

Biomaterials
Product Guide

Premium Care & Class VI lines



Medical-grade silicones

COMMITMENT TO CARE AND INNOVATION

For more than 30 years, the NuSil™ brand has been continuously supplying medical device manufacturers with silicones of the highest purity and long-term stability for general healthcare applications. Our market-leading, medical-grade silicones for use in and on the body are trusted to help save and improve the quality of life worldwide.

Industry leaders depend on the quality, purity and reliability of our silicones for a wide range of life-saving and life-enhancing medical devices and healthcare products.

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 the U.S. Food and Drug Administration and are typically supported with Master Files.

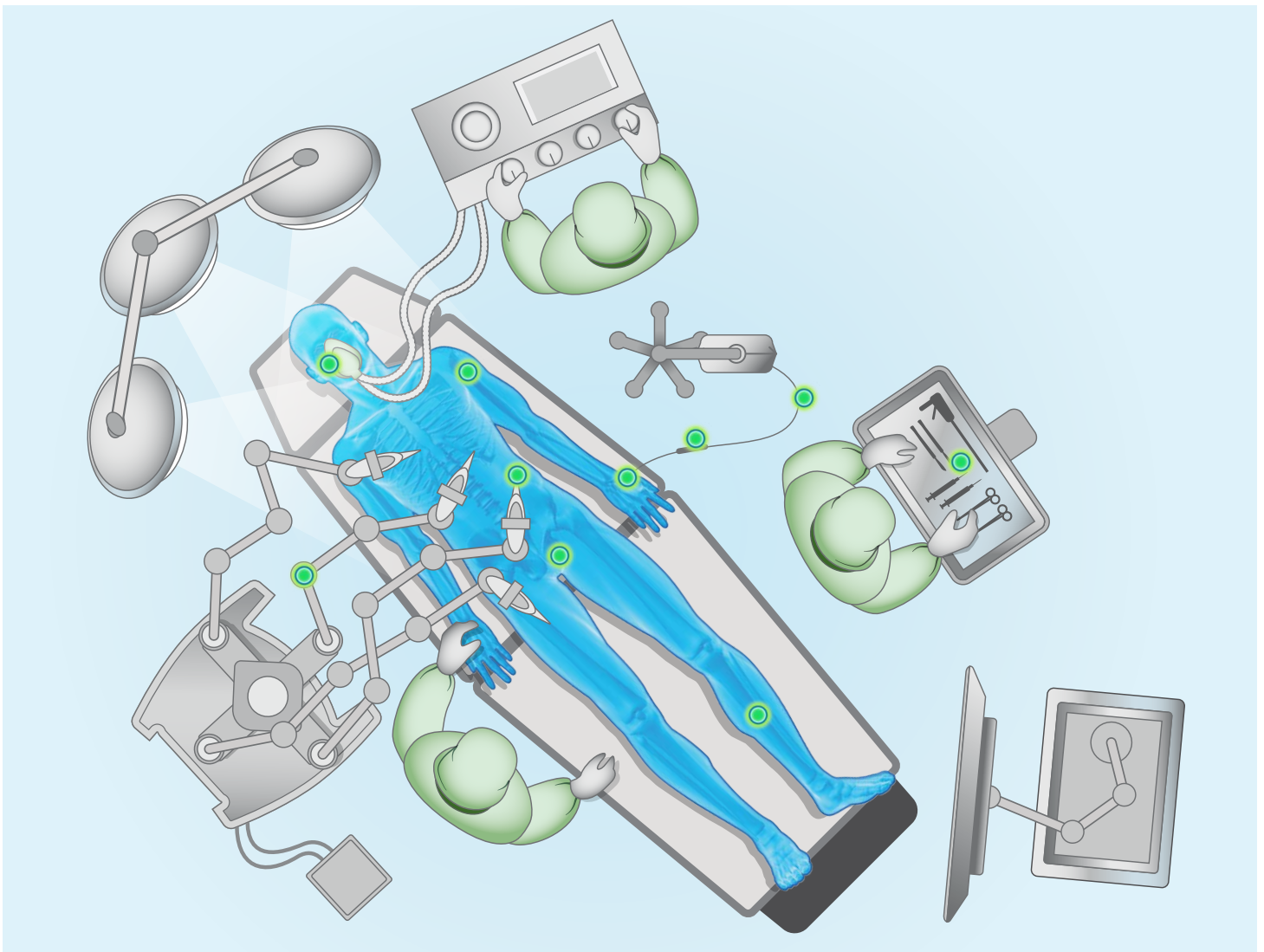


Applications

We leverage our insight into the unique performance characteristics of high-purity silicones to help medical device manufacturers explore and expand their use into multiple therapeutic applications.

