

IMPLANT LINE



PRODUCT GUIDE

LONG TERM COMMITMENT

Our signature Implant Line offers a complete range of silicones that are the preferred choice for long-term implant devices. Like all of our medical grade silicones, they are designed, manufactured and purified to meet the strictest requirements of the healthcare industry.

NuSil™ Care

High-risk industries demand a higher level of customer support. Over decades, we've refined our support systems to meet the high-touch needs of our customers. We call this premium level of support NuSil™ Care, and it's our standard across all industries.

Liquid Injection Molding

Our liquid silicone rubbers, or LSRs, are designed for liquid injection molding (LIM) including overmolding. NuSil™ LSRs are used to create precision molded components such as o-rings, gaskets, valves, seals, and other parts.



LIQUID SILICONE RUBBERS

PRODUCT NUMBERS	DUROMETER TYPE A	TENSILE psi (MPa)	STRESS @ STRAIN psi (MPa) @ %	ELONGATION %	TEAR ppi (kN/m)	CERTIFIED CURE SCHEDULE TIME / °C	COMMENTS
MED-4810	11	700 (4.8)	45 (0.3) @ 200	1,075	65 (11.5)	5 m / 150	Key Features of NuSil™ LSRs: <ul style="list-style-type: none"> • Designed for High-throughput Manufacturing • Platinum Cure System—No Post-Cure Required • Able to Cure Rapidly at Elevated Temperatures • Easily Pigmented Using NuSil™ Color Masterbatches • Formulated as 1:1 Mix Ratio
MED-4820	20	910 (6.3)	65 (0.5) @ 200	875	125 (22.0)	5 m / 150	
MED-4830	30	1,350 (9.3)	175 (1.2) @ 200	750	150 (26.5)	5 m / 150	
MED-4840	43	1,180 (8.1)	425 (2.9) @ 200	590	245 (43.2)	5 m / 150	
MED-4850	50	1,475 (10.2)	400 (2.8) @ 200	675	240 (42.3)	5 m / 150	
MED-4860	60	1,350 (9.3)	600 (4.1) @ 200	530	255 (45.0)	5 m / 165	
MED-4870	70	1,500 (10.3)	750 (5.2) @ 200	415	230 (40.6)	5 m / 165	
MED-4880	80	1,030 (7.1)	650 (4.5) @ 100	265	90 (15.9)	5 m / 165	

SPECIALTY LIQUID SILICONE RUBBERS

PRODUCT NUMBERS	DUROMETER TYPE A	TENSILE psi (MPa)	STRESS @ STRAIN psi (MPa) @ %	ELONGATION %	TEAR ppi (kN/m)	CERTIFIED CURE SCHEDULE TIME / °C	COMMENTS
MED50-5338	30	650 (4.5)	230 (1.6) @ 200	350	37 (6.5)	30 m / 150	50M% Fluorosilicone
MED-5440	40	1,250 (8.6)	--	380	60 (10.6)	30 m / 150	100M% Fluorosilicone
MED-4842	44	1,070 (7.4)	525 (3.6) @ 200	400	250 (44.1)	10 m / 150	Resists blocking
MED1-4855	55	1,100 (7.6)	525 (3.6) @ 200	475	240 (42.3)	5 m / 165	Self-lubricating

All materials are Platinum cure

m = minutes

STRENGTH IN NUMBERS

Extrusion & Molding

NuSil™ high consistency rubbers, or HCRs, are designed for extrusion, calendaring and compression or transfer molding. HCRs are available for extruding medical tubing, rod, or ribbon profiles. They are used to calendar sheeting for die-cutting, and molding parts such as balloons, gaskets or o-rings.

Platinum vs. Peroxide Cure Systems

Our HCRs are available in two cure systems: platinum and peroxide.

Platinum cure:

- Typically Two-Part Systems
- No Byproducts
- Post Cure Optional

Peroxide cure:

- Typically One-Part Systems
- Indefinite Work Time
- Post Cure Typically Required



HIGH CONSISTENCY RUBBER (PLATINUM CURE)

