

## Technical Data Sheet

### **Purocoat 17/02 Electronic Grade Conformal Nano Coating** (2% polymer concentration)

Version	Revision Date:	Date of last issue:	03-Nov-2025
4.0	14-Nov-2025	Date of first issue:	03-Nov-2025

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## OVERVIEW

**Type** **Purocoat 17/02 Electronic Grade Conformal Nano-Coating** is a ready-to-use, clear liquid of fluoroacrylate polymer (fluoropolymer) dissolved in a hydrofluoroether solvent.

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**Purocoat 17/02** creates a surface with good anti-moisture, anti-surface diffusion and anti-corrosion properties. Surface energy: 8 to 12 mN/m. Liquids (e.g. water, heptane, toluene, lubricating oils, biofluids, silicones) run off surface while protective film remains intact.

### Functionality

- Masking not required. Removable. Solder-through repairable.
  - RF Transparent
  - Hydrophobic, Oleophobic
  - UV tracer version available
  - Not electrically conductive (button cells can be coated)
  - (Electronics) Coated metallic contacts remain functional.
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### Application Methods

**Available Methods:** Dip (manual or automatic), Spray, Syringe  
**Dip application:** 15 to 60 seconds until all surfaces completely wetted.  
**Drying:** Fast drying. Varies by shape of coated object. 15 seconds to 10 minutes.  
**Curing:** No curing required.

**Film thickness is ~500 nanometres (0.5 micron).** For practical purposes during application, film thickness can be tested by measuring solution concentration (see below).

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### Certifications & Approvals

No VOCs. Lead free.  
 UL Listed under E541242.  
 Compliant with IPC-CC-830C (Revision C) as Type UT (Ultra-Thin Coatings).

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**PROPERTIES OF Purocoat 17/02 (Liquid Solution)**

<b>Appearance</b>	Clear, colourless, bright liquid
<b>Fluoropolymer %</b>	2%
<b>Fluoropolymer % typical for application</b>	2.0% mass (1.8% to 2.2%)
<b>Solvent</b>	HFE Purosolve 71/100
<b>Specific density at 23°C</b>	1.47 – 1.52 g/cm <sup>3</sup>
<b>Viscosity at 23°C</b>	0.66 – 0.91 cP (0.45 – 0.6 cSt)
<b>Boiling point of solvent</b>	56–61°C
<b>Freezing point</b>	-94°C to -135°C
<b>Vapor pressure at 25°C</b>	26.8–31.4 kPa
<b>Flash point</b>	Not flammable
<b>Solubility of water in Purocoat</b>	95–900 ppm mass

**ENVIRONMENTAL PROPERTIES**

<b>Ozone Depletion Potential<sub>1</sub></b>	0.0 (for solvent Purosolve 71/100)
<b>Global Warming Potential<sub>2</sub></b>	297–540 (for solvent Purosolve 71/100)
<b>Atmospheric lifetime</b>	4.1 years (for solvent Purosolve 71/100)
<b>Identification</b>	Non-hazardous substance
<b>Dangerousness</b>	Not toxic
<b>Exposure of people to solvent vapours in the air</b>	Max 750 ppm (8 hours average)

1 CFC-11 = 1.0

2 GWP 100 years integrated time horizon (ITH) Multiples of the CO<sub>2</sub> equivalent

**PROPERTIES OF Purocoat 17/02 DRY FILMS**

<b>Heat Stability (dried coating)</b>	-50°C to +175°C (continuous) (max: 250°C for 1 hour)
<b>Surface Energy (dried coating)</b>	8-12 mN/m
<b>Contact Angle</b>	115° (water), > 55° (oil)
<b>Glass Transformation Point*</b>	+ 75°C

\*A layer with a thickness of ~500 nanometres is permanently flexible, does not break when contorted.