Leading applications for NuSil Premium Care and Class VI silicones include:

- Needle coatings
- IV sets
- Airway management
- Catheters
- Wound care and scar management
- Prosthetics
- Surgical tools and robotics



Premium Care & Class VI products

Our Premium Care medical-grade silicones provide proven solutions for general healthcare applications requiring something beyond standard offerings, such as product customization, specialized packaging and/or a higher level of regulatory support. Our Class VI portfolio includes high-value, readily available products that deliver cost efficiencies, standard packaging and testing necessary for high-volume production applications. Both lines are designed for use in medical applications that are not implanted for greater than 29 days.



LIQUID SILICONE RUBBERS

Liquid silicone rubbers (LSRs) are designed for liquid injection molding and provide an excellent material for precision molded components, such as O-rings, gaskets, valves and seals.



HIGH CONSISTENCY RUBBERS

High consistency rubbers (HCRs) are strong silicone materials well-suited for fabrication processes, such as extruding, calendaring and compression or transfer molding into a wide range of parts. NuSil's HCR portfolio features both peroxide and platinum cure systems.



LOW VISCOSITY ELASTOMERS AND DISPERSIONS

Low viscosity elastomers provide a flowable silicone that can be used to encapsulate a device or be low-pressure molded into a part. Dispersions are ideal for processes where the silicone is applied as a thin film coating or for dip molded parts.



ADHESIVES AND PRIMERS

Our silicone adhesives range from adhesive elastomers for permanent bonding to temporary adhesives, such as soft silicone adhesives or pressure sensitive adhesives. Our primers can be applied to substrates to improve adhesion.



LUBRICANTS

Silicone lubricants are used to reduce friction within device components or against human tissue.



SPECIALTY MATERIALS

Our specialty materials include radiopaque masterbatches, as well as silicone marking inks and foams.

REGULATORY SUPPORT

For over three decades, we have been helping medical device companies obtain 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 international regulatory authorities on behalf of our customers.

NuSil maintains over 700 Master Files (MAFs) with the United States Food & Drug Administration (FDA) in support of our Premium Care and Class VI products. A critical element of the MAF is the biological testing performed on the majority of products in our portfolio.



			PREMIUM CARE LINE	CLASS VI LINE
Master File on file with FDA			•	
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 (Extract)	ISO 10993-10	•	•
Implantation (one week)	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

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 of serving the most demanding industries, we've honed our processes and proprietary equipment to take customization to a mass scale.

NuSil has the ability to customize products and packaging according to individual requirements for an array of convenient options that meet our customers' needs. We have over 3,000 standard products that can be customized to very unique specifications.



Liquid silicone rubbers (LSRs)

Description

Liquid silicone rubbers (LSRs) have a consistency similar to petroleum jelly and are designed for high throughput manufacturing processes, such as liquid injection molding and overmolding.

Applications

NuSil's LSRs provide an excellent material for precision molded components, such as O-rings, gaskets, valves and seals.

Key properties and considerations

- No post-cure required
- Ability to cure rapidly with increased temperatures
- Can be supplied in small hand-held cartridges
- Solvent resistance and high clarity options available
- Easily pigmented using NuSil color masterbatches

LIQUID SILICONE RUBBERS (PREMIUM CARE)

PRODUCT NUMBERS	DUROMETER TYPE A	TENSILE psi (MPa)	ELONGATION %	TEAR ppi (kN/m)	STRESS @ STRAIN psi (MPa) @ %	CURE RATE T90 m @ 138°C	CURE RATE SCORCH m @ 138°C	SPECIFIC GRAVITY
MED-4901	40 (00)	335 (2.3)	1,085	55 (9.7)	25 (0.2) @ 300	1.30	0.75	1.10
MED-4905	60 (00)	595 (4.1)	1,070	80 (14.1)	35 (0.2) @ 200	2.05	0.95	1.08
MED-4910	65 (00)	680 (4.7)	1,025	75 (13.2)	50 (0.3) @ 200	1.90	1.00	1.07
MED-4920	20	845 (5.8)	875	115 (20.3)	55 (0.4) @ 200	2.00	1.50	1.14
MED-4930	30	1,350 (9.3)	730	150 (26.3)	190 (1.3) @ 200	2.45	1.35	1.13
MED-4940	40	1,190 (8.2)	560	265 (46.9)	445 (3.0) @ 200	2.10	1.45	1.12
MED-4950	50	1,445 (9.9)	700	245 (42.9)	395 (2.7) @ 200	2.35	1.40	1.14
MED-4960	60	1,365 (9.4)	520	310 (54.2)	585 (4.0) @ 200	2.00	1.05	1.16
MED-4970	70	1,460 (10.0)	415	270 (47.3)	810 (5.6) @ 200	2.30	1.05	1.16
MED-4980	80	1,080 (7.4)	285	110 (19.2)	865 (6.0) @ 200	2.00	0.85	1.16

