



# Silicone Materials for Electronic Devices and Component Assemblies



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## Silicone Product Profile

The products introduced in this selector guide consist of RTV (Room Temperature Vulcanizing) silicone products that are commonly found in Electric and Electronic applications and component assemblies. This family of silicone products consists of both **Room Temperature Cure** and **Heat (Addition) Cure** grades.

Momentive Performance Materials offers a comprehensive portfolio of silicone solutions to help meet a broad array of handling and performance needs in electronic components and assemblies. Selection of the appropriate type of RTV depends upon the required manufacturing process, handling requirements, curing

conditions, equipment, and desired material properties.

### Condensation Cure

Condensation cure silicone products cure when exposed to moisture in the environment at room temperature. These materials are categorized into Alkoxy, Acetoxy, or Oxime based on the byproducts that occur during cure.

### Heat (Addition) Cure

Heat cure grades cure upon exposure to elevated heat or room temperature.

## Sealing & Adhesion

Silicones are used in a wide array of applications for bonding components, and sealing against moisture or environmental contaminants. A comprehensive portfolio of 1 Part and 2 Part Adhesives and Sealants, many of which are excellent candidates for assembly applications on or near sensitive electrical and electronic components, are available. These materials are applied by a variety of methods ranging from manual dispensing to auto-dispensing units for tube, cartridge, pail, or drum packages. Mixing for 2 Part grades may be accomplished by either manual processes

or meter mix dispensing, depending on production volume and post-mix material properties.

#### Performance Considerations

- Temperature Resistance
- Dielectric Resistance
- Flame Retardancy
- Low Volatility
- Adhesion
- Mechanical Strength
- Hardness
- Thermal Conductivity

#### Process Considerations

- Viscosity
- Cure Mechanism
- Cure Temperature
- Cure Time
- Pot Life



## Coating

The Coating process involves the application of silicone in a thin protective layer to a component surface by methods such as dip, flow, spray, and selective robotic



#### Performance Considerations

- Temperature Resistance
- Dielectric Resistance
- Flame Retardancy
- Low Volatility
- Stress Relief

#### Process Considerations

- Viscosity
- Cure Mechanism
- Cure Temperature
- Cure Time
- Pot Life

## Potting & Encapsulation

Silicone rubber and gels are widely used in electronics to ensure mechanical and environmental protection. A full range of products are offered in various cure speeds, viscosities, and

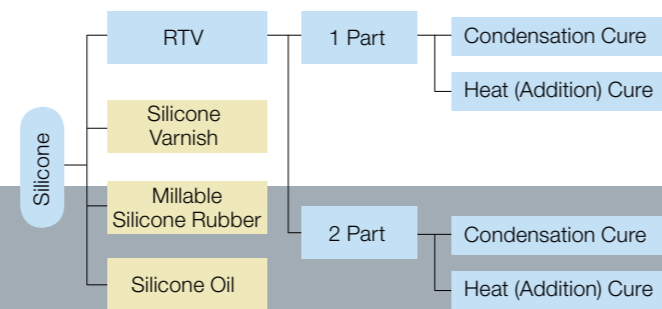


#### Performance Considerations

- Temperature Resistance
- Dielectric Resistance
- Flame Retardancy
- Low Volatility
- Adhesion
- Stress Relief
- Release Properties
- Thermal Conductivity

#### Process Considerations

- Viscosity
- Cure Mechanism
- Cure Temperature
- Cure Time
- Pot Life



## Relative Performance Characteristics

Property	Silicone RTV	Epoxy	Urethane
Temperature Range	-50 ~ +200 °C	-50 ~ +150 °C	-30 ~ +120 °C
Heat Resistance	Good	Poor	Poor
Flame Retardancy <sup>1</sup>	Good	None	None
UV Stability	Good	Poor	Poor
Ozone Stability	Good	Poor	Poor
Modulus	Low	High	High

<sup>1</sup>As a base material silicone demonstrates flame retardant properties comparable to UL94HB.





## Industries Served

### Electronic Devices and Power Modules

Momentive Performance Materials is a driving force as a supplier of advanced silicone technology to the electronics industry. Increasing electronic component densities and performance demands have created a need for specialized silicone solutions from Momentive for a broad mix of performance and handling requirements.

#### Typical Applications:

- Power converters
- Inverters
- Hybrid ICs
- Micro-Electronic packaging
- High-voltage component insulation
- Membrane switches
- Photo couplers



### Board Assembly

Silicones are found in board-level adhesion, coating, and encapsulation applications, and contribute to the long-term, reliable performance of many components and assemblies. A wide portfolio of products is available, providing flame retardancy, thermal conductivity, temperature resistance, low-volatility, or high-purity benefits.

#### Typical Applications:

- Board-level adhesion, fixing, and sealing
- PCB coating
- Component encapsulation
- Junction Coating Resins

### Consumer Electronics

Silicones are commonly used in a variety of consumer electronics applications. In addition to providing adhesion to many substrates, an array of grades are available to provide heat resistance, flame retardancy, low volatility for sensitive components, and moisture protection.

#### Typical Applications:

- Flat panel displays
- PCs and Smart Phones
- LED Lighting
- Steam iron plate seals
- Air conditioner units
- Control panel insulation
- PCB fixing and sealing



### Automotive Electronics

The automotive industry plays a critical role in integrating new electronic technologies. As more and more components migrate to electronic solutions, silicones play an increasingly important role in helping deliver material solutions that contribute to design flexibility and long-term component reliability under harsh



#### Typical Applications:

- ECU potting, sealing, coating
- Wire connector sealing
- Sealing, encapsulation in a broad range of sensors
- HVAC system sealing
- Vibration dampening
- Headlamp assemblies

### Aviation and Aerospace

Avionics and frame assembly needs in Aviation and Aerospace are served through silicone adhesives, coating, encapsulation and potting materials that help withstand stress and temperature extremes.

#### Typical Applications:

- Avionics
- Circuit and terminal protection
- Wire sealants
- Engine gasketing
- Cargo door, window sealing
- Weatherstrip adhesives
- Aviation lighting
- Ventilation ducts



### Energy

Reliability of electronic components and the ability for panels to withstand harsh conditions over the lifecycle of the product are important considerations in solar energy applications. Momentive Performance Materials helps serve this growing industry with its range of potting materials

and sealants.

#### Typical Applications:

- Terminal box potting
- Box and base sealing
- Aluminum frame and glass / EVA plate sealing



## Product Overview: Adhesives & Sealants

Type	Grade	Cure Chemistry	Cured Property	Feature	Performance									Product Detail
					Flowability	Flame Retardancy	Low Volatility	Thermally Conductive	High Temp. Resistance	Low Temp. Resistance	FDA Compliant	MIL-Spec		
1 Part Condensation Cure	RTV133	Alkoxy	Rubber	UL certified non-flowable sealant.	Non-flowable	UL94 V-0								P. 13
	RTV167	Alkoxy	Rubber	High-strength paste adhesive with UL certified and Mil Spec.	Non-flowable	UL94 HB						MIL-A-46146B	P. 13	
	TSE385	Alkoxy	Rubber	Paste adhesive. Suitable for PC substrates.	Non-flowable								P. 13	
	TSE3853-W	Alkoxy	Rubber	UL certified, semi-flowable paste.	Semi-flowable	UL94 V-0							P. 14	
	TSE3854DS	Alkoxy	Rubber	UL certified paste adhesive.	Non-flowable	UL94 V-0							P. 13	
	TN3005	Alkoxy	Rubber	Fast tack, low volatile paste paste adhesive.	Non-flowable		●						P. 13	
	TN3085	Alkoxy	Rubber	Fast tack, low volatile paste paste adhesive. UL certified	Non-flowable	UL94 V-0	●	●					P. 13	
	TSE3941M	Alkoxy	Rubber	Fast tack, thermally conductive flowable sealant.	Flowable			●					P. 14	
	TSE3944	Alkoxy	Rubber	Low volatile, UL certified flowable sealant.	Semi-flowable	UL94 V-0	●						P. 14	
	TN3305	Alkoxy	Rubber	Fast tack, low volatile flowable adhesive / sealant	Flowable		●						P. 14	
	TSE3971	Alkoxy	Rubber	Flowable adhesive / sealant.	Flowable								P. 14	
	TSE3976-B	Alkoxy	Rubber	Low volatile, temperature resistant sealant. UL certified.	Flowable	UL94 HB	●		●				P. 14	
	XE11-B5320	Alkoxy	Rubber	Fast tack, low volatile, thermally conductive adhesive. UL certified.	Non-flowable	UL94 HB	●	●					P. 13	
	FRV1106	Acetoxo	Rubber	Fuel, solvent, chemical, and temperature-resistant fluoro sealant.	Non-flowable				●				P. 16	
	RTV100 series	Acetoxo	Rubber	FDA, USDA, and NSF compliant paste adhesive. Mil Spec.	Non-flowable						●	MIL-A-46106B	P. 17	
	RTV106	Acetoxo	Rubber	Temperature-resistant adhesive. FDA, USDA, & NSF compliant. Mil Spec.	Non-flowable				●		●	MIL-A-46106B	P. 17	
	RTV116	Acetoxo	Rubber	Temperature-resistant flowable sealant. FDA, USDA, & NSF compliant. Mil Spec.	Flowable				●		●	MIL-A-46106B	P. 17	
	RTV157	Acetoxo	Rubber	High strength paste / adhesive.	Non-flowable								P. 17	
	RTV159	Acetoxo	Rubber	High strength paste / adhesive. Temperature-resistant.	Non-flowable				●				P. 17	
	TSE370	Acetoxo	Rubber	Fast tack, general purpose paste adhesive.	Non-flowable								P. 17	
	TSE382	Oxime	Rubber	Fast tack, general purpose adhesive paste. UL certified.	Non-flowable	UL94 HB							P. 15	
	TSE3826	Oxime	Rubber	Fast tack adhesive for high-temperature applications.	Non-flowable				●				P. 16	
	TSE3840-G	Oxime	Rubber	UL certified general purpose adhesive / sealant.	Semi-flowable	UL94 V-0							P. 16	
	TSE3843-W	Oxime	Rubber	UL certified general purpose adhesive / sealant.	Semi-flowable	UL94 V-1		●					P. 16	
	TSE384-B	Oxime	Rubber	UL certified general purpose adhesive / sealant.	Non-flowable	UL94 V-0							P. 16	
	TSE387	Oxime	Rubber	General purpose flowable adhesive / sealant.	Flowable								P. 16	
	TSE3877-B	Oxime	Rubber	Flowable sealant for high-temperature applications.	Flowable				●				P. 16	
	TSE388	Oxime	Rubber	Flowable general purpose adhesive / sealant.	Flowable								P. 16	
1 Part Heat Cure	TSE3212	Heat	Rubber	Thixotropic adhesive / sealant.	Semi-flowable								P. 18	
	TSE322	Heat	Rubber	Flowable adhesive / sealant.	Flowable								P. 18	
	TSE3221S	Heat	Rubber	Flowable adhesive / sealant.	Flowable								P. 19	
	TSE322S	Heat	Rubber	UL certified, semi-flowable adhesive / sealant.	Semi-flowable	UL94 HB							P. 18	
	TSE326	Heat	Rubber	UL certified, high temperature-resistant adhesive / sealant.	Flowable	UL94 HB			●				P. 19	
	TSE3261-G	Heat	Rubber	High temperature-resistant adhesive / sealant.	Flowable				●				P. 18	
	TSE326M <sup>1</sup>	Heat	Rubber	High temperature-resistant adhesive / sealant.	Flowable				●				P. 19	
	TSE3280-G	Heat	Rubber	Thermally conductive adhesive.	Flowable			●					P. 18	
	TSE3281-G	Heat	Rubber	Thermally conductive adhesive.	Flowable			●					P. 19	
XE13-B3208	Heat	Rubber	General purpose adhesive / sealant.	Non-flowable								P. 18		
2P RT	RTV577	Condensation	Rubber	Extreme low temperature resistant sealant. Release capability.	Non-flowable					●			P. 21	
	RTV88	Condensation	Rubber	Semi-flowable temperature-resistant sealant. Release capability.	Semi-flowable				●				P. 21	
2 Part Heat Cure	TSE3360	Heat	Rubber	General purpose adhesive / sealant.	Non-flowable								P. 23	
	TSE3380	Heat	Rubber	Thermally conductive adhesive. Fast cure at elevated temperatures.	Flowable			●					P. 23	
	XE14-A0425	Heat	Rubber	Heat resistant, thermally conductive adhesive.	Semi-flowable			●	●				P. 23	