PRODUCT NUMBERS	DUROMETER TYPE A	TENSILE psi (MPa)	STRESS @ STRAIN psi (MPa) @ %	ELONGATION %	TEAR ppi (kN/m)	WORK TIME @ 25°C	PLASTICITY mils	SPECIFIC GRAVITY	CERTIFIED CURE SCHEDULE TIME / °C	POST-CURE TIME / °C	COMMENTS
MED-4714	15	715 (4.9)	40 (0.28) @ 200	1,385	155 (27.3)	> 24 h	60	1.08	10 m / 116	--	--
MED-4720	25	1,390 (9.6)	75 (0.52) @ 200	1,240	190 (33.5)	10 h	65	1.10	10 m / 116	--	--
MED-4725	30	1,395 (9.6)	110 (0.76) @ 200	890	135 (23.8)	2 h	85	1.11	10 m / 171	--	Low tension set
MED-4735	35	1,535 (10.6)	180 (1.2) @ 200	1,055	195 (34.4)	3.5 h	70	1.11	10 m / 116	--	--
MED-4750	50	1,545 (10.7)	300 (2.1) @ 200	1,050	270 (47.6)	2.5 h	95	1.16	10 m / 116	--	--
MED-4765	65	1,240 (8.6)	355 (2.4) @ 200	1,005	265 (46.7)	6 h	125	1.20	10 m / 116	--	--
MED-4780	80	1,155 (8.0)	450 (3.1) @ 200	740	225 (39.7)	8.5 h	125	1.20	10 m / 116	--	--

ULTRA-HIGH PERFORMANCE

MED-4727	30	2,300 (15.9)	100 (0.7) @ 200	1,050	235 (41.2)	2.5 h	75	1.11	10 m / 171	--	Ultra-high tensile
MED-4755	55	1,640 (11.3)	490 (3.4) @ 200	875	310 (54.6)	2.5 h	85	1.14	10 m / 138	4 h / 177	Ultra-high tear
MED-4770	70	1,415 (9.8)	595 (4.1) @ 200	760	300 (52.9)	2.5 h	120	1.19	10 m / 138	4 h / 177	Abrasion / fatigue resistant

h = hours

HIGH CONSISTENCY RUBBERS (PEROXIDE CURE)

PRODUCT NUMBERS	DUROMETER TYPE A	TENSILE psi (MPa)	STRESS @ STRAIN psi (MPa) @ %	ELONGATION %	TEAR ppi (kN/m)	PLASTICITY mils	SPECIFIC GRAVITY	CERTIFIED CURE SCHEDULE TIME / °C	POST-CURE TIME / °C	COMMENTS
MED-4520	28	1,320 (9.1)	105 (0.7) @ 200	950	135 (23.8)	65	1.10	5 m / 116	2 h / 177	Uncatalyzed
MED-4535	35	1,300 (9.0)	185 (1.3) @ 200	800	125 (22.0)	70	1.10	5 m / 116	2 h / 177	Uncatalyzed
MED-2174	50	1,300 (8.9)	325 (2.2) @ 200	750	225 (39.7)	110	1.15	5 m / 116	4 h / 205	Uncatalyzed
MED-4550	50	1,400 (9.7)	250 (1.7) @ 200	750	195 (34.4)	85	1.16	5 m / 116	2 h / 177	Uncatalyzed
MED4-4515	50	1,650 (11.4)	400 (2.8) @ 200	500	100 (17.6)	90	1.15	5 m / 116	2 h / 249	Pre-catalyzed with non-vinyl specific peroxide
MED-4565	65	1,250 (8.6)	375 (2.6) @ 200	700	200 (35.3)	115	1.21	5 m / 116	2 h / 177	Uncatalyzed
MED4-4516	70	1,300 (9.0)	500 (3.4) @ 200	450	130 (22.9)	120	1.21	5 m / 116	2 h / 249	Pre-catalyzed with non-vinyl specific peroxide

m = minutes

It is the sole responsibility of each purchaser to ensure that any use of these materials is safe and complies with all applicable laws and regulations. It is the user's responsibility to adequately test and determine the safety and suitability for their applications and NuSil Technology LLC makes no warranty concerning fitness for any use or purpose.

BONDED FOR LIFE

Bonding

NuSil™ adhesives offer excellent bonding to substrates including silicones, metals, polyurethanes and a variety of plastics.

Key Features of NuSil™ Adhesives:

- Variable Cure Times for Faster Throughput
- Low Modulus Prevents Warping, Delamination and Substrate Failure

Primers may be used to improve the bond between a silicone adhesive and a substrate (silicone, metal, and certain plastics).

Soft Tissue Implants

Our high-purity gels tend to be low in viscosity when uncured and can range in hardness from very firm to soft making them suitable for a variety of applications including soft tissue implants.

