



GE Silicones

Silicones In Communications

Materials &
Applications



A Global Leader In Silicones

Since the ground-breaking invention of silicones over 50 years ago, GE has been a global leader in developing new silicone products and finding new applications for silicone technology.

GE Silicones manufactures and sells a comprehensive portfolio of value-add silicone products. These products have been developed to solve customer problems and to open new markets and applications for silicones. Major markets served include Automotive, Appliances, Electronics, Telecommunications, Personal Care, Consumer Hardware, Construction, Textiles and Petroleum.

In Communications, major application opportunities include the following:

- Sealing and bonding of mechanical and electrical parts in home and office electronics equipment with silicone adhesive sealants and pressure-sensitive adhesives.
- Encapsulation and protection of printed circuit boards using electronic potting materials, gels and coatings.
- Encapsulation and protection of discrete semiconductor devices requiring very high temperature performance, thermal shock resistance, ionic purity and low co-efficient of thermal expansion (CTE). Products used are silicone molding compounds, encapsulating devices such as power transistors, rectifiers, thermal switches, sensors and wirewound resistors.
- Fabrication of keypads, keyboards and other mechanical parts such as copier rollers, using injection-molded silicone elastomers.
- Hardcoating of polycarbonate and acrylic housings for computers, fax machines, telephones, and home entertainment equipment.



From Silicon To Solutions

Manufactured from silicon, silicones were the first synthetic inorganic materials ever made. For over half a century, they have provided versatile, environmentally friendly solutions for manufacturers worldwide. Primary uses fall into these broad categories:

- Adhesion • Sealing • Insulation • Coating • Gasketing

Within those categories, and more, is a wealth of applications that take advantage of silicones' remarkable physical properties: high- and low-temperature stability, strength, flexibility, moisture resistance, environmental protection and electrical insulation, as well as both adhesion to and protection for a broad range of substrates.

Communications Solutions At Work

GE Silicones sealants and encapsulants are among the materials designed for assembly, electrical and electronic applications in video display terminals and other communications equipment. They fall into the following performance categories:

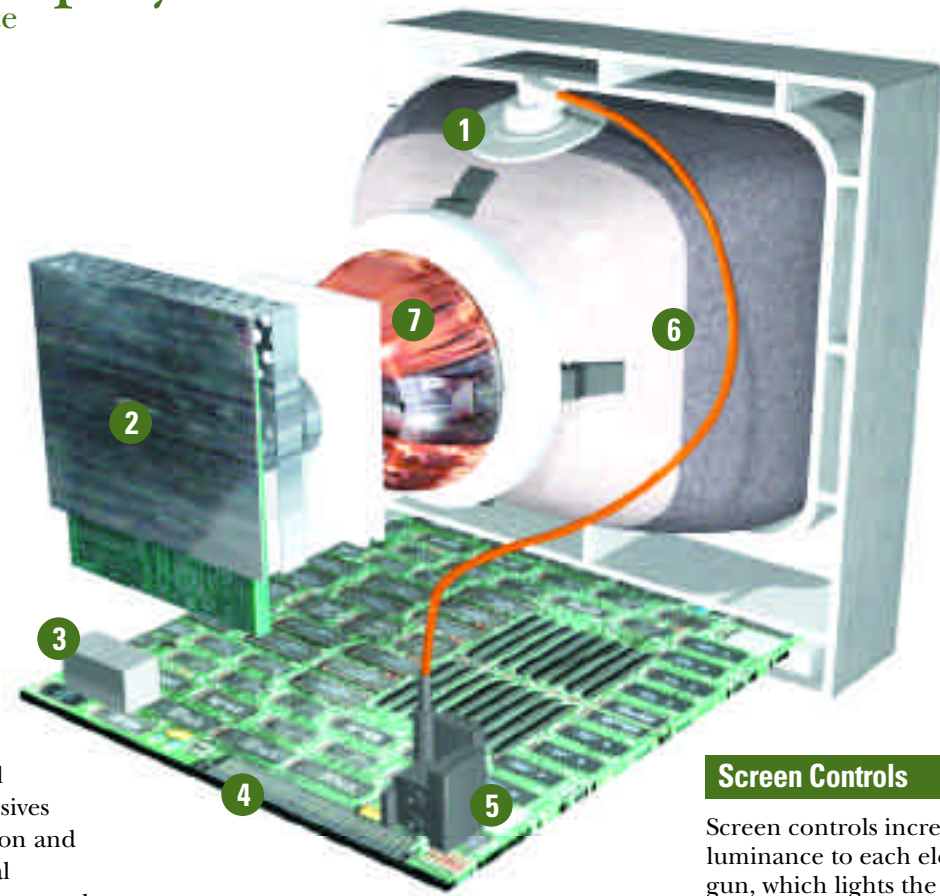
- **Specialties** RTV133, TSE3940 and TSE3941.
- **High Performance** RTV5240 Series.
- **Electronics – Room Temperature Cure** RTV160 Series, TSE392, TSE397 and TSE399.
- **Electronics – Thermal (Addition) Cure** TSE3280, TSE3281, TSE3331, TSE3033 and RTV627.



