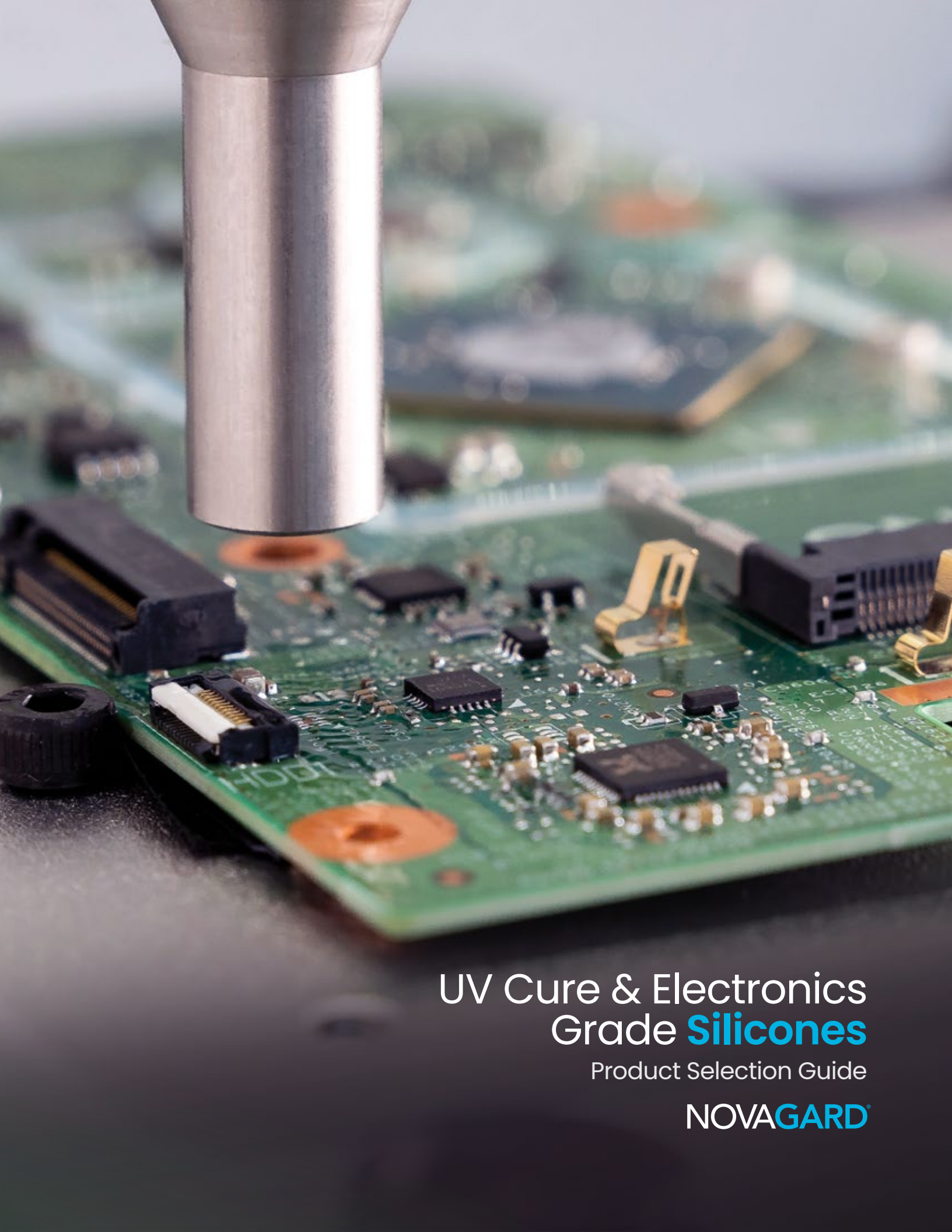
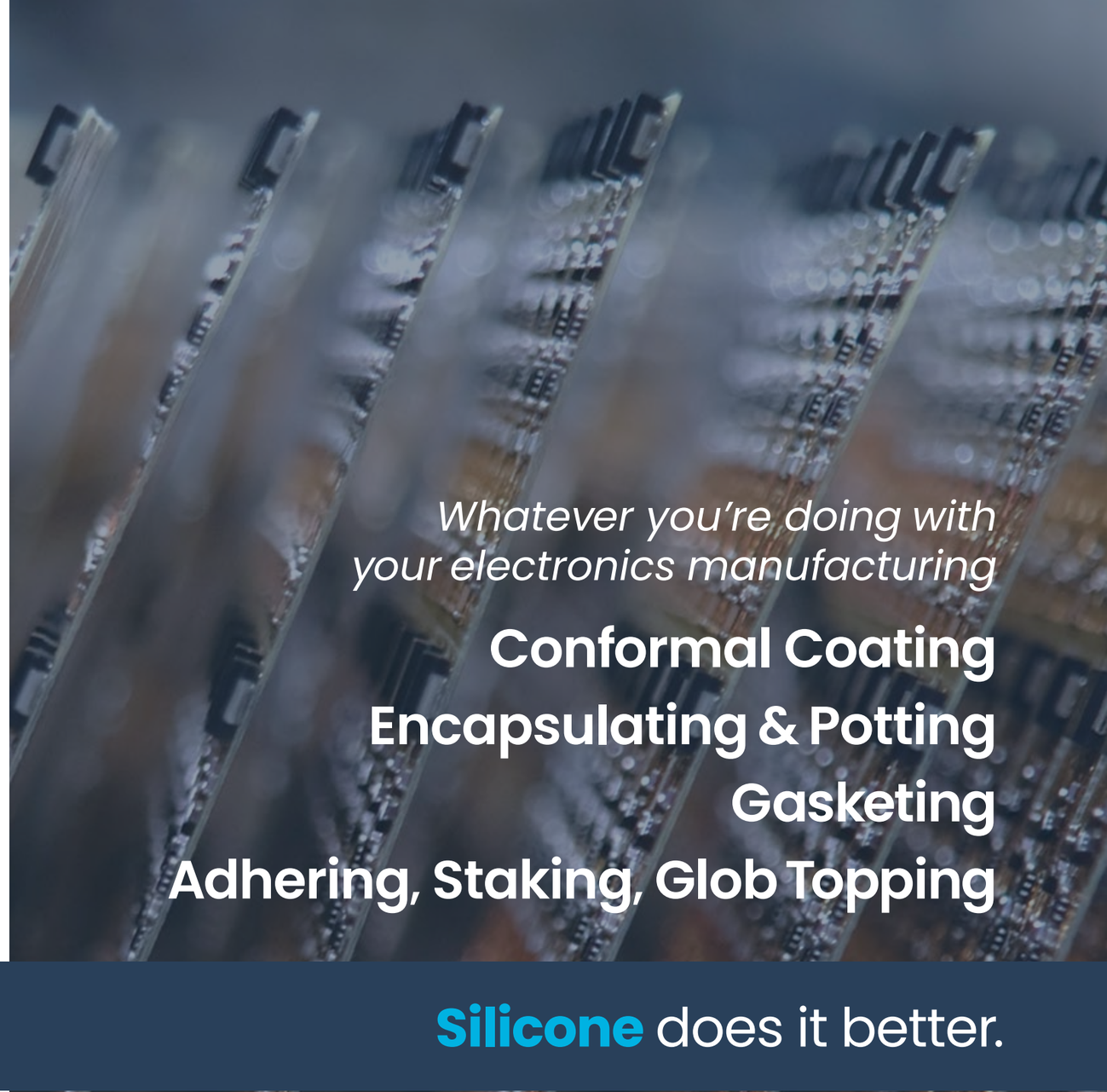


UV Cure & Electronics Grade Silicones

Product Selection Guide

NOVAGARD®



Whatever you're doing with your electronics manufacturing

Conformal Coating
Encapsulating & Potting
Gasketing
Adhering, Staking, Glob Topping

Silicone does it better.

DESIGNED & MANUFACTURED
in CLEVELAND, OH

The values outlined in the following tables reflect testing that was conducted under laboratory conditions, actual results may vary. Some data in the enclosed tables are derived from pre-production samples and are subject to change. Consult TDS for up to date product data and specifications. The information provided in the tables is not intended for use in preparing specifications. Please consult your sales representative for additional info.

Silicones are the go-to material for harsh and demanding environments

With the miniaturization and electrification of everything, silicones play a vital role in today's manufacturing process.

Silicone's unique molecular structure provides the rare combination of increased flexibility and high temperature resistance, allowing more versatility in the design, assembly process, and performance characteristics of modern electronics:

- **Maximum stress relief** caused by thermal cycling
- **Extraordinary protection** against shock and vibration
- **Extreme thermal stability** for more reliable performance at sustained temperatures ranging from -40˚F to 392˚F (-40˚C to 200˚C)
- **High dielectric strength** and **insulation resistance**
- **Stronger resistance** to UV radiation
- Simple **solvent-free** handling and processing

Silicone does it better. And nobody does silicone better than **Novagard**.

Standard silicones utilize acetoxy or oxime cure mechanisms, releasing acetic or ketonic acid fumes, which can corrode copper and other metals. By using an **alkoxy cure**, electronics grade silicones release only non-corrosive methanol which is not harmful to sensitive electronics.

In addition, Novagard **Electronics Grade Silicones** are formulated without non-reactive plasticizers for **superior performance** within a wide range of possible uses.

Cure chemistries

Curing is the process by which the liquid (wet) silicone is converted into a solid form. During this process, the silicone polymer chains and other elements of the material bind together in a process called crosslinking. Novagard offers multiple cure mechanisms in our product line, providing designers and engineers with options for material selection and optimizing processing on the manufacturing floor.

Moisture Cure

These materials react with moisture (humidity) in the atmosphere to drive the crosslinking process. The moisture-cure crosslinking process produces a small amount of byproduct. Depending on the type of moisture cure, some of these byproducts can be corrosive to copper and yellow metals. For electronics applications, engineers will typically prefer an alkoxy moisture cure, which produces only non-corrosive methanol.

Novagard offers one component and two component moisture cure materials. Single component materials arrive from Novagard completely mixed and ready to use. The cure rate of single component materials is limited by the rate at which the material can absorb moisture from the atmosphere.