<sup>1</sup> TSE326M-EX in Europe and the Americas

## Product Overview: Coating Materials

Type	Grade	Cure Chemistry	Cured Property	Feature	Performance								Product Detail	
					Flowability	Flame Retardancy	Low Volatility	Thermally Conductive	High Temp. Resistance	JCR Grade	FDA Compliant	MIL-Spec		
1 Part Condensation Cure	ECC3010	Alkoxy	Rubber	Fast cure conformal coating material. Solvent free	Flowable									P. 15
	ECC3050S	Alkoxy	Rubber	Fast cure conformal coating material. Low volatile. Solvent free	Flowable		●							P. 15
	ECS0600	Alkoxy	Rubber	High purity repairable electrode coating. Fast tack.	Flowable		●							P. 15
	ECS0601	Alkoxy	Rubber	High purity, non-repairable type electrode coating. UL certified.	Flowable	UL94 HB	●							P. 15
	ECS0609FR	Alkoxy	Rubber	High purity, non-repairable type electrode coating. UL certified.	Flowable	UL94 V-0	●							P. 14
	RTV160	Alkoxy	Rubber	UL certified flowable sealant.	Flowable	UL94 HB								P. 14
	TSE3941M	Alkoxy	Rubber	Fast tack, thermally conductive flowable sealant.	Flowable			●						P. 14
	TSE3944	Alkoxy	Rubber	Low volatile, UL certified flowable sealant.	Semi-flowable	UL94 V-0	●							P. 14
	TN3305	Alkoxy	Rubber	Fast tack, low volatile flowable adhesive / sealant	Flowable		●							P. 14
	TSE3971	Alkoxy	Rubber	Flowable sealant.	Flowable									P. 14
	TSE3976-B	Alkoxy	Rubber	Low volatile, temperature resistant sealant. UL certified.	Flowable	UL94 HB	●		●					P. 14
	TSE398	Alkoxy	Rubber	Pourable coating / encapsulant.	Flowable									P. 15
	TN3705	Alkoxy	Rubber	Low volatile, low viscosity coating / potting material	Flowable		●							P. 15
	XE11-A5133S	Alkoxy	Rubber	Low volatile, UL certified, thermally conductive coating & potting.	Flowable	UL94 V-1	●	●						P. 14
	RTV110 series	Acetoxy	Rubber	General purpose coating / encapsulant. FDA, USDA, and NSF compliant. Mil Spec.	Flowable						●	MIL-A-46106B		P. 17
	TSE387	Oxime	Rubber	General purpose flowable sealant / coating.	Flowable									P. 16
	TSE3877-B	Oxime	Rubber	Flowable sealant for high-temperature applications.	Flowable				●					P. 16
	TSE388	Oxime	Rubber	Flowable, general purpose sealant / coating.	Flowable									P. 16
	TSE389	Oxime	Rubber	Flowable, UL certified coating / sealant.	Flowable	UL94 HB								P. 16
1 Part Heat Cure	ECC4865	Heat	Rubber	Extreme low viscosity coating material with UV tracer.	Flowable									P. 20
	TSE3221S	Heat	Rubber	Flowable sealant / coating material.	Flowable									P. 19
	TSE325	Heat	Rubber	Flowable coating / encapsulant.	Flowable									P. 20
	TSE3250	Heat	Rubber	Flowable coating / encapsulant.	Flowable									P. 20
	TSE3251	Heat	Rubber	Flowable coating material.	Semi-flowable									P. 20
	TSE3251-C	Heat	Rubber	Flowable coating material.	Semi-flowable									P. 20
	TSE325-B	Heat	Rubber	Flowable coating / encapsulant.	Flowable									P. 20
	TSJ3155	Heat	Rubber	High purity JCR-grade white rubber.	Semi-flowable						●			P. 27
	TSJ3195-W	Heat	Gel	High purity JCR-grade white gel.	Semi-flowable						●			P. 27
TSJ3185	Heat	Gel	High purity JCR-grade translucent gel.	Semi-flowable						●			P. 27	
2P RT	RTV11	Condensation	Rubber	General purpose encapsulation and potting. FDA compliant.	Flowable						●			P. 22
	TSE3033	Heat	Rubber	Transparent coating / encapsulant. Fast cure at elevated temperatures.	Flowable									P. 24
2 Part Heat Cure	TSE3331	Heat	Rubber	UL certified, thermally conductive, coating / encapsulant.	Flowable	UL94 V-0		●						P. 23
	TSE3331K <sup>1</sup>	Heat	Rubber	Low viscosity variant of TSE3331.	Flowable	UL94 V-0		●						P. 24
	TSE3331K EX <sup>1</sup>	Heat	Rubber	Low viscosity variant of TSE3331.	Flowable	UL94 V-0		●						P. 23
	XE14-B5778	Heat	Rubber	High purity JCR-grade translucent rubber.	Semi-flowable						●			P. 27
	TSJ3175	Heat	Gel	High purity JCR-grade thixotropic gel.	Semi-flowable						●			P. 27

<sup>1</sup> TSE3331K for Asia Pacific, TSE3331K EX for Europe and the Americas

## Grease - Product Index

Grade	Feature	Performance				Product Detail
		Thermally Conductive	Low Bleed	Low Volatility	Heat Resistant	
TSK5303	Moderate thermal conductivity with heat resistance.	●		●	●	P. 28
TSK5370	General electrical insulation. Swell resistant on silicone.			●		P. 28
TSK550	General electrical insulation, arc resistance.					P. 28
TSK551	Insulator protection from salt, dust.					P. 28
YG6111	Moderate thermal conductivity.	●		●		P. 28
YG6240	Moderate thermal conductivity, low-bleed performance.	●	●	●		P. 28
YG6260	Moderate thermal conductivity.	●		●		P. 28
TIG1000	High thermal conductivity.	●		●		P. 28

## Product Overview: Encapsulants and Potting Materials

Type	Grade	Cure Chemistry	Cured Property	Feature	Performance								Product Detail	
					Flowability	Flame Retardancy	Low Volatility	Thermally Conductive	High Temp. Resistance	Low Temp. Resistance	FDA Compliant	MIL-Spec		
1 Part Cond. Cure	RTV160	Alkoxy	Rubber	UL certified flowable encapsulant.	Flowable	UL94 HB								P. 14
	TSE398	Alkoxy	Rubber	Pourable coating / encapsulant.	Flowable									P. 15
	TN3705	Alkoxy	Rubber	Low volatile, low viscosity potting / coating material.	Flowable		●							P. 15
	XE11-A5133S	Alkoxy	Rubber	Low volatile, UL certified, thermally conductive coating & potting.	Flowable	UL94 V-1	●	●						P. 14
	RTV110 series	Acetoxo	Rubber	General purpose coating / encapsulant. FDA, USDA, and NSF compliant. Mil Spec.	Flowable						●		MIL-A-46106B	P. 17
	RTV116	Acetoxo	Rubber	Temperature-resistant flowable sealant. FDA, USDA, and NSF compliant. Mil Spec.	Flowable				●		●		MIL-A-46106B	P. 17
1 Part Heat Cure	TSE325	Heat	Rubber	Flowable coating / encapsulant.	Flowable									P. 20
	TSE3250	Heat	Rubber	Flowable coating / encapsulant.	Flowable									P. 20
	TSE325-B	Heat	Rubber	Flowable coating / encapsulant.	Flowable									P. 20
	TSE3051	Heat	Gel	Low viscosity potting gel.	Flowable									P. 25
	TSE3051-FR	Heat	Gel	UL certified variant of TSE3051.	Flowable	UL94 V-1								P. 25
	TSE3051-L	Heat	Gel	Low penetration variant of TSE3051.	Flowable									P. 25
2 Part Room Temp. Cure	TSE3053	Heat	Gel	High penetration gel.	Flowable									P. 25
	RTV11	Condensation	Rubber	General purpose encapsulation and potting. FDA compliant.	Flowable							●		P. 22
	RTV31	Condensation	Rubber	High temperature resistant potting. Good release properties.	Flowable				●					P. 22
	RTV566	Condensation	Rubber	Low volatile, high-low temperature-resistance.	Flowable		●		●	●				P. 21
	RTV60	Condensation	Rubber	Extreme high temperature-resistant coating / potting. Release capability.	Flowable				●					P. 21
	TSE3663	Condensation	Rubber	Flowable encapsulant / potting material.	Flowable									P. 22
	TSE3661	Condensation	Rubber	Flowable encapsulant / potting material.	Flowable	UL94 HB								P. 22
2 Part Heat Cure	TSE3664K	Condensation	Rubber	UL certified, flowable encapsulant / potting material.	Flowable	UL94 V-0								P. 22
	RTV615	Heat	Rubber	High strength potting material. Fast cure at elevated temperatures.	Flowable							●		P. 23
	TSE3032	Heat	Rubber	Transparent potting / encapsulant with excellent release properties.	Flowable									P. 23
	TSE3033	Heat	Rubber	Low viscosity, transparent potting material. Fast cure at elevated temperatures.	Flowable									P. 24
	TSE3331	Heat	Rubber	UL certified, thermally conductive, coating / encapsulant.	Flowable	UL94 V-0		●						P. 23
	TSE3331K <sup>1</sup>	Heat	Rubber	Low viscosity variant of TSE3331.	Flowable	UL94 V-0		●						P. 24
	TSE3331K EX <sup>1</sup>	Heat	Rubber	Low viscosity variant of TSE3331.	Flowable	UL94 V-0		●						P. 23
	TSE3431	Heat	Rubber	UL certified, thermally conductive potting material. Release capability.	Flowable	UL94 V-0		●						P. 24
	TSE3431-H	Heat	Rubber	UL certified, thermally conductive potting material. Release capability.	Flowable	UL94 V-0		●						P. 24
	XE14-B7892	Heat	Rubber	UL certified low-viscosity potting material. Low temperature cure. Release capability.	Flowable	UL94 V-0								P. 24
	YE5822	Heat	Rubber	Low viscosity potting material. Good release properties.	Flowable									P. 24
	RTV6136-D1	Heat	Gel	Low viscosity potting gel with fast cure at low temperatures.	Flowable									P. 26
	TSE3062	Heat	Gel	Fast cure at low temperatures.	Flowable									P. 26
TSE3070	Heat	Gel	High-elongation gel with low temperature cure.	Flowable									P. 26	

<sup>1</sup> TSE3331K for Asia Pacific, TSE3331K EX for Europe and the Americas

## Selection Guide

### 1 Part Grades

BLACK=Rubber RED=Gels Alkoxy Acetoxy Oxime Heat

Viscosity Range	Performance					
	Thermally Conductive	Low Volatility	UL Certified	Temp. Resistant	FDA Compliant	General Purpose
Non-Flowable	TN3085 XE11-B5320	TN3005 TN3085 XE11-B5320	TSE3854DS TN3085 RTV133			TSE385
				FRV1106 RTV106	RTV100 RTV106	RTV157 TSE370
			TSE382 TSE384-B	TSE3826		
						XE13-B3208
High Viscosity		TSE3976-B	TSE3853-W TSE3976-B	TSE3976-B		TSE3971
				RTV159		
	TSE3843-W		TSE3840-G TSE3843-W	TSE3877-B		
Medium Viscosity						TSE3212 TSE322
	TSE3941M XE11-A5133S	TSE3944 XE11-A5133S TN3305	TSE3944 XE11-A5133S RTV160 RTV167 RTV110	RTV116	RTV110 RTV116	TSE398
						TSE387 TSE388
	TSE3280-G TSE3281-G		TSE322S TSE325	TSE326 TSE3261-G TSE326M		TSE3221S
Low Viscosity		ECC3050S ECS0600 ECS0601 ECS0609FR TN3705	ECS0601 ECS0609FR			ECC3010
			TSE389 TSE3051FR			TSE3051 TSE3051-L TSE3053 TSE325 TSE3250 TSE3251 TSE3251-C TSE325-B

