

KE 1204 (A-B) RTV Silicones

Two-Component, Non-flammable, Silicone Elastomer

PRODUCT DESCRIPTION

- Low viscosity
- Ideal protectant against environmental hazards
- UL 94V-0 yellow card
- Excellent dielectric properties
- Cures in enclosed assemblies
- Easy to mix and use
- Cure can be heat accelerated

Shin-Etsu KE 1204 (A-B) is an easy to use 1:1 mix ratio silicone potting compound. Ideal for potting sensitive electrical/electronic components and power supplies, KE 1204 (A-B)

cures into a tough yet flexible elastomer. KE 1204 (A-B) can be cured in any thickness at room temperature or can be heat accelerated for faster processing.

KE 1204 (A-B) offers outstanding electrical and physical properties over a wide temperature range (-55°C – 250°C). A UL rating of 94V-0 is maintained and a copy of the UL yellow card is available. The excellent heat resistance and non-flammability of KE 1204 (A-B) make it an excellent choice for high temperature applications.

APPLICATIONS

With its UL 94V-0 rating, low cost, easy processability, and excellent retention of flexibility under wide temperature extremes, Shin-Etsu KE 1204 (A-B) may be used in a variety of electrical/electronic potting or encapsulating applications including:

- Electronic components
- Power supplies and control devices

- High voltage resistor packs
- Transformers
- Relays and Connectors
- Voltage regulators
- Sensing devices
- Electronic controls
- Lifting magnets
- Loading coils

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DIRECTIONS FOR USE

Mixing

As an easy to use, two-component material, Shin-Etsu KE1204 (A-B) is simply mixed on a 1:1 ratio by either weight or volume. The one-to-one mix ratio may be varied by 10% without significantly affecting the properties of the cured elastomer.

Prior to mixing parts A and B together, each should be thoroughly mixed separately. Settling may have occurred while standing, causing filler to fall to the bottom of each container. To ensure thorough cure, it is important that these fillers are mixed back into the liquid. Once accomplished, immediately mix parts A and B together.

Thorough blending of parts A and B will become apparent when the material becomes dark red in appearance. Should there appear to be any marbling or light streaks in the mixture, continue to mix until they have disappeared.

Deaeration

To ensure the elimination of entrapped air within the material that may cause voids in the cured compound, deaeration of the mixed material may be required. To do so, place the mixture under a vacuum of 28-29 inches Hg. As full vacuum is applied, the material will "froth" and expand to about 4 times its original volume, crest and eventually recede back to its original level. (A film coating along the container sides should be evident above the original volume.) The deaeration cycle is complete approximately 2 minutes after the frothing action ceases. Should the container size used be inadequate for deairing the mixture, the vacuum may be broken during operation to reduce bubble formation.

Shin-Etsu KE 1204 (A-B) may then be applied by pouring, brushing or dipping. Pouring should be done carefully to avoid entrapping air. For complex assemblies, pouring under vacuum or deairing after pouring may be necessary to prevent voids in the cured material.

Surface Preparation

Prior to potting or encapsulating, all surfaces should be thoroughly cleaned with an environmentally suitable solvent to remove dirt, oil and grease. The surface should then be wiped dry before applying the primer or elastomer.

When solvents are used, proper safety precautions must be observed. Exposure to high vapor concentration must be avoided. Where flammable solvents are used, storage, mixing and use must be in areas away from heat, sparks, open flames or other sources of ignition.

Pot Life

Shin-Etsu KE 1204 will begin curing immediately after parts A and B have been mixed. Evidence of cure will be the gradual increase in the overall viscosity of the liquid. Under ambient conditions of 25°C (77°F), the viscosity will double to approximately 100 poise after the first 2 hours of cure. The mixture should become a solid elastomer within 24 hours. To extend the pot life or working time of the material, simply lower the room temperature. To shorten the pot life and accelerate cure, higher temperatures may be used.

Cure Schedule

Temperature	Cure Time
25°C (77°F)	24 hours
60°C (140°F)	2 hours
100°C (212°F)	15 minutes
150°C (302°F)	5 minutes

Adhesion

KE 1204 (A-B) will require a primer for maximum adhesion. The following table shows the adhesive strength of KE 1204 (A-B) to various substrates when Primer X-33-139 is used.

Substrate	Shear Strength (psi)
Iron	91
Copper	92
Aluminum	95
Chrome	105
ABS	94
Rigid PVC	98
Polycarbonate	148
Polyester	138
Phenolic	178
Epoxy	168

Temperature Stability

Shin-Etsu KE 1204 (A-B) cures chemically to a thermoset material that will not melt or appreciably soften even at elevated temperatures greater than 250°C (482°F).