Novagard two component moisture cure materials are separate components (Part A and Part B) that must be mixed prior to use. The moisture required to drive the crosslinking process is contained within one of the components, which allows these products to cure rapidly, speeding production in customer manufacturing environments. The mix ratio of two component systems may be fixed or variable, depending on the composition of the formula. These products are typically meter-mixed for precise control.

Addition Cure

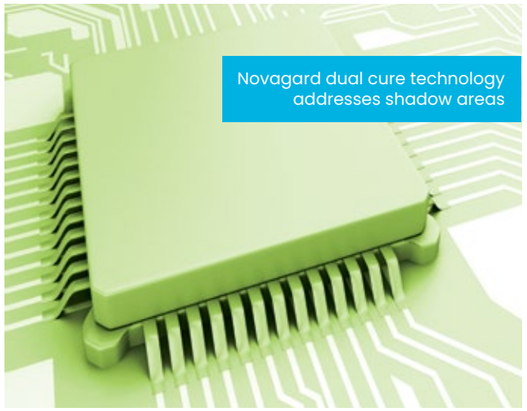
Addition cure materials arrive from Novagard as separate components (Part A and Part B) that must be mixed in a specific ratio prior to use. Everything necessary to crosslink these materials is contained within either Part A or Part B. Once the two components are mixed, the platinum catalyzed reaction occurs automatically – no added moisture or energy is necessary to complete the reaction (although the cure can often be accelerated with heat). Two component addition cure materials crosslink very uniformly and predictably – at any depth desired – allowing for deep section potting. In addition, these materials do not absorb any constituent from the atmosphere nor release any byproduct – making them very dimensionally stable – preventing virtually all shrinkage and reducing stress on surrounding components. Addition cure materials typically have very limited adhesion, further reducing stress on components. Certain contaminants can interfere with the platinum cure system ("platinum inhibition"), so proper industrial hygiene is necessary when working with these materials.

UV Cure & UV/Dual Cure

Novagard UV Cure and UV/dual cure materials are premixed and arrive ready to use. Once dispensed, these materials require energy to drive the crosslinking process. This energy comes from UV light, traditionally from a broad-spectrum mercury lamp, but more recently from a narrow spectrum LED lamp. Our UV only and UV/dual cure materials can be cured by using either a broad-spectrum UV system or a **365nm LED** UV system. For the broad-spectrum UV system, we recommend a minimum dosage of 1,000 mJ/cm^2. For the 365nm LED UV system, we recommend a minimum dosage of 4,000 mJ/ cm^2. Once exposed to sufficient UV energy, the crosslinking process occurs very rapidly — often as quickly as 3 - 5 seconds.

UV materials will not cure without exposure to UV light. Applying UV light allows material to be cured on demand. The depth of cure is limited by the degree to which the UV light photons can penetrate the material and whether or not there are any obstructions which prevent the UV light from reaching all the material (shadow areas). UV only materials can typically cure to a depth of ~**10-20mm** in a single pass. UV/dual cure materials typically cure to a depth of ~**1mm under UV light**, with the balance of the material curing via a secondary moisture cure mechanism.

Once the primary UV cure is complete, these dual cure materials will draw moisture from the atmosphere to drive crosslinking of any material that did not receive sufficient UV exposure during the primary cure. This includes areas that exceed the penetration depth of the UV light, or material in a shadow area. This dual cure mechanism also allows these materials to develop good adhesion to the underlying substrate. This secondary moisture cure will produce a small amount of byproduct, so engineers and designers of electronics will typically prefer an alkoxy secondary cure.



Novagard's **R&D** center of excellence and innovation **delivers results**.

Industry relies on silicones. Thousands of consumer, business, medical, and military electronic systems depend on silicones to seal, bond, and encapsulate electrical parts in order to protect delicate components and modules in harsh and demanding environments. Companies turn to Novagard for electronics grade alkoxy silicones that enable and enhance their technological innovations.


PCBs & Power Electronics


Mobility


Renewable Energy


LED Lighting


Medical On-body


Aerospace


Consumer Electronics


Defense


Solar

Novagard scientists can modify silicone properties such as:

LOW **HARDNESS** HIGH

Provides thermal and physical stress relief
- Allows components to expand and contract at different rates without crowding/contacting/harming each other
- Absorbs shock so vibration does not get transmitted to components

Best for: Dense topography, high thermal environments

Provides abrasion and impact resistance
- Protects raised, delicate components from being broken or knocked off
- Protects integrity of entire board/build against violent jolts and collisions

Best for: Delicate topography, protruding components, punishing environments

LOW **VISCOSITY** HIGH

Provides speedier and assured coverage throughout
- High-speed application and superior 'wet out' ability
- Easily flows into tight spaces, under components, and through vias

Best for: Intricate architecture, delicate potting, high-speed manufacturing, automated dispensing

Provides precise flow and distance spread control
- Allows for extremely targeted 'spot' application with no spread into 'keep-out' areas
- Permits damming and filling of larger, tightly defined areas
- Thicker application provides extra protection and vibration damping

Best for: Staking, laminating, filling large gaps, vertical surfaces

LOW **ADHESION** HIGH

Provides more controlled adhesion
- Permits future access to components for reworking and repair
- Coating will come off clean leaving substrate ready for reapplication

Best for: Products that reach 'failure mode' or require regular maintenance

Permanent adhesion, including low energy surfaces
- Simplifies process with no primer or corona treatment necessary
- Various types of substrates may be permanently bonded together

Best for: Assembly of difficult substrates, protecting unique technologies

LOW **THERMAL CONDUCTIVITY** HIGH

No conductive fillers, no fuss
- Meets the needs of most standard applications

Best for: Products emitting minimal heat, cost effectiveness

Actively moves heat away from components
- Protects components from thermal damage
- Standard thermal filler packages provide pathway for heat to travel & dissipate

Best for: Semiconductors (Si, SiC, GaN), batteries, LED lighting, power supplies

THIXOTROPY

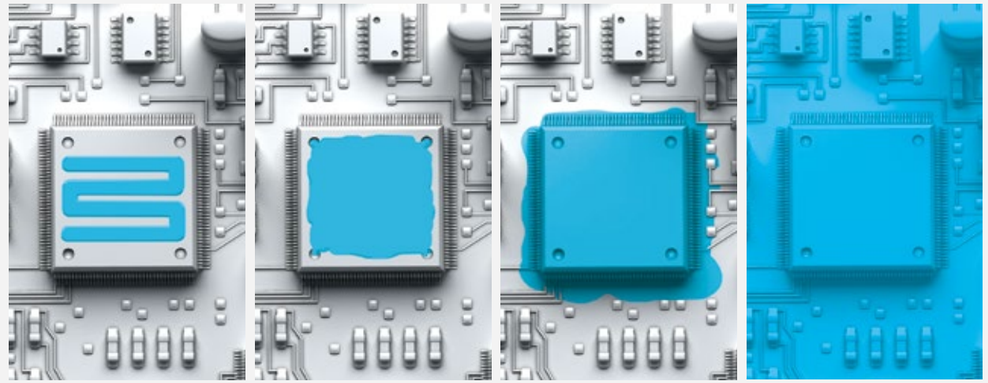
When you need absolute precision during dispensing, we can adjust thixotropy ratios to achieve it with your machinery. So when the pressure stops, the flow stops, and the bead holds its shape perfectly. Crucial for dot placement, bead formation, dam contours, and precise injections into extremely small crevices with no sagging, no spreading, and no dripping.

CURE TIME

Depending on your application and your process — and even the precise set-up of your line — we can adjust and fine tune our silicone formulations to cure as quick (or not) as you need, and offer you tack-free handling in less than 5 seconds.

Impact of rheology: Viscosity & Flowability

Just as crucial as achieving the required material performance is assuring the silicone is getting to where it needs to go using the dispensing equipment on your line. This is where proper viscosity and flowability selection is critical.



Higher viscosity provides greater control of speed and distance of flow to prevent spreading into safe areas, while enabling thicker coating layers in one pass.

Lower viscosity aids high-speed production techniques such spraying, flow coating, or jetting, and allows your coating to flow through vias or under components.

A leader in **UV silicone**

Now on our 4th generation of UV cure technology, Novagard is the **market leader** of **UV/dual cure silicones**. Our click-cure chemistry provides an unparalleled level of speed to your manufacturing process. With each generation, our chemists have improved our products, resulting in UV silicones with a faster secondary alkoxy moisture cure that offer better dielectric properties and superior adhesion.

Committed to your **success**

As an innovator and manufacturer of silicones, Novagard enables our customers to develop new and **sustainable** ways of doing business. Mindful of our environmental impact, our products are PFAS and solvent free, so there is **no harmful VOC emissions** or outgassing.

Conformal Coatings

Essential Attributes	800-505FC page 10	500-210 page 11	800-520FC page 12
	Sprayable		Sprayable, Flowable, or Dip Coating
	PHYSICAL PROPERTIES		
Appearance	Clear, sprayable	Clear, sprayable	Clear, flowable
Cure Chemistry	UV Alkoxy Dual Cure	Alkoxy Moisture Cure	UV Alkoxy Dual Cure
Viscosity (cPs)	670	450	1,800
Tensile Strength	13 psi	65 psi	17 psi
Elongation	125%	95%	235%
Hardness (Shore A)	8	40	8
Flammability Class (UL94)	V-1 V-0 *(pending)*	V-1	V-1 V-0 *(pending)*
Specifications	UL 746E certified	UL 746E certified	UL 746E certified ISO 10993-5
	ELECTRICAL PROPERTIES		
Volume Resistivity	$2.50x10^{15}$ Ω-cm	$1.55x10^{14}$ Ω-cm	$2.21x10^{14}$ Ω-cm
Dissipation Factor	0.0035 @100 Hz 0.0002 @100 kHz	0.0012 @100 Hz 0.0001 @100 kHz	0.0010 @100 Hz 0.0003 @100 kHz
Dielectric Constant	1.18 @100 Hz 1.18 @100 kHz	2.25 @100 Hz 2.25 @100 kHz	1.67 @100 Hz 1.67 @100 kHz
Dielectric Strength	>13 kV/mm >330 V/mil	>13.5 kV/mm >340 V/mil	>17.6 kV/mm >447 V/mil

Conformal coatings conform to the contours of PCBs to protect circuits from moisture, dirt, chemicals, dust, and other environmental contaminants. Novagard's conformal coatings are solvent free and offer greater flexibility and vibration dampening than other types of coating materials.