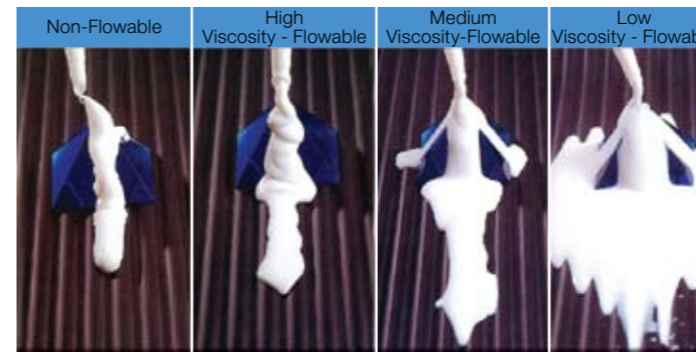
### Cure System Performance Guide

Attribute	Alkoxy		Acetoxy	Oxime	Heat Cure
	Fast Cure	Slow Cure			
Cure Byproduct	Alcohol	Alcohol	Acetic Acid	Methylethyl Ketoxime	None
Cure Speed	Fast	Slow	Fast	Moderate	Very Fast
Corrosion on Copper	None	None	Yes	Yes	None
Corrosion on Metals	None	None	Yes	None	None
Odor	Low	Low	Strong	Low	None
Strength	Good	Good	Very Strong	Good	Good

## 2 Part Grades

BLACK=Rubber RED=Gels Heat Room Temperature

Viscosity Range	Performance					
	Thermally Conductive	Low Volatility	UL Certified	Temp. Resistant	FDA Compliant	General Purpose
Non-Flowable						TSE3360
High Viscosity						XE14-A0425 TSE3971
						RTV577 RTV88
Medium Viscosity						TSE3380
		RTV566				RTV31 RTV566 RTV60
Low Viscosity						RTV615 RTV6136-D1 TSE3032 TSE3033 TSE3062 TSE3070 TSE3330 YE5822
	TSE3331 TSE3331K TSE3431 TSE3431-H		TSE3331 TSE3331K TSE3431 TSE3431-H XE14-B7892			
	TSE3661 TSE3664K	RTV567	RTV567 TSE3664K			TSE3663



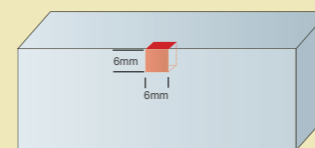
Viscosity and flowability of the silicone material are often key factors in the selection of a material for use in sealing, coating, and encapsulation / potting applications. A broad array of material performance and viscosity combinations are provided to help match the requirements of many applications.

### Application Geometry and Cure Chemistry Options

The shape and conditions of the part are important in selecting the suitable silicone grade for each application.

The following are some general guidelines:

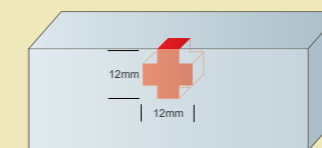
#### Shallow Cavity / Small Mass



#### Selection Options:

- 1 Part Condensation Cure
- 1 Part Heat Cure
- 2 Part Room Temp. Cure
- 2 Part Heat Cure

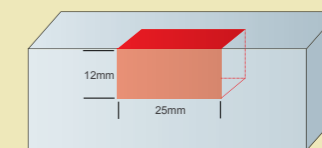
#### Complex Design - Exposed Surface



#### Selection Options:

- 1 Part Heat Cure
- 2 Part Room Temp. Cure
- 2 Part Heat Cure

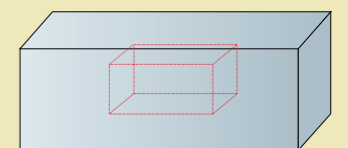
#### Deep Cavity / Large Mass



#### Selection Options:

- 1 Part Heat Cure
- 2 Part Room Temp. Cure
- 2 Part Heat Cure

#### Enclosed System



#### Selection Options:

- 1 Part Heat Cure
- 2 Part Heat Cure

## Product Details - 1 Part Condensation Cure Grades

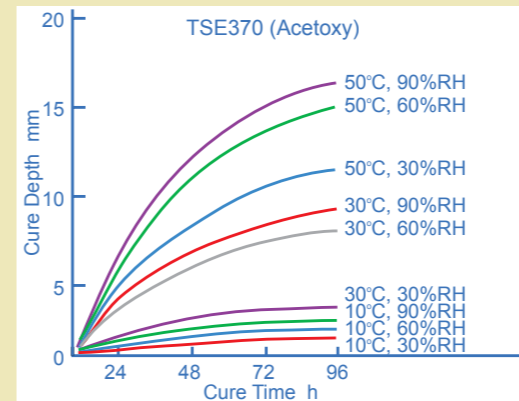
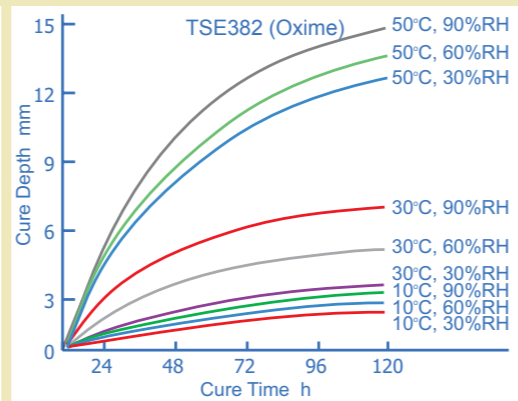
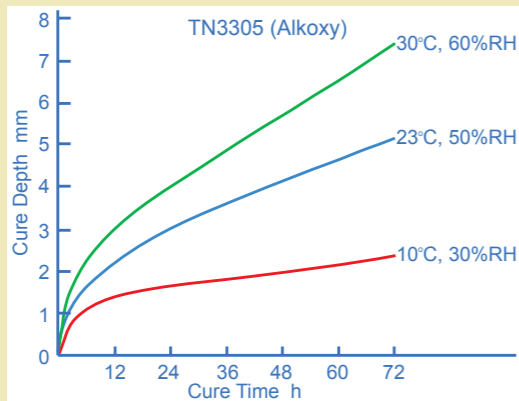
Properties		RTV167	RTV133	TSE385	TSE3854DS	TN3005	TN3085	XE11-B5320		TSE3944	TSE3853-W	TSE3971	TSE3976-B	XE11-A5133S	TSE3941M	TN3305	RTV160	ECS0609FR
Cure Chemistry		Alkoxy	Alkoxy	Alkoxy	Alkoxy	Alkoxy	Alkoxy	Alkoxy		Alkoxy	Alkoxy	Alkoxy	Alkoxy	Alkoxy	Alkoxy	Alkoxy	Alkoxy	Alkoxy
Flowability		Non-Flowable	Non-Flowable	Non-Flowable	Non-Flowable	Non-Flowable	Non-Flowable	Non-Flowable		Semi-Flowable	Semi-Flowable	Flowable	Flowable	Flowable	Flowable	Flowable	Flowable	Flowable
Features and Benefits		High strength, paste adhesive with MILA-46106B and UL certified	UL certified paste adhesive.	Paste adhesive	Paste adhesive. UL certified	Fast tack, low volatile paste adhesive.	Fast tack, low volatile paste adhesive. UL certified	Fast tack, low volatile, thermally conductive paste adhesive.		Flowable low volatile adhesive / sealant. UL certified	Flowable adhesive / sealant. UL certified	Flowable adhesive / sealant.	Flowable, high-temperature resistant low volatile adhesive / sealant. UL certified	Flowable, low volatile thermally conductive potting / coating material. UL certified	Fast tack, thermally conductive flowable adhesive / sealant.	Fast tack, flowable adhesive / sealant.	Flowable adhesive with UL certified	High-purity electrode coating material with fast tack performance. UL certified
Application	Adhesive / Sealant	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●
	Coating									●	●	●	●	●	●	●	●	●
	Encapsulant / Potting												●				●	
Viscosity (23°C)	Pa.s (P)	-	-	-	-	-	-	-		-	400 (4000) <sup>1</sup>	100 (1000) <sup>1</sup>	100 (1000) <sup>1</sup>	60 (600) <sup>1</sup>	50 (500) <sup>1</sup>	47 (470) <sup>1</sup>	38 (380) <sup>2</sup>	18 (180) <sup>1</sup>
Application Rate	g/min	180	650	-	-	-	-	-		-	-	-	-	-	-	-	-	-
Tack Free Time	min	240	60	90	15	7	7	5		5	15	10	5	10	5	9	240	7
Specific Gravity (23°C)		1.12	1.23	1.10	1.33	1.04	1.63	2.59		1.31	1.31	1.04	1.08	1.64	1.64	1.04	1.04	1.22
Hardness		37	46	35	45	22	46	80		38	34	16	30	63	63	14	25	28
Tensile Strength	MPa (psi)	5.5 (800)	4.5 (650)	2.9 (420)	3.0 (435)	1.8 (260)	2.3 (335)	3.6 (520)		1.5 (220)	2.3 (335)	1.5 (220)	1.7 (245)	3.9 (565)	3.2 (465)	1.5 (220)	1.9 (275)	2.4 (350)
Elongation	%	600	250	390	300	330	150	40		170	270	350	210	100	70	400	230	250
Adhesive Strength	MPa (psi)	1.2 (175)	-	2.0 (290)	2.2 (320)	1.2 (175)	1.3 (190)	1.3 (190)		1.0 (145)	1.3 (190)	1.1 (160)	1.3 (190)	1.3 (190)	1.4 (205)	1.0 (145)	-	1.2 (175)
Thermal Conductivity	W/m-K	-	-	0.17	0.34	0.18	0.7	1.3		0.36	0.34	0.18	0.18	0.83	0.83	0.18	-	-
Volume Resistivity	MΩ·m	3.0x10 <sup>7</sup>	3.0x10 <sup>7</sup>	5.0x10 <sup>7</sup>	2.0x10 <sup>6</sup>	2.0x10 <sup>6</sup>	4.0x10 <sup>7</sup>	2.0x10 <sup>7</sup>		1.0x10 <sup>7</sup>	2.0x10 <sup>6</sup>	2.0x10 <sup>7</sup>	1.0x10 <sup>7</sup>	4.0x10 <sup>6</sup>	4.0x10 <sup>6</sup>	2.0x10 <sup>7</sup>	4.0x10 <sup>6</sup>	1.0x10 <sup>5</sup>
Dielectric Strength	kV/mm	20	20	22	25	23	22	17		22	20	21	20	20	21	26	20	20
Dielectric Constant (60Hz)		2.8	2.8 (100Hz)	3.0	3.1	4.0	2.9	2.6		3.8	3.1	2.9	3.5	4.0	4.0	2.7	2.8	3.1
Dissipation Factor (60Hz)		0.0026	0.001 (100Hz)	0.001	0.02	0.002	0.04	0.005		0.02	0.02	0.005	0.01	0.04	0.04	0.002	0.001	0.05
Low Molecular Siloxane (D <sub>3</sub> -D <sub>10</sub> ) wt%		-	-	-	-	0.01	0.01	0.010		0.028	-	-	0.025	0.025	-	0.028	-	-
Flame Retardancy		UL94 HB	UL94 V-0		UL94 V-0		UL94 V-0	UL94 HB		UL94 V-0	UL94 V-0		UL94 HB	UL94 V-1			UL94 HB	UL94 V-0
Low Volatility						●	●	●		●			●	●		●		●
Temperature Resistance													●					
Thermally Conductive														●	●			
FDA																		
MIL-Spec <sup>2</sup>		MIL-A-46106B <sup>3</sup>																
Color	White			●	●	●	●	●		●	●	●	●	●	●	●	●	●
	Clear					●										●		
	Black		●			●						●	●			●		
	Gray	●								●								●
Packaging	Tube	●		●	●		●	●		●	●	●	●	●	●		●	●
	Cartridge	●	●	●	●		●	●		●	●	●	●	●	●		●	●
	Can																	
	Pail														●			
	See Page 15 for details					●										●		

<sup>1</sup>JIS K 6249 <sup>2</sup>Testing is performed in accordance with current Momentive Performance Materials quality test methods, laboratory conditions, procedures, frequency and sampling. <sup>3</sup>MIL-A-46106B Group I Type I

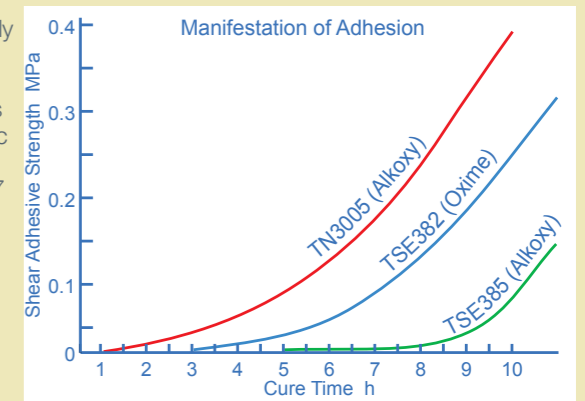
Typical property data values should not be used as specifications

### Cure Properties:

Condensation cure grades cure with exposure to atmospheric moisture. The cure process begins from the outer surface and proceeds inward. Therefore, deep section curing (in excess of 6mm) is not recommended. Typically, tack-free is achieved in 5-60 minutes at 25°C, 50%RH, depending on the grade.