Video Display Terminals

for Home & Office Equipment

- 1 Anode Cap
- 2 Drive Board
- 3 Tuner
- 4 Main Board
- 5 Flyback Transformer
- 6 CRT
- 7 Deflection Yolk



Cabinet Interior – High Voltage

Silicones are ideal materials for high-voltage applications because of their excellent electrical insulative properties. Silicone adhesives and coatings provide heat dissipation and long-lasting protection for electrical circuitry from dirt, dust and environmental contaminants. Arcing is eliminated because of the high dielectric strength of silicones.

Cathode Ray Tube (CRT)

Cathode ray tubes are located inside all video display monitors in computers, television sets, test equipment (oscilloscopes), and as video displays in aircraft and control towers. They take electrical signals and convert them to video images.

GE Silicones are used as adhesives in CRT applications because of variable tack-free times available, excellent primerless adhesion and non-corrosive properties. Several applications require additional performance capabilities.

CRT and base adhesive – Choose among the following:

- **TSE392** Translucent, short tack-free time, non-corrosive.
- **RTV133** Black, long tack-free time, flame retardance, UL recognition.

- **RTV162** White, long tack-free time, UL recognition, MIL Spec compliance.

Anode cap adhesive – RTV5240 Series or TSE392/397, offering fast cure and excellent electrical insulation. RTV5240 Series also has UL recognition.

CRT and glass adhesive – TSE3033 with clarity and heat-accelerated cure.

Adhesive between video monitor display window and its protective shield – TSE3033 with clarity and heat-accelerated cure.

Printed circuit board adhesives – Choose among non-corrosive materials including the following:

- **TSE392** Translucent, short tack-free time.
- **RTV162** White, UL recognition.
- **RTV167** Gray, high strength, UL recognition, MIL Spec compliance.

Screen Controls

Screen controls increase luminance to each electron gun, which lights the video display screen. Silicones are used to insulate high-voltage wires and prevent arcing across conductive pads.

TSE397 and RTV160 are the products of choice and are both flowable, non-corrosive adhesive sealants.

- **TSE397** Translucent, flowable, fast tack-free material.
- **RTV160** White with a long tack-free time, which provides the option of longer work time.

Second Anode

The second anode delivers the output of the high-voltage circuit to the CRT, which produces raster (light). Silicones are used both as wire insulation and adhesives, insulating and isolating this circuit. The high voltage circuit also controls picture focus.

Cabinet Interior – High Voltage (cont.)

Transformers

Transformers in video display terminals, whether in televisions, computer monitors or other devices, produce the high voltage required for the second anode, which produces raster (light) on the CRT. They require silicone potting compounds and adhesives to protect sensitive electrical components.

The **integral high-voltage transformer (IHVT)** is the newest device for producing high voltage. It incorporates a flyback transformer and a tripler.

The **flyback transformer (FBT)** is also a high-voltage transformer and either a component of the IHVT or a singular device.

The **ferrite coil transformer** is an intermediate frequency transformer. It amplifies the audio and video signals and optimizes them, prior to their routing to the output transformers. It requires a silicone seal for environmental and dielectric protection.

Other Transformer Applications

Sealing the flyback transformer to the focus case – TSE399 sealant is the recommended product for this application due to its flowability, non-corrosive properties and fast tack-free time.

Transformer coil potting – Use TSE3331 two-part silicone for this application. TSE3331 is flowable and thermally-conductive with a heat-accelerated cure capability.

Deflection Yoke

The deflection yoke is a high-voltage magnetic coil mounted on the neck of the CRT. This component requires silicone adhesives for environmental protection, sealing and for fixing critical components permanently in place.

Bonding adhesive – Between the deflection yoke spacer and CRT. Use one of the following non-corrosive materials:

- **TSE392** Translucent, short tack-free time.

Recommended products for transformer applications include the following:

- **TS392** Translucent paste sealant, primerless adhesion, fast tack-free time.
- **TSE397 and TSE399** Translucent flowable sealants, fast tack-free time, non-corrosive.
- **RTV627 and TSE3331** Two-part encapsulating and potting compounds offer long assembly work times. RTV627 is black in color with UL94 V-0* flame retardant properties. TSE3331 is dark gray and thermally conductive.

Exterior

Converter Unit Seal

The converter retrieves signals and relays them to television receivers. Sealing the converter unit provides dielectric and environmental protection to the unit.

TSE397 and RTV160 are the products of choice, and are both flowable, non-corrosive adhesive sealants.

