

3M™ Novec™ 1702 Electronic Grade Coating

Introduction

3M™ Novec™ 1702 Electronic Grade Coating is a clear, low viscosity, low surface tension solution of a fluorochemical acrylic polymer carried in a hydrofluoroether solvent. A lower solids content version of Novec 1700 coating, it dries to an even thinner film and coats under low stand-off components. Designed for moisture and corrosion protection of printed circuit boards and electronic components, it dries to a thin, transparent, film with excellent hydrophobic and oleophobic properties. It is easy to apply, does not need post-curing, is removable and repairable. It is non-flammable, low in toxicity, non-ozone depleting and RoHS compliant.

Construction

Solids	Solvent	Color	Container Size
0.2 wt% fluoropolymer	3M™ Novec™ 7100DL Engineered fluid	Clear	3.5 gal (40lb/18.1 kg), 1 gal (12lb/5.4 kg)

Typical Physical Properties

Property	Coating Solution
Appearance	Clear, colorless liquid solution
Solids	0.2 wt% fluoropolymer
Solvent	3M™ Novec™ 7100DL Engineered Fluid
Specific Gravity	1.5
Boiling Point of Solvent	61°C (142°F)
Flash Point	None
Environmental System	Low in toxicity, non-ozone depleting, non-flammable, VOC exempt (US EPA), RoHS compliant, contains no chlorine or bromine One Part

Property	Fluoropolymer Coating
Appearance	Transparent, colorless
Coating Thickness	<100 nm
Solvent and Chemical Resistance	Yes
T _g (glass transition temperature)	44.5°C
Thermal Stability of Dry Film	Repellent to chlorinated silicone oil after 24 hours to 175°C
Contact Angles (static, dip coated/dried on glass substrate)	105° (water), 65° (hexadecane)
Refractive Index	1.39
Shelf Life	Four years from date of manufacture in unopened container
Solder-Through Repairability	Yes
Nonflammability	Meets UL 94 V-0
Dielectric Constant @30% RH	3.1 (@1 kHz)
Dissipation Factor @30% RH	0.0089 (@1 kHz)
Dielectric Breakdown Strength @35% RH	1000 V/mil

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

Features

- Easy application and processing – dries in seconds without the need for thermal post-curing
- Requires little or no masking
- Is easily removed for rework & repair
- Allows solder-through repairability
- Contains no volatile organic compounds (VOCs) and has low global warming potential
- Is thermally and electrically stable with excellent dielectric properties
- Can be applied to metals, glass or epoxy laminates
- Provides excellent repellency, anti-wetting and anti-sticking properties against liquids – water, hydrocarbons, silicones, and photoresists
- Is insoluble in solvents such as heptane, toluene & water
- The polymer can endure up to 175°C for prolonged periods and maintain good 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 including under low profile components



Application Ideas

- Provides excellent moisture, chemical and corrosion protection to printed circuit boards and their components
- Is an easy and cost effective alternative to conformal coatings
- Can be used as a sacrificial surface treatment that can be selectively removed with Novec Engineered Fluids
- Can serve as
 - an anti-stiction coating for liquid crystal displays, micromotors or MEMS (Micro Electronic Mechanical Systems) components
 - an anti-migration coating for displays, spindle motors or lubricated electronic parts or
 - an anti-corrosion coating for a variety of materials and components

Application Techniques

Can be dipped, sprayed or selectively deposited. Water should be kept out of coating bath as contact will interfere with coating deposition. Surfaces to be coated should be clean and dried before application. Masking may not be required for many connector types – but testing is suggested. The solvent will evaporate quickly and the fluoropolymer film will dry in minutes.

Application Options	Dipping (preferred), spray, syringe dispense
Dilution	Can be diluted with 3M™ Novec™ 7100DL Engineered Fluid
Drying/Curing	Dries at room temperature; can be handled in under two minutes
Removability	Removable with Novec 7100 DL Engineered Fluid

Safety, Handling, Storage, Shelf Life

To avoid thermal decomposition, the coating solution should not be heated above 150°C (302°F) and the dried fluoropolymer 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 four years. Before using this product, please read the current product Material 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.

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 web site at 3M.com/electronics.

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, lubricant deposition 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

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