<b>Dried Coating Thickness (dip process)</b>	~500 nanometres (0.5 micron)
<b>Dielectric Constant (30% RH, 25°C at 1 kHz)</b>	3.0
<b>Dielectric Strength (35% RH, 25°C)</b>	0.0089
<b>Electric Breakdown Strength</b>	59 V/500 nm, 35% RH
<b>Aging and Resistance</b>	Very good; minimum 10 years
<b>Refractive Index</b>	1.34
<b>Flammability (UL-94)</b>	V-0 (UL listing E541242)

## PREPARATION OF MODULES TO BE COATED

In general, no special preparation of the modules is required. It makes sense to clean the modules before coating, as it increases the quality, but is not absolutely necessary. Purocoat 17/02 adhesion is good enough to adhere to almost any type of surface and form a coating. However, avoid coating modules that contain lubricants (on mechanically moving parts), especially silicone lubricants, as these dissolve in 17/02 and cause contamination.

## HANDLING OF COATED MODULES

Modules coated with Purocoat 17/02 are covered with an approx. 500 nm thin protective film. This is permanently flexible and to a certain extent also mechanically resilient. After it has completely dried (15 seconds to 10 minutes depending on size of component), the module can easily be touched by hand or held with clamping tools. Avoid scratching, vigorous rubbing and bulk material. There is no curing or post-curing time, the assemblies can already be fully loaded after drying.

## NATURAL CHANGE IN CONCENTRATION

Purocoat 17/02 is supplied in a ready-to-use concentration of 2%. If filling Purocoat into a container or bath that is not tightly sealed, the solvent in Purocoat will evaporate quickly and easily, increasing the concentration of the ready-to-use liquid to above 2%. If using manual dip method, keep Purocoat in sealed container until ready to use.

## ELECTRIC CONTACTABILITY

Purocoat 17/02 forms an ultra-thin layer designed to protect against environmental stressors and contaminants, while allowing contact with plugs, switches, relays, needle adapters, etc. In general, contactability remains unaffected for all types of metallic contacts after coating of modules. For typical plugs (USB plugs, post connectors, jack plugs) no increased contact resistance can be measured.

To ensure contactability, test a sample module coated with Purocoat 17/02 to rule out anomalies. **The following connection types can be affected by coating: elastomeric connectors, rubber keypads, edge card connectors.**

## REPAIRABILITY & RE-COATING

Purocoat 17/02 coating layers can be soldered through. The heat of the solder iron will partially destroy the coated area producing slightly toxic vapors. Always use a suction device when soldering through. To apply a new coating layer after soldering, use the same process as the first coating, but increase dipping time to at least 60 seconds, ideally 180 seconds. This will ensure the original coating layer is completely dissolved and replaced with a new, even-thickness coating layer when dry.

## REMOVAL OF PUROCOAT

Purocoat 17/02 creates an ultra-thin polymer film that can be easily removed using fluorinated solvents. Purocoat coating layers can be removed without trace residues by immersion or exposure to solvent vapor. For best results, use Purosolve 71/100. Purosolve 71/100 evaporates at 61°C. The process is therefore not associated with high temperature stress.

## MANUAL DIP COATING APPLICATION GUIDE

Purocoat 17/02 can be applied using a manual dipping process. Create a coating bath by selecting a vessel of a suitable size. Use a container that is as tall and narrow as possible, with a small opening at the top. Stainless steel, glass, and nearly all common plastics are suitable. The container should have a tightly fitting lid to prevent wastage of solvent through evaporation. Purosolve evaporates quickly. Store Purocoat in original bottles when possible.

### [A] CLEANING PROCESS

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

### [B] MANUAL DIP COATING PROCESS

- A coating bath can be made in a vessel suitable for dipping the components.
  - For example, a beaker filled with Purocoat 17/02 liquid. \*
- Recommended starting test point immersion speed of 15cm/min, withdrawal speed of 15cm/min.
- Control immersion speed to avoid excessive air bubbles. Bubbles can result in voids in the coating.
- Withdrawal speed determines the cosmetic appearance and uniformity of the coating. Slow is good.
- If the component has 'nests' from which Purocoat 17/02 cannot drain, tilt the component to release trapped liquid.
- Dry by hanging (room temperature) or leaving in basket. Ensure ventilation for solvent evaporation. \*\*
- It is advisable to monitor the coating concentration during a production run. See relevant section below.