As component density continues to increase, Novagard's advanced conformal coatings provide the necessary electrical isolation to ensure long and trouble free service life. Our 4th generation UV/dual cure technology has further expanded and enhanced the electrical performance of these vital materials.

Novagard conformal coating features

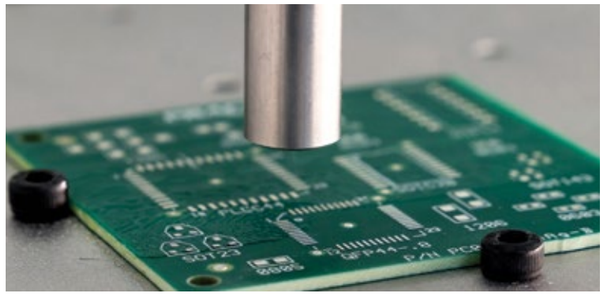
- UV options offer exceptionally fast room temperature cure on demand
- UV curing with no oxygen inhibition
- 100% solids, VOC compliant
- NO added solvents, no isocyanates, and are both PFAS-free and tin-free
- Thermally stable from -40°F to 392°F (-40°C to 200°C)
- Excellent adhesion to a variety of plastic and metal substrates, including FR4 and copper
- Electronics grade and UL certifications
- Can be applied by spray coating, automated needle dispense, jetting, hand dispense, flow coating, brushing, or dipping

UV Alkoxy Dual Cure Sprayable Silicone

800-505FC

800-505FC is a UV curable silicone sprayable conformal coating. This non-corrosive, single component silicone cures to a solid elastomer in seconds upon exposure to ultraviolet (UV) light. 800-505FC is UL 746E certified and has a V-1 rating for flammability. This silicone contains a standard UV tracer for quality control and is easily applied using standard PCB spray coating equipment.

After the initial UV cure, 800-505FC has a secondary moisture cure which enhances adhesion and ensures no unreacted coating remains in shadow areas. This next generation of Novagard UV/dual cure silicone conformal coatings cures in a fraction of the time needed for traditional conformal coatings.



The speed and efficiency of UV curing can practically eliminate racking and WIP, is far more energy efficient, and requires a much smaller manufacturing footprint thereby reducing your total cost of ownership.

Offering a faster, more reliable cure, our 800 series of products is an attractive alternative to solvent-based silicone and epoxy solutions.

Used for:
- Printed circuit/wiring boards
- Flexible hybrid electronics
- Rigid electronics
- Sensitive components and harsh environments
- Conformal coating, sealing, and potting

	800-505FC
Appearance & Form	Clear, sprayable
Cure Chemistry	UV Alkoxy Dual Cure
Viscosity (cPs) Brookfield LV CPA - 52Z @ 1.5 rpm	670
Refractive Index (uncured)	1.40
Tensile Strength ASTM D412	13 psi
Elongation ASTM D412	125%
Hardness (Shore A) ASTM D2240	8
Specific Gravity ASTM D1875	0.98
Volume Resistivity (Ω-cm) ASTM D257	$2.50x10^{15}$
Dissipation Factor (100 Hz / 100 kHz) ASTM D150	0.0035 0.0002
Dielectric Constant (100 Hz / 100 kHz) ASTM D150	1.18 / 1.18
Dielectric Strength ASTM D149	>13 kV/mm >330 V/mil
Shadow Area Cure	Yes
UV Tracer	Yes
Service Temp	-40°F to 392°F (-40°C to 200°C)
Flammability Class (UL 94)	V-1 V-0 *(pending)*
Listings / Specifications	UL 746E
Compliance	REACH, PFAS free, 50 state VOC

General Purpose Alkoxy Conformal Coating

500-210

500-210 is a balanced-performance translucent sprayable silicone featuring a rapid room temperature alkoxy moisture cure that can be further accelerated with moderate heat. This **solvent-free** conformal coating seals and protects components from dust, moisture, and environmental hazards. It's a ready-to-use, single component silicone that cures to a resilient elastomer that is tough, yet compliant enough to reduce strain on electronic components.

500-210 offers simple "dispense and forget" processing and skins over in as little as 10 minutes. This silicone is UL 746E certified and has a V-1 rating for flammability.

As one of our 500 series electronics-grade silicones, 500-210 is a neutral cure (alkoxy) sealant suitable for spraying or flow coating. When a non-corrosive product is required, 500-210 is an ideal coating with unprimed adhesion to many substrates that:

- Bonds securely to electronic substrates for maximum protection
- Provides a barrier coating to protect against moisture and dust
- Helps dampen vibrations

500-210 contains a standard UV tracer for quality control.

Used for:
- Protecting sensitive electronic components and circuit boards
- Thin-section encapsulation
- General electronics/industrial coating applications requiring a non-corrosive product

	500-210
Appearance & Form	Clear, sprayable
Cure Chemistry	Alkoxy Moisture Cure
Viscosity (cPs) Brookfield LV CPA - 52Z @ 1.5 rpm	450
Refractive Index (uncured)	1.40
Skin-Time	<10 min
Tensile Strength ASTM D412	65 psi
Elongation ASTM D412	95%
Hardness (Shore A) ASTM D2240	40
Specific Gravity ASTM D1875	0.98
Volume Resistivity (Ω-cm) ASTM D257	$1.55x10^{14}$
Dissipation Factor (100 Hz / 100 kHz) ASTM D150	0.0012 0.0001
Dielectric Constant (100 Hz / 100 kHz) ASTM D150	2.25 / 2.25
Dielectric Strength ASTM D149	>13.5 kV/mm >340 V/mil
UV Tracer	Yes
Service Temp	-40°F to 392°F (-40°C to 200°C)
Flammability Class (UL 94)	V-1
Listings / Specifications	UL 746E
Compliance	REACH, PFAS free, 50 state VOC

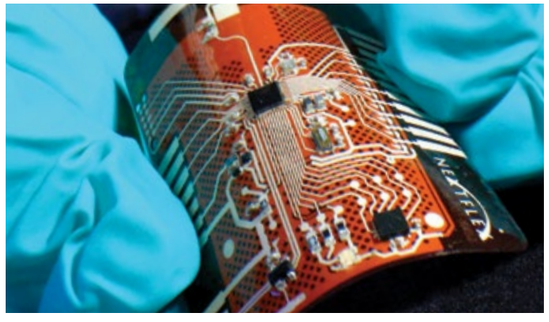
UV Alkoxy Dual Cure Flowable Silicone

800-520FC

This non-corrosive, single component silicone will cure to a solid elastomer in seconds upon exposure to ultraviolet (UV) light. 800-520FC has a secondary, neutral alkoxy moisture cure for enhanced adhesion and shadow cure. With a viscosity of ~1,800 cPs, this formulation is ideal for applying thicker layers of coating for applications requiring additional protection.

800-520FC's secondary moisture cure begins immediately and can develop full adhesion in hours. The speed and efficiency of UV curing can practically eliminate racking and WIP, reducing the total cost of ownership. UV curing lamps are far more energy efficient and need less manufacturing space than the ovens required for traditional heat-cured solutions, further reducing operational costs.

800-520FC has been independently tested and meets the standards of ISO 10993-5. This conformal coating contains a standard UV tracer for quality control.



Used for:

- Printed circuit/wiring boards
- Flexible hybrid electronics
- Rigid electronics
- Sensitive components and harsh environments
- Applications that require a non-cytotoxic material
- Conformal coating, sealing, and potting

	800-520FC
Appearance & Form	Clear, flowable
Cure Chemistry	UV Alkoxy Dual Cure
Viscosity (cPs) Brookfield LV CPA-52Z @ 1.5 rpm	1,800
Refractive Index (uncured)	1.40
Tensile Strength ASTM D412	17 psi
Elongation ASTM D412	235%
Hardness (Shore A) ASTM D2240	8
Specific Gravity ASTM D1875	0.98
Volume Resistivity (Ω-cm) ASTM D257	$2.21x10^{14}$
Dissipation Factor (100 Hz / 100 kHz) ASTM D150	0.0010 0.0003
Dielectric Constant (100 Hz / 100 kHz) ASTM D150	1.67 / 1.67
Dielectric Strength ASTM D149	>17.6 kV/mm >447 V/mil
Shadow Area Cure	Yes
UV Tracer	Yes
Service Temp	-40°F to 392°F (-40°C to 200°C)
Flammability Class (UL 94)	V-1 V-0 *(pending)*
Listings / Specifications	UL 746E ISO 10993-5
Compliance	REACH, PFAS free, 50 state VOC

ISO 10993 Standards

The ISO 10993 series of standards evaluate the biocompatibility of medical devices based on material, contact type, and duration of contact. These standards cover a number of biological safety scenarios and enable medical device manufacturers to manage biological risk.

Novagard is proud to have a number of products independently tested that meet the ISO 10993 standards.

There are several tests that make up the ISO 10993 standards, each focused on a different safety factor. Based on the applications that use Novagard silicones, we have selected to test our products to three standards:

ISO 10993-5: Cytotoxicity

This test assesses the in vitro cytotoxicity of medical devices. These methods specify the incubation of cultured cells in contact with a device and/or extracts of a device either directly or through diffusion. The test methods used are designed to determine the biological response of mammalian cells in vitro using appropriate biological parameters.

ISO 10993-10: Skin Sensitization

The test used for this standard assesses medical devices and their constituent materials with regard to their potential to induce skin sensitization. This test looks at repeated exposure to skin.