SPECIALTY LIQUID SILICONE RUBBERS

PRODUCT NUMBERS	DUROMETER TYPE A	TENSILE psi (MPa)	ELONGATION %	TEAR ppi (kN/m)	STRESS @ STRAIN psi (MPa) @ %	CURE RATE T90 m @ 138°C	CURE RATE SCORCH m @ 138°C	SPECIFIC GRAVITY	COMMENTS
MED50-5438	30	710 (4.9)	355	50 (8.8)	295 (2.0) @ 200	2.82	1.23	1.26	50M% fluorosilicone
MED10-5440	30	1,015 (6.9)	365	50 (8.8)	260 (1.8) @ 200	2.53	2.02	1.38	100M% fluorosilicone
MED30-4940-1	35	990 (6.8)	535	235 (41.4)	375 (2.4) @ 200	2.15	1.02	1.11	Self-lubricating, medium
MED-4942	40	955 (6.6)	435	215 (38.0)	470 (3.2) @ 200	2.31	1.44	1.15	Resists blocking
MED1-4955	55	1,165 (8.0)	440	250 (44.1)	550 (3.6) @ 200	2.2	1.1	1.14	Self-lubricating, high
MED2-4955	60	1,275 (8.8)	490	265 (46.7)	625 (4.3) @ 200	1.94	1.04	1.15	Self-lubricating, medium
MED-4971	65	945 (6.5)	245	155 (27.1)	900 (6.2) @ 200	2.75	0.75	1.16	High clarity



LIQUID SILICONE RUBBERS (CLASS VI)

PRODUCT NUMBERS	DUROMETER TYPE A	TENSILE psi (MPa)	ELONGATION %	TEAR ppi (kN/m)	STRESS @ STRAIN psi (MPa) @ %	WORK TIME @ 25 °C	CURE RATE T90 m @ 138°C	CURE RATE SCORCH m @ 138°C	SPECIFIC GRAVITY
SIL-5920	20	990 (6.8)	820	85 (14.8)	90 (0.6) @ 200	>24 h	0.60	0.31	1.08
SIL-5930	30	1,355 (9.3)	815	140 (24.5)	165 (1.1) @ 200	>24 h	0.80	0.29	1.11
SIL-5940	40	1,405 (9.6)	720	165 (28.9)	270 (1.8) @ 200	>24 h	0.80	0.33	1.12
SIL-5950	50	1,460 (10.0)	580	210 (36.7)	430 (2.9) @ 200	> 72 h	0.90	0.25	1.14
SIL-5960	60	1,265 (8.7)	390	180 (31.5)	690 (4.7) @ 200	> 72 h	0.50	0.16	1.14
SIL-5970	68	1,310 (9.0)	390	230 (40.2)	880 (6.0) @200	> 72 h	0.50	0.17	1.14

Processing tips

The two parts of this system should be mixed in equal portions prior to use. Mixing in anything other than the specified ratio may yield properties outside of the specification range. Airless mixing, metering and dispensing equipment are recommended for production operations.

High consistency rubbers (HCRs)

Description

High consistency rubbers (HCRs) from NuSil have the consistency of clay and are well-suited for fabrication processes, such as extruding, calendaring and compression or transfer molding into a wide range of parts. The NuSil brand HCR portfolio features both platinum and peroxide catalyzed systems along with a line of versatile uncatalyzed HCRs that can cure using either a platinum or peroxide catalyst.

Applications

NuSil HCRs can be used to extrude rod and ribbon profiles and tubing for medical applications. They can also be calendared into sheets for die-cutting or molded into parts, such as balloons, gaskets or O-rings.

Key properties and considerations

- Green strength: ideal for extrusion processes
- High mechanical properties
- One- or two-part systems available
- Easily pigmented using NuSil color masterbatches

HIGH CONSISTENCY RUBBERS (PLATINUM CURE)