### [C] COATING DURING ASSEMBLY

It may be useful to apply a drop of Purocoat 17/02 using a dropper or syringe to exposed connectors and joints made during device assembly. This will assure that water will be effectively repelled for the life of the device.

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## MINIMIZING EVAPORATION DURING MANUAL DIP COATING

Purocoat 17/02 is supplied in a ready-to-use concentration of 2%. By filling Purocoat 17/02 into a container or bath that is not tightly closed, the solvent content is lost over time through evaporation. The contained fluorosolvent evaporates very easily and quickly. This means that over time the concentration increases from the original 2% fluoropolymer content to higher values.

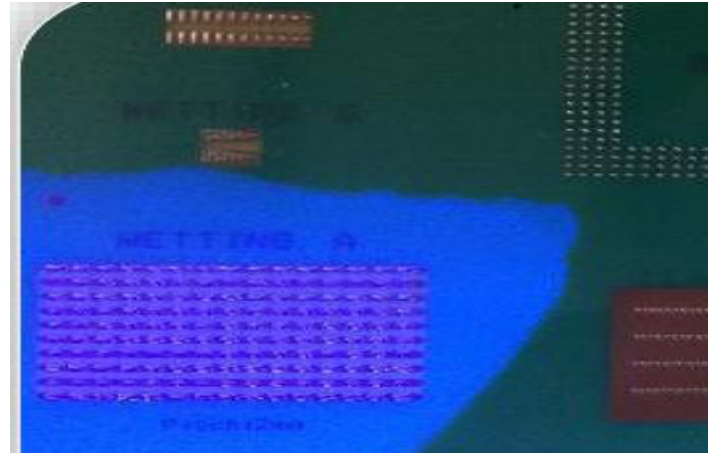
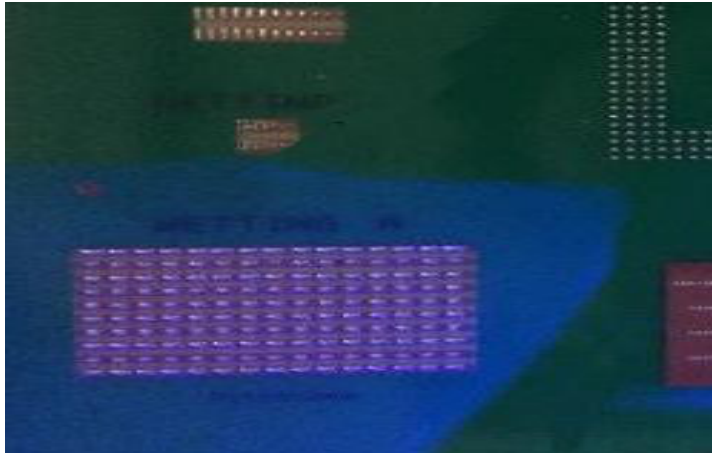
\*Make sure you only have Purocoat 17/02 in open containers for as long as is absolutely necessary. For coating bath vessel, use a container that is as tall and narrow as possible, with a small opening at the top. Immediately after use, pour it back into the original bottles and close the cap tightly.

\*\*Avoid any kind of draft, open windows, fans or active suction. Moving air increases evaporation.

## Purocoat 17/02 UV FILMS and QUALITY CONTROL INSPECTION

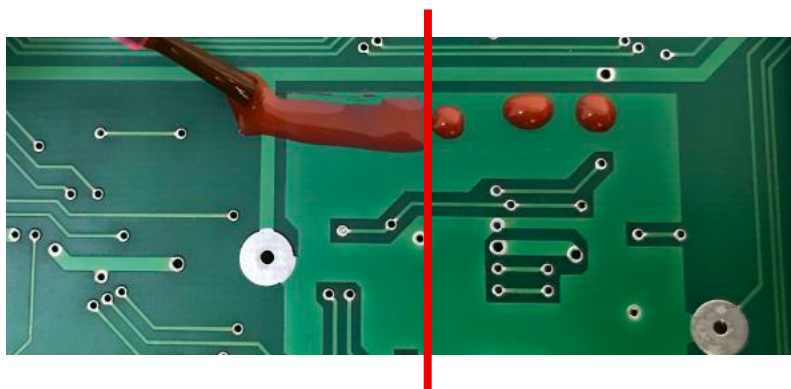
365 nm lamp (blacklight)

