



Contact Cleaner for Fiber Optic Connector Cleaning



Introduction

Cleaning fiber optic connectors is an important part of any fiber optic network assembly operation. The goal is to prevent damage to the fiber during mating of the fiber optic connector ends.

3M™ Novec™ Contact Cleaner uses an advanced 3M solvent technology that effectively cleans fiber optic connectors. Typical uses include: during and after processing; prior to inspection; before shipping; or during field installations. The cleaner offers a number of significant advantages over many conventional spray cleaners, including:

- Fast drying
- Streak free
- Low in toxicity
- Non-flammable

Novec Contact Cleaner also features an excellent environmental profile. The product is non-ozone depleting, is exempt from the U.S. EPA's and most state and district definitions of a volatile organic compound (VOC) and contains no nPB or HAPS. It is based on a sustainable technology and offers an alternative for cleaners containing HCFC-141b or HCFC-225.

Novec Contact Cleaner is also a useful tool to help meet commitments for reducing greenhouse gas emissions by eliminating the hydrofluorocarbons (HFCs) associated with many traditional contact cleaners.

Features

Novec Contact Cleaner can be applied directly to the connectors in or out of the fixture or onto a 3M™ High Performance Wiping Cloth before cleaning the connector ends. It is ideal for use after processing your connectors with 3M's Diamond Lapping Films and 3M's Final Polish products on all types of connectors.

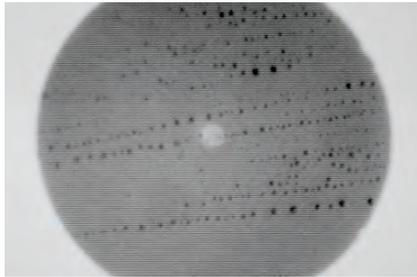
- Removes particulates, oils, light grease, silicones, dust and other soils from connector end faces
- Quick drying and non-corrosive
- Safe for plastics and metals

Novec Contact Cleaner offers a wide margin of safety in its intended applications. The product is low in toxicity, non-flammable and non-conductive, allowing it to be safely used on energized electrical components and circuits. It is odorless, and will not dry out skin like many other solvents.

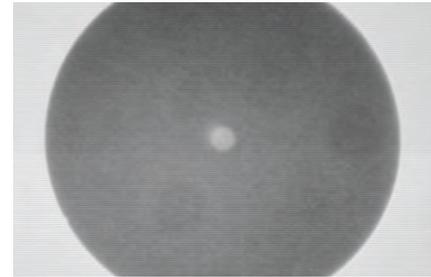
Novec Contact Cleaner makes a convenient addition to field kits. With its fast drying, streak free and effective cleaning performance, it provides clean end faces, while minimizing risk of fiber damage. The user should determine the best method for use.

Performance Information

The photos below compare identical connectors that were wiped with isopropanol (IPA) and Novec Contact Cleaner. The Novec Contact Cleaner does not leave residual contamination on the surface that can affect fiber optic circuit performance.



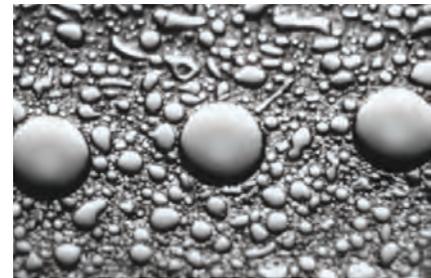
Ceramic Connector
Cleaned with IPA



Ceramic Connector
Cleaned with Novec Contact Cleaner



MT Connector
Cleaned with IPA



MT Connector
Cleaned with Novec Contact Cleaner

Examples of Application Methods

In method #1, the cleaner is applied to a wiping cloth; the cloth is then used to wipe the connectors clean. This can be done in the fixture or on individual connectors during inspections. If cleaned in the fixture additional cleaning at inspection is all but eliminated.

This technique is similar to current practices with alcohol. The advantages of cleaning with Novec Contact Cleaner are that the cleaning is more complete, with no residual left behind; no odor; and minimal irritation to skin. In addition, Novec Contact Cleaner is non-flammable. The cleaner is fast drying, which also aids in both visual and interferometric inspection.

Method 1:



Applying contact cleaner to cloth.



Wiping connectors in fixture
with cloth and Novec Contact Cleaner.

Performance Information

(Continued)

Examples of Application Methods

The second technique can be used to effectively clean a complete fixture with connectors. This technique is appropriate for MT style connectors that can have excessive debris. The ferrules should be wiped clean after the initial spray of the cleaner.

Method 2:



Applying contact cleaner to fixture with connectors.

Environmental and Safety Properties and Exposure Guidelines

Data compiled from published information

Not for specification purposes

Properties	Novec Contact Cleaner	HCFC-141b
Ozone Depletion Potential ¹ –ODP	0.00	0.10
Global Warming Potential ² –GWP	320	700
Atmospheric Lifetime–ALT (yrs)	4.1	9.2
Flashpoint	None	None
Flammability Range in Air	None	7.6-17.7 ³
Exposure Guidelines, ppm (8 hr. time-weighted average)	750	500
Exposure Ceiling (ppm)	None	None
Acute Toxicity (4 hr. LC ₅₀ [Rat])	>100,000	62,000

¹ CFC-11 = 1.0

² GWP–100 year Integration Time Horizon (ITH)

³ Vol % by ASTM E681-94 @ 100°C

Toxicity Profile

The toxicological testing completed on Novec Contact Cleaner shows the overall toxicity is low. The material is practically non-irritating to the eyes, minimally irritating to the skin and is not a mutagen. It is rated “practically non-toxic” through inhalation. A 90-day inhalation study has helped establish a recommended exposure guideline of 750 ppm for an eight-hour average worker exposure per day. This exposure guideline was established by the American Industrial Hygiene Association. When used as directed, in its intended applications, there is a large margin of safety between anticipated exposures and the exposure guideline.

Safety and Handling

Novec Contact Cleaner is nonflammable and does not exhibit flammability characteristics under normal operating and storage conditions. This fluid is highly resistant to thermal breakdown and hydrolysis in storage and during use. Recommended handling procedures are provided in the product Material Safety Data Sheet which is available from your local 3M representative upon request.

Resources

3M™ Novec™ products 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.

For additional technical information on Novec Contact Cleaner in the United States, call 800 364 3577 or 651 737 6501.

For information on other 3M fluids, coatings, gases and chemical products for the electronics industry, visit our web site at:

www.3m.com/electronicmaterials



**3M Electronics Markets
Materials Division**

3M Center
Building 224-3N-11
St. Paul, MN 55144-1000
800-251-8634

www.3m.com/electronicmaterials

3M and Novec are trademarks
of 3M Company.

Used under license by 3M
subsidiaries and affiliates.

Issued: 3/05

© 2005 3M
60-5002-0084-9

Important Notice: Please be aware that 3M™ Novec™ Contact Cleaner is considered to be experimental or developmental, which means that this product may be subject to modification or withdrawal. Future availability, formulation, performance properties, and pricing for the material are not guaranteed, and are subject to change. Any technical information should be considered representative or typical only, and should not be used for specification purposes.

Disclaimer of Warranty: 3M MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. User is responsible for determining whether the 3M product is fit for a particular purpose and suitable for user's application.

Limitation of Liability: Except where prohibited by law, 3M 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.