Key Features of NuSil™ Gels:

- Solvent-Free
- Modifiable Penetration
- Adjustable Cure Profiles
- Non-Allergenic
- Superior Permeability



ADHESIVES

PRODUCT NUMBERS	FLOW Inches	WORK TIME @ 25°C	DUROMETER TYPE A	TENSILE psi (MPa)	STRESS @ STRAIN psi (MPa) @ %	ELONGATION %	TEAR ppi (kN/m)	CERTIFIED CURE SCHEDULE TIME / °C	COMMENTS
1 PART RTV									
MED-1137	0.2	< 8 m	30	700 (4.8)	170 (1.2) @ 200	560	--	72 h / RTV	Non-Self-Leveling
MED-1511	0.9	< 10 m	25	1,440 (9.9)	130 (0.9) @ 200	680	95 (16.7)	72 h / RTV	Self-Leveling
MED-2000	2.2	< 10 m	25	1,375 (9.5)	105 (0.7) @ 200	800	80 (14.1)	72 h / RTV	Self-leveling
2 PART HEAT CURE									
MED1-4213	0.2	15 m	20	930 (6.4)	--	820	110 (19.3)	24 h / RTV	Designed to cure at room temperature or rapidly at elevated temperatures.
MED2-4213	0.6	15 h	15	845 (5.8)	--	850	120 (21.1)	15 m / 150	Designed to cure with elevated temperatures.
MED3-4213	0.8	2 h	20	945 (6.5)	--	745	110 (19.3)	24 h / RTV	Designed to cure at room temperature or rapidly at elevated temperatures.

RTV = Room Temperature Vulcanizing

GELS

PRODUCT NUMBERS	PENETRATION mm (in) (Shaft weight / ft diameter / time)	VISCOSITY cP (mPa-sec)	MIX RATIO	CERTIFIED CURE SCHEDULE TIME / °C	SPECIFIC GRAVITY	COMMENTS
MED-6311	2.6 (0.1) 12g / 25.4 mm / 5 s	500	1:1	3.5 h / 160	0.97	Low penetration, high strength gel
MED1-6300	5 (0.2) 12 g / 25.4 mm / 15 s	1,000	1:1	5 h / 140	0.98	Medium penetration, soft responsive gel
MED2-6300	10 (0.4) 19.5 g / 6.35 mm / 15 s	1,000	1:1	5 h / 140	0.97	Low penetration, firm cohesive gel
MED3-6300	15 (0.6) 12 g / 25.4 mm / 15 s	1,000	3:1	5 h / 140	0.97	High penetration, soft responsive gel

All materials are Platinum cure

s = seconds

m = minutes

h = hours

PRIMERS

PRODUCT NUMBERS	SOLIDS CONTENT %	COMMENTS
MED-160	4.0	General all-purpose primer. Use with platinum or moisture cure silicones.
MED1-161	4.5	Increased adhesion to aluminum. Use with platinum cure silicones.
MED2-161	4.5	Increased adhesion to most metals. Use with platinum cure systems.
MED6-161	8.7	Increased adhesion to titanium, polysulfone (PSU), polycarbonate (PC), polyurethane (PU). Recommended where platinum inhibition is of concern.
MED-162	15.0	Increased adhesion to polycarbonate (PC), polyurethane (PU), and polyetheretherketone (PEEK)
MED-163	15.0	Improved adhesion to polyimide (PI). Recommended where platinum inhibition is of concern.
MED-164	10.0	Increased adhesion to various substrates. Designed for use with moisture cure systems.
MED-165	4.8	Increased adhesion to various metals.
MED-166	6.5	Dispersed in IPA, compatible with acrylics

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SERVE AND PROTECT

Molding, Potting & Encapsulating

NuSil™ low viscosity elastomers are useful alternatives to LSR and HCR for design engineers who need a flowable elastomer. They are available for encapsulating a device or molding lenses. Due to their low viscosity, these elastomers make a great base material that can easily incorporate fillers.

Key Features of NuSil™ Low Viscosity Elastomers:

- Self-Leveling and Flowable
- Low Temperature Cure

Dip Molding & Spraying

NuSil™ dispersions are silicone elastomer systems that are dispersed in a solvent carrier. They are ideal for applications where a thin film coating is needed, or for dipping and spraying processes.