Adhesion is typically achieved after 5-15 hours. Full material properties including electronic performance, is achieved in up to 7 days.





## Product Details - 1 Part Condensation Cure Grades

Properties		TSE398	ECS0600	TN3705	ECS0601	ECS3050S	ECC3010	TSE382		TSE3826	TSE384-B	TSE3840-G	TSE3843-W	TSE3877-B	TSE387	TSE388	TSE389	FRV1106	
Cure Chemistry		Alkoxy	Alkoxy	Alkoxy	Alkoxy	Alkoxy	Alkoxy	Oxime		Oxime	Oxime	Oxime	Oxime	Oxime	Oxime	Oxime	Oxime	Oxime	Acetoxy
Flowability		Flowable	Flowable	Flowable	Flowable	Flowable	Flowable	Non-Flowable		Non-Flowable	Non-Flowable	Semi-Flowable	Semi-Flowable	Flowable	Flowable	Flowable	Flowable	Non-Flowable	
Features and Benefits		Flowable adhesive / sealant.	High-purity electrode coating material with fast tack performance. Repairable type	Low volatile potting and coating material	High-purity electrode coating material with fast tack performance	Fast cure conformal coating material. Low volatile. Solvent free	Fast cure conformal coating material. Solvent free	General purpose paste adhesive. UL certified		High temperature resistant paste adhesive	General purpose paste adhesive. UL certified	UL certified semiflowable adhesive / sealant.	General purpose flowable adhesive / sealant. UL certified	General purpose flowable adhesive / sealant. UL certified	General purpose flowable adhesive / sealant.	General purpose flowable adhesive / sealant.	Flowable sealant / coating material. UL certified	Fluorosilicone with high temperature performance. Good fuel, oil, moisture, UV, ozone & chemical resistance	
Application	Adhesive / Sealant							●		●	●	●	●	●	●	●	●	●	
	Coating	●	●	●	●	●	●						●	●	●	●	●		
	Encapsulant / Potting	●		●															
Viscosity (23°C)	Pa.s (P)	17 (170) <sup>1</sup>	5.0 (50) <sup>1</sup>	1.5 (15) <sup>1</sup>	1.4 (14) <sup>1</sup>	0.55 (5.5) <sup>1</sup>	0.11 (1.1) <sup>1</sup>	-	-	-	-	500 (5000) <sup>1</sup>	300 (3000) <sup>1</sup>	60 (600) <sup>1</sup>	10 (100) <sup>1</sup>	5.6 (56) <sup>1</sup>	-		
Application Rate	g/min	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	88	
Tack Free Time	min	10	7	7	7	5	3	10	10	60	30	60	20	90	60	30	20		
Specific Gravity (23°C)		1.04	1.03	1.01	1.01	0.98	0.99	1.04	1.04	1.46	1.40	1.57	1.08	1.03	1.04	1.04	1.04	1.58	
Hardness		14	20	13	25	22	35	28	29	50	31	60	25	25	16	30	42		
Tensile Strength	MPa (psi)	1.3 (190)	1.2 (175)	0.4 (60)	0.8 (115)	-	-	1.9 (275)	2.0 (290)	2.9 (421)	2.4 (350)	3.9 (565)	2.0 (290)	2.3 (335)	1.5 (220)	2.0 (290)	3.33 (485)		
Elongation	%	230	450	130	150	-	-	380	400	270	270	130	440	350	330	200	230		
Adhesive Strength	MPa (psi)	0.7 (100)	-	0.2 (30)	0.3 (45)	-	-	1.7 (245)	1.4 (205)	1.4 (203)	1.5 (220)	1.8 (260)	2.0 (290)	1.3 (190)	1.3 (190)	1.8 (260)	-		
Thermal Conductivity	W/m-K	0.18	-	0.18	-	-	-	0.18	0.18	0.59	0.25	0.67	0.18	0.18	0.18	0.18	-		
Volume Resistivity	MΩ·m	2.0x10 <sup>7</sup>	4.0x10 <sup>7</sup>	2.0x10 <sup>7</sup>	2.0x10 <sup>7</sup>	1.0x10 <sup>7</sup>	1.0x10 <sup>7</sup>	1.0x10 <sup>7</sup>	1.0x10 <sup>7</sup>	1.0x10 <sup>7</sup>	1.0x10 <sup>7</sup>	1.0x10 <sup>7</sup>	1.0x10 <sup>7</sup>	1.0x10 <sup>7</sup>	1.0x10 <sup>7</sup>	1.0x10 <sup>7</sup>	-		
Dielectric Strength	kV/mm	23	20	26	20	20	20	23	23	22	22	21	20	20	20	20	20	13.7	
Dielectric Constant (60Hz)		3.0	2.8	2.7	2.6	2.60	2.78	2.9	2.9	4.0	4.0	3.9	3.5	2.9	2.8	2.7	6.3 (1000Hz)		
Dissipation Factor (60Hz)		0.01	0.001	0.002	0.002	0.001	0.001	0.004	0.004	0.016	0.02	0.02	0.01	0.004	0.008	0.009	-		
Low Molecular Siloxane (D3-D10)	wt%	-	0.01	0.01	0.01	0.01	-	-	-	-	-	-	-	-	-	-	-		
Flame Retardancy					UL94 HB			UL94 HB		UL94 V-0	UL94 V-0	UL94 V-1					UL94 HB		
Low Volatility			●	●	●	●													
Temperature Resistance									●				●				●		
Thermally Conductive												●							
FDA																			
MIL-Spec <sup>2</sup>																			
Color	White	○	○	○	○			○				○		○	○	○	○		
	Clear	○		○		○	○	○						○		○			
	Black			●	●			●		●				●	●	●	●		
	Gray							●			●				●				
	Red								●								●		
Packaging	Tube	●							●	●		●							
	Cartridge	●	●		●				●	●	●	●	●		●		●		
	Can					●	●												
	Pail		●				●						●						
	See Page 15 for details			●				●						●		●			

<sup>1</sup>JIS K 6249 <sup>2</sup>Testing is performed in accordance with current Momentive Performance Materials quality test methods, laboratory conditions, procedures, frequency and sampling.

Typical property data values should not be used as specifications

## Packaging Supplement

Grade	Tube			Cartridge				Can			Pail		
	W	C	B	W	C	B	G	W	C	B	W	C	B
TN3005	○	○		○	○	●					○	○	
TN3305	○	○	●	○	○	●					○	○	
TN3705	○	○	●	○	○	●		○	○	●			●
TSE382	○	○		○	○	●	●				○	○	
TSE387	○	○		○	○	●					○	○	
TSE389		○		○	○	●			○				

W: White, C: Clear, B: Black, G: Gray

## Product Details - 1 Part Condensation Cure Grades

Properties		RTV157	RTV159	RTV100 series	RTV106	TSE370	RTV116	RTV110 series
Cure Chemistry		Acetoxy	Acetoxy	Acetoxy	Acetoxy	Acetoxy	Acetoxy	Acetoxy
Flowability		Non-Flowable	Non-Flowable	Non-Flowable	Non-Flowable	Non-Flowable	Flowable	Flowable
Features and Benefits		High strength paste adhesive	High temperature, high strength, paste adhesive	Paste adhesive with FDA, USDA, NSF, and MIL-A-46106B	High temperature resistant paste adhesive. FDA, USDA, NSF, MIL-A-46106B	Fast tack paste adhesive	High temperature resistant, flowable adhesive. FDA, USDA, NSF, MIL-A-47040, MIL-A-46106B	Flowable adhesive with FDA, USDA, NSF, MIL-A-46106B
Application	Adhesive / Sealant	●	●	●	●	●	●	●
	Coating							●
	Encapsulant / Potting						●	●
Viscosity (23°C)	Pa.s (P)	-	-	-	-	-	25 (250) <sup>1</sup>	20 (200) <sup>1</sup>
Application Rate	g/min	155	175	400	400	-	-	-
Tack Free Time	min	45	45	20	20	5	30	20
Specific Gravity (23°C)		1.09	1.09	1.05	1.07	1.04	1.09	1.05
Hardness		28	20	30	30	22	20	25
Tensile Strength	MPa (psi)	6.2 (900)	7.0 (1,025)	2.75 (400)	2.55 (370)	2.5 (365)	2.45 (355)	2.20 (320)
Elongation	%	825	350	450	400	530	350	325
Adhesive Strength	MPa (psi)	1.3 (183) <sup>3</sup>	-	1.4 (200) <sup>2</sup>	1.4 (200) <sup>2</sup>	2.2 (320) <sup>2</sup>	0.9 (125) <sup>2</sup>	0.7 (100) <sup>2</sup>
Thermal Conductivity	W/m-K	-	-	-	-	0.18	-	-
Volume Resistivity	MΩ·m	7.5x10 <sup>6</sup>	1.1x10 <sup>7</sup>	3.0x10 <sup>7</sup>	3.0x10 <sup>6</sup>	1.0x10 <sup>7</sup>	2.0x10 <sup>6</sup>	6.0x10 <sup>6</sup>
Dielectric Strength	kV/mm	20.7	19.7	20	20	22	16	16
Dielectric Constant (60Hz)		2.9	2.6	2.8	2.8	3.0	2.8	2.8
Dissipation Factor (60Hz)		0.0009	0.0007	0.001	0.001	0.003	0.001	0.001
Low Molecular Siloxane (D3-D10) wt%		-	-	-	-	-	-	-
Flame Retardancy								
Low Volatility								
Temperature Resistance			●		●		●	
Thermally Conductive								
FDA				●	●		●	●
MIL-Spec <sup>2</sup>				MIL-A-46106B <sup>3</sup>	MIL-A-46106B <sup>3</sup>		MIL-A-46106B <sup>3</sup>	MIL-A-46106B <sup>3</sup>
Color	White			RTV102		○		RTV112
	Clear			RTV108		○		RTV118
	Black			RTV103		●		
	Gray	●						
	Red		●		●		●	
	Aluminum			RTV109				
Packaging	Tube	●	●	●	●	●	●	●
	Cartridge	●	●	●	●			
	Can							
	Pail	●	●	●	●		●	●

<sup>1</sup>ASTM D 2196S 2 Testing is performed in accordance with current Momentive Performance Materials quality test methods, laboratory conditions, procedures, frequency and sampling <sup>3</sup>MIL-A-46106B Group III Type I  
Typical property data values should not be used as specifications

## Product Details - 1 Part Heat Cure Grades

Properties		XE13-B3208	TSE3212	TSE322	TSE322S	TSE3261-G	TSE3280-G
Flowability		Non-Flowable	Semi-Flowable	Non-Flowable	Semi-Flowable	Flowable	Flowable
Features and Benefits		Paste adhesive / sealant	Thixotropic adhesive / sealant	Flowable adhesive / sealant	Flowable adhesive / sealant. UL certified	High temperature resistant flowable adhesive / sealant	Thermally conductive flowable adhesive
Application	Adhesive / Sealant	●	●	●	●	●	●
	Coating						
	Encapsulant / Potting						●
Viscosity (23°C)	Pa.s (P)	670 (6700) <sup>1</sup>	280 (2800) <sup>1</sup>	110 (1100) <sup>1</sup>	70 (700) <sup>1</sup>	50 (500) <sup>1</sup>	60 (600) <sup>1</sup>
Cure Condition	°C/h	150/1	150/1	150/1	150/1	150/1	150/1
Specific Gravity (23°C)		1.08	1.26	1.27	1.26	1.48	2.10
Hardness		50	52	45	37	52	62
Tensile Strength	MPa (psi)	4.4 (640)	3.7 (535)	3.4 (495)	3.6 (520)	4.9 (710)	3.2 (465)
Elongation	%	430	240	230	230	160	110
Adhesive Strength	MPa (psi)	3.7 (535)	2.6 (375)	2.5 (365)	2.5 (365)	2.0 (290)	2.0 (290)
Thermal Conductivity	W/m-K	0.20	0.29	0.29	0.29	0.41	0.88
Volume Resistivity	MΩ·m	1.0x10 <sup>7</sup>	2.0x10 <sup>7</sup>	2.0x10 <sup>7</sup>	1.0x10 <sup>7</sup>	2.0x10 <sup>7</sup>	2.5x10 <sup>6</sup>
Dielectric Strength	kV/mm	23	20	20	25	22	21
Dielectric Constant (60Hz)		3.1	3.2	3.1	3.1	3.9	4.3
Dissipation Factor (60Hz)		0.001	0.001	0.006	0.006	0.005	0.002
Flame Retardancy					UL94 HB		
Temperature Resistance						●	
Thermally Conductive							●
Color	White		○				
	Clear	○					
	Black			●			
	Gray					●	●
	Blue			●	●		
Packaging	Tube		●	●			●
	Cartridge	●	●	●	●		●
	Can		●	●	●		●
	Pail	●	●	●	●	●	●

