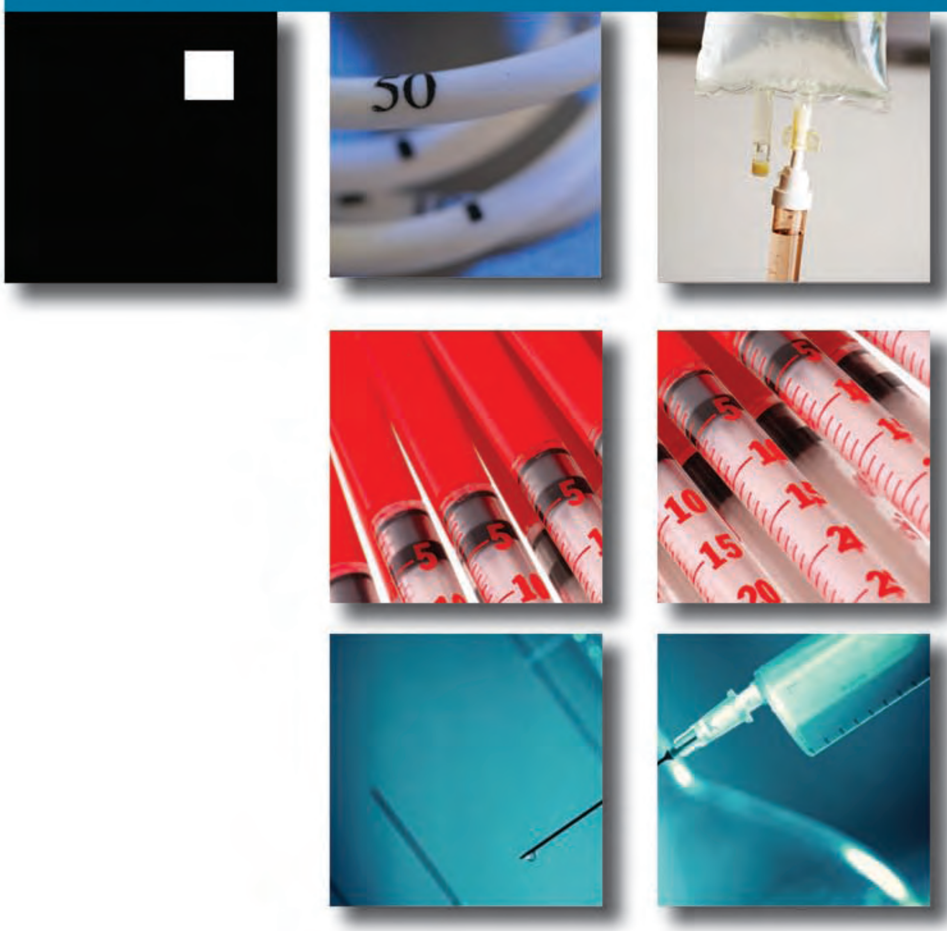
NuSil SILICONE TECHNOLOGY

Creative Partners in a Material World

Restricted Healthcare Materials Selection Guide



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RESTRICTED HEALTHCARE MATERIALS

Restricted Healthcare Silicones Definition

NuSil Technology's restricted materials may be considered for use in short-term implant applications, 29 days or less, or for external applications. It is the responsibility of the device manufacturer to determine the safety and efficacy of the device and the materials used in that device.

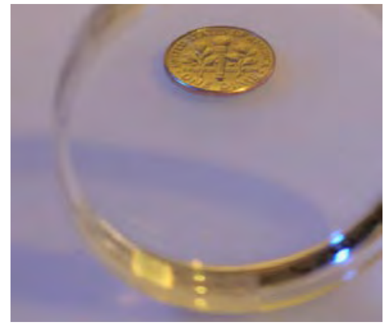
Biological Data

The following table lists the biological testing conducted on most materials found in this selection guide. These materials meet or exceed all USP Class VI and many ISO-10993 test requirements.

Standard FDA Class	Test
Cytotoxicity	Cytotoxicity testing using the ISO Elution Method in the L-929 Mouse Fibroblast Cell Line
Hemolysis	In Vitro Hemolysis Study (Extraction Method)
Systemic Extracts	USP Systemic Toxicity Study in the Mouse (Extracts)
Intracutaneous Extracts	Acute Intracutaneous Reactivity Study in the Rabbit (Extracts)
Implantation One Week	USP Muscle Implantation Study in the Rabbit (Extracts)
Salmonella Mutagen	Ames Salmonella/Mammalian Microsome Mutagenicity Assay
Rabbit Pyrogen	Rabbit Pyrogen Study - Material Mediated
Sensitization	Delayed Contact Sensitization Study (A Maximization Method) in the Guinea Pig (Saline Extract)

Warranty Statement

NuSil Technology's warranty period is product-specific and is provided on the Product Profile and Material Certification. The warranty period begins on the date of shipment when stored below 40° C in original unopened containers. Unless NuSil Technology provides you with a specific written warranty of fitness for a particular use, NuSil Technology's sole warranty is that the product will meet our current specification.

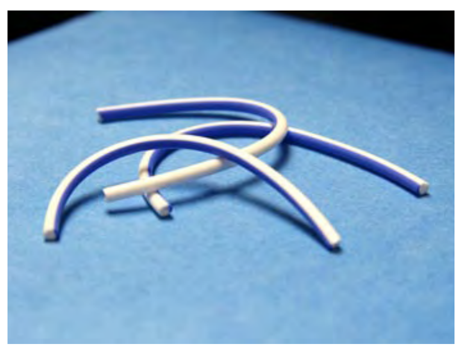


Improving Adhesion

NuSil Technology specializes in helping our customers solve complex problems related to the processing and adhesion of silicones. In general, silicones adhere quite well to substrates such as ceramics, glass, metals, urethanes, and other silicones. Substrates with low surface energy, such as plastics, are difficult to bond with silicone adhesives. Modification of the surface of the substrate allows the adhesive to spread well, allowing both chemical and mechanical interactions. Many substrates need to have the surface "activated" to enhance the adhesive's bond to the substrate. Common techniques can be used to improve the adhesive bond such as: primers, plasma, corona, flame treatment or abrasion of the substrate's surface. These surface treatments enhance the adhesive bond; however, the type of treatment is dependent on configuration complexity, silicone adhesive and substrates. Adhesion is a very complex subject that incorporates principles from several scientific disciplines. For more information on adhesion, please review our White Papers at www.nusil.com/whitepapers.

Inhibition

NuSil Technology's adhesives, gels, and elastomers are designed to provide optimal mechanical and physical properties. Some ingredients commonly found in certain adhesives, plastics, and elastomers adversely affect the cure in these products. NuSil recommends analyzing adhesives, plastics and elastomers for cure inhibition prior to selecting the silicone material for use. This evaluation includes materials used in any transfer containers, dispensing hoses, or utensils that come in direct contact with the silicone materials. Please visit our website to find listings of common silicone inhibitors at www.nusil.com/whitepapers/resources.



SILICONE ADHESIVES, SEALANTS AND PRIMERS

Silicone adhesives are elastomers or pressure sensitive adhesive systems that are designed to bond silicone surfaces to each other and to other substrate surfaces such as metals and plastics. There are one-part and two-part adhesives, ranging in consistency from flowable to non-flowable (non-slump). Silicone primers are specially formulated silanes supplied in a solvent that are used to improve the bond strength between a silicone elastomer or adhesive and another substrate surface (silicone, metals, and certain plastics).

Important Properties of Adhesives

In general, silicone adhesives adhere well to substrates such as glass, aluminum, titanium, other silicones, and some ceramics. While various types of materials can be used as adhesives, silicones are consistently chosen for their many inherent properties and overall versatility. Advantages of these adhesives are as versatile as silicone itself:

- Proven biocompatibility
- Resistance to moisture
- Ability to remain elastic at temperatures below 0 ºC
- Ability to resist chemical breakdown at temperatures >200 ºC
- Low modulus prevents warpage, delamination and substrate failure.