PRODUCT NUMBERS	DUROMETER TYPE A	TENSILE psi (MPa)	ELONGATION %	TEAR ppi (kN/m)	STRESS @ STRAIN psi (MPa) @ %	WORK TIME @ 25°C	CURE RATE T90 m @ 116°C	CURE RATE SCORCH m @ 116°C	SPECIFIC GRAVITY	COMMENTS
MED-4014	15	875 (6.0)	1240	160 (28.2)	45 (0.3) @ 200	25 h	2.5	1.25	1.08	Low modulus
MED-4019	55	1,290 (8.9)	645	205 (36.2)	310 (2.1) @ 200	5 h	2.99	1.3	1.23	-
MED-4020	25	1,495 (10.3)	1200	190 (33.5)	70 (0.5) @ 200	10 h	2.3	0.95	1.10	Low modulus with high tear
MED-4025	30	1,410 (9.7)	910	165 (29.1)	105 (0.7) @ 200	1.5 h	2.8	0.75	1.11	Low tension set
MED-4035	35	1,565 (10.8)	1055	195 (34.4)	195 (1.3) @ 200	2 h	2.7	1	1.11	-
MED-4050	50	1,500 (10.3)	985	265 (46.7)	305 (2.1) @ 200	3.5 h	2.6	1.1	1.16	-
MED-4065	65	1,230 (8.5)	970	270 (47.6)	355 (2.4) @ 200	6 h	2.65	0.85	1.20	-
MED-4080	75	1,210 (8.3)	735	250 (44.1)	450 (3.1) @ 200	8 h	2.75	0.8	1.20	-
ULTRA-HIGH PERFORMANCE										
MED-4027	30	2,300 (15.9)	1,050	235 (41.2)	100 (0.7) @ 200	2.5 h	4.30	2.00	1.11	Ultra-high tensile strength
MED-4055	55	1,655 (11.4)	880	315 (55.6)	490 (3.4) @ 200	2.5 h	2.85	1.00	1.14	Ultra-high tear strength
MED-4070	70	1,460 (10.1)	725	320 (56.4)	635 (4.8) @ 200	2 h	2.70	0.90	1.19	Abrasion/fatigue-resistant

HIGH CONSISTENCY RUBBERS (CLASS VI)

PRODUCT NUMBERS	DUROMETER TYPE A	TENSILE psi (MPa)	ELONGATION %	TEAR ppi (kN/m)	STRESS @ STRAIN psi (MPa) @ %	WORK TIME @ 25°C	CURE RATE T90 m @ 116°C	CURE RATE SCORCH m @ 116°C	SPECIFIC GRAVITY	COMMENTS
SIL2-5020	20	1,475 (10.2)	1185	195 (34.3)	65 (0.5) @ 200	8 h	4.79	1.42	1.1	-
SIL2-5030	30	1,690 (11.7)	1140	215 (37.8)	120 (0.8) @ 200	5 h	2.94	1.31	1.11	-
SIL2-5040	40	1,510 (10.4)	1115	220 (38.7)	140 (1.0) @ 200	4 h	3.81	1.66	1.15	-
SIL2-5050	50	1,500 (10.3)	990	255 (45.0)	335 (2.3) @ 200	4 h	4.74	1.49	1.16	-
SIL2-5060	60	1,415 (9.8)	920	265 (46.7)	390 (2.7) @ 200	11 h	5.95	1.67	1.18	-
SIL2-5070	70	1,300 (9.0)	810	260 (45.8)	400 (2.8) @ 200	2 h	3.55	1.12	1.19	-
SIL2-5080	80	1,275 (8.8)	665	210 (37.0)	500 (3.4) @ 200	> 24 h	3.66	0.99	1.2	-

Processing tips (Platinum cure)

To blend NuSil HCRs, separately soften Part A and B on a clean and cooled two-roll mill, then combine both components in equal portions. Avoid adjusting the mix ratio of the two components to accelerate the cure. Temperature can be adjusted to vary the rate of cure.

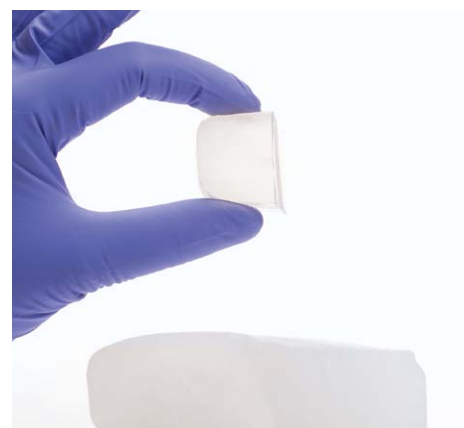
Be sure to free the area of any materials that can potentially inhibit the curing process. Most inhibitors typically have a sulfur-containing material (e.g., natural rubber, latex and neoprene), a nitrogen-containing material (e.g., amines) or an organotin-containing material (e.g., condensation-cured silicones).

Uncatalyzed HCRs

NuSil uncatalyzed HCR systems offer the flexibility of using your preferred catalyst to achieve desired properties or cure chemistry.

Pre-catalyzed HCRs

Our pre-catalyzed peroxide curing HCRs, are one-part systems that contain a dichlorobenzoyl peroxide catalyst and are ready for use.



