3M

Novec™

Brand

3M™ Novec™ 2202 Electronic Grade Coating

Introduction

3M™ Novec™ 2202 Electronic Grade Coating is a fluorinated polymer diluted in 3M™ Novec™ 7200DL Engineered Fluid, a segregated hydrofluoroether solvent, providing a clear, low viscosity, low surface tension coating solution. It forms a thin, transparent fluorinated polymer coating when dry, adding durable anti-smudge and easy-to-clean properties. Novec 2202 coating helps to improve the lubricious feel of a variety of glass and glass-like surfaces such as displays, touch screens and mobile electronic device components. Thermal curing provides added durability, chemical resistance and abrasion resistance. Novec 2202 coating is non-flammable, non ozone-depleting, low in toxicity, low in GWP, RoHS compliant, and VOC exempt (per the U.S. EPA).*

Construction

Solids	Solvent	Color	Container Size
0.2 wt% fluorinated polymer	3M™ Novec™ 7200DL Engineered Fluid	Clear	1 gal (11 lb/5.0 kg)

Table 1: Typical physical properties

Not for specification purposes. All values @ 25°C unless otherwise specified. Data compiled from published information.

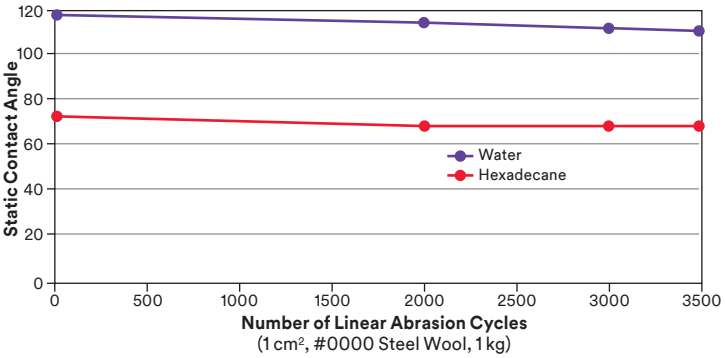
Properties	Coating Solution
Appearance	Clear, colorless liquid solution
Solids	0.2 wt% fluorinated polymer
Solvent	3M™ Novec™ 7200DL Engineered Fluid
Density	1.41 g/ml
Viscosity	0.61 cP
Boiling Point of Solvent	76°C (169°F)
Flash Point	None (per closed cup method)
Environmental (Solvent)	Low in toxicity, non-ozone depleting, non-flammable, VOC exempt (per the U.S. EPA),* RoHS compliant, contains no chlorine or bromine
Shelf Life	Two years from date of manufacture in original unopened package

*The U.S. EPA defines a VOC as "any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates and ammonium carbonate, which participates in atmospheric photochemical reactions, except those designated by the EPA as having negligible photochemical reactivity." This product is VOC exempt per the U.S. EPA.

Table 2: Typical physical properties

Not for specification purposes. All values @ 25°C unless otherwise specified. Measures contact angles can vary based on the type of surface, surface roughness and the application method.

Properties	Fluorinated Polymer Coating
Appearance	Transparent, colorless
Coating Thickness	Typically <10 nm
Solvent and Chemical Resistance	Resists a variety of solvents and chemicals
Thermal Stability of Dry Film	Can withstand 175°C for 24 hours and maintain repellency
Contact Angles (Static, Glass Substrate)	>110° (water), >60° (hexadecane)



Even after abrasion with steel wool, the Static Contact Angle remains stable. Contact angles are correlated to easy clean capabilities.

Features

- Helps provide an easy-to-clean, smudge resistant surface with excellent repellency to oils, dirt, grime and water
- Cured coating helps provide anti-smudge properties via anti-wetting and anti-stiction
- Excellent adhesion to a variety of glass and glass-like surfaces
- Durable and abrasion-resistant for long lasting protection
- Improves lubricious feel by helping to reduce stick-slip friction
- Ultrathin, optically transparent and does not alter surface appearance
- Excellent surface coverage and wetting due to its low surface tension solvent
- Air dries in seconds after application
- Easy to apply – should be thermally cured for added durability and abrasion resistance
- Volatile organic compound (VOC) exempt (per the U.S. EPA)* and has low global warming potential (GWP)
- Low in toxicity, non-ozone depleting and RoHS compliant

Applications

Helps provide:

- Easy-to-clean, smudge-resistant protection for glass and glasslike surfaces such as touch screens, displays, mobile electronic handhelds, electronic tablets and other electronic components and devices
- Anti-wetting, anti-stiction, anti-migration and anti-corrosion properties in many diverse applications

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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. The solvent will evaporate quickly and the fluorinated polymer film will dry in minutes. Addition of a thermal curing step significantly improves abrasion resistance.

Application Options	Spray, dipping, syringe dispense
Drying/Curing	Dries at room temperature; can be handled in under two minutes. Thermally cure at 185°C (365°F) for 60 minutes. Other curing conditions can be recommended by 3M technical service representatives.

Safety, handling, storage and shelf life

To avoid thermal decomposition, the coating solution should not be heated above 150°C (302°F) and the dried fluorinated polymer film should not be heated to temperatures above 225°C (482°F), which, in general, is lower than the onset of thermal degradation under TGA test conditions. See SDS for thermal degradation products. 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 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).

Resources

For more information on 3M Novec products or to contact a 3M representative, visit **3M.com/Novec**.

Smart. Safe. Sustainable.

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 smart, safe and 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™ Insulating Gases

Safety Data Sheet: Consult Safety Data Sheet before use.

Regulatory: For regulatory information about this product, contact your 3M representative.

Technical Information: The technical information, recommendations and other statements contained in this document are based upon tests or experience that 3M believes are reliable, but the accuracy or completeness of such information is not guaranteed.

Product Use: Many factors beyond 3M's control and uniquely within user's control can affect the use and performance of a 3M product in a particular application. Given the variety of factors that can affect the use and performance of a 3M product, user is solely responsible for evaluating the 3M product and determining whether it is fit for a particular purpose and suitable for user's method of application.

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