Processing Adhesives

Because surface energy plays a role in adhesion, some substrates with low surface energy, such as polycarbonate, polysulphone, and polymethyl methacrylate, may be difficult for silicones to adhere to. To promote adhesion between non-bonding surfaces, the surface of the substrate must be "activated" to enhance the adhesive's bond to the substrate. For instance, a monolayer of primer can first be applied to a substrate as surface preparation for the adhesive. Primers increase the number of covalent bonds formed between the adhesive and substrate. Besides primers, other techniques can be used to improve the adhesive bond: plasma, corona, flame treatment, or abrasion of the substrate's surface. Despite these other techniques, silicone primers are often the first activation technique considered to improve adhesion.

Storage and Handling of Primers

The following procedures are recommended for best bonding results with primers:

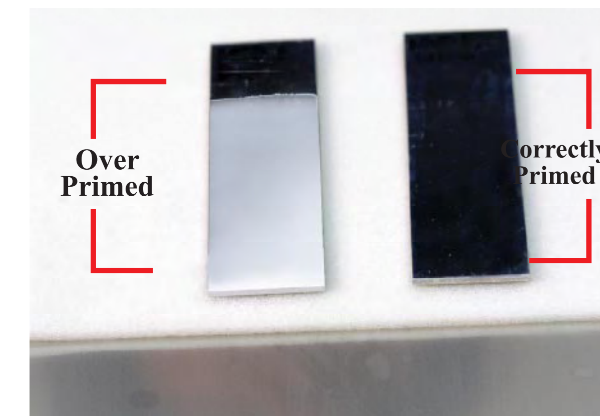
1. Decant the amount of primer needed for use into a secondary container.
2. Containers should remain sealed when not in use. Silicone primers will react with atmospheric moisture and hydrolyze. Precautions should be taken to minimize exposure to moisture.

   Note: The formation of moderate amounts of precipitate as a result of hydrolyzation is inherent in this material and will not adversely affect the performance of the material.

3. It is recommended to fill empty space in container with a dry gas such as nitrogen or argon.
4. Discard primer from the secondary container once finished using this amount of primer. Do not return the primer from the secondary container to the original container.

Instructions for Application

1. Using gloves, clean the surface using a lint-free wipe with cleaning agent or solvent.
2. Apply primer to a lint-free wipe and apply a thin uniform coat.
3. Remove excess primer by gently wiping with a clean lint-free wipe.
4. Overprimed surfaces will decrease the effectiveness of the primer. An indication of an overprimed surface is a thick, chalky white appearance of the primed surface (see photo at right).
5. Allow to dry for 30 minutes at room temperature and 50% relative humidity. The primer is activated by atmospheric moisture, so lower levels of humidity require longer drying times.
6. Apply the appropriate NuSil Technology adhesive/sealant.



NuSil's Restricted Product Numbers	Comments	Cure System	Work Time @ 25 °C	Mix Ratio	Certified Cure Schedule** Time / °C	Durometer Type A		Tensile psi (MPa)		Elongation %		Tear ppi (kN/m)		Specific Gravity	Rheology	Stress @ Strain psi (MPa) @ %
			Typical			Certified	Typical	Certified	Typical	Certified	Typical	Certified	Typical	Typical	Typical	Typical
ADHESIVES AND SEALANTS																
1 PART															(extrusion rate)	
MED-1000	SELF-LEVELING	ACETOXY	< 10 m	1 PART	72 h / R.T.	20-40	25	650 (4.5)	1300 (8.6)	450	775	28 (4.9)	75 (13.2)	1.08	135 g/minute	105 (0.72) @ 200
MED-1011	FLOWABLE	ACETOXY	< 10 m	1 PART	72 h / R.T.	20-35	25	870 (6.0)	1400 (9.7)	450	750	52 (9.1)	100 (17.6)	1.12	100 g/minute	110 (0.76) @ 200
MED-1031	NO ACIDIC LEAVING GROUP	OXIME	< 25 m	1 PART	7 d / R.T.	25-40	35	400 (2.8)	1075 (7.4)	200	400	25 (4.4)	80 (14.1)	1.11	LOW FLOW	150 (1.0) @ 100
MED-1037	NON-SLUMP, THIXOTROPIC	ACETOXY	< 8 m	1 PART	3 d / R.T.	20-40	25	275 (1.9)	625 (4.3)	200	550	-	-	1.07	180 g/minute	130 (0.9) @ 100
MED-1040	RTV, SELF-LEVELING	ACETOXY	9.5 h	1 PART	3 d / R.T.	20-30	23	125 (0.9)	265 (1.8)	225	340	15 (2.6)	17 (3.0)	1.03	HIGH FLOW	-
MED-1055	RTV, FLUOROSILICONE SEALANT	ACETOXY	15 m	1 PART	3 d / R.T.	30-40	35	600 (4.1)	820 (5.7)	200	400	-	50 (8.8)	1.35	230 g/minute	-
MED-1356	PSA / ETHYL ACETATE	NON-CURING	N/A	1 PART	-	-	-	-	-	-	-	-	-	-	1,370 cP	-
2 PART															(viscocity, cP)	
MED1-4013	RTV, FAST CURE, HIGH EXTRUSION RATE	PLATINUM	15 m	1:1	1 d / R.T.	12	20	550 (3.8)	1000 (6.9)	600	800	60 (10.5)	130 (23.0)	1.12	THIXOTROPIC	-
MED2-4013	HTV, FAST CURE, HIGH EXTRUSION RATE	PLATINUM	15 h	1:1	15 m / 150	12	15	550 (3.8)	1000 (6.9)	600	800	60 (10.5)	130 (23.0)	1.12	THIXOTROPIC	-
MED3-4013	RTV, FAST CURE, HIGH EXTRUSION RATE	PLATINUM	2 h	1:1	1 d / R.T.	12	20	550 (3.8)	1000 (6.9)	600	800	60 (10.5)	130 (23.0)	1.12	THIXOTROPIC	-
PRIMERS															(viscosity, cP)	
MED-160	GENERAL PURPOSE PRIMER	HYDROLYSIS	N/A	1 PART	30 m / R.T.	-	-	-	-	-	-	-	-	0.77	1	-
MED1-161	DESIGNED FOR USE WITH PLATINUM CURE SILICONES	HYDROLYSIS	N/A	1 PART	30 m / R.T.	-	-	-	-	-	-	-	-	0.77	1	-
MED2-161	DESIGNED FOR USE WITH PLATINUM CURE SILICONES	HYDROLYSIS	N/A	1 PART	30 m / R.T.	-	-	-	-	-	-	-	-	0.77	1	-
MED6-161	FORMULATED FOR USE ON INHIBITING SURFACES	HYDROLYSIS	N/A	1 PART	30 m / R.T.	-	-	-	-	-	-	-	-	0.78	1	-
MED-162	FORMULATED FOR POLYCARBONATE SUBSTRATES	HYDROLYSIS	N/A	1 PART	30 m / R.T.	-	-	-	-	-	-	-	-	0.80	1	-
MED-163	INCREASED ADHESION TO INHIBITING SURFACES	HYDROLYSIS	N/A	1 PART	30 m / R.T.	-	-	-	-	-	-	-	-	0.78	1	-
MED-164	DESIGNED FOR USE WITH CONDENSATION CURE SILICONES	HYDROLYSIS	N/A	1 PART	30 m / R.T.	-	-	-	-	-	-	-	-	0.78	1	-
MED-165	DESIGNED FOR USE WITH PLATINUM CURE SILICONES	HYDROLYSIS	N/A	1 PART	30 m / R.T.	-	-	-	-	-	-	-	-	0.77	1	-
MED-166	IN ISOPROPYL ALCOHOL, COMPATIBLE WITH ACRYLICS	HYDROLYSIS	N/A	1 PART	30 m / R.T.	-	-	-	-	-	-	-	-	0.80	1	-

** Test specimen cure parameters

d = days
h = hours
m = minutes
R.T. = Room temperature

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LIQUID SILICONE RUBBERS

Liquid silicone rubbers, or LSRs, are elastomer systems reinforced with silica. They contain functional polymers of lower average molecular weight and viscosity when compared to high consistency rubbers (HCRs). They are typically supplied as two-component systems and formulated in a 1:1 mix ratio. Because their consistency is akin to petroleum jelly, they are often pumped with injection molding equipment to form molded components such as o-rings, gaskets, valves, seals, and other precision molded parts.

