



# 3M™ Novec™ Engineered Fluids

## Tube Swelling

### Introduction

Our understanding of the effects of various chemicals on both the human body and the environment continues to evolve. Now, performance of chemical solutions is only one parameter users must consider. New regulations make it more challenging than ever to find cost-effective solutions that meet performance needs without compromising worker safety or our environment. That's where 3M can help. 3M™ Novec™ Engineered Fluids are a proprietary class of materials, developed to provide safe, effective and sustainable alternatives to conventional process solvents.

For tube swelling Novec Fluids are particularly effective and are compatible with a wide variety of materials including PTFE, PFA, FEP and especially silicone which is widely used in the MedTech industry. Medical grade silicones are silicones tested for biocompatibility and are appropriate to be used for medical applications.

### Application & Uses

Novec fluids can rapidly swell silicone tubing and other elastomers, which then recover to their original dimensions on exposure to air or in a drying oven. Novec fluids evaporate quickly, leaving little or no residual solvent behind. This makes device assembly more efficient when connecting silicone tubing to barbed fittings.

### Medical Grade Silicone uses include:

- Tubing
- Surgical drains
- Feeding tubes
- Catheters
- Implants for long and short term use
- Seals and gaskets
- Syringe pistons

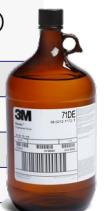
### Benefits

Novec Fluids combine proven performance with an outstanding environmental and safety profile. Compared to more aggressive solvents like Hexane they are non-flammable, low in toxicity, have zero ozone depletion potential and low global warming potential. Novec fluids are compatible with many types of surfaces – including silicone, plastics and elastomers.

Their very low surface tension can penetrate into the polymer matrix enabling the tubing to swell. And because they dry quickly, without leaving a residue, the use of Novec fluids can help speed up your drying process. Our expert global technical teams can help you match the right Novec fluid to your specific compatibility needs.

### 3M™ Novec™ Engineered Fluids for Tube Swelling

Properties	Unit	3M™ Novec™ Engineered Fluids				
		7100	7200	71DE	72DE	73DE
Formulation	-	Novec 7100 (100%)	Novec 7200 (100%)	Novec 7100 (50%) t-DCE** (50%)	t-DCE** (70%) Novec 7200 (20%) Novec 7100 (10%)	t-DCE** (85%) Novec 7300 (15%)
Boiling point	°C	61	76	41	44	48
Kinematic viscosity	cSt	0.38	43	0.31	0.35	0.3
Specific heat	J/kg•K	1183	1220	1192	1210	1201
Surface tension	mN/m	13.6	13.6	16.6	19	19.9



## Technical support from 3M

3M™ Novec™ Engineered Fluids have replaced a wide variety of solvents that have been restricted due to regulations – including HCFC-141b and HCFC-225. Our global technical service team has significant experience assisting customers with conversions to Novec fluids. There are many factors to consider in these conversions and our team can work with you side-by-side to assist with process optimisation factors.

## Safety, handling & storage

To make sure your coating solutions perform as designed, it is important that they are handled and stored appropriately. Please follow the “Safety, Handling and Storage” information on the 3M Technical Data Sheets and Safety Data Sheets for these products.

Before using 3M products, please read the current product Safety Data Sheets (SDS), which are available through your 3M sales or technical service representative or at [3M.com/SDS](http://3M.com/SDS), and the precautionary statement on the product package. Follow all applicable precautions and directions. Always practice smart and safe industrial hygiene practices.

## For additional information

To request additional product or process information, please contact 3M Customer Service at one of the numbers below or visit [3M.ie/MedTech](http://3M.ie/MedTech).

## 3M EMSD Medical Device Policy

3M™ Novec™ Engineered Fluids are intended for use as process solvents in applications, such as cleaning and coating, that historically used CFCs and HCFCs. They are not intended, nor approved, for incorporation into medical devices or for use in pharmaceuticals. 3M will not support applications that involve temporary or permanent implantation of the Novec product.

[Click here](#) to download a complete statement of 3M Electronics Materials Solutions Division’s Global Policy regarding the sale and use of products for medical and pharmaceutical applications. This document is also available on [3M.com/Novec](http://3M.com/Novec).

## 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™ Insulating Gases

**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 knowledge and 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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## 3M Ireland Limited

The Iveagh Building  
The Park Carrickmines  
Dublin 18  
D18 X015  
Tel: +353 12803555  
[www.3M.ie](http://www.3M.ie)

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