254 nm lamp



### Use of Test Inks for Quality Inspection:

Test inks can be used for quality inspection. The test ink has a specific surface energy and indicates whether the surface to which it is applied is above or below this value. Use a test ink with a surface energy value of 28mN/m for clear visual quality inspection results.



(Left) Uncoated  
(Right) Coated

### Instructions:

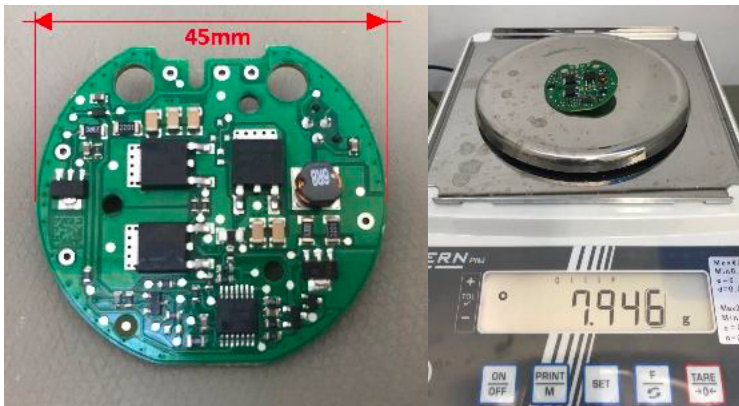
1. Use brush to apply test ink to the surface.
2. If the test ink contracts and cannot form a closed film, **the surface is coated.**
3. If the test ink remains on the surface as a closed film, **the surface is NOT coated.**
4. Wipe off the test ink with a dry, soft cloth.

## Purocoat 17/02 CONSUMPTION GUIDELINES

The consumption of the fluoropolymer content depends solely on the surface to be coated. If many modules with a large surface are coated, the fluoropolymer content is consumed much faster. The consumption of solvent depends on many factors, such as the size of the tank opening, air movement, cooling capacity of the machine, etc.

Arithmetically, an area of 23m<sup>2</sup> can be coated with 1 kg of Purocoat 17/02. In practice, it has been shown that measuring the thickness of the coated module is too imprecise to determine the actual consumption. It is better to weigh several modules before and after coating with accuracy of 1mg and calculate an average value to determine the consumption of the solid fluoropolymer content of the Purocoat 17/02.

### Representative Example of Purocoat 17/02 Consumption during Coating Application Run



Component with 45mm diameter  
**Production:** 4500 pieces per work day

Weight before coating: 7.938g  
 Weight after coating with Purocoat 17/02: 7.946g

Consumption of solid fluoropolymers: 0.008g\*  
 (difference in component weight before and after)

### Typical consumption when using automated dip coating machine\*

Consumption of solid fluoropolymers per module	0.008g
Modules per work day	4500
Consumption of solid fluoropolymers per work day	36g
Solvent consumption per work day	1000g
Solvent losses per day	100g
Typical solvent to fluoropolymer consumption ratio	25
Purocoat 17/02 consumption per work day	360g
Fluorosolvent consumption per work day	676g
Work days per month	21
Purocoat 17/02 7kg bottle (10% concentrate)	1.08 bottles
Purosolve 71/100 7kg bottle	2.16 bottles

\*figures are described for representative purposes only

In this example, 36g of fluoropolymers are consumed per day, requiring consumption of approximately:

- 1x 7kg bottle of Purocoat 17/02 (10% concentrate)
- 1x 7kg bottle of Purosolve 71/100

With this amount of material, a total of 94,500 of these modules can be coated in one month.