Important Properties of Liquid Silicone Rubbers

LSRs are designed for liquid injection molding (LIM) processes which may utilize single or multi-cavity molds, or for overmolding processes. Originally designed for automated systems, they are developed with high volume applications in mind and benefit from their high strength. Features of liquid silicone rubbers include the following:

- Ideal for high throughput manufacturing
- Platinum cure system—no post cure required
- Typical work time in excess of 72 hours
- Cure rapidly at elevated temperatures
- Easily pigmented using NuSil color masterbatches

Cured LSRs can display a variety of physical properties, listed below:

- Type A durometer from < 5-80
- Tensile strength up to 1350 psi (9.3 MPa)
- Elongation up to 1100%
- Tear strength up to 260 ppi

Processing LSRs

While processing considerations vary depending on application, the following guidelines are generally helpful to manufacturers using LSRs:

Mixing

Parts A and B should be mixed in equal portions prior to use. Airless mixing, metering, and dispensing equipment are recommended for production operations.

Vacuum Deaeration

For manual mixing techniques, remove entrapped air by common vacuum deaeration procedure, observing all applicable safety precautions. Slowly apply vacuum, up to 28 inches of mercury (0.95 Barr), to a container rated for use and at least four times the volume of the material being deaerated. Hold vacuum until presence of air is no longer evident.

Vulcanization

As supplied, the elastomer system is designed to be mixed and cured at a predetermined mix ratio. Mixing the two components in anything other than the specified ratio may change the properties of the rubber.

Thermally Conductive Silicone Elastomers

Applications such as pacemakers, cochlear implants or other devices that rely on electronics or battery use may benefit from a component with a conductive feature. While silicone is naturally insulative, it can be developed to help dissipate heat from one area to another. Through the addition of different types and quantities of fillers, medical grade silicone formulations can acquire a level of thermal conductivity to fit a given application's needs.

NuSil's Restricted Product Numbers	Comments	Cure System	Work Time @ 25 °C	Mix Ratio	Certified Cure Schedule** Time / °C	Durometer Type A		Tensile psi (MPa)		Elongation %		Tear ppi (kN/m)		Specific Gravity	Extrusion Rate	Stress @ Strain psi (MPa) @ %
			Typical			Certified	Typical	Certified	Typical	Certified	Typical	Certified	Typical	Typical	Typical	Typical
LIQUID SILICONE RUBBERS																
MED-4901	LOW DUROMETER LSR	PLATINUM	13 h	1:1	5 m / 150	30-45 (00)	40 (00)	200 (1.4)	315 (2.2)	900	1075	50 (8.8)	60 (10.5)	1.09	160 g/minute	15 (0.1) @ 300
MED-4905	INJECTION MOLDING ELASTOMER	PLATINUM	24 h	1:1	5 m / 150	4-8	7	350 (2.4)	525 (3.6)	1000	1100	50 (8.8)	60 (10.6)	1.07	65 g/minute	40 (0.3) @ 200
MED-4910	INJECTION MOLDING ELASTOMER	PLATINUM	24 h	1:1	5 m / 150	8-13	10	450 (3.1)	700 (4.8)	1000	1100	50 (8.8)	70 (12.3)	1.07	80 g/minute	35 (0.2) @ 200
MED-4915	INJECTION MOLDING ELASTOMER	PLATINUM	24 h	1:1	5 m / 150	13-18	15	750 (5.2)	975 (6.4)	700	925	90 (15.8)	125 (21.9)	1.10	75 g/minute	55 (0.4) @ 200
MED-4920	INJECTION MOLDING ELASTOMER	PLATINUM	24 h	1:1	5 m / 150	18-25	20	750 (5.2)	1000 (6.9)	700	900	90 (15.8)	125 (22.0)	1.13	35 g/minute	65 (0.5) @ 200
MED-4930	INJECTION MOLDING ELASTOMER	PLATINUM	24 h	1:1	5 m / 150	26-37	30	800 (5.5)	1350 (9.3)	450	750	120 (21.0)	150 (26.3)	1.13	75 g/minute	175 (1.2) @ 200
MED-4940	INJECTION MOLDING ELASTOMER	PLATINUM	24 h	1:1	5 m / 150	38-48	40	850 (5.9)	1100 (7.6)	350	550	130 (22.8)	250 (44.1)	1.12	200 g/minute	425 (2.9) @ 200
MED-4950	INJECTION MOLDING ELASTOMER	PLATINUM	24 h	1:1	5 m / 150	45-55	50	1000 (6.9)	1300 (9.0)	400	675	200 (35.0)	250 (44.1)	1.15	50 g/minute	400 (2.8) @ 200
MED-4960	INJECTION MOLDING ELASTOMER	PLATINUM	24 h	1:1	5 m / 165	55-65	60	1100 (7.6)	1300 (9.0)	400	525	230 (40.3)	260 (45.9)	1.16	35 g/minute	600 (4.1) @ 200
MED-4970	INJECTION MOLDING ELASTOMER	PLATINUM	24 h	1:1	5 m / 165	68-78	70	900 (6.2)	1250 (8.6)	250	300	125 (22.0)	185 (32.6)	1.16	40 g/minute	750 (5.2) @ 200
MED-4980	INJECTION MOLDING ELASTOMER	PLATINUM	24 h	1:1	5 m / 165	78-88	80	500 (3.5)	900 (6.2)	50	250	40 (7.0)	90 (15.9)	1.16	50 g/minute	650 (4.5) @ 100
SPECIALTY LIQUID SILICONE RUBBERS																
MED-4942	INJECTION MOLDING ELASTOMER, RESISTS BLOCKING	PLATINUM	24 h	1:1	10 m / 150	35 - 45	40	850 (5.9)	1000 (6.9)	350	425	130 (22.8)	250 (44.1)	1.17	200 g/minute	525 (3.6) @ 200
MED1-4955	INJECTION MOLDING ELASTOMER, SELF LUBRICATING	PLATINUM	24 h	1:1	5 m / 165	50 - 60	55	800 (5.5)	1100 (7.6)	250	450	125 (22.0)	225 (39.7)	1.15	150 g/minute	525 (3.6) @ 200
MED50-5438	FLUOROSILICONE	PLATINUM	10 h	1:1	30 m / 150	23-40	30	500 (3.5)	700 (4.8)	300	375	-	30 (5.3)	1.26	90 g/minute	230 (1.6) @ 200
THERMALLY CONDUCTIVE																
MED15-2980	1.56 W/(mK), (37 x 10-4 cal/(cm•sec•°C))	PLATINUM	4 h	15:1	30 m / 150	70	80	200 (1.4)	300 (2.1)	15	20	-	-	1.53	-	-
MED20-2955	0.644 W/(mK), (15 x 10-4 cal/(cm•sec•°C))	PLATINUM	3 h	20:1	30 m / 150	40	55	200 (1.4)	400 (2.75)	100	225	30 (5.3)	55 (9.7)	-	140 g/minute	-
COLOR MASTERBATCHES																
MED2-4900	LSR MASTERBATCH, 50% BaSO4	-	N/A	1 PART	-	-	-	-	-	-	-	-	-	1.57	-	-
MED3-4900	LSR MASTERBATCH, 50% TiO2	-	N/A	1 PART	-	-	-	-	-	-	-	-	-	1.54	-	-
MED4-4900	LSR FOAM MASTERBATCH	-	N/A	1 PART	-	-	-	-	-	-	-	-	-	-	-	-
MED-4900-X	LSR MASTERBATCH, VARIOUS COLORS	-	N/A	1 PART	-	-	-	-	-	-	-	-	-	-	-	-
MED50-4900-X	TRANSLUCENT LSR MASTERBATCH, VARIOUS COLORS	-	N/A	1 PART	-	-	-	-	-	-	-	-	-	-	-	-

** Test specimen cure parameters

h = hours
m = minutes

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HIGH CONSISTENCY RUBBERS

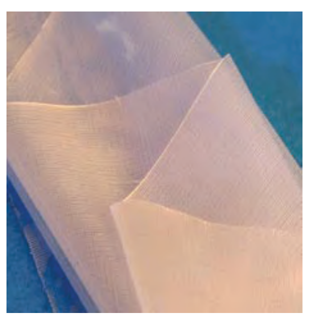
PLATINUM CURE

High consistency rubber, or HCR, consists of high molecular weight polymer combined with silica to produce a material that can be molded, extruded, or calendared into a useful end product. An HCR has the consistency of clay and is primarily formulated in a one or two part system (peroxide and platinum catalysts respectively).