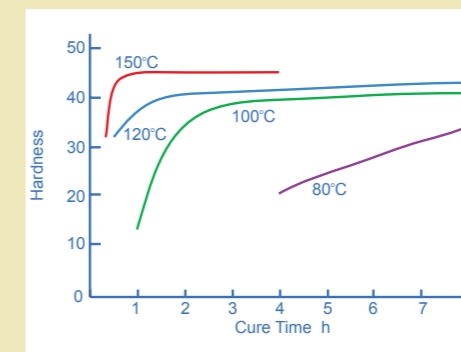
<sup>1</sup>JIS K 6249

Typical property data values should not be used as specifications

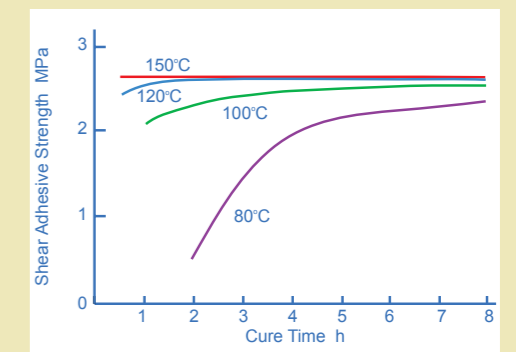
### Cure Properties:

The cure performance of 1 Part Heat Cure grades is demonstrated by the relationship between temperature and hardness, and temperature and adhesive strength of TSE322 when placed in an oven at temperatures ranging from 80°C to 150°C.

### Hardness & Cure Time - TSE322



### Adhesion & Cure Time - TSE322



## Product Details - 1 Part Heat Cure Grades

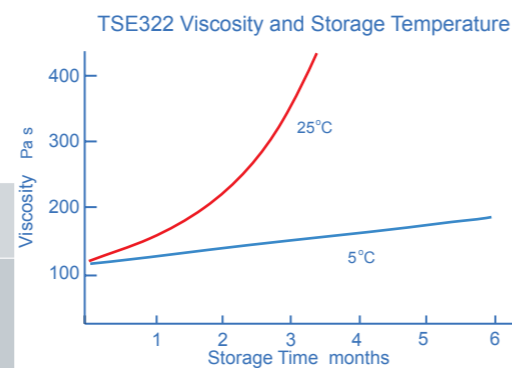
Properties		TSE3281-G	TSE3221S	TSE326	TSE326M <sup>3</sup>	TSE3251	TSE3251-C	TSE325	TSE325-B	TSE3250	ECC4865
Flowability		Flowable	Flowable	Flowable	Flowable	Semi-Flowable	Semi-Flowable	Flowable	Flowable	Flowable	Flowable
Features and Benefits		Thermally conductive flowable adhesive	Flowable adhesive / sealant, coating material	High temperature resistant flowable adhesive. UL certified	High temperature resistant flowable adhesive	Flowable coating material	Flowable coating material	Flowable potting / coating material	Flowable potting / coating material	Flowable potting / coating material	Low viscosity conformal coating with UV tracer, fast thermal cure & long-term viscosity stability
Application	Adhesive / Sealant	●	●	●	●						
	Coating		●			●	●	●	●	●	●
	Encapsulant / Potting							●	●	●	
Viscosity (23°C)	Pa.s (P)	60 (600) <sup>1</sup>	58 (580) <sup>1</sup>	28 (280) <sup>1</sup>	16 (160) <sup>1</sup>	8.5 (85) <sup>1</sup>	7.0 (70) <sup>1</sup>	4.0 (40) <sup>1</sup>	3.5 (35) <sup>1</sup>	1.3 (13) <sup>1</sup>	0.25 (2.5) <sup>2</sup>
Cure Condition	°C/h	150/1	150/1	150/1	200/0.5	150/1	150/1	150/1	150/1	150/1	-
Specific Gravity (23°C)		2.70	1.03	1.45	1.46	1.02	1.02	1.02	1.02	0.97	1.19
Hardness		84	28	43	38	16	16	12	20	9	35
Tensile Strength	MPa (psi)	4.5 (655)	2.8 (405)	3.4 (495)	2.9 (420)	0.7 (100)	0.7 (100)	0.7 (100)	0.9 (130)	-	-
Elongation	%	50	370	170	180	200	200	200	200	-	-
Adhesive Strength	MPa (psi)	2.5 (365)	2.5 (365)	2.0 (290)	1.5 (220)	0.4 (60)	0.4 (60)	0.4 (60)	0.4 (60)	0.1 (15)	-
Thermal Conductivity	W/m-K	1.68	0.18	0.41	0.41	0.18	0.18	0.18	0.18	0.17	-
Volume Resistivity	MΩ-m	4.8x10 <sup>6</sup>	6.0x10 <sup>7</sup>	2.0x10 <sup>7</sup>	2.0x10 <sup>7</sup>	2.0x10 <sup>7</sup>	2.0x10 <sup>7</sup>	2.0x10 <sup>7</sup>	2.0x10 <sup>7</sup>	2.0x10 <sup>7</sup>	-
Dielectric Strength	kV/mm	15	23	22	22	20	20	21	21	21	20
Dielectric Constant (60Hz)		5.2	2.8	3.3	3.3	2.8	2.8	2.9	2.9	2.8	2.4
Dissipation Factor (60Hz)		0.002	0.001	0.02	0.02	0.002	0.001	0.001	0.001	0.001	0.01
Flame Retardancy				UL94 HB							
Temperature Resistance				●	●						
Thermally Conductive		●									
Color	White					○		○			
	Clear		○				○			○	○
	Black								●		
	Gray	●									
	Red			●	●						
Packaging	Tube		●	●							
	Cartridge			●							
	Can	●	●	●	●	●	●	●	●	●	
	Pail			●				●			●

<sup>1</sup>JIS K 6249 <sup>2</sup>ASTM D2196S <sup>3</sup>TSE325M EX in Europe and the Americas.

Typical property data values should not be used as specifications

### Storage Stability:

Storage under low temperature conditions is important particularly for 1-part heat cure grades to prevent viscosity increase.



## Product Details - 2 Part Room Temperature Cure Grades

Properties		RTV577	RTV88	RTV60	RTV566		RTV31	RTV11	TSE3663	TSE3661	TSE3664K
Components		RTV577 <sup>3</sup> DBT	RTV88 <sup>3</sup> DBT	RTV60 <sup>3</sup> DBT	RTV566(A) <sup>3</sup> RTV566(B) <sup>3</sup>		RTV31 <sup>3</sup> DBT	RTV11 <sup>3</sup> DBT	TSE3663(A) TSE3663(B)	TSE3661(A) TSE3661(B)	TSE3664(A) TSE3664(B)
Flowability		Non-Flowable	Semi-Flowable	Flowable	Flowable		Flowable	Flowable	Flowable	Flowable	Flowable
Features and Benefits		Low temperature resistant paste sealant with good release capabilities	High temperature resistant, semi-flowable sealant. Good release capabilities	High temperature resistant flowable sealant with good release capabilities	Low volatile, low out gassing sealant with Low and High temperature performance capability		High temperature resistant flowable sealant with good release capabilities	Sealant with good release properties. FDA compliance	Flowable encapsulant / adhesive	Flowable encapsulant / adhesive	Flowable encapsulant / adhesive with fast tack free times. UL certified
Application	Adhesive / Sealant	●	●								
	Coating						●				
	Encapsulant / Potting			●	●		●	●	●	●	●
Mixing Ratio ((A):(B) by weight)		100:0.5	100:0.5	100:0.5	100:0.1		100:0.5	100:0.5	100:2	100:2	100:7.5
Color (mixed)		White	Red	Red	Red		Red	White	Off-White	Off-White	Gray
Viscosity (mixed) (23°C) Pa.s (P)		700 (7000) <sup>2</sup>	880 (8800) <sup>2</sup>	47 (470) <sup>2</sup>	43 (430) <sup>2</sup>		25 (250) <sup>2</sup>	11 (110) <sup>2</sup>	4.0 (40) <sup>1</sup>	4.0 (40) <sup>1</sup>	3.0 (30) <sup>1</sup>
Pot Life (23°C) h		2	0.75	2	1.5		2	1.5	0.5	0.5	0.1
Cure Condition °C/h		25/24	25/24	25/24	25/24		25/24	25/24	23/72	23/72	23/72
Specific Gravity (23°C)		1.35	1.47	1.48	1.49		1.42	1.19	1.19	1.19	1.41
Hardness		48	58	57	61		54	41	42	42	60
Tensile Strength MPa (psi)		3.0 (440)	5.8 (840)	6.9 (995)	5.5 (795)		5.9 (870)	2.1 (300)	1.4 (205)	1.4 (205)	3.0 (435)
Elongation %		150	120	120	120		170	160	110	110	70
Adhesive Strength MPa (psi)		-	-	-	3.2 (465)		-	-	0.9 (130)	0.9 (130)	1.0 (145)
Thermal Conductivity W/m-K		0.31	0.31	0.31	0.31		0.31	0.29	0.27	0.27	0.42
Volume Resistivity MΩ·m		5.6x10 <sup>6</sup>	2.8x10 <sup>6</sup>	4.4x10 <sup>6</sup>	2.0x10 <sup>6</sup>		1.6x10 <sup>6</sup>	1.1x10 <sup>7</sup>	1.0x10 <sup>7</sup>	1.0x10 <sup>7</sup>	5.0x10 <sup>7</sup>
Dielectric Strength kV/mm		18.5	17.4	17.7	21.2		17	20.3	20	20	26
Dielectric Constant (60Hz)		3.98 (1kHz)	4.3 (1kHz)	4.0 (1kHz)	3.9 (1kHz)		4.4 (1kHz)	3.3 (1kHz)	3.1	3.1	3.1
Dissipation Factor (60Hz)		0.02 (1kHz)	0.03 (1kHz)	0.02 (1kHz)	0.02 (1kHz)		0.03 (1kHz)	0.006 (1kHz)	0.025	0.025	0.01
Flame Retardancy										UL94 HB	UL94 V-0
Low Volatility					●						
Temperature Resistance		●	●	●	●		●				
FDA							●				
Packaging	Bottle								●	●	●
	Can								●	●	●
	Pail								●	●	●
	Kit	●	●	●	●		●	●			

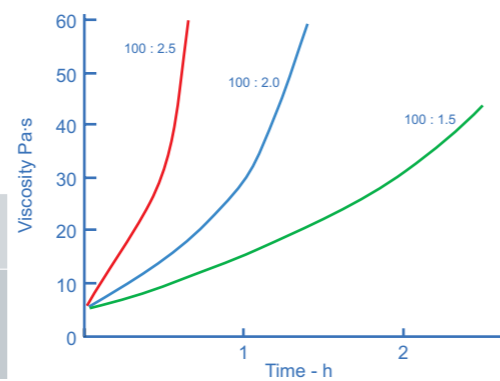
<sup>1</sup>JIS K 6249 <sup>2</sup>ASTM D2196 3Sub-Zero long-term storage required.

Typical property data values should not be used as specifications

### Cure Speed:

The cure speed of 2 Part Condensation Cure grades can be changed by adjusting the amount of the catalyst component. However, the post-cure properties of the material may vary from those achieved under standard mixing ratios, and therefore, adequate testing and confirmation prior to use in an application is required.