## CONCENTRATION MEASUREMENT (evaporation method)

### Setup

1. Precision balance with a display accuracy of 0.001 g
2. Weighing dish - disposable items made of aluminium foil with a diameter of approx. 70 mm
3. 5 or 10 ml withdrawal syringe, reusable

### Instructions

1. Balance turned on for at least 5 minutes. Without loading the tare display, press 0.000 g.
2. Tare scale. Place the dish and empty syringe and note the weight. (Result 2)
3. Fill the syringe with 17/02 liquid, place on the scale with the dish. Note the total weight. (Result 3)
4. Carefully empty the contents of the syringe into the dish and set the syringe aside. \*
5. Let the dish dry out for about 10 hours - preferably overnight - at room temperature.
6. Place the dry dish and syringe back on the zeroed scale and note the weight. (Result 6)

*\*When emptying syringe into dish, liquid may splash. To avoid this, pierce a small hole in the top of the syringe and then pull the syringe plunger up over the hole to allow the liquid to drain slowly into the dish.*

### Concentration Calculation Steps

Tare weight from result 2 is deducted from the gross weights from result 3 and result 6, and the two results are set in relation to one another in order to determine the percentage.

$$\frac{\text{result 6} - \text{result 2}}{\text{result 3} - \text{result 2}} * 100 = \% \text{ of the solid content 'w'}$$

## RECALIBRATION OF LIQUID CONCENTRATION

After the current concentration 'w' has been determined, an existing coating bath can be adjusted to the desired target concentration of 2% by refilling with Purocoat 17/02 concentrate or pure solvent.

- If the value is lower than the desired target concentration of typically 2%, then Purocoat 17/02 concentrate is refilled to add more fluoropolymer solids to the existing coating bath and raise the value:

**nk:** Amount of Purocoat 17/02 concentrate to be refilled in litres

**b:** Amount of the existing coating bath in litres

**w:** Value of the concentration in the existing coating bath in %

**z:** Target concentration (typical 2) in %

$$nk = b * \left( \frac{z - 1}{10\% - z} \right)$$

- If the value is higher than the desired target concentration of typically 2%, then pure solvent is refilled to dilute the existing coating bath and lower the value:

**nv:** Amount of pure solvent to be refilled in litres

**b:** Amount of the existing coating bath in litres

**w:** Value of the concentration in the existing coating bath in %

**z:** Target concentration (typical 2) in %

$$nv = b * (w/z - 1)$$

## SAFETY & HEALTH

Before using Purocoat 17/02 (and Purosolve 71/100), please read the relevant, current Safety Data Sheet and follow precautionary information given there.

## STORAGE & DISPOSAL of Purocoat 17/02

Liquid Purocoat 17/02 must be disposed of properly. It must not be discharged into sewage or water systems. Bottles can be reused to store Purocoat 17/02 at a later date, e.g. when coating baths are emptied.

Purocoat 17/02 can be stored in the original bottle container. Bottles can be resealed. Storage room should be ventilated. No expiry of shelf-life in sealed container. Avoid heating above 55°C. Purocoat 17/02 is not flammable. Dangerous goods storage not required. Container has a shelf-life of 5 years. Purocoat 17/02 coating layers have no expiry once applied correctly.

## CONTAINER SIZES

Name	Content	Amount (calibrated according to mass)
Purocoat 17/02	2% Fluoropolymer solvent	1kg / 658ml / Aluminum security bottle
Purocoat 17/02	2% Fluoropolymer solvent	7kg / 4.605ml / Aluminum security bottle
Purocoat 17/02	2% Fluoropolymer solvent	15kg / 9.868ml / Aluminum security bottle

## IDENTIFICATION

**Product name**

Purocoat 17/02

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## MANUFACTURER or SUPPLIER'S DETAILS

**Company name of supplier**

ViriDyn LLC  
[www.viridyn.com](http://www.viridyn.com)  
[info@viridyn.com](mailto:info@viridyn.com)

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