Important Properties of Platinum Cure High Consistency Rubbers

Most platinum cure high consistency rubbers are two component systems with an easy-to-work-with 1:1 mix ratio. Features of platinum cure high consistency rubbers include the following:

- Two part (typically)
- Heat accelerated
- No byproducts
- Post cure optional
- Low percent shrinkage



Processing

When mixing platinum cure HCRs on a two-roll mill, to avoid inhibiting the cure, work in a meticulously clean area with no organic rubbers used on the same equipment. Traces of foreign materials can poison the catalyst, thus inhibiting the cure.

Blending

To blend, separately soften Parts A and B on a cooled two-roll mill, then combine both components in equal portions on the mill. For maximum table life, keep the temperature of the blended material as low as possible. Carefully wrapped blended material may be stored in a freezer for up to 7 days. Before unwrapping, heat the material to room temperature so as to avoid condensation, which may cause voids in molded or extruded parts.

Vulcanization

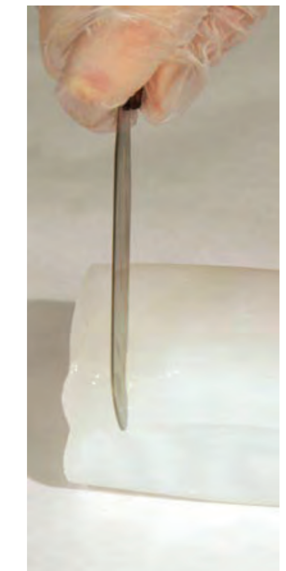
Although a set cure time is achieved with the pre-measured catalyst, the cure of a blended elastomer can be accelerated with heat. Attempting to change molding times by mixing the two components in any other than the specified ratio, will change the properties of the elastomer. To vary the rate of cure, only adjust the temperature.

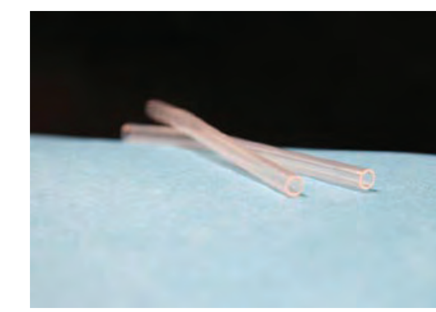
Cure Inhibition

The cure may be inhibited by traces of amines, sulfur, nitrogen oxide, organotin compounds, and carbon monoxide, often found in organic rubbers. Catalyst residues from silicone RTV elastomers and peroxide-cured silicone elastomers may also inhibit the cure.

Post-Curing

No byproducts are present and post cure is not required for many applications. The user must confirm that press molding or short oven-cures are suitable for any specific application.





NuSil's Restricted Product Numbers	Comments	Cure System	Work Time @ 25 °C	Mix Ratio	Certified Cure Schedule** Time / °C	Post Cure Time / °C	Durometer Type A		Tensile psi (MPa)		Elongation %		Tear ppi (kN/m)		Specific Gravity	Plasticity mils	Stress @ Strain psi (MPa) @ %
			Typical				Certified	Typical	Certified	Typical	Certified	Typical	Certified	Typical	Typical	Typical	Typical
HIGH CONSISTENCY ELASTOMERS																	
2 PART STANDARD																	
MED-2045	MIX RATIO 100 (A):0.7 (B):0.16 (C)	PLATINUM	N/A	3 PART	10 m / 171	2 h / 148	35-45	40	1000 (6.9)	1500 (10.3)	550	775	100 (17.5)	200 (35.3)	1.13	98	200 (1.4) @ 200
MED-4014	LOW DUROMETER	PLATINUM	3 h	1:1	10 m / 116	-	8-18	14	300 (2.1)	675 (4.6)	1000	1450	60 (10.5)	140 (24.7)	1.09	60	35 (0.2) @ 200
MED-4020	HIGH TEAR	PLATINUM	3 h	1:1	10 m / 116	-	19-27	25	1100 (7.6)	1400 (9.7)	1050	1200	140 (24.5)	180 (31.7)	1.10	65	80 (0.6) @ 200
MED-4025	LOW TENSION SET	PLATINUM	1.5 h	1:1	10 m / 171	-	25-35	30	1100 (7.6)	1400 (9.7)	800	900	70 (12.3)	140 (24.7)	1.12	90	110 (0.9) @ 200
MED-4035	HIGH TEAR	PLATINUM	2 h	1:1	10 m / 116	-	30-40	35	900 (6.2)	1500 (10.3)	800	1000	175 (30.6)	200 (35.3)	1.11	75	200 (1.4) @ 200
MED-4050	HIGH TEAR	PLATINUM	2 h	1:1	10 m / 116	-	45-55	50	1200 (8.3)	1450 (10.0)	750	1000	200 (35.0)	250 (44.1)	1.16	100	300 (2.1) @ 200
MED-4065	HIGH TEAR	PLATINUM	2.5 h	1:1	10 m / 116	-	60-70	65	700 (4.8)	1150 (7.9)	700	950	200 (35.0)	250 (44.1)	1.21	130	350 (2.4) @ 200
MED-4080	HIGH TEAR	PLATINUM	4.5 h	1:1	10 m / 116	-	73-83	80	750 (5.2)	1100 (7.6)	450	700	175 (30.6)	215 (37.9)	1.21	120	475 (3.3) @ 200
ULTRA HIGH PERFORMANCE																	
MED-4055	ULTRA HIGH TEAR	PLATINUM	2 h	1:1	10 m / 138	4 h / 177	52-60	55	1100 (7.6)	1600 (11.0)	500	900	250 (44.0)	300 (52.5)	1.15	70	385 (2.7) @ 100
MED-4070	ABRASION / FATIGUE RESISTANT	PLATINUM	2 h	1:1	10 m / 138	4 h / 177	65-75	70	1000 (6.9)	1300 (9.0)	500	700	250 (44.0)	285 (50.3)	1.19	110	600 (4.1) @ 100
COLOR MASTERBATCHES																	
MED-4102-X	HCR MASTERBATCH, VARIOUS COLORS	-	N/A	1 PART	-	-	-	-	-	-	-	-	-	-	-	-	-
MED2-4102	HCR MASTERBATCH, 75% BaSO4	-	N/A	1 PART	-	-	-	-	-	-	-	-	-	-	2.31	-	-
MED3-4102	HCR MASTERBATCH, 75% TiO2	-	N/A	1 PART	-	-	-	-	-	-	-	-	-	-	2.27	-	-

** Test specimen cure parameters

h = hours
m = minutes

HIGH CONSISTENCY RUBBERS

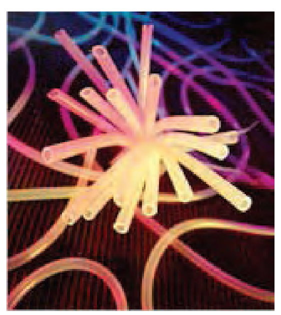
PEROXIDE CURE

HCRs can be used for extrusion of tubing and profiles (rod or ribbon), in calendared sheeting for die-cutting, or in compression or transfer molded parts such as balloons, gaskets or o-rings. HCRs are clay-like in the uncured state and when cured generally exhibit very high mechanical properties and low modulus.