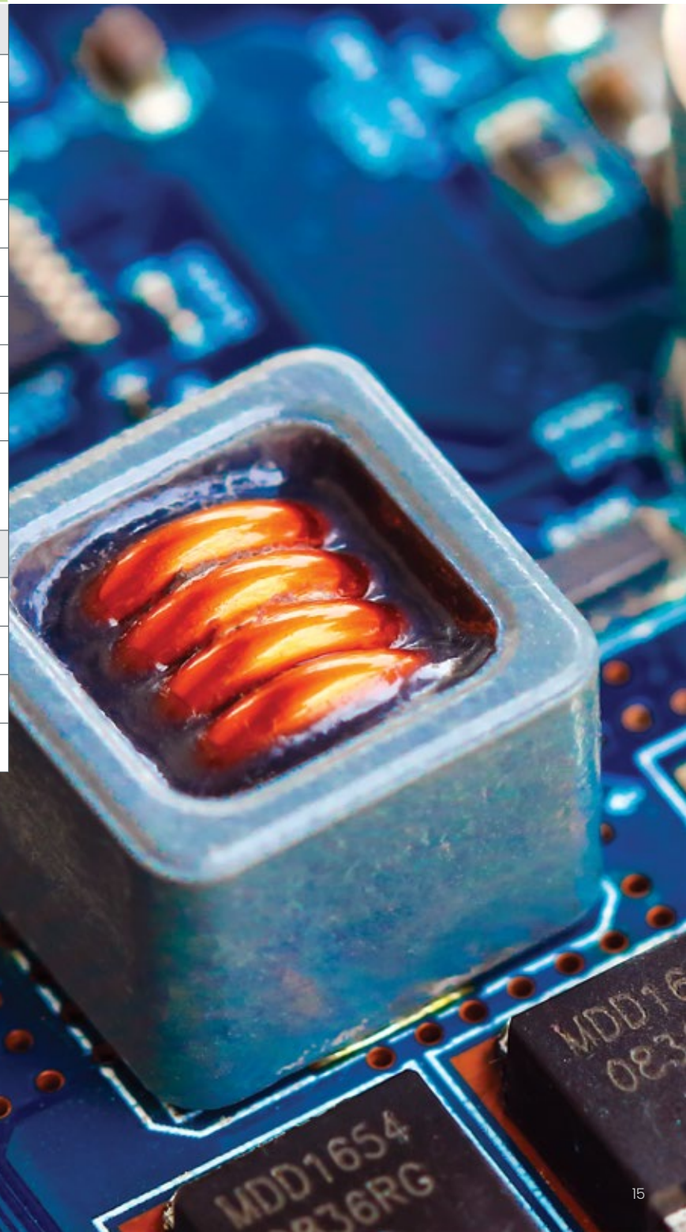
ISO 10993-23: Irritation

This test specifies the procedure for the assessment of medical devices and their constituent materials with regard to their potential to produce irritation. This test focuses on the first interaction of the material to the skin.

The final selection of a material depends on application-specific performance criteria that should be confirmed by the medical device designer's own testing. While Novagard is happy to provide ISO 10993 test data to our customers, medical device and wearable manufacturers are ultimately responsible for submitting their final product to the appropriate governing body to receive certifications.

Encapsulants, Pottants & Gels

Essential Attributes	800-610 page 16	800-550 page 17	800-750 page 18	600-223 page 19	800-754 page 20	800-755 page 21	600-250 page 22	600-251 page 23
	Sprayable / Flowable Encapsulants		Sensor Coating Encapsulant	Soft Encapsulating Gels			Clear Pottant	Filled Encapsulant / Pottant
	PHYSICAL PROPERTIES							
Appearance	Clear, sprayable	Clear, flowable	Clear, semi-flowable	Clear, flowable	Clear, semi-flowable	Clear, semi-flowable	Clear, flowable	White, flowable
Cure Chemistry	UV only	UV Alkoxy Dual Cure	UV Alkoxy Dual Cure	2k Addition Cure	UV only	UV only	2k Addition Cure	2k Addition Cure
Viscosity (cPs)	1,000	5,500	50,000	500 (mixed, 1:1)	50,000	55,000	6,300 (mixed, 1:1)	5,700 (mixed, 1:1)
Tensile Strength	14.5 psi	18 psi	15 psi	-	160 psi	-	550 psi	420 psi
Elongation	155%	295%	185%	-	520%	-	170%	71%
Hardness (Shore A)	19	8	8	16 (Shore 000)	65 (Shore 000)	-	35	52
Thermal Expansion	386 ppm/°C	-	-	400 ppm/°C	-	-	350 ppm/°C	250 ppm/°C
Flammability Class (UL94)	-	V-1	V-1 *(pending)*	-	-	-	HB *(pending)* V-1 *(pending)*	V-0 *(pending)*
Specifications	-	UL 746E certified ISO 10993-5	ISO 10993-5 ISO 10993-10 ISO 10993-23 UL 746E *(pending)*	-	-	-	-	ASTM E595
	ELECTRICAL PROPERTIES							
Volume Resistivity	$7.22x10^{14}$ Ω-cm	$2.11x10^{14}$ Ω-cm	-	$1.90x10^{14}$ Ω-cm	$1.47x10^{14}$ Ω-cm	-	$7.60x10^{14}$ Ω-cm	$7.20x10^{14}$ Ω-cm
Dissipation Factor	0.0010 @100 Hz 0.0026 @100 kHz	0.0012 @100 Hz 0.0006 @100 kHz	-	0.0024 @100 Hz 0.0001 @100 kHz	0.0002 @100 Hz 0.0001 @100 kHz	-	0.0016 @100 Hz 0.0007@100 kHz	0.0317 @100 Hz 0.0058 @100 kHz
Dielectric Constant	2.31 @100 Hz 2.31 @100 kHz	2.07 @100 Hz 2.07 @100 kHz	-	2.79 @100 Hz 2.80 @100 kHz	2.40 @100 Hz 2.40@100 kHz	-	2.53 @100 Hz 2.52 @100 kHz	3.38 @100 Hz 3.23 @100 kHz
Dielectric Strength	35.7 kV/mm 907 V/mil	>15.9 kV/mm >405 V/mil	-	13 kV/mm 330 V/mil	>14.4 kV/mm >365 V/mil	-	26.5 kV/mm 673 V/mil	>22 kV/mm >559 V/mil



As the world continues to miniaturize and electrify everything, silicones play an increasingly vital role in protecting electrical components. Novagard silicones are used across a broad spectrum of applications where sensitive and critical components need to be protected from environmental conditions, shock, and vibrations.

Your electronics have very specific operational goals — our Novagard engineers can develop tailored silicone products with highly customized attributes to fit your requirements.

UV Cure Sprayable Silicone Encapsulant

800-610

800-610 is a low viscosity, optically clear pourable or sprayable encapsulant. Its low viscosity ensures the material flows easily around components for thorough wet out and to prevent air entrapment. 800-610 is a UV cure silicone with no secondary moisture cure, offering very low adhesion. This non-corrosive, single component silicone will cure to a solid elastomer in seconds upon exposure to ultraviolet (UV) light.

This high-performance material will cure up to 20mm deep in a single pass under UV light. With a typical viscosity of ~1,000 cPs, 800-610 enhances reliability of delicate components, and provides both stress and shock relief.

Used for:
- Printed circuit/wiring boards
- Flexible hybrid electronics
- Rigid electronics
- Sensitive components and harsh environments
- Potting

	800-610
Appearance & Form	Clear, sprayable
Cure Chemistry	UV only
Viscosity (cPs) Brookfield RV #5 @ 10 rpm	1,000
Tensile Strength ASTM D412	14.5 psi
Elongation ASTM D412	155%
Hardness (Shore A) ASTM D2240	19
Volume Resistivity (Ω-cm) ASTM D257	$7.22x10^{14}$
Thermal Expansion (CTE) (ppm/°C) ASTM E831	386
Dissipation Factor (100 Hz / 100 kHz) ASTM D150	0.0010 0.0026
Dielectric Constant (100 Hz / 100 kHz) ASTM D150	2.31 / 2.31
Dielectric Strength ASTM D149	35.7 kV/mm 907 V/mil
Transmittance 450 nm 550 nm 740 nm	92% 93% 94%
Shadow Area Cure	No
Refractive Index	1.41
Compliance	REACH, PFAS free, 50 state VOC

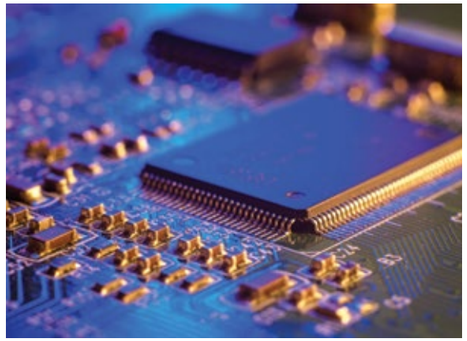
UV Alkoxy Dual Cure Flowable Silicone

800-550

This non-corrosive, single component silicone will cure to a solid elastomer in seconds upon exposure to ultraviolet (UV) light. 800-550 has a secondary, neutral alkoxy moisture cure for enhanced adhesion and shadow cure. With a viscosity of 5,500 cPs, 800-550 flows readily to surround the complex geometry of modern circuitry design.

800-550 is UL 746E certified, and has been independently tested to meet ISO 10993-5 standards.

800-550 contains a standard UV tracer for quality control.



Used for:
- Sealing sensitive components and gaps against moisture and harsh environments
- Coating and protecting fiber optic cables
- Printed circuit/wiring boards
- Flexible hybrid electronics
- Rigid electronics
- Conformal coating, sealing, and potting

	800-550
Appearance & Form	Clear, flowable
Cure Chemistry	UV Alkoxy Dual Cure
Viscosity (cPs) Brookfield LV CPA-52Z @ 1.5 rpm	5,500
Refractive Index (uncured)	1.40
Tensile Strength ASTM D412	18 psi
Elongation ASTM D412	295%
Hardness (Shore A) ASTM D2240	8
Specific Gravity ASTM D1875	0.98
Volume Resistivity (Ω-cm) ASTM D257	$2.11x10^{14}$
Dissipation Factor (100 Hz / 100 kHz) ASTM D150	0.0012 0.0006
Dielectric Constant (100 Hz / 100 kHz) ASTM D150	2.07 / 2.07
Dielectric Strength ASTM D149	>15.9 kV/mm >405 V/mil
Shadow Area Cure	Yes
UV Tracer	Yes
Service Temp	-40°F to 392°F (-40°C to 200°C)
Flammability Class (UL 94)	V-1
Listings / Specifications	UL 746E ISO 10993-5
Compliance	REACH, PFAS free, 50 state VOC

UV Alkoxy Dual Cure Silicone Sensor Coating

800-750

With a viscosity of ~50,000 cPs, 800-750 is a translucent silicone that clings readily electronics to coat and protect sensor systems. This non-corrosive, single component silicone will cure to a soft elastomer in seconds upon exposure to ultraviolet (UV) light, making it ideal for stress and strain relief, assembly of sensors, and protection of delicate sensor detector elements. The UV primary cure provides initial crosslinking in 3-5 seconds, coupled with a secondary alkoxy moisture cure for enhanced adhesion and shadow area curing.