Key Features of NuSil™ Dispersions:

- Viscosity and Solids Content Easily Adjusted by Modifying Solvent Ratio
- Available in Both Heat and Room Temperature Curing Systems



LOW VISCOSITY ELASTOMERS

PRODUCT NUMBERS	VISCOSITY cP (mPa-sec)	WORK TIME @ 25°C	DUROMETER TYPE A	TENSILE psi (MPa)	STRESS @ STRAIN psi (MPa) @ %	ELONGATION %	TEAR ppi (kN/m)	MIX RATIO	CERTIFIED CURE SCHEDULE TIME / °C	POST-CURE TIME / °C	COMMENTS
MED-6215	5,000	5 h	50	1,250 (8.6)	--	100	--	10:1	15 m / 150	--	Clear, 1.41 R.I.
MED-4286	6,350	17.5 h	55 (000)	45 (0.28)	8 (0.06) @ 200	475	--	1:1	45 m / 150	--	Ultra-soft
MED-6210	16,000	4 h	50	930 (6.4)	--	140	35 (6.1)	1:1	30 m / 150	--	Clear, 1.43 R.I.
MED2-4420	20,500	3 m	20	600 (4.1)	100 (0.7) @ 200	500	--	1:1	15 m / 150	--	Rapid RTV cure
MED4-4420	23,250	> 24 h	17	700 (4.8)	--	600	35 (6.2)	1:1	15 m / 150	--	--
MED-6219	25,500	2.5 h	75	1,300 (9.0)	--	65	35 (6.2)	1:1	2 h / 50	--	--
MED-6820	66,000	4.5 h	40	670 (4.6)	--	210	40 (7.6)	1:1	30 m / 150	--	Clear, 1.43 R.I.
MED-6233	73,500	> 24 h	50	740 (5.1)	--	380	80 (14.1)	1:1	30 m / 150	--	Clear, 1.41 R.I.
MED-4211	95,600	--	25	685 (4.7)	--	530	--	10:1	3 m / 150	1 h / 150	--
MED-4244	118,200	4 h	40	865 (6.0)	480 (3.3) @ 200	350	150 (26.4)	10:1	5 m / 177	1 h / 150	--

m = minutes
h = hours

DISPERSIONS

PRODUCT NUMBERS	VISCOSITY cP (mPa-sec)	SOLIDS CONTENT %	DUROMETER TYPE A	TENSILE psi (MPa)	STRESS @ STRAIN psi (MPa) @ %	ELONGATION %	TEAR ppi (kN/m)	SOLVENT	CERTIFIED CURE SCHEDULE TIME / °C	COMMENTS	
1 PART RTV											
MED6-6606	95	30.0	20	1,190 (8.3)	50 (0.34) @ 100	800	115 (20.3)	Heptane	3 d / RTV	RTV Adhesive	
MED-6605	700	29.0	25	1,500 (10.3)	110 (0.7) @ 300	980	120 (21.1)	Xylene	5 d / RTV	RTV	
MED-6655	700	60.0	35	775 (5.3)	--	425	45 (7.9)	Tert Butyl Acetate	3 d / RTV	100M% Fluorosilicone	
2 PART HEAT CURE											
MED-6600	350	35.0	25	1,200 (8.3)	300 (2.0) @ 300	800	160 (28.2)	Xylene	30m / 25°C + 45m / 75°C + 135m / 150°C	1.46 R.I.	
MED-6400	860	35.0	30	1,600 (11.3)	350 (2.4) @ 300	850	160 (28.2)	Xylene	30m / 25°C + 45m / 75°C + 135m / 150°C	1.43 R.I.	
MED-6640	3,000	20.0	40	1,700 (11.7)	150 (1.03) @ 100	1,000	300 (52.9)	Xylene	30m / 25°C + 45m / 75°C + 135m / 150°C	Ultra-high tear	
SPECIALTY DISPERSIONS											
MED-6670	20	25.0	--	--	--	--	--	Xylene	5 m / 150	Low coefficient of friction coating	

RTV = Room Temperature Vulcanizing
m = minutes
d = days

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THE FLUID ANSWER

Lubrication

NuSil™ fluids are non-curing, silicone polymers typically used as lubricants. Dimethyl fluids are designed for lubricating thermoplastic parts and our fluoro fluids are designed to lubricate silicone parts. Depending on the viscosity, fluids can be applied by spraying, dipping, wiping, or brushing.

Radio Opacity

Our masterbatches offer off-the-shelf pigmenting options for silicone devices intended for the medical device market. These masterbatches are intended to yield a radio opaque adhesive, liquid silicone rubber (LSR), or high consistency silicone rubber (HCR).

Pad Printing

NuSil™ silicone marking inks are available in a variety of colors and are specifically designed for pad printing and silk screening healthcare devices.