Important Properties of Peroxide Cure High Consistency Rubbers

HCRs with a peroxide cure system have a long history in implant applications. The cure mechanism can be vinyl specific or non vinyl specific. Non vinyl specific peroxide catalysts are more commonly used with HCRs than vinyl specific peroxide catalysts. Features of peroxide cure high consistency rubbers include the following:

- One or two part
- Indefinite work time
- Heat required
- Acid or alcohol byproducts
- Post cure required
- % shrinkage ~2 -5%



Additional Features

- Green strength- ideal for extrusion processes
- Low modulus compared to other elastomer systems
- Wide range of available durometers

Processing

Prior to use, soften the HCR on a two-roll mill. If the HCR base is not catalyzed, add the peroxide catalyst after softening the base. A minimum of 10 passes on the two-roll mill should be used to ensure the catalyst is uniformly mixed into the base.

Vulcanization

The cure rates of HCRs with preblended peroxide catalyst can be varied by adjusting the initial cure temperature. If the peroxide catalyst is added on the mill at the time of use, the amount of catalyst can be adjusted to vary the cure rate (Note this may also affect the ultimate cured physical properties).

Cure Inhibition

Depending on the peroxide catalyst used, cure inhibition may or may not be an issue. Understanding the chemistry of the specific peroxide catalyst to be used is needed to determine what, if anything, will inhibit the cure.

Post-Curing

Post cure is dependant on the peroxide catalyst used. Consult catalyst specific literature to determine the appropriate post cure time and temperature.

NuSil's Restricted Product Numbers	Comments	Cure System	Work Time @ 25 °C	Mix Ratio	Certified Cure Schedule** Time** / °C	Post Cure Time / °C	Durometer Type A		Tensile psi (MPa)		Elongation %		Tear ppi (kN/m)		Specific Gravity	Plasticity mils	Stress @ Strain psi (MPa) @ %
			Typical				Certified	Typical	Certified	Typical	Certified	Typical	Certified	Typical	Typical	Typical	Typical
HIGH CONSISTENCY ELASTOMERS																	
1 PART STANDARD																	
MED4-4115	NON-VINYL SPECIFIC PEROXIDE PRECATALYZED	PEROXIDE	N/A	1 PART	5 m / 116	2 h / 249	45-55	50	1000 (6.9)	1500 (10.3)	360	450	45 (7.9)	100 (17.6)	1.15	90	450 (3.1) @200
MED4-4116	NON-VINYL SPECIFIC PEROXIDE PRECATALYZED	PEROXIDE	N/A	1 PART	5 m / 116	2 h / 249	65-75	70	900 (6.2)	1350 (9.3)	250	375	-	125 (22.0)	1.21	130	675 (4.7) @ 200
MED-4120	UNCATALYZED	PEROXIDE	N/A	1 PART*	5 m / 116	2 h / 177	20-30	25	900 (6.2)	1350 (9.3)	750	950	80 (14.1)	140 (24.7)	1.10	65	110 (0.8) @ 200
MED-4128	LOW TENSION SET, UNCATALYZED	PEROXIDE	N/A	1 PART*	10 m / 116	2 h / 200	20-30	25	800 (5.5)	1075 (7.4)	700	825	40 (7.0)	75 (13.2)	1.11	71	90 (0.6) @ 200
MED-4135	UNCATALYZED	PEROXIDE	N/A	1 PART*	5 m / 116	2 h / 177	30-40	35	800 (5.5)	1250 (8.6)	700	800	90 (15.8)	110 (19.4)	1.10	70	185 (1.3) @ 200
MED-4150	UNCATALYZED	PEROXIDE	N/A	1 PART*	5 m / 116	2 h / 177	45-55	50	1000 (6.9)	1450 (10.0)	500	700	120 (21.0)	180 (31.7)	1.16	100	300 (2.1) @ 200
MED-4165	UNCATALYZED	PEROXIDE	N/A	1 PART*	5 m / 116	2 h / 177	60-70	65	900 (6.2)	1200 (8.3)	450	500	150 (26.3)	200 (35.3)	1.21	115	450 (3.1) @ 200
MED-4174	UNCATALYZED	PEROXIDE	N/A	1 PART*	5 m / 116	4 h / 205	45-55	50	1000 (6.9)	1200 (8.3)	550	775	175 (30.7)	225 (39.7)	1.15	105	325 (2.2) @ 200
MASTERBATCHES																	
MED2-4102	HCR MASTERBATCH, 75% BaSO4	-	N/A	1 PART	-	-	-	-	-	-	-	-	-	-	2.31	-	-
MED3-4102	HCR MASTERBATCH, 75% TiO2	-	N/A	1 PART	-	-	-	-	-	-	-	-	-	-	2.27	-	-

** Test specimen cure parameters

*Suggest using CAT-102 Peroxide Catalyst @ 1pph

h = hours
m = minutes

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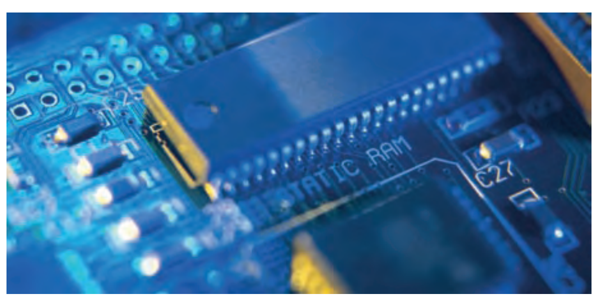
LOW CONSISTENCY ELASTOMERS

Low consistency elastomers (LCEs) are useful alternatives to liquid silicone rubber (LSR) and high consistency rubber (HCR) for end users who need a low viscosity elastomer which provides other unique properties.

Important Properties of Low Consistency Elastomers

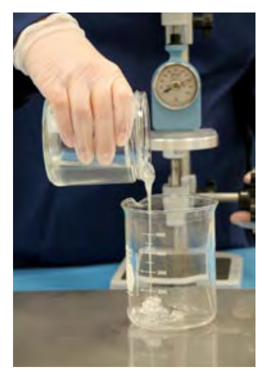
LCEs lend themselves to applications that require a pourable, self-leveling silicone. Applications include: encapsulating a device, backfilling a void, potting an electronic component that cannot withstand exposure to high heat, or prototyping a mold. Features of low consistency elastomers may include the following:

- Optically clear
- Self-leveling
- Low and high temperature cure
- Low viscosity
- Easy to process



Processing LCEs

One advantage of LCEs is their adjustable cure schedule, which allows curing at various temperatures. In some applications, due to equipment limitations or heat sensitive materials within the assembly, higher temperatures can not be used and a low curing temperature is required. Another advantage of curing at lower temperatures is avoiding common defects such as bowing, warping and delamination caused by heating bonded materials with different coefficients of thermal expansion (CTE). Yet these same silicones are also designed to allow the engineer to accelerate the cure time with heat and allow more efficient processing times and reduce production cost. Contact NuSil Technology for more information on the recommended cure schedules of different products.



Mixing and De-airing

When mixing by hand or with a propeller-type mixer, scrape the container's sides and corners to ensure the Part A and B are homogeneously mixed. Using Planetary and Dual Asymmetric Centrifugal mixers is another method for mixing materials rapidly and thoroughly. With these types of mixers, heat can be generated through shear caused by the mixing process and can have an adverse effect on the pot life of the silicone. Adjust mixing times and speed to minimize heat. To enable airless mixing and dispensing, most low consistency elastomers are available in convenient side by side kit packaging.

While very low viscosity materials may not require de-airing, NuSil recommends slowly applying vacuum up to approximately 28 inches of mercury (0.95 Barr). Hold vacuum until bubbles are no longer observed. Periodically release the vacuum to allow bubbles to burst and subsequently expedite the de-airing process. This process can be accomplished with an industry standard vacuum chamber and vacuum pump. A standard centrifuge is also an adequate tool for removing air in low consistency elastomer.