HIGH CONSISTENCY RUBBERS (PEROXIDE CURE)

PRODUCT NUMBERS	DUROMETER TYPE A	TENSILE psi (MPa)	ELONGATION %	TEAR ppi (kN/m)	STRESS @ STRAIN psi (MPa) @ %	CURE RATE T90 m @ 116°C	CURE RATE SCORCH m @ 116°C	SPECIFIC GRAVITY	COMMENTS
MED-4128	25.00	1,010 (6.9)	780.00	70 (12.3)	90 (0.6) @ 200	1.60	0.50	1.11	Uncatalyzed, low-tension set
MED-4120	25.00	1,445 (10.0)	1005.00	165 (29.1)	80 (0.6) @ 200	1.75	0.65	1.10	Uncatalyzed
MED-4135	35.00	1,220 (8.4)	760.00	145 (25.6)	180 (1.2) @ 200	2.00	0.65	1.10	Uncatalyzed
MED-4174	50.00	1,300 (8.9)	750.00	225 (39.7)	325 (2.2) @ 200	1.60	0.55	1.15	Uncatalyzed
MED-4150	50.00	1,400 (9.7)	800.00	230 (40.9)	240 (1.7) @ 200	1.85	0.55	1.16	Uncatalyzed
MED4-4115	50.00	1,600 (11.3)	500.00	100 (17.6)	400 (2.8) @ 200	2.05	0.65	1.15	Pre-catalyzed with dichlorobenzoyl peroxide
MED-4165	65.00	1,250 (8.6)	715.00	225 (39.7)	370 (2.6) @ 200	1.70	0.50	1.20	Uncatalyzed
MED4-4116	70.00	1,300 (9.0)	450.00	130 (23.3)	470 (3.2) @ 200	2.25	0.55	1.22	Pre-catalyzed with dichlorobenzoyl peroxide

HIGH CONSISTENCY RUBBERS (PLATINUM OR PEROXIDE CURE)

PRODUCT NUMBERS	DUROMETER TYPE A	TENSILE psi (MPa)	ELONGATION %	TEAR ppi (kN/m)	STRESS @ STRAIN psi (MPa) @ %	WORK TIME* @ 25°C	CURE RATE T90 m @ 116°C	CURE RATE SCORCH m @ 116°C	SPECIFIC GRAVITY	COMMENTS
MED-4032	30	1,370 (9.4)	1070	190 (33.5)	160 (1.1) @ 200	4 h	2.85	1.15	1.10	Platinum cure variations require CAT-40 inhibitor and CAT-55 catalyst to cure. Peroxide cure variations require the use of a peroxide catalyst.
MED-4042	40	1,450 (10.0)	1040	185 (32.6)	220 (1.5) @ 200	5 h	2.60	0.80	1.11	
MED-4052	50	1,400 (9.7)	1100	230 (40.6)	280 (1.9) @ 200	3 h	2.35	0.85	1.16	
MED-4062	60	1,400 (9.7)	970	250 (44.1)	315 (2.2) @ 200	9 h	2.30	0.80	1.16	
MED-4072	70	1,100 (7.6)	875	240 (42.3)	450 (3.1) @ 200	2 h	1.75	0.60	1.22	
MED-4082	80	1,170 (8.1)	850	250 (44.1)	415 (2.9) @ 200	18 h	1.95	0.60	1.22	

Based on a platinum cure system

Processing tips (Peroxide cure)

A standard method of processing is to soften the HCR on a clean two-roll mill prior to use; if a two-part cure is used, add the peroxide catalyst after softening the base. A slight adjustment to the levels of peroxide catalyst may influence cure rate and cured properties. Also, some peroxide catalysts require a post cure to remove acidic byproducts, which may result in additional shrinkage of the molded component.



Low viscosity elastomers

Description

Low viscosity elastomers provide a flowable silicone that can be used to encapsulate a device or be low-pressure molded into a part. NuSil low viscosity elastomers offer an alternative to HCRs and LSRs with other unique properties.

Applications

Low viscosity elastomers are particularly useful for applications and manufacturing processes that are most efficient using a pourable, self-leveling silicone. Applications include encapsulating a device, backfilling a void and potting an electronic component.

Key properties and considerations

- Flowable and self-leveling
- Easy to process
- Adjustable cure schedule: low- and high-temperature cure
- Many optically clear options

LOW VISCOSITY ELASTOMERS

PRODUCT NUMBERS	VISCOSITY cP (mPa·s)	WORK TIME @ 25°C	DUROMETER Type A	TENSILE psi (MPa)	ELONGATION %	TEAR ppi (kN/m)	STRESS @ STRAIN psi (MPa) @ %	MIX RATIO	COMMENTS
MED-6015	3,800	5.5 h	50	1,200 (8.2)	100	-	-	10:1	Clear, 1.41 R.I.
MED-4086	6,450	18 h	55 (000)	-	-	-	-	1:1	Ultra-soft
MED-4917	11,750	31 h	20	500 (3.4)	385	-	120 (0.8) @ 200	1:1	-
MED-6010	16,000	4 h	50	950 (6.5)	140	30 (5.3)	-	1:1	Clear, 1.43 R.I.
MED2-4220	19,500	3 m	20	585 (4.4)	500	-	95 (0.7) @ 200	1:1	Rapid RTV
MED4-4220	22,000	27 m	17	660 (4.5)	580	35 (6.2)	80 (0.6) @ 200	1:1	RTV
MED-6019	25,500	2.5 h	75	1,300 (9.0)	65	-	-	1:1	Clear, 1.41 R.I.
MED-6020	65,000	4 h	40	680 (4.7)	215	40 (7.5)	-	1:1	Clear, 1.43 R.I.
MED-6033	72,000	50 h	50	730 (5.3)	390	80 (14.1)	650 (4.5) @ 200	1:1	Clear, 1.41 R.I.
MED-4044	73,400	5 h	40	875 (6.0)	360	150 (26.5)	480 (3.3) @ 200	10:1	-
MED3-4220	74,500	15 m	25	1,100 (7.6)	625	74 (13.5)	-	1:1	-
MED-4011	97,400	2 h	27	670 (4.6)	530	-	135 (0.9) @ 200	10:1	-