800-750 is soft and compliant enough to be used for medical on-body applications, yet tough enough to hold up in automotive applications and other harsh and demanding environments.

This material meets the standards of ISO 10993-5, 10993-10, and 10993-23.

Used for:
- Sensor coating
- Medical device electronics
- Printed circuit/wiring boards
- Flexible hybrid electronics
- Rigid electronics
- Sensitive components and harsh environments
- Formed-in-place gasketing
- Sealing and potting

	800-750
Appearance & Form	Clear, semi-flowable
Cure Chemistry	UV Alkoxy Dual Cure
Viscosity (cPs) Brookfield RV #4 @ 20 rpm	50,000
Tensile Strength ASTM D412	15 psi
Elongation ASTM D412	185%
Hardness (Shore A) ASTM D2240	8
Specific Gravity ASTM D1875	0.98
Shadow Area Cure	Yes
UV Tracer	Yes
Service Temp	-40°F to 392°F (-40°C to 200°C)
Flammability Class (UL 94)	V-1 *(pending)*
Listings / Specifications	ISO 10993-5 ISO 10993-10 ISO 10993-23 UL 746E *(pending)*
Compliance	REACH, PFAS free, 50 state VOC

Soft Dielectric Potting Gel
(2-part silicone)

600-223 *Product Development Pipeline*

600-223 is a platinum catalyzed, addition cure, dielectric potting gel. This is a specialized silicone encapsulant, with low viscosity for easy flowability around complex components. 600-223 cures to an extremely soft elastomer, with no unreacted components remaining after cure. 600-223 retains much of the stress relief qualities of a liquid while providing the dimensional stability of an elastomer, protecting even the most delicate components from shock and vibration as well as thermal and mechanical stress. In addition, 600-223 protects circuits from the harmful effects of moisture, dust, and other contaminants, and provides electrical insulation for high voltage circuits. 600-223 cures clear, allowing for easy inspection of components.

Designed to protect the most delicate circuits and assemblies, 600-223's extremely low viscosity allows for excellent flow under and around incredibly complex geometries, while minimizing the stress on components during the potting process itself. Convenient 1:1 mix ratio and extended working time further simplifies processing by allowing for complete component wet out and thorough deaeration before curing.

Used for:
- Protecting delicate components
- Sealing PCB assemblies
- Encapsulating or potting sensors and other electronic devices

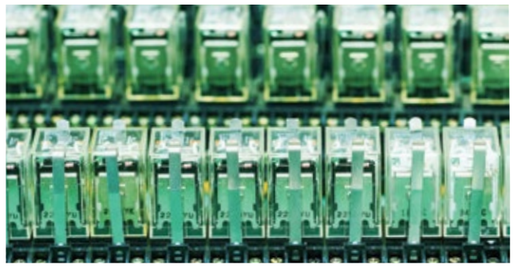
	600-223
Appearance & Form	Clear, flowable
Cured Appearance	Clear gel
Cure Chemistry	2k Addition Cure 1:1 (v:v)
Viscosity (cPs) Brookfield HBT #2 @ 20 rpm ASTM E3119	Part A: 550 Part B: 450 Mixed: 500
Hardness (Shore 000) ASTM D2240	16
Specific Gravity ASTM D1875	Part A: 0.95 Part B: 0.95
Thermal Expansion (CTE) (ppm/°C) ASTM E831	400
Volume Resistivity (Ω-cm) ASTM D257	1.90×10^{14}
Dissipation Factor (100 Hz / 100 kHz) ASTM D150	0.0024 0.0001
Dielectric Constant (100 Hz / 100 kHz) ASTM D150	2.79 / 2.80
Dielectric Strength ASTM D149	13 kV/mm 330 V/mil
Working Time ASTM D3532	>2 hrs @ RT
Cure Time ASTM D3532	72 hrs @ RT 3 hrs @140°F (60°C) 30 min @212°F (100°C) 15 min @302°F (150°C)
Compliance	REACH, PFAS free, 50 state VOC

UV Cure Self-Leveling Soft Pottant/Encapsulant

800-754

Designed to maximize vibration damping, 800-754 is a very soft, translucent pottant/encapsulant. 800-754 is a low strength silicone with limited adhesion to reduce strain on delicate components. This non-corrosive, single component silicone will cure to a compliant elastomer in seconds upon exposure to ultraviolet (UV) light to a depth of up to 20mm in a single pass.

With a viscosity of ~50,000 cPs, it flows predictably during application. After curing, 800-754 has a solid surface that is soft (**not tacky**) that protects delicate components, and provides both stress and shock relief.



Used for:
- Printed circuit/wiring boards
- Flexible hybrid electronics
- Formed-in-place gasketing
- Rigid electronics
- Sensitive components and harsh environments
- Potting

	800-754
Appearance & Form	Clear, semi-flowable
Cure Chemistry	UV only
Viscosity (cPs) Brookfield HB #4 @ 20 rpm	50,000
Tensile Strength ASTM D412	160 psi
Elongation ASTM D412	520%
Hardness (Shore 000) ASTM D2240	65
Specific Gravity ASTM D1875	0.98
Volume Resistivity (Ω-cm) ASTM D257	$1.47x10^{14}$
Dissipation Factor (100 Hz / 100 kHz) ASTM D150	0.0002 0.0001
Dielectric Constant (100 Hz / 100 kHz) ASTM D150	2.40 / 2.40
Dielectric Strength ASTM D149	>14.4 kV/mm >365 V/mil
Shadow Area Cure	No
UV Tracer	No
Service Temp	-40°F to 392°F (-40°C to 200°C)
Compliance	REACH, PFAS free, 50 state VOC

UV Cure Pottant & Encapsulant Soft Gel

800-755

800-755 is an incredibly soft, non-corrosive, single component gel that is an ideal pottant or encapsulant. This self-leveling gel will cure in seconds upon exposure to ultraviolet (UV) light, forming a soft - yet **tacky** - flexible, resilient cushion which provides shock relief and protects delicate circuitry and interconnections from thermal and mechanical stresses. 800-755 also isolates circuits from moisture and other contaminants while providing insulation for high voltage electrical currents.

800-755 is a clear pottant/encapsulant, designed to maximize vibration damping. It is a low strength silicone with limited adhesion which reduces strain on delicate components. Upon exposure to UV light, it will cure to a depth of 20mm in a single pass, dramatically increasing manufacturing throughput.

With a viscosity of ~55,000 cPs, 800-755 flows predictably during application.

Used for:
- Potting of delicate components
- Printed circuit/wiring boards
- Flexible hybrid electronics
- Rigid electronics
- Sensitive components and harsh environments

	800-755
Appearance & Form	Clear, semi-flowable
Cure Chemistry	UV only
Viscosity (cPs) Brookfield HB #4 @ 20 rpm	55,000
Specific Gravity ASTM D1875	0.98
Penetration ASTM D217	165
Shadow Area Cure	No
UV Tracer	No
Service Temp	-40°F to 392°F (-40°C to 200°C)
Compliance	REACH, PFAS free, 50 state VOC

Clear Pottant

Clear Flowable Electronics Pottant
(2-part silicone)

600-250 *Product Development Pipeline*

600-250 is a flowable, platinum catalyzed, addition cure, durable encapsulant with good dielectric properties and flame resistance. Once mixed, this highly transparent silicone elastomer will cure at room temperature in 4 hours. The cure time can be significantly accelerated with moderate heat. The high (>90%) transparency of 600-250 allows for easy inspection of components.

The convenient 1:1 mix ratio provides for simplified production processing compared with off-ratio products. In addition, 600-250 provides good flowability, long working time, and low viscosity for complete wet out and thorough deaeration.

Used for:
- LED lighting encapsulation
- Power supplies
- Connectors & sensors
- Industrial controls
- Transformers
- Amplifiers
- High voltage resistor packs
- Relays
- Junction boxes

	600-250
Appearance & Form	Clear, flowable
Cured Appearance	High Transparency
Cure Chemistry	2k Addition Cure 1:1 (v:v)
Viscosity (cPs) Brookfield HBT #4 @ 20 rpm ASTM E3119	Part A: 7,200 Part B: 5,600 Mixed: 6,300
Tensile Strength ASTM D412	550 psi
Elongation ASTM D412	170%
Hardness (Shore A) ASTM D2240	35
Specific Gravity ASTM D1875	Part A: 0.98 Part B: 0.98
Thermal Conductivity ASTM D5470	0.17 w/m·K
Thermal Expansion (CTE) (ppm/°C) ASTM E831	350
Volume Resistivity (Ω-cm) ASTM D257	$7.60x10^{14}$
Dissipation Factor (100 Hz / 100 kHz) ASTM D150	0.0016 / 0.0007
Dielectric Constant (100 Hz / 100 kHz) ASTM D150	2.53 / 2.52
Dielectric Strength ASTM D149	26.5 kV/mm 673 V/mil
Working Time ASTM D3532	30 min @ RT
Cure Time ASTM D3532	≥4 hrs @ RT 30 min @140°F (60°C)
Flammability Class (UL 94)	HB *(pending)* V-1 *(pending)*
Compliance	REACH, PFAS free, 50 state VOC

Filled Pottant

Flowable White Filled Encapsulant/Pottant
(2-part silicone)

600-251 *Product Development Pipeline*

600-251 is a platinum catalyzed, room temperature, addition cure silicone for potting and encapsulant applications requiring thermal conductivity. The cure rate of 600-251 can be dramatically accelerated with moderate heat. 600-251 has good flowability and moderate thermal conductivity, with excellent dielectric properties and flame resistance.

600-251 is easy to process and calibrate on the manufacturing floor, featuring a 1:1 mix ratio with similar viscosities of Part A and Part B. Long working times facilitate deaeration. Application methods include manual mixing and pouring, or automated mixing and dispensing.

Used for:
- Photovoltaic junction boxes
- Power inverters/power supplies
- Industrial controls, transformers, and amplifiers
- High voltage resistor packs and relays
- Sensor electronics
- Security coatings
- General potting applications

The Value of E595 Certification in Space Applications

ASTM E595 is a critical standard used to evaluate the outgassing properties of materials intended for use in the vacuum of space. In this environment, even minimal outgassing can lead to condensation of volatile compounds on sensitive optical or electronic components, impairing performance. ASTM E595 tests materials under vacuum and elevated temperature conditions to measure Total Mass Loss (TML) and Collected Volatile Condensable Materials (CVCM), ensuring that only low-outgassing materials are selected. E595 certified products help engineers mitigate contamination risks and maintain the long-term reliability and functionality of electronics in space.