### TSE3663 - Mixing Ratios & Viscosity (23°C)



## Product Details - 2 Part Heat Cure Grades

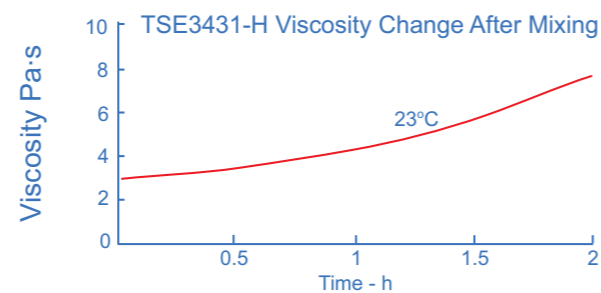
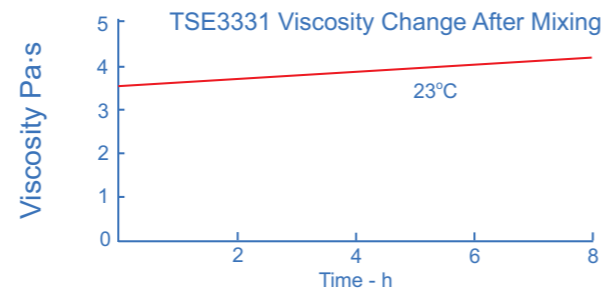
Properties		TSE3360	XE14-A0425	TSE3380	RTV615	TSE3032	TSE3331	TSE3331K EX <sup>3</sup>	TSE3331K <sup>2</sup>	TSE3431	TSE3431-H	XE14-B7892	YE5822	TSE3033
		TSE3360(A) TSE3360(B)	XE14-A0425(A) XE14-A0425(B)	TSE3380(A) TSE3380(B)	RTV615(A) RTV615(B)	TSE3032(A) TSE3032(B)	TSE3331(A) TSE3331(B)	TSE3331KEX(A) TSE3331KEX(B)	TSE3331K(A) TSE3331K(B)	TSE3431(A) TSE3431(B)	TSE3431(A) TSE3431(B)	XE14-B7892(A) XE14-B7892(B)	YE5822(A) YE5822(B)	TSE3033(A) TSE3033(B)
Components		Non-Flowable		Semi-Flowable	Flowable	Flowable	Flowable	Flowable	Flowable	Flowable	Flowable	Flowable	Flowable	Flowable
Features and Benefits		General purpose paste adhesive with extended pot life		High temperature resistant paste adhesive with thermal conductive performance	Thermally conductive paste adhesive	Low viscosity encapsulant / potting material with capability to cure at RT. FDA recognition	Transparent encapsulant / potting material with good release properties	Thermally conductive encapsulant / potting material. UL certified	Thermally conductive encapsulant / potting material. UL certified	Thermally conductive encapsulant / potting material. UL certified	Encapsulant / potting material with UL certified, thermal conductivity, and good release properties	Encapsulant / potting material with UL certified, thermal conductivity, and good release properties	Encapsulant / potting material with UL certified, low temperature cure, and good release properties	Low viscosity transparent encapsulant / potting material. Good release properties
Application	Adhesive / Sealant	●		●	●									
	Coating						●	●	●					●
	Encapsulant / Potting				●	●	●	●	●	●	●	●	●	●
Mixing Ratio ((A):(B) by weight)		100:100	100:100	100:100	100:10	100:10	100:100	100:100	100:100	100:10	100:10	100:100	100:10	100:100
Color (mixed)		White	Reddish Brown	Gray	Transparent	Transparent	Gray	Dark Gray	Dark Gray	Black	Black	Black	Transparent	Transparent
Viscosity (mixed) (23°C) Pa.s (P)		640 (6400) <sup>1</sup>	400 (4000) <sup>1</sup>	40 (400) <sup>1</sup>	4.0 (40) <sup>2</sup>	4.0 (40) <sup>1</sup>	3.5 (35) <sup>1</sup>	3.0 (30) <sup>1</sup>	2.6 (26) <sup>1</sup>	2.6 (26) <sup>1</sup>	2.6 (26) <sup>1</sup>	1.3 (13) <sup>1</sup>	1.0 (10) <sup>1</sup>	0.9 (9) <sup>1</sup>
Pot Life (23°C) h		24	24	8	4	4	8	8	8	1.5	1.5	2	4	6
Cure Condition °C/h		150/1	150/1	150/0.5	150/0.25	100/1	120/1	120/1	120/1	100/1	100/1	60/1	100/1	150/0.5
Specific Gravity (23°C)		1.12	2.11	2.70	1.02	1.02	1.51	1.43	1.43	1.50	1.52	1.39	0.97	1.01
Hardness		42	65	70	44	35	60	50	45	70	70	60	27	30
Tensile Strength MPa (psi)		5.4 (785)	5.0 (725)	2.5 (365)	6.3 (920)	4.5 (655)	2.9 (420)	3.0 (440)	3.1 (450)	4.9 (710)	4.1 (595)	3.5 (510)	0.4 (58)	1.0 (145)
Elongation %		380	120	100	120	210	70	100	120	70	60	100	130	130
Adhesive Strength MPa (psi)		3.1 (450)	2.9 (420)	1.5 (220)	-	-	1.3 (190)	1.6 (230)	1.6 (230)	-	-	-	-	0.3 (44)
Thermal Conductivity W/m-K		0.23	0.80	1.68	0.19	0.17	0.63	0.53	0.53	0.63	0.63	0.44	0.17	0.17
Volume Resistivity MΩ·m		1.0x10 <sup>7</sup>	2.0x10 <sup>6</sup>	2.1x10 <sup>6</sup>	1.8x10 <sup>7</sup>	2.0x10 <sup>7</sup>	2.0x10 <sup>6</sup>	6.0x10 <sup>6</sup>	6.0x10 <sup>6</sup>	5.0x10 <sup>7</sup>	5.0x10 <sup>6</sup>	2.0x10 <sup>7</sup>	2.0x10 <sup>7</sup>	2.0x10 <sup>7</sup>
Dielectric Strength kV/mm		21	26	15	19.7	21	26	22	22	26	27	27	21	21
Dielectric Constant (60Hz)		3.0	3.4	5.7	2.7 (1kHz)	2.8	3.4	3.1	3.1	3.4	3.5	3.1	2.8	2.8
Dissipation Factor (60Hz)		0.001	0.017	0.002	0.0006 (1kHz)	0.001	0.017	0.015	0.015	0.014	0.014	0.01	0.001	0.001
Flame Retardancy							UL94 V-0	UL94 V-0	UL94 V-0	UL94 V-0	UL94 V-0	UL94 V-0		
Temperature Resistance			●											
Thermally Conductive			●	●			●	●	●	●	●			
FDA					●									
Packaging	Bottle					●				●	●		●	
	Can		●	●			●	●	●	●	●	●	●	●
	Pail	●	●	●	●		●	●		●	●	●	●	●
	Kit				●									

<sup>1</sup>JIS K 6249 <sup>2</sup>ASTM D2196 3Sub-Zero long-term storage required.

Typical property data values should not be used as specifications

### Pot Life:

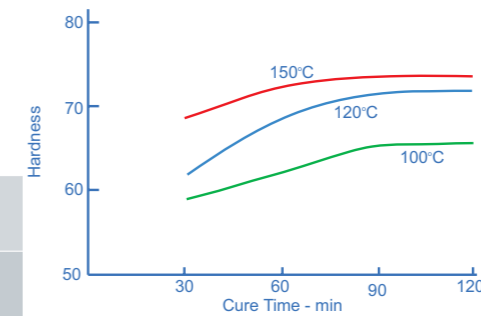
The pot life of a 2 Part Heat Cure grade is affected by changes in viscosity that occur after the components have been mixed.



### Cure Properties:

The cure performance of 2 Part Heat Cure grades is demonstrated by the relationship between temperature and hardness of TSE3380 when placed in an oven at temperatures ranging from 100°C to 150°C.

### Hardness & Cure Time - TSE3380



## Product Details - 1 Part Gels

Properties		TSE3051	TSE3051-FR	TSE3051-L	TSE3053
Flowability		Flowable	Flowable	Flowable	Flowable
Features and Benefits		Low viscosity	Low viscosity, UL certified	Low viscosity, low penetration	Low viscosity, high penetration
Viscosity (23°C)	Pa.s (P)	0.7 (7) <sup>1</sup>	0.7 (7) <sup>1</sup>	0.7 (7) <sup>1</sup>	0.7 (7) <sup>1</sup>
Cure Condition	°C/h	125/2	150/1	125/2	125/2
Specific Gravity (23°C)		0.97	0.97	0.97	0.97
Penetration		85	85	65	105
Thermal Conductivity	W/m-K	0.17	0.17	0.17	0.17
Volume Resistivity	MΩ·m	1.0x10 <sup>7</sup>	5.0x10 <sup>7</sup>	1.0x10 <sup>7</sup>	1.0x10 <sup>7</sup>
Dielectric Strength	kV/mm	18	18	18	18
Dielectric Constant (60Hz)		2.8	2.8	2.8	2.8
Dissipation Factor (60Hz)		0.001	0.001	0.001	0.001
Flame Retardancy			UL94 V-1		
Color	White	●			
	Transparent	●	●	●	●
	Gray	●			
Pkg	1kg can	See below matrix	●	●	●
	15kg can		●	●	

<sup>1</sup>JIS K 6249 Typical property data values should not be used as specifications

TSE3051	W	C	G
1kg bottle	●	●	●
4kg can		●	
15kg can		●	
20kg pail		●	●

W: White, C: Clear, G: Gray



## Product Details - 2 Part Gels

Properties		TSE3062		TSE3070		RTV6136-D1	
Components		TSE3062(A)	TSE3062(B)	TSE3070(A)	TSE3070(B)	RTV6126(A)	RTV6126(B)
Flowability		Flowable		Flowable		Flowable	
Features and Benefits		Low temperature cure		High elongation gel		Fast cure, low viscosity	
Mixing Ratio ((A):(B) by weight)		100:100		100:100		100:100	
Color (mixed)		Transparent		Transparent		Transparent	
Viscosity (mixed) (23°C)	Pa.s (P)	1.0 (10) <sup>1</sup>		0.8 (8) <sup>1</sup>		0.75 (7.5) <sup>2</sup>	
Pot Life (23°C)	h	1		4		0.5	
Cure Condition	°C/h	70/0.5		70/0.5		100/0.3	
Specific Gravity (23°C)		0.97		0.97		0.98	
Penetration		55		65		60	
Thermal Conductivity	W/m-K	0.17		0.17		0.19	
Volume Resistivity	MΩ·m	1.0x10 <sup>7</sup>		1.0x10 <sup>7</sup>		1.0x10 <sup>7</sup>	
Dielectric Strength	kV/mm	18		18		20.5	
Dielectric Constant (60Hz)		2.7		2.7		2.8 (1kHz)	
Dissipation Factor (60Hz)		0.001		0.001		0.001 (1kHz)	
Package	Bottle			●	●		
	Can	●	●				
	Pail						●

<sup>1</sup>JIS K 6249 <sup>2</sup>ASTM D2196  
Typical property data values should not be used as specifications

## Product Details - 1 Part JCR Grades

Properties	TSJ3155	TSJ3195-W	TSJ3185
Flowability	Semi-Flowable	Semi-Flowable	Semi-Flowable
Features and Benefits	Thixotropic JCR rubber. Low post-cure hardness contributes to stress relief of critical components	Low viscosity JCR gel. Provides stress and vibration relief performance	Thixotropic JCR gel. Provides stress and vibration relief performance
Property	Rubber	Gel	Gel
Viscosity (23°C) Pa.s (P)	6 (60) <sup>1</sup>	4 (40) <sup>1</sup>	3 (30) <sup>1</sup>
Color	White	White	Translucent
Cure Condition °C/h	150/4	150/4	150/4
Specific Gravity (23°C)	1.02	1.00	1.01
Hardness	11	-	-
Penetration	-	80	80
Thermal Conductivity W/m-K	0.18	0.18	0.18
Volume Resistivity MΩ·m	1.0x10 <sup>7</sup>	1.0x10 <sup>7</sup>	1.0x10 <sup>7</sup>
Dielectric Strength kV/mm	20	15	15
Dielectric Constant (60Hz)	2.8	2.8	2.7
Dissipation Factor (60Hz)	0.0004	0.0004	0.001
Na <sup>+</sup> K <sup>+</sup> ppm	<2	<2	<2
Pkg: 500g bottle	●	●	●

<sup>1</sup>JIS K 6249 Typical property data values should not be used as specifications

