



**Novec™**

Brand

# 3M™ Novec™ 2704 Electronic Grade Coating offers a high performance, environmentally sustainable coating solution to protect printed circuit boards in head-up displays.

## A precision coating solution for electronic windscreen displays

Head-up displays are a safer way for drivers to view projected data, such as driving status, system warnings, directional messages and multimedia, without having to take their eyes off the road.

These displays, pioneered by the automotive industry, are projected onto a transparent film on the front windscreen in the driver's line of eyesight and are powered by electronic printed circuit boards.

These circuit boards need to be protected from environmental contaminants, such as moisture, condensing water from the windscreen, pollution and grime, to avoid corrosion that can lead to electrical shorts, poor performance and failure of the display.

One printed circuit board manufacturer based in mainland Europe has discovered a smart, safe and sustainable coating solution for the electronics embedded in the display that complies with EU regulations.

This combines 3M Novec 2704 coating solubilised in 3M™ Novec™ 7200 Engineered Fluid to provide a ready to use, ultra-thin, long-lasting low viscosity, low surface tension transparent coating solution to repel contaminants and protect against oxidation and corrosion caused by humidity.

As well as being easy to apply and electrically stable, these Novec coatings are a kinder choice for the environment as they are non-flammable and have low toxicity.

## A quick, easy and safe application process

The head-up display printed circuit boards are coated by dipping them into a solution that combines 3M Novec 2704 coating, a fluorinated polymer, diluted in 3M Novec 7200 fluid, a segregated hydrofluoroether solvent.

After dipping, the solvent evaporates in seconds, leaving behind an ultra-thin layer of coating, between 1 and 5 microns. There is no need for curing and the coating process does not require any heat source,

creating a safe working environment for applicators and saving energy costs.

As part of the quality control process, a yellow-orange dye can be incorporated into the fluorinated polymer that will show up under ultraviolet (UV) light. This aids the visual inspection of the dipped circuit boards to ensure that they are fully coated.

In addition to dipping, Novec coatings can also be applied by spraying or syringing.

## Benefits of using 3M Novec 2704 coating to protect head-up displays

- ▶ Easy application and processing – dries in seconds without the need for thermal post-curing
- ▶ Allows solder-through repairability and is easily removed for rework and repair
- ▶ Is thermally and electrically stable with excellent dielectric properties
- ▶ The coating repels and has anti-wetting and anti-sticking properties against liquids, water, hydrocarbons and silicon
- ▶ Contains a UV fluorescent dye incorporated into the polymer, making the inspection process quicker and easier

## Better for the environment

3M Novec 2704 coating is HFC free, non-flammable, has low toxicity and a stable composition. Once released, it has a short atmospheric lifetime and low global warming potential (GWP). This makes this coating solution environmentally sustainable and able to stand up to the toughest industry standards. The fluid complies with all EU regulations and IMDS registration.



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3M™ Novec™ Engineered Fluids are designed to balance performance with favourable environmental and worker safety properties. They are available for a wide variety of applications, including heat transfer, cleaning, testing, and lubricant deposition. Novec™ fluids offer excellent dielectric properties; wide range of boiling points; good materials compatibility; low toxicity and non-flammability; low global warming potential; and zero ozone depletion potential.

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### 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.

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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

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