	600-251
Appearance & Form	White, flowable
Cured Appearance	White
Cure Chemistry	2k Addition Cure 1:1 (v:v)
Viscosity (cPs) Brookfield HBT #2 @ 20 rpm ASTM E3119	Part A: 6,000 Part B: 5,400 Mixed: 5,700
Tensile Strength ASTM D412	420 psi
Elongation ASTM D412	71%
Hardness (Shore A) ASTM D2240	52
Specific Gravity ASTM D1875	Part A: 1.60 Part B: 1.60
Thermal Conductivity ASTM D5470	0.60 w/m·K
Thermal Expansion (CTE) (ppm/°C) ASTM E831	250
Volume Resistivity (Ω-cm) ASTM D257	$7.20x10^{14}$
Dissipation Factor (100 Hz / 100 kHz) ASTM D150	0.0317 / 0.0058
Dielectric Constant (100 Hz / 100 kHz) ASTM D150	3.38 / 3.23
Dielectric Strength ASTM D149	>22 kV/mm >559 V/mil
Working Time ASTM D3532	2 hrs @ RT
Cure Time ASTM D3532	24 hrs @ RT 30 min @140°F (60°C)
Flammability Class (UL 94)	V-0 *(pending)*
Outgassing (TML & CVCM)	E595 certified
Compliance	REACH, PFAS free, 50 state VOC

Gasketing

Essential Attributes	800-230 page 26	800-750 page 27	800-235 page 28	800-400 page 29	800-401 page 29
	Self-Leveling Gasketing	Semi-Flowable Gasketing		Gasketing Paste	
	PHYSICAL PROPERTIES				
Appearance	Translucent, self-leveling	Clear, semi-flowable	Translucent, semi-flowable	Translucent, paste	Opaque, paste
Cure Chemistry	UV only	UV Alkoxy Dual Cure	UV only	UV only	UV only
Viscosity (cPs)	17,500	50,000	65,000	300,000	300,000
Tensile Strength	75 psi	15 psi	-	370 psi	150 psi
Elongation	380%	185%	-	1,200%	1,000%
Hardness (Shore A)	20	8	-	20	20
Flammability Class (UL94)	-	V-1 *(pending)*	-	V-1 *(pending)*	-
Specifications	-	ISO 10993-5 ISO 10993-10 ISO 10993-23 UL 746E *(pending)*	-	-	-
	ELECTRICAL PROPERTIES				
Volume Resistivity	$2.10x10^{14}$ Ω-cm	-	-	$3.01x10^{13}$ Ω-cm	$3.01x10^{13}$ Ω-cm
Dissipation Factor	0.0013 @100 Hz 0.0005 @100 kHz	-	-	0.0011 @100 Hz 0.0021 @100 kHz	-
Dielectric Constant	2.45 @100 Hz 2.45 @100 kHz	-	-	3.34 @100 Hz 3.33 @100 kHz	-
Dielectric Strength	-	-	-	14.9 kV/mm 378 V/mil	-

Looking to properly seal joints, fill gaps, limit vibration, prevent leaks, and enhance mounting – all while increasing production throughput on your manufacturing floor? Silicone is an excellent solution for complex formed-in-place (FIPG) or cured-in-place (CIPG) gaskets. Novagard silicones contain no solvents, adhere well to many surfaces without primers, and offer extreme stability at extended temperature ranges.

When combined with Novagard's fast curing technologies, the performance advantages of silicone can be brought to your high-speed production environment. Discover the strength, durability, and stability of Novagard silicones for your gasketing needs.

Self-Leveling Gasketing

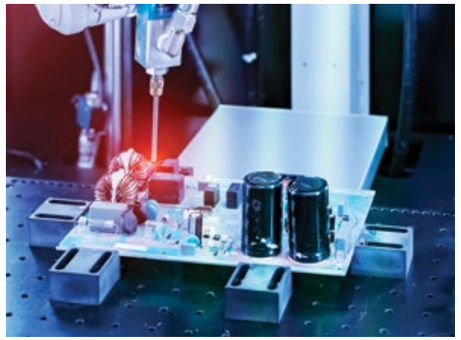
UV Cure Self-Leveling Silicone

800-230

800-230 is a UV curable self-leveling silicone pottant that offers a higher viscosity coating option, while still remaining flowable.

With a viscosity of ~17,500 cPs, 800-230 is an ideal cure-in-place gasketing material that offers limited adhesion for simplified re-work. When dispensed into a channel or gasket groove, this material will self-level to provide a smooth mating surface for the enclosure lid. This non-corrosive, single component silicone will cure to a solid elastomer in seconds upon exposure to ultraviolet (UV) light.

When used in a potting application, 800-230 enhances reliability of delicate components, and provides both stress and shock relief.



Used for:
- Cured-in-place gasketing
- Printed circuit/wiring boards
- Flexible hybrid electronics
- Rigid electronics
- Additive manufacturing and 3D printing
- Sensitive components and harsh environments
- Gasketing, sealing, potting, and coating

	800-230
Appearance & Form	Translucent, self-leveling
Cure Chemistry	UV only
Viscosity (cPs) Brookfield RV #4 @ 10 rpm	17,500
Tensile Strength ASTM D412	75 psi
Elongation ASTM D412	380%
Hardness (Shore A) ASTM D2240	20
Specific Gravity ASTM D1875	0.98
Volume Resistivity (Ω-cm) ASTM D257	$2.10x10^{14}$
Dissipation Factor (100 Hz / 100 kHz) ASTM D150	0.0013 / 0.0005
Dielectric Constant (100 Hz / 100 kHz) ASTM D150	2.45/2.45
Shadow Area Cure	No
UV Tracer	No
Service Temp	-40°F to 392°F (-40°C to 200°C)
Compliance	REACH, PFAS free, 50 state VOC

Semi-Flowable Gasketing

UV Alkoxy Dual Cure Semi-Flowable Silicone

800-750

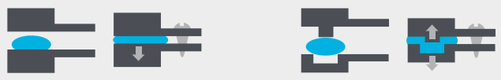
With viscosity of 50,000 cPs, 800-750 is a translucent silicone that clings readily to components for formed-in-place gasketing, staking, and glob-top applications. This non-corrosive, single component silicone will cure to a soft elastomer in seconds upon exposure to ultraviolet (UV) light, making it ideal for stress and strain relief as well as protection of delicate circuits. It has a secondary, neutral alkoxy moisture cure for enhanced adhesion and shadow cure.

800-750 contains a standard UV tracer for quality control.

Used for:
- Formed-in-place gasketing
- Medical device electronics
- Sensitive components and harsh environments
- Screen printing on flexible seals
- Gasketing, sealing, and potting

	800-750
Appearance & Form	Clear, semi-flowable
Cure Chemistry	UV Alkoxy Dual Cure
Viscosity (cPs) Brookfield RV #4 @ 20 rpm	50,000
Tensile Strength ASTM D412	15 psi
Elongation ASTM D412	185%
Hardness (Shore A) ASTM D2240	8
Specific Gravity ASTM D1875	0.98
Shadow Area Cure	Yes
UV Tracer	Yes
Service Temp	-40°F to 392°F (-40°C to 200°C)
Flammability Class (UL 94)	V-1 *(pending)*
Listings / Specifications	ISO 10993-5 ISO 10993-10 ISO 10993-23 UL 746E *(pending)*
Compliance	REACH, PFAS free, 50 state VOC

Two approaches to gasketing



CIPG: Adheres to one side of substrate

FIPG: Adheres to both sides of substrate

CIPG (Cured-in-Place Gasket) provides greater gasket design flexibility and allows the opening and closing of lids to repair components inside.

FIPG (Formed-in-Place Gasket) adheres to both substrates, ideal for non-reenterable enclosures.

Semi-Flowable Gasketing

UV Cure Semi-Flowable Silicone

800-235

800-235 is a UV curable semi-flowable silicone pottant or sealant. This non-corrosive, single component silicone will cure to a solid elastomer in seconds upon exposure to ultraviolet (UV) light. A UV cure only silicone with limited adhesion, 800-235's higher viscosity makes it ideal for cured-in-place gaskets.

With a viscosity of ~65,000 cPs, 800-235 enhances reliability of delicate components, and provides both stress and shock relief.

Used for:
- Printed circuit/wiring boards
- Flexible hybrid electronics
- Rigid electronics
- Sensitive components and harsh environments
- Gasketing, sealing, and potting
- Pin connectors and junctions

	800-235
Appearance & Form	Translucent, semi-flowable
Cure Chemistry	UV only
Viscosity (cPs) Brookfield RV #7 @ 10 rpm	65,000
Shadow Area Cure	No
UV Tracer	No
Service Temp	-40°F to 392°F (-40°C to 200°C)
Compliance	REACH, PFAS free, 50 state VOC

Gasketing Pastes

UV Cure Silicone Paste

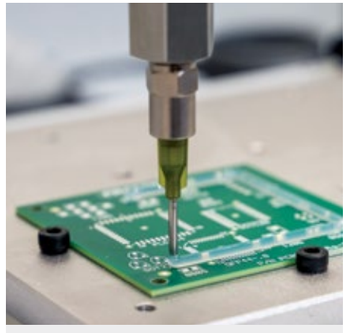
800-400
800-401

With a typical viscosity of ~300,000 cPs, 800-400 and 800-401 are UV cure only, fast curing pastes that consistently hold their shape even when dispensed into complex patterns. With its nearly instant UV cure, these materials are widely used for automated dispensing and cured-in-place gaskets (CIPG). Their consistent rheology makes them ideal as damming materials in a dam and fill process.

These non-corrosive, single component silicones offer a room temperature cure in seconds upon exposure to ultraviolet (UV) light. These silicone pastes are 100% solids with no solvents. They can be applied by automated needle dispense, jetting, or hand dispense.

800-400 (non-adhesive)
800-401 (adheres to plastic)

Used for:
- Medical device electronics
- Printed circuit/wiring boards
- Flexible hybrid electronics
- Rigid electronics
- Sensitive components in harsh environments
- Gasketing and sealing



800-400 applied as part of a dam and fill process.