## Product Details - 2 Part JCR Grades

Properties	XE14-B5778	TSJ3175
Components	XE14-B5778(A) XE14-B5778(B)	TSJ3175(A) TSJ3175(B)
Flowability	Semi-Flowable	Semi-Flowable
Features and Benefits	Flow-controllable JCR rubber.	Thixotropic JCR gel. Soft gel property contributes to stress and vibration relief
Property	Rubber	Gel
Mixing Ratio ((A):(B) by weight)	100:100	100:100
Color (mixed)	Translucent	Black
Viscosity (mixed) (23°C) Pa.s (P)	14 (140) <sup>1</sup>	17 (170) <sup>1</sup>
Pot Life (23°C) h	8	12
Cure Condition °C/h	80/2	125/2
Specific Gravity (23°C)	1.02	1.01
Hardness	16	-
Penetration	-	70
Thermal Conductivity W/m-K	0.17	0.18
Volume Resistivity MΩ·m	2.0x10 <sup>5</sup>	1.0x10 <sup>7</sup>
Dielectric Strength kV/mm	24	15
Dielectric Constant (60Hz)	2.7	2.7
Dissipation Factor (60Hz)	0.001	0.001
Na <sup>+</sup> K <sup>+</sup> ppm	<2	<2
Pkg: 500g bottle	●	●

<sup>1</sup>JIS K 6249 Typical property data values should not be used as specifications

## Product Details - Grease

Properties	TSK5303	TSK5370	TSK550	TSK551	YG6111	YG6240	YG6260	TIG1000
Features and Benefits	Thermally conductive compound for medium heat dissipation. Heat resistance	Compound for electrical insulation & sealing with swell resistant performance	Compound for electrical contact insulation protection against moisture & contaminants	Compound for electrical contact insulation protection against moisture & contaminants	Thermally conductive compound for medium heat dissipation. Low oil separation	Thermally conductive compound for medium heat dissipation. Low oil separation	Thermally conductive compound for medium heat dissipation. Low oil separation	Thermally conductive compound for medium to high heat dissipation applications
Color	White	White	White	Green	White	White	White	White
Specific Gravity	2.34	-	1.03	1.03	2.45	2.45	2.30	2.50
Penetration	330	270	220	220	310	290	300	340
Bleed (150°C, 24h) %	2.8	1.5	1.5	1.0	0.4	0.0	0.5	0.1
Evaporation (150°C, 24h) %	0.2	0.2	0.2	0.3	0.1	0.4	0.1	0.1
Thermal Conductivity W/m-K	0.84	-	-	-	0.84	0.84	0.84	1.00
Volume Resistivity MΩ·m	-	1.0x10 <sup>5</sup>	2.0x10 <sup>7</sup>	2.0x10 <sup>7</sup>	2.0x10 <sup>6</sup>	2.0x10 <sup>6</sup>	2.0x10 <sup>7</sup>	3.0x10 <sup>6</sup>
Dielectric Constant (60Hz)	5.0	2.5	2.8	2.8	5.0	5.0	5.0	5.0
Dissipation Factor (60Hz)	0.005	0.0001	0.0002	0.0002	0.006	0.006	0.005	0.006
Low Molecular Siloxane (D3-D10) wt%	0.0015	0.01	-	-	0.01	0.003	0.003	0.003
Arc Resistance <sup>1</sup> s	-	-	120<	120<	-	-	-	-
Low Volatility	●	●			●	●	●	●
Temperature Resistance	●							
Thermally Conductive	●				●	●	●	●
Low Bleed						●		
Packaging	Bottle	●	●	●	●	●	●	
	Can	●		●	●	●	●	●
	Pail			●		●	●	

<sup>1</sup>ASTM D-495 Typical property data values should not be used as specifications

Type	Grade	Color	Thickness mm	RTI		Flame Class	HWI (PLC)	HAI (PLC)	HVTR (PLC)	D495 (PLC)	CTI (PLC)	File No.
				Elec.	Mech.							
1 Part Condensation Cure	ECS0601	Black Clear White	1.5	105	105	HB	-	-				E56745
	ECS0609FR	Gray	0.2	105	105	V-0	-	-				E56745
		Gray	3.0	105	105	V-0	-	-				
	TN3085	Gray	1.0	105	105	V-1	0	0	0	4	0	E56745
		Gray	3.0	105	105	V-0	0	0				
		White	1.0	105	105	V-1	2	0				
	RTV133	Black	0.71	105	105	V-1	3	0				E36952
		Black	1.6	105	105	V-1	2	0	0	3	0	
		Black	3.4	105	105	V-0	1	0				
	RTV160	White	0.75	105	105	HB	4	0	1	5	0	E36952
		White	1.5	105	105	HB	3	0				
		White	2.5	105	105	HB	3	0				
	RTV167	White	3.0	105	105	HB	-	-				E36952
		Gray	0.83	105	105	HB	3	0				
		Gray	1.5	105	105	HB	2	0	0	5	0	
	TSE382	Gray	2.6	105	105	HB	2	0				E36952
		Clear White	0.75	105	105	HB	4	0	0	4	0	
		Clear White	1.5	105	105	HB	3	0				
	Clear White	1.9	150	140	HB	3	0					
	TSE3826	Clear White	3.0	150	140	HB	3	0				E56745
		Red	2.0	200	200	-	-	-				
		Red	3.0	200	200	-	-	-				
	TSE3840-G	Gray	0.75	105	105	V-0	-	-	0	2	0	E56745
		Gray	1.5	105	105	V-0	0	0				
		Gray	3.0	105	105	V-0	0	0				
	TSE3843-W	White	1.1	105	105	V-1	-	-	0	1	1	E56745
		White	1.5	105	105	V-1	0	0				
		White	1.9	150	140	V-1	-	-				
		White	2.5	150	140	V-1	-	-				
	TSE384-B	White	3.0	150	140	V-1	-	-				E56745
		Black	1.2	105	105	V-0	0	0	0	3	1	
		Black	1.9	150	140	V-0	-	-				
	Black	3.0	150	140	V-0	-	-					
	TSE3853-W	White	1.5	105	105	V-0	0	3	0	3	0	E56745
		White	3.0	105	105	V-0	0	3				
	TSE3854DS	Gray	0.75	105	105	V-0	0	0	0	3	0	E56745
		Gray	1.5	105	105	V-0	0	0				
		White	3.0	105	105	V-0	0	3				
	TSE389	Clear White Black	1.5	105	105	HB	-	-				E56745
		Clear White Black	3.0	105	105	HB	-	-				
	TSE3944	Gray	0.75	105	105	V-0	-	-	0	3	0	E56745
		White	0.75	105	105	V-1	-	-				
Gray White		1.5	105	105	V-0	0	0					
		Gray White	3.0	105	105	V-0	0	0				

RTI: Relative Temperature Index PLC: Performance Level Category HWI: Hot Wire Ignition HAI: High-Current Arc Ignition HVTR: High-Voltage Arc Tracking Rate D495: D495 High-Voltage Dry Arc Resistance CTI: Comparative Tracking Index

Type	Grade	Color	Thickness mm	RTI		Flame Class	HWI (PLC)	HAI (PLC)	HVTR (PLC)	D495 (PLC)	CTI (PLC)	File No.
				Elec.	Mech.							
1 P Cond Cure	TSE3976-B	Black	0.64	105	105	HB	-	-				E56745
		Black	1.5	105	105	HB	-	-				
		Black	3.0	105	105	HB	-	-				
1 P Cond Cure	XE11-A5133S	White	3.0	105	105	V-1	-	-				E56745
		White	1.5	105	105	HB	-	-				E56745
		White	3.0	105	105	HB	-	-				
1 Part Heat Cure	TSE3051-FR	Clear	2.7-3.3	105	105	V-1	-	-				E56745
		NC	1.0	105	105	HB	-	-				E56745
		NC	1.5	105	105	HB	-	-				
1 Part Heat Cure	TSE322S N	NC	3.0	105	105	HB	-	-				E56745
		Red	1.0	105	105	HB	-	-				E56745
		Red	3.0	105	105	HB	-	-				
2 Part	TSE3331	Black	1.0	105	105	V-0	-	-	0	0	0	E56745
		Black	1.6	105	105	V-0	2	0				
		Black	2.0	105	105	V-0	-	-				
	TSE3331K	Black	3.0	105	105	V-0	0	0				E56745
		Black	2.5	105	105	V-0	-	-				
		Black	3.0	105	105	V-0	-	-				
	TSE3331K EX	Black	2.5	105	105	V-0	-	-				E56745
		Black	3.0	105	105	V-0	-	-				
	TSE3431	Gray	2.0	105	105	V-1	-	-				E56745
		Gray	4.0	105	105	V-0	-	-				
	TSE3431-H	Gray	1.0	105	105	V-0	0	0	0	1	1	E56745
		Gray	1.5	105	105	V-0	-	-				
Gray		2.5	105	105	V-0	0	0					
TSE3664K	Gray	3.0	105	105	V-0	-	-				E56745	
	Gray	1.0	105	105	V-1	-	-					
	Gray	2.0	105	105	V-0	-	-					
XE14-B7892	Black	2.0	105	105	V-1	-	-				E56745	
	Black	3.0	105	105	V-0	-	-					
TSE3661	All	1.0	105	105	HB	4	0			0	E56745	
	All	3.0	105	105	HB	3	0					

HWI	HAI	HVTR	D495	CTI
Resistance to ignition when exposed to high temperatures. Expressed as the mean number of seconds required to ignite a specimen when wrapped with an energized ni-chrome resistive wire that dissipates a specified level of energy.	Ability to withstand electrical arcing. Expressed as the number of arc rupture exposures required to ignite a specimen when the arc occurs directly on the surface or a specified distance above the test specimen.	Expressed as the rate (inches per minute) that a tracking path can be produced on the surface of the material under standardized test conditions.	Expressed as the number of seconds that a material resists the formation of a surface-conducting path when subjected to an intermittently occurring arc of high voltage, low current characteristics.	Expressed as that voltage which causes tracking after 50 drops of 0.1% ammonium chloride solution have fallen on the material.
Mean Ignition Time (sec)	Mean No. of Arcs	HVTR Range (in mm/min)	Arc Resistance (sec)	Tracking Index (volts)
PLC	PLC	PLC	PLC	PLC
≥ 120	≥ 120	0 - 10	≥ 420	≥ 600
60 - 119	60 - 119	10.1 - 25.4	360 - 419	400 - 599
30 - 59	30 - 59	25.5 - 80	300 - 359	250 - 399
15 - 29	15 - 29	80.1 - 150	240 - 299	175 - 249
7 - 14	< 15	> 150	180 - 239	100 - 174
< 7			120 - 179	< 100
			60 - 119	
			< 60	



## Typical Adhesion Performance

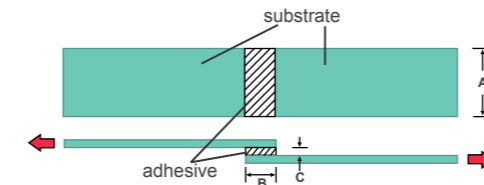
### Condensation Cure Grades

Substrate	Alkoxy				Acetoxy			Oxime			XP80-A5363 / YP9341
	Primer-less	ME121	ME123	XP80-A5363	Primer-less	ME121	ME123	Primer-less	ME121	ME123	
Metals	Copper	●	●		● <sup>1</sup>	● <sup>1</sup>		▲ <sup>1</sup>	● <sup>1</sup>		
	Steel	●	●		▲	●		●	●		
	Brass	●	●		▲ <sup>1</sup>	▲ <sup>1</sup>		▲ <sup>1</sup>	● <sup>1</sup>		
	Stainless Steel	●	●		▲	●		●	●		
	Aluminum	●	●		●	●		●	●		
	Galvanized Steel	●	●		●	●		●	●		
	Tin	●	●		●	●		●	●		
Plastic	Acrylic Resin	●		●	x		●	●	●		
	Phenol Resin	●		●	●		●	●	●		
	Epoxy Resin	●		●	●		●	●	●		
	Polycarbonate	● <sup>2</sup>		● <sup>2</sup>				● <sup>2</sup>	● <sup>2</sup>		
	Soft Polyvinyl Chloride	●		●	x		●	x	x	●	
	Rigid Polyvinyl Chloride	●		●	●		●	●	●	●	
	Polyester Film	●		●	▲		●	●	●	●	
	Unsaturated Polyester	●		●	●		●	●	●	●	
	Polyamide	●		●	●		●	●	●	●	● <sup>3</sup>
	Nylon 66	●		●	●		●	●	●	●	● <sup>3</sup>
	PBT	●		●	●		▲	●	●	●	● <sup>3</sup>
	PPS	●		●	●		▲	●	●	●	● <sup>4</sup>
	ABS	●		●	●		●	●	●	●	● <sup>4</sup>
	Polypropylene	x		x	●			x	x	x	
	Polyethylene	x		x	▲	x		x	x	x	x
	Fluorocarbon Resin	x		x	▲	x		x	x	x	x
	Silicone Resin Laminate	●		●	●		●	●	●	●	
Rubber	Chloroprene Rubber	▲		●	▲		●	▲	●	●	
	Nitrile Rubber	▲		●	●		●	▲	●	●	
	Styrene Butadiene Rubber	▲		●	●		●	▲	●	●	
	Ethylene Propylene Rubber	▲		●	●		●	▲	●	●	
	Silicone	●		●	●		●	●	●	●	
Inorganic	Glass	●	●		●	●		●	●		
	Ceramic	●	●		●	●		●	●		