NuSil's Restricted Product Numbers	Comments	Cure System	Work Time @ 25 °C	Mix Ratio	Certified Cure Schedule** Time / °C	Post Cure Time / °C	Durometer Type A		Tensile psi (MPa)		Elongation %		Tear ppi (kN/m)		Specific Gravity	Viscosity cP	Stress @ Strain psi (MPa) @ %
			Typical				Certified	Typical	Certified	Typical	Certified	Typical	Certified	Typical	Typical	Typical	Typical
LOW CONSISTENCY ELASTOMERS																	
MED-4011	FLOWABLE	PLATINUM	N/A	10:1	3 m / 150	1 h / 150	25-35	25	-	675 (4.7)	350	530	-	-	1.09	A:114,000 / B:1,600	-
MED-4044	FLOWABLE, MEDIUM DUROMETER	PLATINUM	4 h	10:1	5 m / 177	1 h / 150	36-44	40	600 (4.1)	850 (5.9)	250	300	80 (14.1)	150 (26.5)	1.10	A:120,000 / B:270	480 (3.3) @ 200
MED-4086	ULTRA SOFT ELASTOMER	PLATINUM	14 h	1:1	45 m / 150	-	45-65 (000)	55 (000)	-	45 (0.28)	-	475	-	-	-	A:8,300 / B:4,600	8 (0.06) @ 200
MED2-4220	LOW VISCOSITY, RAPID RTV CURE	PLATINUM	3 m	1:1	15 m / 150	-	-	20	-	550 (3.8)	-	550	-	-	1.07	A:20,000 / B:16,500	100 (0.7) @ 200
MED4-4220	LOW VISCOSITY	PLATINUM	25 m	1:1	15 m / 150	-	-	17	-	645 (4.4)	-	570	20 (3.5)	35 (6.2)	-	A:23,000 / B:18,000	-
MED-4917	LOW VISCOSITY, LONG POT LIFE	PLATINUM	14 h	1:1	30 m / 150	-	17 min	20	300 (2.0)	475 (3.3)	200	350	-	-	1.06	A:14,000 / B:9,500	-
MED-6010	1.43 R.I., OPTICALLY CLEAR	PLATINUM	3.5 h	1:1	30 m / 150	-	40-60	45	700 (4.8)	800 (5.5)	90	130	25 (4.4)	30 (5.3)	1.05	A:18,000 / B:12,000	-
MED-6015	1.41 R.I., OPTICALLY CLEAR, LOW VISCOSITY	PLATINUM	4 h	10:1	15 m / 150	-	40 min	50	700 (4.8)	1300 (9.0)	80	100	-	-	1.03	A:6,000 / B:90	-
MED-6019	LOW VISCOSITY, HIGH DUROMETER	PLATINUM	> 24 h	1:1	30 m / 150	-	65 min	80	850 (5.8)	950 (6.6)	-	55	-	50 (8.8)	1.07	A:27,500 / B:25,000	-
MED-6020	1.43 R.I., OPTICALLY CLEAR	PLATINUM	4 h	1:1	30 m / 150	-	35-45	40	500 (3.5)	640 (4.4)	100	175	25 (4.4)	35 (6.2)	1.05	A:70,000 / B:40,000	-
MED-6033	1.41 R.I., OPTICALLY CLEAR, POURABLE	PLATINUM	> 24 h	1:1	30 m / 150	-	40-60	50	600 (4.1)	750 (5.2)	150	305	70 (12.3)	80 (14.1)	1.03	A:75,000 / B:50,000	-
MED-6382	FAST CURE, OPAQUE	TIN-ALKOXY	10 m	100:0.5	24 h / R.T.	-	35-55	45	300 (2.1)	500 (3.4)	100	100	-	-	1.13	40,000	-
MED-6755	1.46 R.I., OPTICALLY CLEAR	PLATINUM	2 h	1:1	30 m / 150	-	30 min	30	500 (3.5)	750 (5.2)	175	300	20 (3.5)	40 (7.1)	1.14	A:40,000 / B:35,000	-

** Test specimen cure parameters

h = hours
m = minutes
R.T. = Room temperature

DISPERSIONS AND INKS

"Dispersion" is a term used to describe a silicone elastomer system that is suspended or dispersed in a solvent carrier. It is a complex solution that contains silicone polymers of various molecular weights and reinforcing fillers. The substituent groups comprising the polymer back bone structure may consist of the following: Polydimethylsiloxane, Dimethyl Diphenyl copolymer, and Fluoro homo polymer or copolymer. Silicone dispersions typically have low viscosities, which is beneficial for applications wherein a thin film coating is needed, and they can easily be used in dipping and spraying processes. NuSil uses a variety of solvents to disperse silicones, such as xylene, tert butyl acetate, heptane, hexane, acetone and naphtha.

Important Properties of Dispersions

Prior to curing, dispersions can exhibit various uncured properties, as listed below. These properties define the characteristics of dispersions and their behavior during application:

- Addition or moisture cure
- Supplied as one or two part system
- Viscosity and Rheology - Most dispersions are shear thinning, meaning the viscosity decreases with increase in shear.
- Viscosity decreases by decreasing the solids content.

Processing Dispersions

Understanding the processing details is essential in order to choose the right dispersion to maximize the performance and processing efficiency.

Mixing, De-airing, and Wait Time

Most dispersions require additional handling prior to application, such as adequate mixing of Parts A and B to get a homogeneous blend. Although it is not always necessary, NuSil recommends individual pre-mixing of the Part A and Part B prior to combining the two components. Additional solvent may be added to further dilute the dispersed silicone.

Some processes may require a waiting period before the material is used for its intended application. The length of this waiting period may have a positive or negative influence on a dispersion's performance. If too much time is taken the solvent may evaporate, changing the dispersion's rheology; this causes increased solids and therefore higher viscosity which could affect the thickness of the coating. If the waiting period is too short after high shear was used to mix the dispersion, the material may not have sufficient time to return to its rest properties due to shear thinning. Silicones in general are shear thinning and this should be taken into account when mixing dispersions with high shear, which may result in different flow characteristics affecting final coating thickness.

Coating Basics

There are many different ways to apply dispersions as coatings. The commonly used methods are dipping (manual or automated), slush molding, knife coating, and spraying. In most cases, more than one layer of dispersion is needed to achieve the desired thickness. This involves a delicate balance between allowing the solvent to evaporate at a rate which does not leave surface defects and curing. The quality of the coating will depend significantly on the number of coats, device geometry, device size, coating sequence, environmental conditions, and coating techniques.

Ramp Cure

The cure schedule will vary depending on the application and solids content. NuSil establishes a ramp cure for platinum cure dispersions. By increasing the temperature slowly, the solvent will evaporate prior to the silicone beginning to cure. This will reduce the risk of voids forming in the coating. As the temperature further increases, with the solvent nearly completely removed from the coating, the silicone will begin to cure. The cure profile will typically need to be adjusted to give the best results based on the curing environment and device configuration. Deviations in cure schedules (temperature and time) may cause different elastomeric properties; therefore, controlling the process once it has been established is recommended.

