

3M™ Novec™ 27002 Electronic Grade Coating

Introduction

3M™ Novec™ 27002 Electronic Grade Coating is a fluorinated polymer solution carried in a hydrofluoroether solvent. Designed for moisture and corrosion protection of printed circuit boards and electronic components, the polymer coating dries to a thin, transparent film with excellent hydrophobic and oleophobic properties. It does not need curing and is easy to apply, remove and repair. Both the solution and polymer are low in toxicity, non-ozone depleting and RoHS compliant.

Construction

| Solids | Solvent | Color | Container Size |
|-----------------------------|----------------------------------|--------|---|
| 0.2 wt% fluorinated polymer | 3M™ Novec™ 7200 Engineered Fluid | Yellow | 3.5 gal (40 lb/18 kg), 1 gal (11 lb/5.0 kg) |

Typical Physical Properties

| Property | Coating Solution |
|--------------------------|---|
| Appearance | Transparent, yellow, liquid solution |
| Solids | 0.2% fluorinated polymer |
| Solvent | 3M™ Novec™ 7200 Engineered Fluid |
| Density | 1.41 g/mL |
| Viscosity | 0.6 cP |
| Boiling Point of Solvent | 77°C (170°F) |
| Flash Point | None (per closed cup method) |
| Environmental System | Low in toxicity, non-ozone depleting, nonflammable, low-VOC, RoHS compliant, contains no chlorine or bromine One part homogeneous solution |

Not for specification purposes. All values @ 25°C unless otherwise specified.

| Property | Fluoropolymer Coating |
|--|--|
| Appearance | Transparent, light yellow to orange (depending on thickness) |
| Coating Thickness | Less than 1 micron (depending on application method) |
| Solvent and Chemical Resistance | Yes (resists aqueous, hydrocarbon and alcohol based fluids) |
| T _g (glass transition temperature) | 53°C (127°F) |
| Thermal Stability of Dry Film | Can withstand 175°C for 24 hours and maintain repellency |
| Contact Angles (static, dip coated/dried on glass substrate) | 105° (water), 65° (hexadecane) |
| Refractive Index | 1.3778 |
| Shelf Life | Two years in the original unopened package |
| Solder-Through Repairability | Yes |
| Dielectric Constant @30% RH | 2.8 (@1kHz) |
| Dissipation Factor @30% RH | 0.011 (@1kHz) |
| Dielectric Breakdown Strength @35% RH | 3700 V/mil |

Features

- Easy application and processing – dries in seconds without the need for post-application curing
- Can be easily removed for rework and repair using 3M™ Novec™ Engineered Fluids
- Allows solder-through repairability
- Contains less than 1% volatile organic compounds (VOCs) and has low global warming potential
- Is thermally and electrically stable with good dielectric properties
- Adheres to a variety of materials (metals, glass, ceramics, polymers, composites, laminates)
- Provides excellent repellency, anti-wetting and anti-sticking properties against liquids – water, hydrocarbons, silicones, and photoresists
- Is insoluble in solvents such as heptanes, toluene and water
- The polymer can endure up to 175°C for 24 hours and maintain repellency
- Has low surface energy which allows lubricating oils, silicones, photoresist solutions, etc. to bead and drain freely from coated surfaces
- Has excellent surface wetting, especially under low standoff SMT components



Application Ideas

- Provides excellent moisture, chemical and corrosion protection to printed circuit boards and their components
- Provides protection of display and touch panel components
- Is an easy and cost-effective alternative to conformal coatings
- Provides excellent anti-wetting, anti-stiction, anti-migration and anti-corrosion properties in many diverse applications
- Can serve as an anti-corrosion coating for a variety of materials and components

For Additional Information

To request additional product information or sales assistance, contact 3M Customer Service at one of the numbers below or visit www.3M.com/Novec. For other 3M global offices or information on other 3M products for electronics, visit our website at 3M.com/electronics.

Application Techniques

Can be dipped, sprayed or selectively deposited as per the safety and handling requirements stated in the Material Safety Data Sheet (MSDS). Surfaces to be coated should be clean and dry before application. Masking may not be required for larger connector types but testing is always suggested. The solvent will evaporate quickly and the fluorochemical polymer film will dry in minutes.

| | |
|---------------------|--|
| Application Options | Dipping (preferred), spray, syringe dispense |
| Dilution | This product is intended to be used as-is, and should not be further diluted |
| Drying/Curing | Dries at room temperature; can be handled in under two minutes |
| Removability | Removable with a variety of 3M Novec Engineered Fluids |

Safety, Handling, Storage, Shelf Life

To avoid thermal decomposition, the coating solution should not be heated above 150°C (302°F) and the dried fluorochemical polymer film should not be heated to temperatures above 250°C (482°F). Please note that we do not recommend open, manual spraying of the material. Use of automated/robotic equipment that is enclosed and vented is highly suggested. Contact 3M for equipment vendor suggestions. When stored under conditions of 16-27°C (60-80°F) and less than 60% R.H. in the original, unopened container, the shelf life is certified for 2 years from date of manufacture. Before using this product, please read the current product Safety Data Sheet (available through your 3M sales or technical service representative or at www.3M.com/Novec) and the precautionary statement on the product package. Follow all applicable precautions and directions. Always practice smart and safe industrial hygiene practices.

The 3M™ Novec™ Brand Family

The Novec brand is the hallmark for a variety of proprietary 3M products. Although each has its own unique formula and performance properties, all Novec products are designed in common to address the need for safe, effective, sustainable solutions in industry-specific applications. These include precision and electronics cleaning, heat transfer, fire protection, protective coatings, immersion cooling, advanced insulation media replacement solutions and several specialty chemical applications.

3M™ Novec™ Engineered Fluids • 3M™ Novec™ Aerosol Cleaners • 3M™ Novec™ 1230 Fire Protection Fluid • 3M™ Novec™ Electronic Grade Coatings • 3M™ Novec™ Electronic Surfactants • 3M™ Novec™ Dielectric Fluids

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