



# Lubricious Silicone Coatings and Lubricants



Cutting edges, hypodermic or suture needles, and other medical instruments that are inserted into the human body such as catheters and feeding tubes often require lubrication or lubricious coatings that are durable and long lasting for repeated use.

## Benefits of Siliconization

Silicones are known for their feel-enhancing effects and lubricity. Silicones provide effective lubrication solutions for many medical device applications by:

- Spontaneously spreading out in thin films
- Reducing the coefficient of friction, insertion force, and machine-ability
- Minimizing break-loose and extrusion forces
- Alleviating any discomfort a patient may experience during insertion and removal of a device

Lubricious silicone coatings come in the form of fluids, dispersions and greases varying in viscosity, cure characteristics and functionality. Some attributes of each are listed below:

	Fluids	Dispersions	Greases
Viscosity	Variable (100 - 100,000 cPs)	Water-like to thick (Depends on silicone base properties and/or ratio of silicone/solvent)	Self Leveling - Thixotropic
Polymer Characteristics	<ul style="list-style-type: none"> <li>• Varying molecular weights</li> <li>• Non-functional (Non-Curing)</li> <li>• Able to bake polymer onto the substrate with high heat</li> </ul>	<ul style="list-style-type: none"> <li>• Suspended or dissolved in solvent carrier</li> <li>• Available as functional (Curing) or Non-Functional (non-Curing)</li> </ul>	<ul style="list-style-type: none"> <li>• Non-Functional (Non-Curing)</li> <li>• Copolymer available</li> </ul>
Application	<ul style="list-style-type: none"> <li>• Dipping</li> <li>• Spraying</li> <li>• Brushing</li> </ul>	<ul style="list-style-type: none"> <li>• Dipping</li> <li>• Wiping</li> </ul>	<ul style="list-style-type: none"> <li>• Dispensing</li> <li>• Wiping</li> </ul>
Other Benefits	<ul style="list-style-type: none"> <li>• Little interactivity with the device substrate/surface</li> <li>• Easily removed/wiped form substrate</li> <li>• Compatible with most commonly used sterilization techniques</li> </ul>	<ul style="list-style-type: none"> <li>• May be diluted prior to use (depending on specific application)</li> <li>• Curable dispersions are more durable than fluids and non-curing dispersions</li> </ul>	<ul style="list-style-type: none"> <li>• Non-Migrating</li> <li>• Easily Applied</li> <li>• Compatible with most commonly used sterilization techniques</li> </ul>

Note: Experimentation may be required to determine the optimum concentration. Combinations of dispersed functional coatings and non-functional polymers have also been found to give excellent properties.

For more information, please visit:  
<https://www.silicone-polymers.com>



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## Fluids

NuSil Product Number	Cure Characteristics	Dimethyl Copolymer (mol%)	Solvent Carrier	Standard Viscosity (cP)	Commonly Used Lubrication Application
MED-361	Non-Curing	100% Dimethyl	None (polymer only)	100, 350, 1,000 & 12,500+	Glass, metal, plastic, and rubbers
MED-400	Non-Curing	100% Trifluoropropyl	None (polymer only)	350, 1,000 & 12,500+	Silicone parts - i.e. o-rings, valves, catheters
MED-420	Non-Curing	20% Trifluoropropyl	None (polymer only)	350, 1,000 & 12,500+	Silicone parts - i.e. o-rings, valves, catheters
MED-460	Non-Curing	60% Trifluoropropyl	None (polymer only)	350, 1,000 & 12,500+	Silicone parts - i.e. o-rings, valves, catheters

## Dispersions

NuSil Product Number	Cure Characteristics	Dimethyl Copolymer (mol%)	Solvent Carrier	Average Viscosity (cP)	Commonly Used Lubrication Application
MED10-4161*	Moisture Cure	50% Amino	Xylene	150	Metal substrates - i.e. cutting edges and needle cannula
MED-4159*	Moisture Cure	50% Amino	Aliphatic/Isopropyl Blend	200	Metal substrates - i.e. cutting edges and needle cannula
MED-4162	Non-Curing	100% Dimethyl	Xylene	28,000	Metal, plastics and other silicones

\*Amino-functional polymers have a reactive methoxy group that aids in the cure characteristics of the polymer

## Greases

NuSil Product Number	Cure Characteristics	Dimethyl Copolymer (mol%)	Solvent Carrier	Average Viscosity (cP)	Commonly Used Lubrication Application
MED-9011	Non-Curing	100% Dimethyl	None (polymer only)	100,000	Glass, metal, plastic, and rubbers
MED-9021	Non-Curing	100% Dimethyl	None (polymer only)	350,000	Glass, metal, plastic, and rubbers
MED-9031	Non-Curing	100% Dimethyl	None (polymer only)	1,000,000	Glass, metal, plastic, and rubbers
MED-6731	Non-Curing	20% Trifluoropropyl	None (polymer only)	2,000,000	Silicone parts - i.e. o-rings, valves, catheters

## Regulatory Support

Most NuSil materials intended for use as a healthcare lubricant are supported by applicable USP and ISO 10993 testing requirements. Master Access Files that have been submitted with the US FDA are available upon request. MED-361 has been tested in accordance with and meets the requirements of: European Pharmacopoeia (EP) Monograph for "Silicone Oil Used as a Lubricant". Customers interested in more information should contact Polymer Systems Technology Limited.



For more information, please us at:

<https://www.silicone-polymers.com>



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