3M™ Novec™ 1904 Electronic Grade Coating

Introduction

Designed for spray application, however can also be applied via dip or syringe dispensing methods.

3M™ Novec™ Electronic Grade Coating is a fluorinated polymer diluted in a blend of 3M™ Novec™ 7100 and 7200 Engineered Fluids, segregated hydrofluoroether solvents, providing a low viscosity, low surface tension coating solution. Designed for moisture and corrosion protection of printed circuit boards and electronic components, it dries to an ultrathin, transparent coating with excellent hydrophobic and oleophobic properties. It does not need curing and is easy to apply. Novec 1904 coating is non-flammable, non ozone-depleting, low in toxicity, low in GWP, RoHS compliant, and VOC exempt (per U.S. EPA).

Construction

Solids	Solvent	Color	Container Size
4 wt% fluoropolymer	3M™ Novec™ 7100 and 7200 Engineered Fluids	Clear	1 gal (11lb/5.0 kg)

Typical Physical Properties

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

Property	Coating Solution
Appearance	Clear, colorless liquid solution
Solids	4 wt% fluoropolymer
Solvent	3M™ Novec™ 7100 and 7200 Engineered Fluids
Density	1.43 g/mL
Viscosity	1.11 cP
Boiling Point	71°C (171°F)
Flash Point	None (per closed cup method)
Environmental	Non ozone-depleting, low in toxicity, low in GWP, RoHS compliant, and VOC exempt (per U.S. EPA), contains no chlorine or bromine
Shelf Life	Two years from date of manufacture in original unopened package

Measured contact angles can vary based on the type of surface, surface roughness and the application method.

Property	Fluoropolymer Coating
Appearance	Transparent, colorless
Coating Thickness	Typically 0.25 - 4.0 microns depending upon application method, although can be thicker
Solvent and Chemical Resistance	Resists a variety of solvents and chemicals
T_g (glass transition temperature)	52°C (126°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	1.3841
Solder-Through Repairability	Yes
Non-Flammability	Meets UL 94 V-0
Dielectric Constant @30% RH	2.8 (@1kHz)
Dissipation Factor @30% RH	0.011 (@1kHz)
Dielectric Breakdown Strength @35% RH	3700 V/mil

Features

- Designed for moisture and corrosion protection of printed circuit boards and electronic components
- Low surface energy allows lubricating oils, silicones, photoresist solutions, etc. to bead and drain freely from coated surfaces
- Helps provide repellency and anti-wetting properties against liquids – water, hydrocarbons, silicones, and photoresists
- Helps protect against corrosive gases and vapors in addition to liquids
- The polymer can endure up to 175°C for 24 hours and maintain repellency
- Essentially insoluble in solvents such as heptanes, toluene & water
- Adheres to a variety of materials (metals, glass, ceramics, polymers, composites, laminates)
- Thermally and electrically stable with good dielectric properties
- Easy to apply – dries quickly without the need for post-application curing
- Excellent surface wetting, especially under low standoff SMT components
- Allows solder-through repairability
- Non-flammable, non ozone-depleting, and low in toxicity
- Low in global warming potential (GWP), RoHS compliant, and volatile organic compound (VOC) exempt (per U.S. EPA)

Application Ideas

Helps provide:

- Moisture, chemical and corrosion protection for printed circuit boards and their components
- Protection of display connections and components (e.g. Anisotropic Conductive Film)
- An easy and cost-effective alternative to conformal coatings
- Anti-wetting, anti-stiction, anti-migration and anti-corrosion properties in many diverse applications

Can serve as:

- Anti-migration coating for displays, spindle motors or lubricated electronic parts
- 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 sprayed (preferred), dipped or selectively deposited as per the safety and handling requirements stated in the Safety Data Sheet (SDS). 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	Spray, dip, syringe dispense
Drying/Curing	Dries at room temperature; can be handled in under two minutes

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). 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 two 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. Do not spray apply without proper ventilation and/or personal protective equipment (PPE).

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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3M Belgium N.V.
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Japan
3M Japan Limited
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Korea
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Regulatory: For regulatory information about this product, contact your 3M representative.

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