Processing tips

Blend both components of the material into a homogenous mixture and de-air if necessary to remove bubbles. Note: Heat can easily be generated during the mixing process which can cause an adverse effect on the pot life.

Dispersions

Description

NuSil silicone dispersions are silicone elastomer systems that are dispersed in a solvent carrier. Dispersions are ideal for dipping and spraying processes.

Applications

Our dispersions can be used for applications requiring a low viscosity silicone that will cure into a strong elastomer. They can be used to provide a coating on devices and create thin elastomeric films or forms.

Key properties and considerations

- Supplied as one-part RTV or two-part heat cure systems
- Ability to decrease viscosity through further dilution
- Product chemistry may influence permeability



DISPERSIONS

PRODUCT NUMBERS	DUROMETER TYPE A	TENSILE psi (MPa)	ELONGATION %	TEAR ppi (kN/m)	STRESS @ STRAIN psi (MPa) @ %	VISCOSITY cP (mPa-s)	SOLIDS CONTENT %	SOLVENT	COMMENTS
ONE-PART									
MED16-6606	20	1,240 (8.5)	800	120 (21.0)	90 (0.6) @ 200	105	30	Heptane	RTV Adhesive
MED10-6605	25	1,500 (10.3)	950	125 (22.0)	115 (0.8) @ 200	700	29	Xylene	RTV
MED-2014	35	1,700 (11.7)	900	160 (33.6)	130 (0.9) @ 200	1800	35	Xylene	Requires heat to cure
MED10-6655	35	775 (5.3)	425	45 (7.9)	310 (2.1) @ 200	700	60	Tert Butyl Acetate	RTV, 100M% fluorosilicone
TWO-PART									
MED10-6600	25	1,200 (8.3)	750	145 (25.5)	200 (1.4) @ 200	400	35	Xylene	1.46 R.I.
MED10-6400	30	1,500 (10.3)	800	150 (26.5)	210 (1.4) @ 200	800	35	Xylene	1.43 R.I.
MED10-6640	40	1,700 (11.7)	1,000	300 (52.9)	200 (1.4) @ 200	2,500	20	Xylene	Ultra-high tear

SPECIALTY DISPERSIONS

PRODUCT NUMBERS	VISCOSITY cP (mPa-s)	SOLIDS CONTENT %	SOLVENT	COMMENTS
MED10-4161	265	33	Xylene	RTV lubricious coating
MED-4159	130	53	Stoddard Solvent/IPA	RTV lubricious coating
MED10-6670	25	25	Xylene	Low CoF coating
MED-4162	30,000	31	Xylene	Wax-like coating

Processing tips

It is recommended to individually pre-mix parts A and B prior to combining the components. During the curing process, bubbles may also be caused by the presence of solvent if exposed to elevated temperatures, and de-airing may be required to assure a bubble-free product. It is recommended to increase the cure temperature slowly or utilize a multi-step curing process. This will allow the solvent to evaporate prior to the silicone curing.



Adhesives and primers

Description

NuSil brand silicone adhesives offer efficient, biocompatible and long-lasting ways to bond substrates together. The right NuSil silicone adhesives can help you achieve increased throughput, improved adhesion and greater reliability and durability.

Our primers can be used to improve the bond between a silicone adhesive and the substrates being joined by the adhesive.

Applications

NuSil silicone adhesives offer excellent bonding to a variety of substrates, including silicones, metals, polyurethanes and a variety of plastics. Our soft silicone adhesives provide permeability, protection and atraumatic removal from the skin, making them the preferred choice for wound and scar care applications

Key properties and considerations

- From thixotropic and non-slump to flowable and self-leveling
- Quick cure systems available
- Can be supplied in small handheld cartridges