● Adheres completely, ▲ Adheres, but separates from surface when pulled, x Does not adhere  
<sup>1</sup> May corrode under some usage conditions, <sup>2</sup> Stress cracking may occur under some usage conditions, <sup>3</sup> YP9341, <sup>4</sup> XP80-A5363

Substrate	Condensation Cure							Addition Cure				General
	ME121	ME123	YP9341	XP80-A5363	SS4004P	SS4044P	SS4179	ME151	ME153	XP81-B0016	SS4120	
Appearance	Yellow Transparent	Yellow Transparent	Transparent	Yellow Transparent	Pink	Yellow	Clear Colorless	Yellow	Yellow Transparent	Yellow Transparent	Clear Colorless	Blue
Substrates	Metals, Glass, Plastic	Plastic, Rubber	Plastic, Rubber	Polyolefins	Metals	Metals	Plastic	Metals, Glass, Plastic, Ceramic	Plastic	Metals, Glass	-	-
Specific Gravity (23°C)	0.85	0.86	0.89	0.88	0.85	0.85	0.98	0.87	0.83	0.71	0.82	0.82
Non-Volatile Content	15%	15%	8%	7%	15%	15%	6%	24%	15%	7.5%	3%	10%
Drying Time (23°C) min	30	30	30	20	30	30	15	30	30	30	30	30
Solvents	Acetone Toluene IPA	Acetone Toluene IPA	Butyl Acetate	Toluene	Acetone Xylene N-butanol IPA	Acetone Xylene N-butanol IPA	Ethyl Acetate Toluene Methanol	Toluene IPA	Toluene IPA	n-hexane	Ethanol Methanol	Mineral Spirits

## Shear Adhesion Test Method



JIS Method      ASTM Method  
A:                    25mm                1"  
B:                    10mm                0.5"  
C:                    1mm                    -  
Pull Rate:           10mm/min.        1"/min.

## Typical Chemical Resistance

Chemical	Volume Change
Concentrated Hydrochloric Acid	◎
Hydrochloric Acid (3%)	◎
Concentrated Sulphuric Acid	Decomposition
Sulphuric Acid (10%)	◎
Concentrated Nitric Acid	△
Nitric Acid (7%)	◎
Glacial Acetic Acid	◎
Acetic Acid	◎
Hydrofluoric Acid	Decomposition
Citric Acid	◎
Phosphoric Acid	◎
Concentrated Ammonia	◎
Ammonia (10%)	◎
Potassium Hydroxide (20%)	◎
Sodium Hydroxide (1%)	◎
Sodium Hydroxide (20%)	◎
Sodium Hydroxide (50%)	◎
Sodium Chloride (10%)	◎
Sodium Carbonate (2%)	◎
Sodium Carbonate (20%)	◎
Hydrogen Peroxide (3%)	◎
ASTM No.1 Oil (150°C, 70h)	◎
ASTM No.3 Oil (150°C, 70h)	△
Mineral Oil	◎
Castor Oil	◎
Flax Seed Oil	◎
Silicone Oil (35°C, 70h)	△
Acetone	△
Butyl Alcohol	○
Ethyl Alcohol	◎
Gasoline	X
Mineral Spirit	X
Toluene	X
Water (room temperature)	◎
Boiling Water (70h)	◎

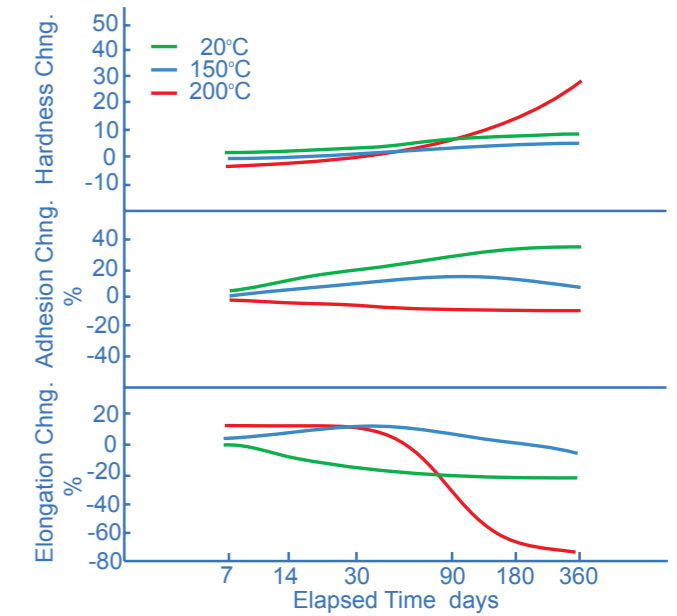
◎: <10%, ○: 10-25%, △: 25-75%, X: >75%

Test Method:

Volume change of cured silicone rubber after immersing 1 week at 25°C

## Typical Heat Resistance

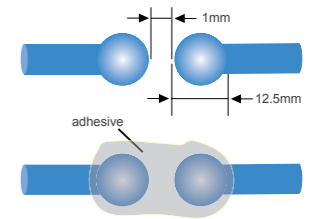
### 1-Part Condensation Cure Adhesive (Alkoxy Type)



## Typical Electrical Performance

Dielectric Strength Test Method:

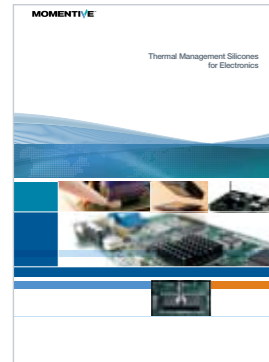
Equipment:  
Dielectric voltage gauge  
Voltage Rise:  
1kV/s  
Terminal Gap:  
1mm (JIS C 2110)



## Electrical Performance of Cured Material

Conditions	TSE3843-W		Volume Resistivity MΩ·m		Dielectric Strength kV/mm	
	40°C, 95%RH	25°C Immersed	40°C, 95%RH	25°C Immersed	40°C, 95%RH	25°C Immersed
Initial			1.6x10 <sup>7</sup>	1.6x10 <sup>7</sup>	29	29
1 Day			2.9x10 <sup>6</sup>	2.2x10 <sup>6</sup>	27	25
2 Days			2.5x10 <sup>6</sup>	3.6x10 <sup>6</sup>	29	22
3 Days			2.7x10 <sup>6</sup>	1.9x10 <sup>6</sup>	24	23

## Other Electronic Solutions from Momentive Performance Materials



Provides detailed information on silicone materials used for thermal management applications in electronics and micro-electronics. Includes SilCool® grease & adhesives, and conventional grades for adhesion, encapsulation and potting.



Provides opto-electronic solutions for LED Packages and Assemblies. Includes InvisiSil™ LED encapsulants, Glob Top, Lens fabrication materials, Die Attach adhesives, and Dot Matrix assembly materials.

## Frequently Asked Questions

### What does RTV mean?

RTV stands for Room Temperature Vulcanization (cure). Despite the low-temperature connotations conveyed by this name, RTV silicones consist of both Room Temperature Cure and Heat Cure grades.

### What is the cure mechanism of a condensation cure product?

Condensation cure silicone products cure when exposed to atmospheric moisture. Moisture in the air is generally required to cure (or vulcanize) condensation cure products. The cure process begins from the outer surface, and therefore time is required for complete cure. The cure time is affected by the reaction mechanism and viscosity of the material. Generally, at 25°C and 50%RH, condensation cure RTV silicones cure through in 24 to 48 hours. Full physical properties may take up to 7 days to develop.

### What is the depth (bead thickness) limit for a condensation cure grade?

For 1-part, condensation cure products, the depth (bead thickness) limitation is approximately 6mm (1/4"). For 2-part, condensation cure products, the depth (bead thickness) limitation is approximately 25mm (1").

### Can I accelerate the cure time of a 1-part product?

Condensation cure silicone cure rates depend on humidity, silicone thickness, and to a smaller degree heat. Increasing the relative humidity around the silicone or reducing the thickness of the material will reduce the time to cure the material. Increased heat (not over 50°C) will somewhat reduce cure time but as mentioned will do so to a much smaller degree than humidity or thickness.

### What is the cure mechanism of an addition cure product?

Addition cure silicone RTV products may be 1 or 2-part and cure when exposed to heat.

Although some heat cure products can cure at room temperature, higher heat greatly accelerates the cure. 1-part heat cure products typically have an inhibitor in the formulation that stops the product from curing until an activation temperature, greater than room temperature, is achieved and the inhibitor is driven off and the cure reaction is allowed to proceed.

### What does "tack free time" mean?

Tack free refers to the amount of time it takes for a condensation cure silicone product to form a cured outer layer (the cured outer layer is not tacky like uncured material).

### What is "mix ratio"?

Mix ratio is a term used to state the amount of each material to be in a multi-component material. The mix ratios for 2-part products are described on the individual product data sheets and are given as a ratio by weight of each material.

### What does "pot life" or "work life" mean?

The amount of time after a 2-part grade is mixed with its curing agent that it will remain useful or pliable.

### How do I remove silicone?

Before it is cured: use a putty knife to remove any of the uncured paste. Wipe the area clean with isopropyl alcohol to remove any leftover residue. After it is cured: First mechanically remove as much of the silicone as you can with either a knife or a razor. A solvent (mineral spirits, toluene, xylene, acetone) can then be used to remove any oily residue or any remaining silicone. It may be necessary to soak the silicone in a solvent overnight to break it down.

### Can I thin a silicone?

Silicone can be thinned using a solvent in which the silicone is miscible, generally an aromatic solvent such as toluene or xylene. As always, be sure to follow the producer's instructions when using solvent products and always use in a well-ventilated area. The shrinkage of the silicone and the cure time will increase with the addition of solvent. Alternative suggestions would include non-

reactive fluids or an RTV with a lower viscosity.

### What can I do to improve the adhesion of the silicone adhesive to my parts?

The first step to good adhesion is to have clean surfaces for the silicone to bond to. For difficult-to-bond-substrates, Momentive Performance Materials offers a number of primers that can be used to improve and maximize adhesion.

### How do I ensure that air is removed from 2-part grades?

If you are hand mixing, air may become added to the material during the mixing process. Vacuum de-airing is most effective in removing air prior to use. Automated mixing equipment that utilizes a static mixer can eliminate the need to de-air prior to dispensing.

On complex high-density electronics, air can sometimes be trapped under components during the potting process. Where this is a concern, potting under vacuum or vacuum de-airing after potting can remove the trapped air. An alternate approach may be to use a grade with a low viscosity and longer potlife and to cure at lower temperatures (if heat-cure grade), allowing entrapped air to escape prior to the cure of the material.

### What is cure inhibition, and how do I prevent it?

Cure inhibition is a phenomenon that may be observed in addition-cure grades. These materials use a platinum catalyst to drive the curing reaction. Surfaces containing water, sulphur, nitrogen compounds, organic metal compounds, or phosphate compounds, may inhibit cure.

Cure inhibition is characterized by a gummy or sticky appearance of the silicone at the interface between the silicone and offending substrate. Inhibition can be prevented by application of a barrier coat, cleaning of the offending material prior to application of the silicone material, replacing the offending material with a suitable alternative, or selection of a condensation cure grade.

## Dispensing Equipment Examples



Tube Type Dispensing Unit



Cartridge Air-Gun Dispensing Unit



Small Can Pump and Dispensing Unit



Cartridge Type Dispensing Unit



Pail Can Pump Unit

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