- **TSE397** is a translucent, flowable, fast, tack-free material.

- **RTV160** is white with a long tack-free time, which provides the option of longer work time.

Antenna Assembly

Sealing antennas with silicone adhesives provides both environmental and vibration protection. *Antenna cover seal* – Use TSE392 and RTV5240 Series. Both are non-corrosive, paste adhesive sealants with fast tack-free times.

- **TSE392** is translucent.

- **RTV5242** is white.

- **RTV5240** Series is also available in black and gray.

Other Components

Stereo Amplifier

Staking adhesives – Thermally conductive silicone sealants are used as staking adhesives for amplifier power transistors.

Heat sinks – In the highest output stereo amplifiers, thermally conductive silicones are used as heat conduits, transferring the massive amount of heat generated by amplifier

power transistors to the heat sink.

Recommended products for these applications:

- **TSE3280** High viscosity.
- **TSE3281** Medium viscosity.

Both are thermally conductive adhesive sealants, offer excellent primerless adhesion and are dark gray in color.

Video Cassette Recorder

Silicones are used as staking adhesives for the VCR jumper wires. Two non-corrosive products are recommended, with choice depending on individual customer requirements:

- **TSE392** Translucent paste adhesive sealant with fast tack-free time and primerless adhesion.

- **RTV133** Paste adhesive sealant with UL94 V-0* flame retardant properties and fast tack-free time.

Projection Televisions

Projection televisions contain three CRTs and therefore three times the number of standard components found in a conventional television set. Each CRT is dedicated to a primary color, with the video output projected onto internal mirrors that magnify this output several times.

Projection televisions therefore contain three times the number of silicone sealing, bonding and insulating applications found in a conventional television set.

Product Profile Comparison

Room Temperature Cure – One-Component

Property	Test Method	TSE392*	TSE397*	TSE399*	TSE3940**	TSE3941**	RTV160*	RTV162*	RTV167*	RTV5240 Series*	RTV133***
Tack-free, minutes	ASTM C-719	5	10	10	5	5	4 hrs	4 hrs	4 hrs	45	4 hrs
Hardness, Shore A	ASTM C-661	30	20	30	40	60	25	35	37	40	46
Tensile, MPa (psi)	ASTM D-412	1.6 (228)	1.1 (156)	1.3 (185)	3.0 (426)	3.0 (426)	1.86 (275)	3.73 (550)	5.49 (800)	2.5 (320)	4.51 (650)
Elongation, %	ASTM D-412	400	300	140	200	100	230	400	600	425	250
Color		Translucent	Translucent	Translucent	Gray	White	White	White	Gray	Gray, White, Black	Black

*Alkoxy neutral cure.
**Thermally conductive, flame retardant, UL recognition.
***Flame retardant, UL recognition.

Thermal Cure – One-Component, Thermally Conductive

Property	Test Method	TSE3280	TSE3281
Hardness, Shore A	ASTM C-661	83	30
Tensile, MPa (psi)	ASTM D-412	4.5 (654)	0.98 (142)
Elongation, %	ASTM D-412	–	40
Color		Dark Gray	Dark Gray

Thermal (Addition) Cure – Two-Component

Property	Test Method	TSE3033 (General Purpose)	TSE3331 (Thermally Conductive)	RTV627
Hardness, Shore A	ASTM C-661	30	60	62
Tensile, MPa (psi)	ASTM D-412	0.98 (142)	3.24 (475)	3.24 (475)
Elongation, %	ASTM D-412	130	50	60
Color		Clear	Dark Gray	Dark Gray

Product/Application Selector Guide

Key Performance Properties	Product Specialties RTV133, TSE3940, TSE3941	High Performance RTV5240 Series	Electronics – Room Temperature Cure RTV160, RTV162, RTV167, TSE392, TSE397, TSE399	Electronics – Thermal (Addition) Cure TSE3331, TSE3033, RTV627, TSE3280, TSE3281
Applications				
Antenna cover seals		•	•	
Converter units			•	
CRTs and bases	•		•	
Anode caps		•	•	
CRTs and glass			•	
Monitor display windows/protective shields			•	
Printed circuit boards			•	
Deflection yoke spacers/CRTs	•	•	•	
Electron guns	•			
Transformers			•	•
Flyback transformers/focus cases			•	•
Transformer coil				•
Second anodes/screen controls			•	
Stereo amplifiers			•	•
VCR jumper wires	•			

*This rating is not intended to reflect hazards presented by this or any other material under actual fire conditions.



To Find Out More...

Customer Service

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- Order entry/status
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Company & Product Info

- Internet address:
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- LJ Fulfillment Services
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- Technical assistance/inquiries
- Application review
- Product recommendations
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Customer Specifications

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- Specification reviews

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