FLUIDS

PRODUCT NUMBERS	VISCOSITY cP (mPa·sec)	SPECIFIC GRAVITY	COMMENTS
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DIMETHYL

MED-360	100 - 12,500	0.97	Non-functional lubricant
MED-366	1,000	0.97	Highly purified
MED-367	5,000	0.97	Highly purified

FLUOROSILICONE

MED-420	350 - 12,500	1.05	Methyl fluoro copolymer (low fluoro)
MED-460	350 - 12,500	1.21	Methyl fluoro copolymer (high fluoro)
MED-400	350 - 12,500	1.26	Fluorosilicone polymer

Custom viscosities available upon request

RADIO OPAQUE MASTERBATCHES

PRODUCT NUMBERS	EXTRUSION RATE g/min PLASTICITY mils	SPECIFIC GRAVITY	COMMENTS
MED2-4800	800 g/min	1.14	LSR masterbatch, 50% BaSO4
MED2-4502	218 mils	2.31	HCR masterbatch, 75% BaSO4

INKS

PRODUCT NUMBERS	VISCOSITY cP (mPa·sec)	SOLIDS CONTENT %	MIX RATIO	CERTIFIED CURE SCHEDULE TIME/°C	COMMENTS
MED8-6608-2	800	70.0	1 PART	7 d / RTV	RTV black ink, increased hiding power
MED-6608-X	1,150	70.0	1 PART	7 d / RTV	RTV Ink available in white and black
MED-6613-X	2,000	65.0	1:1	5 m / 150	Heat curable ink in various colors

RTV = Room Temperature Vulcanizing
m = minutes
d = days

REGULATORY SUPPORT

For over 35 years, we have been assisting medical device and pharmaceutical companies in obtaining regulatory clearance for their products. That commitment extends well beyond the sale of our silicones. We provide the technical and regulatory expertise needed for approval and are willing to communicate directly with regulatory authorities on behalf of our customers.

We have submitted over 700 device Master Files (MAFs) to the United States Food & Drug Administration (FDA) and international authorities in support of our medical grade silicones. A critical element of our MAFs is the biological testing performed on the products found in this guide. Our materials meet the test requirements listed below.

BIOLOGICAL EFFECT	TEST	STANDARD
CYTOTOXICITY	Cytotoxicity testing using the ISO Elution Method	ISO 10993-5
HEMOLYSIS	In Vitro Hemolysis Study (Extract)	ISO 10993-4
SYSTEMIC TOXICITY	USP Systemic Toxicity Study (Extracts)	ISO 10993-11
INTRACUTANEOUS REACTIVITY	Acute Intracutaneous Reactivity Study (Extracts)	ISO 10993-10
IMPLANTATION (ONE WEEK)	USP Muscle Implantation	ISO 10993-6
IMPLANTATION (TWELVE WEEKS)	USP Muscle Implantation	ISO 10993-6
GENOTOXICITY	Bacterial Reverse Mutation Study	ISO 10993-3
RABBIT PYROGEN	Pyrogen Study -- Material Mediated	ISO 10993-11
SENSITIZATION	ISO Maximization Sensitization (GPMT)	ISO 10993-10

CUSTOMIZATION MASTERED 3,000+ STANDARD PRODUCTS AND BEYOND

We know that standard solutions don't always fit. That's why we create customized products based on our customers' unique applications. And after three decades serving the most demanding industries, we've honed our processes and proprietary equipment to take customization to a mass scale.

Today, we have over 3,000 standard products that can easily be mass customized to your precise, unique specifications. Whether you require boutique creations or mass-market offerings, we are committed to creating your products, your way. www.nusil.com/customization

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NUSIL™ MEDICAL GRADE SILICONES

All of our medical grade silicones are specifically designed, manufactured and purified to meet the strictest requirements of the healthcare industry. These products are made under applicable cGMP standards in facilities indirectly or directly regulated by US FDA and are typically supported with master files.

Choose from our three lines of medical grade silicones:

	IMPLANT	PREMIUM CARE	CLASS VI
USE	IMPLANTABLE	IMPLANTABLE (≤ 29 DAYS)	NOT IMPLANTABLE
SPECIFICATIONS/ PACKAGING	CUSTOMIZABLE	CUSTOMIZABLE	STANDARD
REGULATORY SUPPORT/ TESTING	IMPLANT	PREMIUM	CLASS VI
CUSTOMER SERVICE	NUSIL™ CARE		

Please contact NuSil Technology LLC for assistance and recommendations in choosing a particular product line.

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