NuSil's Restricted Product Numbers	Comments	Cure System	Work Time @ 25 °C	Mix Ratio	Certified Cure Schedule** Time / °C	Durometer Type A		Tensile psi (MPa)		Elongation %		Tear ppi (kN/m)		Specific Gravity	Viscosity cP	Stress @ Strain psi (MPa) @ %
			Typical			Certified	Typical	Certified	Typical	Certified	Typical	Certified	Typical	Typical	Typical	Typical
DISPERSIONS																
MED-2014	ONE PART, IN XYLENE	PLATINUM	N/A	1 PART	*1	31-45	35	1200 (8.3)	1800 (12.4)	700	800	100 (17.6)	185 (33.6)	1.10	3,500	150 (1.0) @200
MED10-6400	1.43 R.I. IN XYLENE	PLATINUM	24 h	1:1	*2	20-35	30	950 (6.6)	1500 (10.3)	600	775	130 (22.8)	150 (26.3)	1.08	600	350 (2.4) @ 300
MED10-6600	1.46 R.I. IN XYLENE	PLATINUM	24 h	1:1	*2	15-50	25	700 (4.8)	1200 (8.3)	550	750	50 (8.8)	125 (22.0)	1.10	400	325 (2.2) @ 300
MED11-6604	ONE PART, SMOOTH FINISH IN THF	ACETOXY	N/A	1 PART	1 d / R.T.	10-25	15	30 (0.2)	80 (0.55)	150	350	5 (0.88)	12 (2.1)	0.98	250	-
MED10-6605	ONE PART, IN XYLENE	ACETOXY	N/A	1 PART	5 d / R.T.	20-30	25	1000 (6.9)	1425 (9.8)	550	950	50 (8.8)	125 (22.0)	1.09	700	160 (1.1) @ 300
MED16-6606	ONE PART ADHESIVE, IN HEPTANE	ACETOXY	N/A	1 PART	3 d / R.T.	10-30	15	870 (6.0)	1100 (7.6)	450	950	52 (9.1)	130 (22.9)	1.11	90	95 (0.6) @ 100
MED10-6607	ONE PART, IN NAPHTHA	OXIME	N/A	1 PART	7 d / R.T.	35-45	40	600 (4.1)	1150 (7.9)	500	650	80 (14.1)	95 (16.8)	1.11	6,500	-
MED10-6640	ULTRA HIGH TEAR, IN XYLENE	PLATINUM	24 h	1:1	*2	30-50	40	1500 (10.3)	1700 (11.7)	750	1000	240 (42.0)	300 (52.9)	1.12	4,000	155 (1.0) @ 100
MED10-6655	100M% FLUOROSILICONE	ACETOXY	N/A	1 PART	3 d / R.T.,H	30-45	35	600 (4.1)	775 (5.3)	200	425	-	45 (7.9)	-	700	-
SPECIALTY DISPERSIONS																
MED-4159	LOW CROSSLINK DENSITY	AMINE	N/A	1 PART	7 d / R.T.	-	-	-	-	-	-	-	-	0.85	170	-
MED10-4161	AMINO FUNCTIONAL SILICONE COATING	AMINE	N/A	1 PART	5 d / R.T.	10 - 40 (00)	25 (00)	-	-	-	-	-	-	0.87	140	-
MED-4162	LUBRICIOUS COATING IN XYLENE	NON-CURING	N/A	1 PART	-	-	-	-	-	-	-	-	-	-	29,000	-
MED10-6670	LOW COEFFICIENT OF FRICTION COATING	PLATINUM	24 h	1:1	5 m / 150	-	-	-	-	-	-	-	-	0.96	-	-
INKS																
MED-6608	RTV INK AVAILABLE IN WHITE & BLACK	OXIME	N/A	1 PART	7 d / R.T.	-	30	-	300 (2.1)	-	200	-	-	-	1,100	-
MED8-6608-2	RTV BLACK INK, INCREASED HIDING POWER	OXIME	N/A	1 PART	7 d / R.T.	-	-	-	-	-	-	-	-	1.83	800	-
MED-6613-X	HEAT CURABLE INKS IN VARIOUS COLORS	PLATINUM	N/A	1:1	5 m / 150	-	-	-	-	-	-	-	-	-	2,000	-

** Test specimen cure parameters

d = days
h = hours
m = minutes
R.T. = Room temperature

*1) 1h / 50°C + 1h / 150°C
*2) 30m / 25°C + 45m / 75°C + 135m / 150°C

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SILICONE FLUIDS AND GREASES

Fluids are non-curing, stable silicone polymers typically used as lubricants. Fluids are available in a variety of viscosities. Depending on the viscosity, fluids can be applied by spraying, dipping, wiping, or brushing. For optimal performance, the chemistry of the fluid should not match the chemistry of the substrate being lubricated. If unsure of the compatibility of the substrate and lubricant, contact the supplier of each material for assistance.

Important Properties of Fluids

Because they are so dynamic, fluids can be adapted to perform well in a wide array of projects. The following list summarizes the properties that make fluids ideal components for a variety of applications:

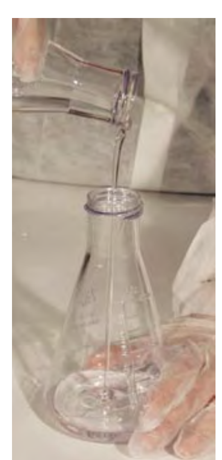
- Varying viscosities
- Can be diluted with solvent for application in thin layers
- Varying polymer chemistry to allow use with various substrates
- Unlimited working time due to non-curing property
- Hydrophobicity adds water repellency

Processing Fluids

Fluids may be applied by spraying, dipping, or brushing techniques.

Note: Standard dimethyl (PDMS) fluids should not be used in conjunction with dimethyl silicone rubber. In these cases, use the MED-400 series (Fluorosilicones and methyl flouro copolymers) to minimize absorption which may affect component dimensions, lubricity, and migration of fluid into molded components.

NuSil's Restricted Product Numbers	Comments	Mix Ratio	Specific Gravity	Viscosity cP
			Typical	Typical
FLUIDS				
MED-361	DIMETHYL POLYMER	1 PART	0.97	100 - 100,000
MED-400	FLUOROSILICONE POLYMER	1 PART	-	350 - 100,000
MED-420	METHYL FLUORO COPOLYMER (LOW FLUORO)	1 PART	-	100 - 100,000
MED-460	METHYL FLUORO COPOLYMER (HIGH FLUORO)	1 PART	-	350 - 100,000
GREASES				
MED-6731	HEAVY CONSISTENCY METHYL FLUORO GREASE	1 PART	1.22	2,000,000
MED-9011	LOW CONSISTENCY GREASE	1 PART	1.01	100,000
MED-9021	MEDIUM CONSISTENCY GREASE	1 PART	1.08	275,000
MED-9031	HEAVY CONSISTENCY GREASE	1 PART	1.10	900,000

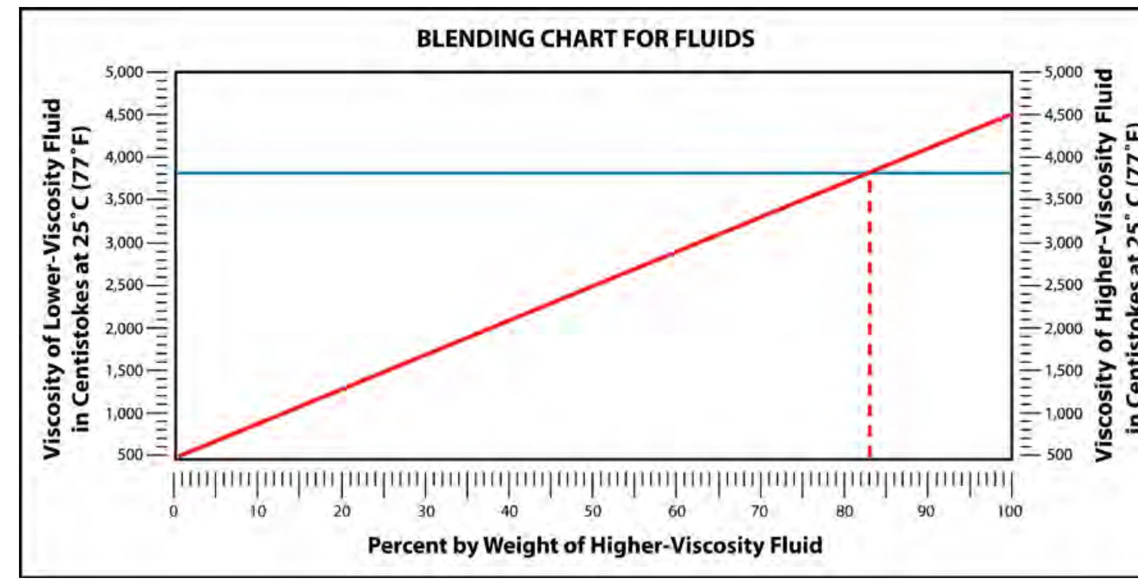


Blending Fluids

Polydimethylsiloxane fluids of different viscosities can be mixed together to create a fluid with an intermediate viscosity. The chart featured here is a guide to blending fluids depending on the desired viscosity. Follow the directions below to determine the right amount of each fluid to mix:

1. Know the viscosities of the fluids to be blended.
2. Find the lower viscosity on the scale at the left side of the chart (e.g. "500").
3. Find the higher viscosity on the scale at the right side of the chart (e.g. "4,500").
4. Draw a straight line between these two points, as shown below.
5. Find the desired viscosity (e.g. "3,800") on the chart and draw another straight line between the two points (Scale is the same on both left and right).
6. At the point where the desired viscosity intersects with the line you constructed, draw another straight line down to the bottom of the chart.
7. Find the percent of the higher viscosity fluid to be blended. This is indicated on the scale at the bottom of the chart (e.g. 83%).

