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# Electronic device component protection with 3M™ Novec™ Electronic Grade Coatings

Electronic devices are more compact and sophisticated than ever, which can make it challenging to protect components from environmental contaminants, such as moisture, sulfur, pollution and grime. Without proper protection, sensitive electronic components can quickly corrode, often leading to electrical shorts, poor performance and device failure. The solution: 3M™ Novec™ Electronic Grade Coatings – a family of clear, low viscosity, low surface tension solutions of fluorinated polymers carried in segregated hydrofluoroether solvents. Easy to apply and electrically stable, they form repellent films designed to protect sensitive electronics from moisture, chemicals and corrosion.

| Properties | Product Family | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1700 Series | | | 1900 Series | | | | 2700 Series | | | | 2702 |
| **Polymer** | Fluorinated Acrylate | | | Fluorinated Acrylate | | | | Fluorinated Acrylate | | | | Fluorinated Acrylate Hybrid |
| **Solvent** | 3M™ Novec™ 7100 Engineered Fluid | | | 3M™ Novec™ 7100 & 7200 Engineered Fluids Blend | | | | 3M™ Novec™ 7200 Engineered Fluid | | | | 3M™ Novec™ 7200 Engineered Fluid |
| **Product Numbers** | **1702** | **1700** | **1710** | **1901** | **1902** | **1904** | **1908** | **27002** | **2701** | **2704** | **2708** | **2702** |
| **Solids Concentration (w/w)** | 0.2% | 2% | 10% | 1% | 2% | 4% | 8% | 0.2% | 1% | 4% | 8% | 2% |
| **Recommended Application Method[1]** | Dip | | | Spray / Dip | | | Dip | Syringe | Spray / Dip | | Dip | Srpay / DIp |
| **Dip Typical Thickness Range µm[2]** | 0.1 | 0.1 - 0.2 | NR[3] | <0.1 | 0.1 - 0.2 | 0.3 - 0.6 | 0.8 - 1.3 | <0.1 | <0.1 | 0.3 - 0.6 | 0.8 - 1.3 | 0.1 - 0.2 |
| **Single-Pass Spray Typical Thickness (µm)[2]** | NR | NR | NR | 1 - 3 | 2 - 5 | 3 - 6 | NR | NR | 1 - 3 | 3 - 6 | NR | 2 - 5 |
| **Viscosity (cP)** | 0.6 | 0.9 | 4.3 | 0.6 | 0.8 | 1.1 | 2.2 | 0.6 | 0.7 | 1.8 | 4.9 | 0.7 |
| **UV Detectable[4]** | No | | | No | | | | Yes | | | | No |
| **Dry Time (minutes)** | <2 | | | <2 | | | | <2 | | | | <2 |
| **Thermal Cure Time & Temperature[5]** | No need to cure | | | No need to cure | | | | No need to cure | | | | 15 to 60 Minutes @ 70-150°C |
| **Dielectric Constant (@1kHz, 30% RH)** | 3.2 | | | 3.2 | | | | 3.2 | | | | 5.5 |
| **Dielectric Factor (@1kHz, 30% RH)** | 0.02 | | | 0.02 | | | | 0.02 | | | | 0.02 |
| **Dielectric Strength (V/mil @ 35% RH)** | 2000 | | | 2000 | | | | 2500 | | | | 2900 |
| **Safety & Sustainability[6]** | Low in toxicity<br>Non-ozone depleting<br>Low GWP<br>Non-flammable<br>VOC exempt<br>RoHS compliant | | | Low in toxicity<br>Non-ozone depleting<br>Low GWP<br>Non-flammable<br>VOC exempt<br>RoHS compliant | | | | Low in toxicity<br>Non-ozone depleting<br>Low GWP<br>Non-flammable<br>VOC exempt[7]<br>RoHS compliant | | | | Low in toxicity<br>Non-ozone depleting<br>Low GWP<br>Non-flammable<br>VOC exempt<br>RoHS compliant |

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

[1] All Novec coatings can be applied using spray, dip or syringe methods. The methods listed are often preferred. 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).

[2] Coating thickness varies based on application methods. Contact your 3M technical representative for more information on other application and thickness options. When spray coating, an automated atomized spray machine is the preferred application method.

[3] Novec 1710 coating should be used as a concentrate for maintaining Novec 1700 coating solids concentration in application baths or incorporated with resins or other liquids for a unique solution, rather than by itself.

[4] Fluorescence of the polymer will depend on several factors including coating thickness; substrate type and color; UV source frequency, intensity and distance from the coating surface. The dye fluoresces brightest under higher frequency UV (254 nm). Please follow the UV lamp manufacturer's recommendations on safe handling of UV radiation.

[5] Preferred conditions. For other processing conditions, contact your 3M technical representative.

[6] Global Warming Potential (GWP); The U.S. Environmental Protection Agency (EPA) defines a volatile organic compound (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." Products marked "VOC exempt" are defined as VOC exempt per the U.S. EPA.

[7] Contain <5% by weight PGMEA, a VOC. See SDS for specific product information.

[8] Based upon the toxicity of close structural analog. Novec 1700, 1900 & 2700 series coatings are all based on the same polymer with insignificant differences.



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