

3M™ Novec™ Engineered Fluids
For Medical Device Manufacturing



Safe, Sustainable Performance

Advanced solvent technology
for precision cleaning,
lubricant deposition, tube
swelling – and more.



Sustainable solvent technology for today's emerging needs

Growing public concern about the effects of chemicals on human health, safety and the environment have led to restrictions on the use of many kinds of process solvents used by the medical device industry.

In evaluating alternatives, users of these materials must balance the need for cost-effective performance with that of a sustainable, long-term solution – a solution that will still be viable for many years to come.

3M™ Novec™ Engineered Fluids were designed to help you achieve that balance. Based on 3M's proprietary segregated hydrofluoroether (HFE) chemistry, Novec fluids combine proven performance with an outstanding environmental and safety profile:

- Zero ozone depletion potential
- Low global warming potential
- Non-flammable
- Low in toxicity
- HAPs-free
- U.S. EPA SNAP-approved

Novec fluids are accepted by regulatory agencies around the world as alternatives to HCFC-225 and HCFC-141B. And, because they are nonflammable, low in toxicity and are generally recognized as sustainable replacements for those solvents targeted for phase-out by international bodies, Novec fluids are ideal candidates to replace materials such as trichlorethylene, methylene chloride and n-Propylbromide (nPb).

The versatile solvent solutions

Novec fluids are available in “neat” form – for light duty cleaning, tube swelling, deposition and other applications – and as azeotropes or blends of azeotropes, which offer higher solvency for more difficult-to-remove soils. Novec fluids are also used as rinsing agents in conjunction with low volatility solvating agents. This co-solvent cleaning process is effective for the removal of the most challenging soils, such as heavy oils, greases and waxes.

Engineered
for performance,
safety & the
environment

Applications

Precision cleaning

3M™ Novec™ Engineered Fluids offer a number of advantages for manufacturers of medical devices and equipment. They have demonstrated excellent compatibility with sensitive materials such as acrylic and polycarbonate, as well as a wide range of other plastics, elastomers and metals. Their low surface tension, low vapor diffusion rates and high liquid densities make Novec fluids ideal for use in vapor degreasing equipment. They are fast-drying, and typically offer lower drag-out losses than conventional degreasing solvents. What's more, Novec fluids easily penetrate tight spaces on complex parts, then drain off easily so they don't become trapped in small spaces. Unlike aqueous solutions, Novec fluids do not support biological growth, and are less equipment- and energy-intensive. In addition, parts cleaned in Novec fluids dry quickly and spot-free, with less chance for corrosion. (See box below for more benefits.)

Deposition

Novec fluids can disperse a wide variety of coatings, including silicone, PTFE and heparin. These coatings can be successfully deposited on many different types of surfaces, including metals, plastics and elastomers. Specific deposition applications include hypodermic needles, surgical and cutting blades, blood bags, filters and PVC tubing. Novec fluids have low surface tension for uniform coating, and evaporate rapidly to potentially speed your drying process.

Tube swelling

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.

Reaction media

Oxygen and other gases are highly soluble in Novec fluids, making them suitable for use as reaction media. The inertness and nonflammability of Novec fluids are especially useful properties for extractions, separations and anhydrous reactions.

Other medical applications

Novec fluids can be used as an inert media to separate samples going for diagnostic analysis.

Cleaning with 3M™ Novec™ Engineered Fluids

Parts	Substrates	Soils
Artificial Hearts	Polycarbonate	Oils
Heart Valves	Silicone Rubber	Particulate
O-Rings	Plastics	Mold Releases
Contact Lenses	Stainless Steel	Mounting wax
Eyeglass Lenses	Titanium	Skin oils
Catheters	Nickel/Cobalt	Buffing Compound
Needle Caps	Aluminum	
Endoscope Parts	Skin	
Gel Capsules		
Needles		
Stents		
Wires		
Cables		
Capillary Tubes		
Orthopedic Implants		
Dental Implants		
Spinal Implants		

Solvent cleaning vs. aqueous cleaning

Advantages of solvent cleaning with Novec Fluids vs. aqueous systems

- Easier to use with cellular manufacturing
- Can be used for silicone deposition
- Better solvency for organic soils
- No need for waste water treatment
- Reduced power consumption
- No anti-corrosion additives required
- Does not promote growth of bioburden
- Smaller equipment "footprint"
- No water spotting
- No drying equipment needed

Deposition with HFEs/PFCs In Medical Applications

Materials	Substrates	Application
Lubricants	Stainless Steel	IV Needles
-Silicones	Polycarbonate	Catheters
-Fluorochemicals	Silicone Rubbers	Blades
Heparin	Foams	Blood Filters
PTFE	Non-wovens	Tubing
Antifoams	Metals	Plungers
	PVC	Filters
	Plastics	Staples
		Bags

3M™ Novec™ Engineered Fluids are supported by global sales, technical and customer service resources, with fully-staffed technical service laboratories in the U.S., Europe, Japan, Latin America and Southeast Asia. Users benefit from 3M's broad technology base and continuing attention to product development, performance, safety and environmental issues.

Conversion assistance and equipment optimization

3M™ Novec™ Engineered Fluids may act differently than your previous fluid in certain key areas. We'll provide suggestions for converting and optimizing your existing equipment or processes for use with the appropriate Novec fluid.

Used Fluid Return Program

3M offers a program for free pickup and return of used 3M specialty fluids in the U.S. with qualifying amounts of used fluid. This program is offered through Safety-Kleen Corp. For additional information on the 3M Used Fluid Return Program, contact Safety-Kleen at this toll-free line: 1.888.932.2731. Contact your local 3M representative for fluid return programs outside the U.S.

3M 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 such as lung perfusion or blood substitutes, that involve temporary or permanent implantation of the Novec engineered fluid.

For a complete statement of 3M's Medical Device Policy, contact your 3M representative.

More
than
great
products

Product Use: All statements, technical information and recommendations contained in this document are based on tests or experience that 3M believes are reliable. However, many factors beyond 3M's control can affect the use and performance of a 3M product in a particular application, including conditions under which the product is used and the time and environmental conditions in which the product is expected to perform. Since these factors are uniquely within the user's knowledge and control, it is essential that the user evaluate the 3M product to determine whether it is fit for a particular purpose and suitable for the user's method of application.

Warranty and Limited Remedy: Unless stated otherwise in 3M's product literature, packaging inserts or product packaging for individual products, 3M warrants that each 3M product meets the applicable specifications at the time 3M ships the product. Individual products may have additional or different warranties as stated on product literature, package inserts or product packages. 3M MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY IMPLIED WARRANTY ARISING OUT OF A COURSE OF DEALING, CUSTOM OR USAGE OF TRADE. User is responsible for determining whether the 3M product is fit for a particular purpose and suitable for user's application. If the 3M product is defective within the warranty period, your exclusive remedy and 3M's and seller's sole obligation will be, at 3M's option, to replace the product or refund the purchase price.

Limitation Of Liability: Except where prohibited by law, 3M and seller will not be liable for any loss or damage arising from the 3M product, whether direct, indirect, special, incidental, or consequential regardless of the legal theory asserted, including warranty, contract, negligence or strict liability.



Electronics

3M Center, Building 224-3N-01
St. Paul, MN 55114
www.3M.com/electronics

Please recycle. Printed in USA.
Issued: 10/07 © 3M 2007.
All rights reserved. 6023HB
60-5002-0170-6

3M and Novec are trademarks of 3M.
Used under license by 3M subsidiaries and affiliates.