To achieve a viscosity of 3,800 cSt as shown in the example, mix 83% of 4500 cSt and 17% of 500 cSt fluids. **The percentages of the two fluids to be blended will add up to 100%.**



This method is reasonably accurate in yielding the necessary blend ratio when the difference in viscosity is one magnitude (one power of ten) or smaller. If the fluids have a greater difference in viscosity, the desired viscosity will most likely not appear on the line drawn between the viscosities of the fluids to be blended.

Fluid Solubility

Different silicone fluids may be more easily dispersed in some solvents compared to others. The following chart features a list of common solvents and the general solubility of silicone fluids to them.

	MED-361	MED-400	MED-420	MED-460
Hexane	S	I	S	I
Heptane	S	I	S	I
Mineral Spirits	S	I	S	SI
Toluene	S	SI	S	SI
Xylene	S	SI	S	SI
MIBK	S	S	S	S
IPA	S	I	SI	SI
Methylene Chloride	S	S	S	S
Acetone	S	S	S	S
Tert Butyl Acetate	S	S	S	S

S=Soluble I=Insoluble SI=Slightly Insoluble

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SILICONE GELS

A silicone gel is an unreinforced, loosely crosslinked network of polymers. Due to the lack of reinforcing filler, gels tend to be low in viscosity in the uncured state, allowing flexibility for various processing techniques. Not only can the crosslink density of the silicone polymers be designed to yield a very firm or soft gel, but the work time and cure profile can also be modified. Accordingly, gels can be used in a variety of applications, including sheeting and encapsulating sensors or electronic devices. Additionally, NuSil's restricted tacky gels can be used as temporary adhesives.

Important Properties of Gels

Silicone gels have a long history of biocompatibility. The following list highlights the properties that make silicone gel systems valuable in the healthcare field:

- Solvent-free
- Modifiable tack and penetration
- Varying viscosities
- Adjustable cure profiles
- Non-allergenic
- Superior breathability

Processing Gels

Airless mixing, metering and dispensing are recommended for production processing, however NuSil's gels may also be mixed by hand.

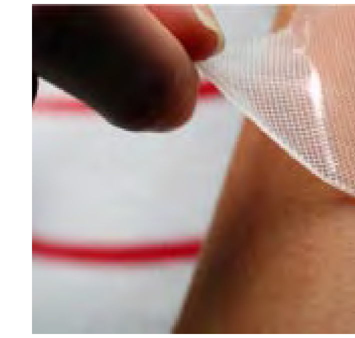
Storage

NuSil recommends storing gels in containers made from stainless steel, polypropylene, high density polyethylene or glass.

Mixing and De-airing

Because of their low viscosity, gels may need to be mixed longer and more aggressively compared to other silicone systems. The appropriate length of mixing time will depend on whether you are mixing mechanically or manually, but NuSil estimates the mixing time for gels may be between five and ten minutes. Stainless steel or glass containers are ideal, but all mixing vessels should be evaluated for compatibility and inhibition. Do not use wooden spatulas to mix and avoid the use of latex gloves.

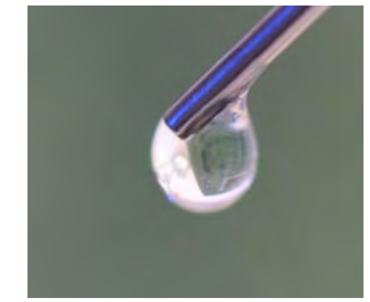
Remove air entrapped after mixing by common vacuum deaeration procedures (slowly applying vacuum up to approximately 28 inches of mercury at (0.95 Barr)) observing all safety precautions. Slowly apply full vacuum to a container rated for use and at least four times the volume of material being deaerated. Hold vacuum until bulk deaeration is complete.



Tacky Gels

Silicone tacky gels are ideal for processing into sheets or pads for various topical applications requiring a temporary adhesive. Some key examples include:

- Wound care
- Scar management therapies
- Transdermal therapeutic systems
- Face masks
- Ostomy and incontinence care products



Silicone gels have a history of biocompatibility, are non-allergenic, and offer superior breathability. In addition, dimethyl silicone tacky gels provide the best moisture permeability on the market, demonstrating Water Vapor Transmission Rates (WVTR) values of up to 68 gm/m2/day.

The advantages of using a silicone tacky gel system are:

- Solvent-free
- Modifiable tack
- Varying viscosities
- Adjustable cure profiles

Surface Tack at Varying Cure Conditions

	NuSil Test Method	MED-6342	MED-6345	MED-6350
Standard Cure		45 min @135 °C	3 hrs @ 60°C	30 min @ 100°C
Surface Tack	TM103	11 psi	6 psi	5 psi
High Temp. Cure		60 min @ 150°C	60 min @150°C	60 min @ 150°C
Surface Tack	TM103	11 psi	5.5 psi	4.5 psi

Cure time may have an affect on both surface tack and cohesive strength properties.

NuSil's Restricted Product Numbers	Comments	Cure System	Work Time @ 25°C	Mix Ratio	Certified Cure Schedule** Time / °C	Post Cure Time / °C	Durometer Type A		Penetration mm (in) Shaft weight / foot diameter / time	Tensile psi (MPa)		Elongation %		Specific Gravity	Viscosity cP
			Typical				Certified	Typical	Typical	Certified	Typical	Certified	Typical	Typical	Typical
GELS															
MED-6340	LOW PENETRATION, LOW TACK GEL	PLATINUM	45 m	1:1	30 m / 140	-	-	-	3 (0.1) 51 g / 3.2 mm / 15 s	-	-	-	-	0.98	8,000
MED-6342	LOW PENETRATION, HIGH TACK GEL	PLATINUM	10 h	1:1	45 m / 135	-	-	-	1.25 (0.05) 19.5 g / 6.35 mm / 5 s	-	-	-	-	-	8,000
MED-6345	MEDIUM PENETRATION, MEDIUM TACK GEL	PLATINUM	30 m	1:1	3 h / 60	-	-	-	5 (0.2) 19.5 g / 6.35 mm / 15 s	-	-	-	-	0.97	12,000
MED-6350	LOW PENETRATION, MEDIUM TACK GEL	PLATINUM	2 h	1:1	30 m / 100	-	-	-	1.7 (0.07) 19.5 g / 6.35 mm / 15 s	-	-	-	-	-	22,000
MED-6370	SOFT GEL	PLATINUM	6 h	1:1	90 m / 80	-	-	-	9 (0.4) 19.5 g / 6.35 mm / 5 s	-	-	-	-	0.98	600
MED12-6381	FIRM RTV GEL	CONDENSATION	N/A	97:2.5:0.5	30 m / 25	24 h / 25	65 (00)	75 (00)	-	45 (0.3)	70 (0.48)	-	125	0.98	10,000

** Test specimen cure parameters

h = hours
m = minutes

s = seconds
mm = millimeters
in = inches
g = grams

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Creative Partners in a Material World

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