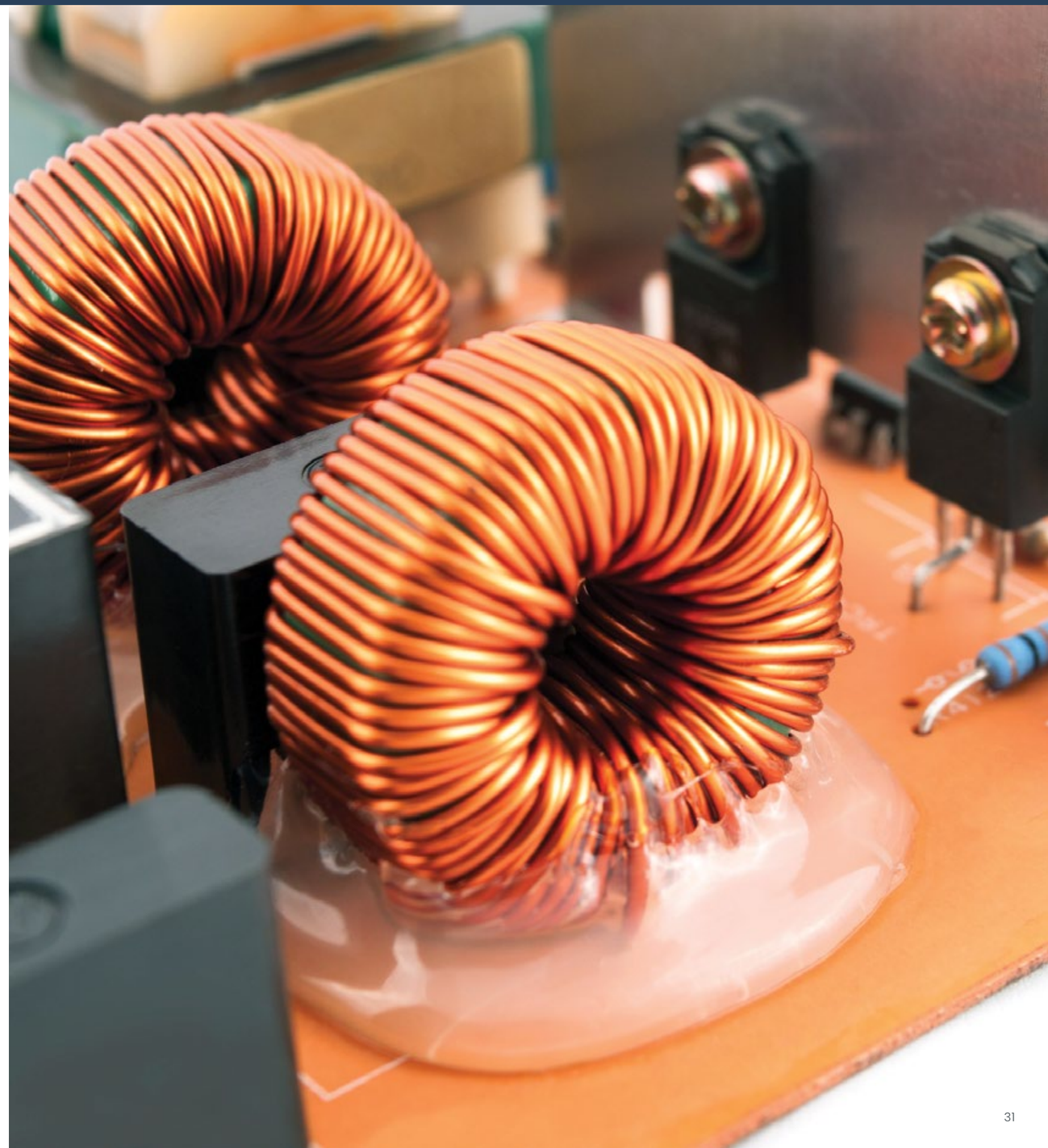
	800-400	800-401
Appearance & Form	Translucent, paste	Opaque, paste
Cure Chemistry	UV only	UV only
Viscosity (cPs) Brookfield HB #6 @ 10 rpm	300,000	300,000
Tensile Strength ASTM D412	370 psi	150 psi
Elongation ASTM D412	1,200%	1,000%
Hardness (Shore A) ASTM D2240	20	20
Specific Gravity ASTM D1875	1.11	1.11
Extrusion Rate 1/8" orifice @ 50 psi	>200 g/min	>200 g/min
Compression Set ASTM D395 25% @60°C	4%	14%
Volume Resistivity (Ω-cm) ASTM D257	$3.01x10^{13}$	$3.01x10^{13}$
Dissipation Factor (100 Hz / 100 kHz) ASTM D150	0.0011/0.0021	-
Dielectric Constant (100 Hz / 100 kHz) ASTM D150	3.34 / 3.33	-
Dielectric Strength ASTM D149	14.9 kV/mm 378 V/mil	-
Shadow Area Cure	No	No
UV Tracer	No	No
Service Temp	-40°F to 392°F (-40°C to 200°C)	-40°F to 392°F (-40°C to 200°C)
Flammability Class (UL 94)	V-1 *(pending)*	-
Compliance	REACH, PFAS free, 50 state VOC	PFAS free, 50 state VOC

Adhesives, Staking & Glob Top

Essential Attributes	500-452 page 32	500-418 page 33	500-PV page 34	800-750 page 35
	Adhesive Pastes		Photovoltaic Adhesive	Staking & Glob Tops
	PHYSICAL PROPERTIES			
Appearance	Gray, paste	Gray, paste	Black, paste	Clear, semi-flowable
Cure Chemistry	Alkoxy Moisture Cure	Alkoxy Moisture Cure	2k Alkoxy Moisture Cure (10:1)	UV Alkoxy Dual Cure
Viscosity (cPs)	250,000	350,000	Part A: 150,000 Part B: 150,000	50,000
Skin Time	8 min	10 min	-	-
Through Cure	72 hours	8 - 24 hours	8 hours	-
Tensile Strength	400 psi	380 psi	268 psi	15 psi
Elongation	185%	300%	103%	185%
Hardness (Shore A)	42	50	48	8
Flammability Class (UL94)	V-0 *(pending)*	-	HB	V-1 *(pending)*
Specifications	-	-	UL 746A UL 746B UL 746C (f1)	ISO 10993-5 ISO 10993-10 ISO 10993-20 UL 746E *(pending)*
Adhesion	glass, aluminum, FR4, stainless steel	aluminum, stainless steel, PET, PVC, nylon	glass, aluminum, steel	-
	ELECTRICAL PROPERTIES			
Volume Resistivity	$2.50x10^{14}$ Ω-cm	$3.08x10^{14}$ Ω-cm	$7.60x10^{16}$ Ω-cm	-
Dissipation Factor	0.0053 @100 Hz 0.0054 @100 kHz	0.0011 @100 Hz 0.0005 @100 kHz	0.0100 @100 Hz 0.0020 @100 kHz	-
Dielectric Constant	2.95 @100 Hz 2.85 @100 kHz	2.92 @100 Hz 2.88 @100 kHz	3.30 @100 Hz 3.21 @100 kHz	-
Dielectric Strength	17.7 kV/mm 732 V/mil	50 kV/mm 1271 V/mil	>38 kV/mm >975 V/mil	-

By shifting to chemical adhesives, design engineers are eliminating the localized stress points associated mechanical fasteners, improving reliability while simultaneously lightening components and reducing cost.

Novagard silicone adhesives can be used as a stabilizing material to minimize stresses on individual components. These staking and glob top connections provide an elastic and resilient bond between the component and the board to minimize shock and vibration, increasing both reliability and service life.



UL 94 V-0 Alkoxy Silicone Paste (1-part sealant)

500-452 *Product Development Pipeline*

500-452 is a neutral cure (alkoxy), UL 94 V-0 rated gray paste for applications that require superior bond strength and flame/fire resistance. This one-part paste has a good balance of tensile strength and elongation and cures to a tough, resilient elastomer with no unreacted components remaining after cure.

When a non-corrosive product is required, 500-452 is an unprimed adhesive solution that delivers a more uniform bond, acts like a gasket to protect against moisture and dust, and helps dampen vibrations. This paste is safe for electronics applications.

500-452 skins over in less than 10 minutes, and is completely cured within 3 days. Specially formulated to retain its physical properties even during service in extreme environmental conditions, it is ideal for applications that require superior bond strength and a UL 94 V-0 rating. 500-452 offers excellent electrical insulation with arc-resistance properties. This product was previously marketed as 500-09x.

Used for:

- Frame and junction box sealant in photovoltaic modules, sensitive electronic components, and circuit boards
- General industrial sealing and bonding applications requiring a non-corrosive product

	500-452
Appearance & Form	Gray, paste
Cure Chemistry	Alkoxy Moisture Cure
Viscosity (cPs) Brookfield HB #7 @ 10 rpm	250,000
Skin-Time 3/8" @ 50% RH & 77°F	8 min
Through Cure 1/8" @ 50% RH & 77°F	72 hours
Tensile Strength ASTM D412	400 psi
Elongation ASTM D412	185%
Hardness (Shore A) ASTM D2240	42
Adhesion ASTM C794 Glass Aluminum FR4 Stainless Steel (apply with primer)	6 - 8 pli 6 - 8 pli 6 - 12 pli 4 - 6 pli
Specific Gravity ASTM D0792	1.40
Extrusion Rate 1/8" orifice @ 50 psi	55 g/min
Thermal Conductivity ASTM D5470	0.60 w/m·K
Thermal Expansion (CTE) (ppm/°C) ASTM E831	272
Volume Resistivity (Ω-cm) ASTM D257	$2.50x10^{14}$
Dissipation Factor (100 Hz / 100 kHz) ASTM D150	0.0053 / 0.0054
Dielectric Constant (100 Hz / 100 kHz) ASTM D150	2.95 / 2.85
Dielectric Strength ASTM D149	17.7 kV/mm 732 V/mil
Chemical Resistance Gasoline Brake Fluid Antifreeze Wheel Cleaner	Yes Yes Yes Yes
Service Temp	-40°F to 392°F (-40°C to 200°C)
Flammability Class (UL 94)	V-0 *(pending)*
Compliance	REACH, PFAS free, 50 state VOC

Alkoxy Paste Adhesive

500-418 *Product Development Pipeline*

500-418 is an electronics grade, alkoxy cure silicone adhesive used for sealing components and accessories in industrial assembly applications. This single component formulation sets quickly and is fast curing, which can help reduce production time. 500-418 also allows for void free filling of the sealant joint.