ADHESIVES

PRODUCT NUMBERS	WORK TIME	DUROMETER TYPE A	TENSILE psi (MPa)	ELONGATION %	TEAR ppi (kN/m)	STRESS @ STRAIN psi (MPa) @ %	COMMENTS
ONE-PART							
MED-1040	< 9 m	25	250 (1.7)	300	20 (3.5)	130 (0.9) @ 200	Self-leveling, high flow
MED-1037	< 9 m	30	645 (4.4)	500	-	170 (1.2) @ 200	Non-slump
MED-1011	< 12 m	25	1,400 (9.7)	655	100 (17.5)	115 (0.8) @ 200	Self-leveling
MED-1000	< 14 m	25	1,325 (9.1)	725	90 (15.8)	110 (0.8) @ 200	Self-leveling
TWO-PART							
MED1-4013	15 m 20 m	20	1,000 (6.9)	760	120 (21.0)	105 (0.7) @ 200	RTV or cures rapidly with heat
MED3-4013	2 h	20	940 (6.5)	740	115 (20.2)	115 (0.8) @ 200	RTV or cures rapidly with heat
MED2-4013	72 h	14	845 (5.8)	800	130 (22.8)	85 (0.6) @ 200	HTV and cures rapidly with heat

DISPERSED ADHESIVES

PRODUCT NUMBERS	SOLVENT	DUROMETER TYPE A	TENSILE psi (MPa)	ELONGATION %	TEAR ppi (kN/m)	STRESS @ STRAIN psi (MPa) @ %	SOLIDS CONTENT %	COMMENTS
MED16-6606	Heptane	20	1,240 (8.5)	800	120 (21.0)	90 (0.6) @ 200	30	RTV adhesive
MED10-6655	Tert Butyl Acetate	35	775 (5.3)	425	45 (7.9)	310 (2.1) @ 200	60	100M% fluorosilicone
MED10-6615	Heptane	70 (00)	1,100 (7.6)	700	120 (21.0)	60 (0.4) @ 100	35	HTV adhesive

SOFT SILICONE ADHESIVES

PRODUCT NUMBERS	VISCOSITY cP (mPa-s)	WORK TIME @ 25°C	TACK psi (MPa)	PENETRATION mm 62.4g cone, 60 seconds
MED-6360	465	1 h	12.0 (0.08)	12
MED-6342	9300	2 h	10.0 (0.07)	12
MED-6345	16000	0.5 h	5.0 (0.03)	16.5
MED-6350	23000	2.5 h	6.5 (0.04)	13.9
MED-6362	8500	1 h	9.0 (0.6)	13

Processing tips

Cleaning, activating and/or priming the surface can improve adhesion by maximizing the surface's available bond sites and wettability. When working with silicone adhesives, it is important to consider the solvents, chemicals or substrates they may contact in their uncured state. Certain chemical elements and compounds can retard or inhibit the adhesive's curing process during the device handling, storing or assembly process.

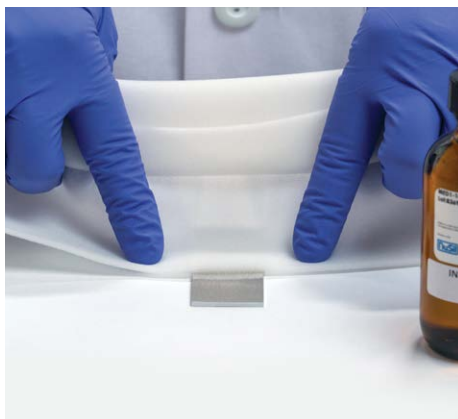


PRESSURE SENSITIVE ADHESIVES

PRODUCT NUMBERS	180° PEEL STRENGTH ppi (kN/m)	VISCOSITY cP (mPa-s)	SOLIDS CONTENT %	SOLVENT
MED-1356	3.75 (0.7)	300	50	Ethyl Acetate
MED-1356	3.0 (0.5)	1,750	65	Ethyl Acetate
MED-1353	5.0 (0.9)	3,500	68	Ethyl Acetate

PRIMERS

PRODUCT NUMBERS	SOLIDS CONTENT %	SOLVENT	COMMENTS
MED-160	4.0	Naptha	Increased adhesion to polyphthalamide (PPA). Use with platinum or moisture cure silicones.
MED-161	4.0	Naptha	Increased adhesion to aluminum. Use with platinum cure silicones.
MED6-161	9.0	Naptha	Increased adhesion to titanium, polysulfone (PSU), polycarbonate (PC), polyurethane (PU). Recommended where platinum inhibition is of concern.
MED-162	15.0	Naptha	Increased adhesion to polycarbonate (PC) and polyurethane (PU)
MED-163	15.0	Naptha	Improved adhesion to polyurethane (PU), polyvinyl chloride (PVC) and silver. Recommended where platinum inhibition is of concern.
MED-164	10.0	Naptha	Increased adhesion to various substrates. Designed for use with moisture cure systems.
MED-165	4.5	Naptha	Increased adhesion to various metals.
MED-166	6.5	IPA	Increased adhesion to, and is compatible with, acrylics.



