NANOCOAT200-2-30ML	2%	No	~0.1µm
NANOCOAT200-4-500ML	NANOCOAT200-4-30ML	4%	No	~0.5µm
NANOCOAT200-10-500ML	NANOCOAT200-10-30ML	10%	No	~1.0µm
NANOCOAT200UV-2-500ML	NANOCOAT200UV-2-30ML	2%	Yes	~0.1µm
NANOCOAT200UV-4-500ML	NANOCOAT200UV-4-30ML	4%	Yes	~0.5µm
NANOCOAT200UV-10-500ML	NANOCOAT200UV-10-30ML	10%	Yes	~1.0µm
NANOCOAT200-THINNER-500ML	NANOCOAT200-THINNER-30ML	0%	No	
NANOCOAT200-2-AERO		2%	No	~0.1µm
NANOCOAT200UV-2-AERO		2%	Yes	~0.1µm

## Properties of Nano Coat 200 Film

Contact Angle to Water	~ 115°
Contact Angle to Oil	>55°
Surface Tension	8-12 dynes/cm
Hardness	>2B pencil
Flammability	Non-burning
UV-Tracer	Optional
Heat Stability-Continuous	150°C
Max Heat Stability one hour	250°C
Refractive index surface	~ 1.34
Transparent	Yes
Electrically resistive	Yes
Removable	Yes
Solder Through Repairable	Yes
Dielectric Constant (30%RH)	3.0 (1kHz)

## Concentration and Thickness Guide

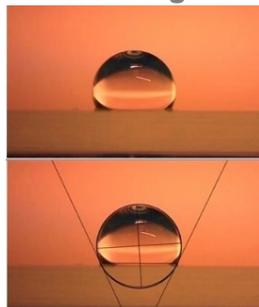
Film thickness at 2% polymer	~ 0.1µm
Film thickness at 4% polymer	~ 0.5 µm
Film thickness at 10% polymer	~ 1.0 µm

## Electrical Properties (Aluminum Plates)

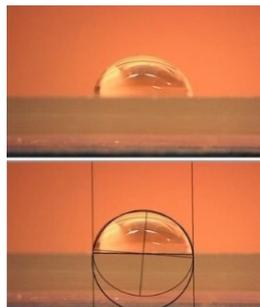
Coating Thickness	Surface Resistance (ohm)	Volume Resistance (ohm·m)
0.1 µm film	Conductive*	4 x 10 <sup>20</sup>
0.5 µm film	1 x 10 <sup>9</sup>	8 x 10 <sup>20</sup>
1.0 µm film	5 x 10 <sup>11</sup>	ND

\* The nano coating itself is electrically non-conductive. However, at 0.1 µm thickness, measurement probes are able to mechanically penetrate the coating and contact the aluminum plate, which is conductive.

## Contact Angle Analysis on Glass



2.0% polymer on glass  
Water contact angle: 113.3°



2.0% polymer on glass  
Oil contact angle: 82.0°

## Dip Coating Application Guide

### A. Masking (could be optional depending on circumstance)

Microphones, speakers, camera lenses may need masking using stretch film or masking agent

### B. Cleaning Process

Device may need to be cleaned using IPA Wipes and/or compressed air to remove dust.

### C. Coating Process

Dip coat manually or using automated system

- Recommended starting test point immersion and withdrawal speed of 15cm/min.
- Control speed to avoid excessive air bubbles which may result in voids in the coating.
- Withdrawal speed determines cosmetic appearance and uniformity of the coating.
- Dry by hanging at room temperature or optional heat cure at 60°C for 10 minutes.
- Monitor coating concentration during production run.

### D. De-masking

Remove stretch film or masking agent with tweezers

## Cleaning

Brushes used to apply Liquid Nano Coating can be soaked in IPA when not in use, to help limit coating of the brush bristles. Allow the IPA to evaporate off before using the brush to apply more Liquid Nano Coating.

## UV Tracer Fluorescence Bandwidth

For Nano Coat part numbers containing the letters "UV", UV tracer has been added to enable verification that the coating has been applied. The UV tracer makes the coating visible when ultra violet light in the bandwidth of 400-500nm is directed at the coating.

## Storage and Handling

Store at room temperature 20-25°C (68-77°F).

## Transportation

This product requires ground shipping. Shipping below 0°C (32°F) or above 25°C (77°F) for normal transit times by ground or air will not impact this product's stated shelf life.

## Health and Safety

Ozone Depletion Potential (ODP):	0
Global Warming Potential (GWP):	320
Atmospheric Lifetime (Years):	4.1