500-418 offers excellent adhesion to a wide variety of substrates, including glass, metals, and plastics. Engineered for strength and flexibility, this product's high modulus ensures lasting durability. This non-corrosive sealant offers outstanding long term resistance to natural weathering, including extreme temperatures, ultraviolet radiation, rain, and snow, with negligible change in elasticity.

Used for:

- Seam sealing
- Photovoltaic frame sealant
- Junction box sealant
- Bonding to glass, plastics, and metals
- Bonding and sealing in appliance applications
- General/electronic assembly sealing

	500-418
Appearance & Form	Gray, paste
Cure Chemistry	Alkoxy Moisture Cure
Viscosity (cPs) Brookfield HB #7 @ 10 rpm	350,000
Tack-Free Time ASTM D2377	10 min
Through Cure 1.05 mm 2.25 mm	8 hours 24 hours
Tensile Strength ASTM D412	380 psi
Elongation ASTM D412	300%
Hardness (Shore A) ASTM D2240	50
Adhesion ASTM D1002 Aluminum Stainless Steel PET PVC Nylon	>80 psi >100 psi >150 psi >50 psi >120 psi
Specific Gravity ASTM D1875	1.36
Extrusion Rate 1/8" orifice @ 90 psi	100 g/min
Volume Resistivity (Ω-cm) ASTM D257	$3.08x10^{14}$
Dissipation Factor (100 Hz / 100 kHz) ASTM D150	0.0011 / 0.0005
Dielectric Constant (100 Hz / 100 kHz) ASTM D150	2.92 / 2.88
Dielectric Strength ASTM D149	50 kV/mm 1271 V/mil
Service Temp	-40°F to 392°F (-40°C to 200°C)
Compliance	REACH, PFAS free, 50 state VOC

Photovoltaic Adhesive

Photovoltaic PV Assembly Sealant (2-part, 10:1)

500-PV

500-PV is a two component, alkoxy condensation cure silicone thixotropic paste. 500-PV has a moderate curing speed at room temperature, allowing sufficient time for large components and complex assemblies to come together during panel manufacturing, while providing significantly greater throughput than single component condensation cure products. 500-PV offers very good adhesion to many different materials, including glass, aluminum, and composites.

It has excellent long-term durability and adhesion performance. This paste is designed for use in a variety of applications where long-term temperature cycle resistance, UV exposure, and other harsh exposure conditions exist. 500-PV offers outstanding weather and aging resistance, is low odor, and non-corrosive. With a 10:1 variable mix ratio, this material is designed to be used with automated dispensing equipment and the cure time is adjustable based on manufacturing requirements.

Used for:

- PV solar panel assembly
- PV junction box assembly and attachment
- PV solar frame assembly
- Interior and exterior bonding
- Interior and exterior sealing
- Encapsulation
- Electrical connector sealing

500-418 is a 1K alternative for frame sealant applications (see page 33).

	500-PV
Appearance & Form	Black, paste
Cure Chemistry	2k Alkoxy Moisture Cure (10:1 variable)
Viscosity (cPs) Brookfield HB #6 @ 20 rpm ASTM D1084	Part A: 150,000 Part B: 150,000
Through Cure	8 hrs
Tensile Strength ASTM D412	268 psi
Elongation ASTM D412	103%
Hardness (Shore A) ASTM D2240	48
Tensile Bonding ASTM D897 Glass Aluminum Steel	>130 psi
Shear Bonding ASTM C974 Glass Aluminum Steel	>100 psi
Specific Gravity ASTM D0792	Part A: 1.40 Part B: 1.03
Extrusion Rate 1/8" orifice @ 50 psi 1/8" orifice @ 90 psi 1/8" orifice @ 30 psi	Part A: 120 g/min Part A: 250 g/min Part B: 800 g/min
Volume Resistivity (Ω-cm) ASTM D257	$7.60x10^{16}$
Dissipation Factor (100 Hz / 100 kHz) ASTM D150	0.0100 / 0.0020
Dielectric Constant (100 Hz / 100 kHz) ASTM D150	3.30 / 3.21
Dielectric Strength ASTM D149	>38 kV/mm >975 V/mil
Tack Free Time ASTM D2377	80 min
Flammability Class (UL 94)	HB
Listings / Specifications	UL 746A UL 746B UL 746C (f1)
Compliance	REACH, PFAS free, 50 state VOC

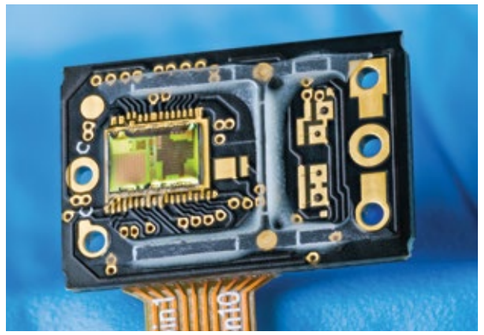
Staking & Glob Top

UV Alkoxy Dual Cure Semi-Flowable Staking Silicone

800-750

With viscosity of 50,000 cPs, 800-750 is a translucent silicone that clings readily to components for formed-in-place gasketing, staking, and glob-top applications. This non-corrosive, single component silicone will cure to a soft elastomer in seconds upon exposure to ultraviolet (UV) light, making it ideal for stress and strain relief as well as protection of delicate circuits. It has a secondary, neutral alkoxy moisture cure for enhanced adhesion and shadow cure.

800-750 contains a standard UV tracer for quality control.



Used for:

- Formed-in-place-gasketing
- Medical device electronics
- Sensor coating
- Printed circuit/wiring boards
- Flexible hybrid electronics
- Rigid electronics
- Sensitive components and harsh environments
- Gasketing, sealing, and potting

	800-750
Appearance & Form	Clear, semi-flowable
Cure Chemistry	UV Alkoxy Dual Cure
Viscosity (cPs) Brookfield RV #4 @ 20 rpm	50,000
Tensile Strength ASTM D412	15 psi
Elongation ASTM D412	185%
Hardness (Shore A) ASTM D2240	8
Specific Gravity ASTM D1875	0.98
Shadow Area Cure	Yes
UV Tracer	Yes
Service Temp	-40°F to 392°F (-40°C to 200°C)
Flammability Class (UL 94)	V-1 *(pending)*
Listings / Specifications	ISO 10993-5 ISO 10993-10 ISO 10993-23 UL 746E *(pending)*
Compliance	REACH, PFAS free, 50 state VOC

Best-in-Class R&D

Combine over 35 years of silicone expertise with a $30 million investment in research, facility, people & processes, and innovative manufacturing solutions are sure to follow.

Formulated to succeed

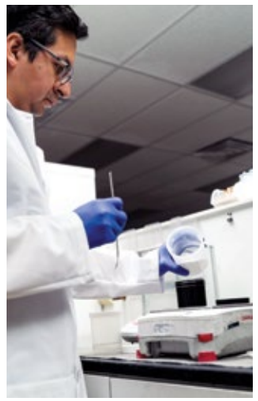
Our scientists work best when armed with raw materials that meet our high standards and equipment that allows them to identify, analyze, quantify, and qualify. With 100+ variations of tests available that measure every aspect of a material, we will go to any length to assure that each innovative product we produce performs to your exacting specifications.

Aged to perfection

Even in a lab stocked with the newest, most advanced, intricate testing equipment, that trusty old oven is still a time tested favorite. We use it to subject our silicones to the harshest of environments in the shortest amount of time. We simulate the aging process to evaluate and assure the shelf life and long term performance of the materials you trust to protect your product.

Listen, learn, *then* innovate

All the best lab equipment being used by the smartest silicone engineers in the world won't make a difference unless there is absolute clarity as to what the silicone material needs to do, where is needs to do it, and why. And that's why any project must start with a meeting of the minds—yours and ours.



Clean and Green

Low odor, solvent free, no harmful VOC emissions or outgassing, no isocyanates, PFAS free - regardless of the industry, Novagard's products provide exceptional performance AND are eco-friendly. Helping you best meet your responsibilities to your customers, your co-workers, and our planet.

World Class Products

In addition to the products offered in this catalog, Novagard manufactures silicone sealants, coatings, and PVC foams for a wide variety of markets.

Building Systems Silicones & Hybrids

We manufacture a complete line of professional grade one-part, two-part, and hybrid silicone sealants designed to meet the needs of window, door, siding, and metal roof manufacturers, dealers, building material wholesalers, and contractors. Novagard silicone sealants and adhesives are permanently flexible, solvent-free, impervious to UV light, and adhere without primers to most common building substrates.

Within the OEM window manufacturing sector, our products meet or surpass all industry standards for window and door fabrication applications. Window and Door manufacturers trust our AAMA/FGIA-approved formulations for their high tensile strength, quick cure rates, and excellent adhesion to most substrates.

Our products are easily gunned at all temperatures, VOC compliant in all 50 states, and available in all major siding, trim coil, window, and metal roof manufacturer colors.

Electronics Grade Silicones

When a non-corrosive product is required, we offer unprimed adhesive solutions that provide excellent insulation properties, vibration damping, and barrier protection against weather and other intrusions in electronics applications. Novagard's electronics grade alkoxy sealants combine increased flexibility and high temperature resistance, allowing you more versatility in the design and assembly process. Our silicones reliably seal, bond, coat, gasket, and encapsulate to protect sensitive components and modules, increase the reliability, and extend the useful life of your product.

PVC Foam

We manufacture PVC foam in a variety of colors, densities, and dimensions to meet the ever-growing needs of our customers in the transportation, HVAC, appliance, and automotive industries. Our foams cushion against shock and vibration, and its closed cell structure seals out light, air, dust, and moisture. Foam Seal foams are sulfur free, low VOC, and certified Prop 65 compliant.

Learn more about everything Novagard can do for you

Our innovative labs produce an extensive line of quality products.

NOVAGARD®

We partner with customers to develop silicone solutions to meet their specific design, production, and performance challenges.

Sustainability, durability, and longevity is at the core of every high performance product designed and manufactured at our site in Cleveland, OH.

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