Upon exposure to lower temperatures, Shin-Etsu KE 1204 (A-B) does not approach a stiffening point until -55°C (-67°F). Overall, the cured elastomer will maintain its basic elastomeric flexibility over an extremely wide range of -55°C (-67°F) to 250°C (482°F), making it an ideal selection for applications that may experience high or low temperature cycling. Resistance to heat aging is shown.

Heat Aging

Property	Initial	200°C			250°C
		100 hrs	500 hrs	1000 hrs	100hrs
Hardness, Shore-A	70	76	77	76	70
Tensile Strength, psi	500	650	610	610	580
Elongation, %	90	70	90	70	60
Weight loss, %	—	-1.7	-3.4	-3.8	-2.2

cure schedule: 100°C/30 min

KE 1204 (A-B) also exhibits outstanding stability of electrical properties over a wide temperature range. The following table shows the effect of heat aging on electrical properties.

Electrical Properties	Initial	150°C/500 hours	200°C/500 hours	250°C/500 hours
Volume Resistivity, Ωcm	2×10^{14}	1×10^{13}	1×10^{14}	1×10^{13}
Dielectric Strength, V/mil	685	685	710	730
Dielectric Constant, 60Hz	3.3	3.3	3.3	3.2
1MHz	3.3	3.2	3.2	3.1
Dissipation Factor, 60Hz	2×10^{-3}	1×10^{-3}	1×10^{-3}	1×10^{-3}
1MHz	1×10^{-4}	1×10^{-4}	1×10^{-4}	1×10^{-4}

cure schedule: 100°C/30 minutes

Reversion Resistance

Addition cured Shin-Etsu KE 1204 (A-B) will not depolymerize or revert to a more liquid state when heated under confinement or in deep sections. This is true even when exposed to temperatures in excess of 200°C (392°F) while under confinement or in deep section.

Flame Retardancy

Shin-Etsu KE 1204 (A-B) offers excellent fire resistant properties and low combustion toxicity. The decomposition products evolved from extreme heat or burning of this product are amorphous SiO₂, CO₂, CO and traces of incompletely burned carbon products. Shin-Etsu KE 1204 (A-B) is UL listed 94V-0 (E-48923).

Repairing

Should the final cured silicone compound require any repairs due to a torn corner or surface blemish, or sub-assembly rework, simply cut away the unwanted material and apply the same Shin-Etsu two-component RTV material originally used.

Cure Inhibition

Certain chemicals, curing agents, plasticizers and materials can inhibit cure. The most common are:

- Organo-tin and other organo-metallic compounds
- Silicone rubber containing organo-tin catalyst
- Sulfur, polysulfides, polysulfones and other sulfur-containing materials
- Amines, urethanes, and amine containing materials
- Unsaturated hydrocarbon plasticizers

Should a substrate or material be a possible cause of inhibition, it is best to test a small sample for compatibility with the elastomer. The presence of liquid or uncured product at the interface between the suspect substrate and the cured elastomer would indicate cure inhibition.

Clean Up and Removal

Before curing, use the same environmentally suitable solvent used to clean the substrate. After cure, selected chemical strippers which will remove the silicone rubber are available from other manufacturers. Specific product information may be obtained upon request.

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Storage and Shelf Life

Shin-Etsu KE 1204 has a shelf life of 6 months from date of shipment when stored in its original, unopened containers, at or below 32°C (90°F). By decreasing the storage temperature, the useful shelf life of the product may be extended.

TYPICAL PROPERTIES

Property		KE 1204	
		A	B
Before Cure	Appearance	Red	White
	Viscosity, 25°C (P)	60	40
	Specific Gravity, 25°C	1.54	1.54
	Pot Life, 25°C	2 hours	
After Cure	Specific Gravity, 25°C	1.54	
	Hardness, Shore-A	70	
	Tensile Strength, PSI	500	
	Elongation, %	90	
	Linear Shrinkage, %	0.1	
	Thermal Conductivity, Cal/cm-sec-°C	7.2 x 10 ⁻⁴	
	Dielectric Strength, Volts/mil	685	
	Volume Resistivity, Ω-cm	2x10 ¹⁴	
	Dielectric Constant, 1 MHz	3.3	
	Dissipation Factor, 1 MHz	1x10 ⁻⁴	
UL Status	94V-0		

Cure schedule: 100°C/30 minutes

SPECIFICATIONS

The information and data contained herein are believed to be accurate and reliable; however, it is the user's responsibility to determine suitability of use. Since Shin-Etsu Silicones cannot know all of the uses to which its products may be put or the conditions of use, it makes no warranties concerning the fitness or suitability of its products for a particular use or purpose.

You should thoroughly test any proposed use of our products and independently conclude satisfactory performance in your application. Likewise, if the manner in which our products are used requires governmental approval or clearance, you must obtain it.

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AVAILABILITY

Shin-Etsu silicones are available from Shin-Etsu Silicones of America, Inc. or from its authorized silicone products distributors. For the name of your nearest distributor or for more information on these products contact:

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