Processing tips

For some applications, primers may be too concentrated to apply the appropriate amount, so further dilution is required. If too much primer is applied, it can negatively affect the adhesive bond.

Lubricants

Description

NuSil biocompatible silicone lubricants are used to reduce friction within device components or against human tissue.

Applications

NuSil silicone fluids help resist silicone blocking and reduce break-loose, insertion or drag forces on applications, such as needles, syringes, trocars, cannulae, catheters, guidewires, valves and stop cocks.

Key properties and considerations

- Lubrication options for a variety of substrates
- Compatibility with most sterilization methods
- Fluids available in wide range of viscosities and can be diluted with solvent for application in thin layers



FLUIDS

PRODUCT NUMBERS	VISCOSITY cP (mPa·s)	VOLATILE CONTENT %	COMMENTS
DIMETHYL			
MED-361	100 - 12,500	0.1	-
FLUROSILICONE			
MED-460	350 - 12,500	≤ 0.2	Methyl fluoro copolymer (high fluoro)
MED-420	100 - 12,500	≤ 0.1	Methyl fluoro copolymer (low fluoro)
MED-400	350 - 12,500	≤ 0.3	Fluorosilicone polymer

*Custom viscosities available upon request

GREASES

PRODUCT NUMBERS	VISCOSITY cP (mPa·s)	VOLATILE CONTENT %	COMMENTS
MED-9011	95,000	< 1.0	Low consistency grease
MED-9021	300,000	0.6	Medium consistency grease
MED-9031	900,000	0.25	High consistency grease
MED-6731	2,070,000	0.2	High consistency methyl fluoro grease

SPECIALTY COATINGS

PRODUCT NUMBERS	VISCOSITY cP (mPa·s)	SOLIDS CONTENT %	SOLVENT	COMMENTS
MED10-4161	150	33	Xylene	Amino functional silicone coating
MED-4159	185	53	Stoddard solvent/IPA	Amino functional silicone coating
MED10-6670	20	25	Xylene	Dry permanent coating
MED-4162	30,000	31	Xylene	Wax-like coating

SELF-LUBRICATING LIQUID SILICONE RUBBER (LSR)

PRODUCT NUMBERS	DUROMETER TYPE A	TENSILE psi (MPa)	ELONGATION %	TEAR ppi (kN/m)	STRESS @ STRAIN psi (MPa) @ %	CURE RATE T90 m @ 138°C	CURE RATE SCORCH m @ 138°C	SPECIFIC GRAVITY	COMMENTS
MED30-4940-1	35	970 (6.7)	570	210 (37.0)	375 (2.4) @ 200	1.80	0.90	1.12	Moderate lubrication
MED1-4955	55	1,165 (8.0)	490	250 (44.1)	550 (3.6) @ 200	2.20	1.10	1.14	High lubrication
MED2-4955	61	1,200 (8.3)	490	250 (44.1)	525 (3.6) @ 200	1.70	0.70	1.14	Moderate lubrication

Processing tips

Depending on the viscosity, silicone lubricants can be applied by spraying, dipping, wiping or brushing. If a very thin film is desired, silicone fluids may be further diluted as far as one-to five-percent silicone solids in a compatible solvent.

Specialty materials

Radiopaque masterbatches

NuSil brand masterbatches provide an easy, more precise way to add barium sulfate to silicone elastomers, reducing production time and eliminating the need for powders that may contaminate cleanroom environments. They consist of barium sulfate dispersed in a vinyl-functional silicone polymer that covalently bonds to the matrix of platinum-cured silicone systems.

Inks

Our inks are designed for marking silicone surfaces. They are made for pad printing or silk screening medical devices and are available in a variety of colors.

Foams

Our low density, lightweight and flexible silicone foam can be used to make foam sheeting, tubing or ribbon. It is ideal for applications that require shock absorption and vibration dampening.

RADIOPAQUE MASTERBATCHES

PRODUCT NUMBERS	EXTRUSION RATE g/min PLASTICITY mils	SPECIFIC GRAVITY	COMMENTS
MED2-4900	800 g/min	1.55	LSR masterbatch, 50% BaSO ₄
MED2-4102	218 mils	2.31	HCR masterbatch, 75% BaSO ₄

INKS

PRODUCT NUMBERS	VISCOSITY cP (mPa·s)	SOLIDS CONTENT %	SOLVENT	COMMENTS
MED-6608-X	1,150	70	Xylene	RTV ink available in white and black
MED-6613-X	2,000	65	XYLENE	Heat curable ink in various colors
MED8-6608-2	800	70	Xylene	RTV black ink, increased hiding power

FOAMS

PRODUCT NUMBERS	FOAM DENSITY g/mL	VISCOSITY cP (mPa·s)	APPLICATION LIFE (minutes)	COMMENTS
MED10-2310	0.2	40000	2	Platinum catalyzed





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