MOMENTIVE
performance materials

SilCool* LTR3295

one component, fast cure, thermally conductive silicone adhesive

Product Description

SilCool LTR3295 silicone adhesive is a fast cure, one component, low viscosity, thermally conductive material. It remains in an uncured state at room temperature and rapidly cures to an elastomer when heat is applied.

SilCool LTR3295 silicone adhesive generally provides higher thermal conductivity than conventional silicone adhesives, which makes it an excellent candidate to consider for electrical and electronic applications where high thermal transfer is required. It is generally non-corrosive to metals and can offer excellent adhesive properties to a wide variety of substrates. For example, primerless adhesion is typically obtained on metals such as aluminum, copper, nickel plate, PPS and PBT plastics, ceramics and glass.

SilCool LTR3295 silicone adhesive can reach full cure in approximately 30 minutes at cure temperatures of 80°C. This material has a pot-life of 12-24 hours at room temperature.

Key Features and Typical Benefits

- Rapid heat accelerated cure at low temperatures (30 minutes at 80°C)
- Excellent adhesive properties after 15-30 minute cure
- Primerless adhesion to many substrates
- Moderate thermal conductivity
- Low thermal resistance

Momentive Performance Materials provides versatile materials as the starting point for our creative approach to ideas that help enable new developments across hundreds of industrial and consumer applications. We are helping customers solve product, process, and performance problems; our silanes, fluids, elastomers, sealants, resins, adhesives, urethane additives, and other specialty products are delivering innovation in everything from car engines to biomedical devices. From helping to develop safer tires and keeping electronics cooler, to improving the feel of lipstick and ensuring the reliability of adhesives, our technologies and enabling solutions are at the frontline of innovation.

Typical Properties Data

UNCURED PROPERTIES	SilCool LTR3295		
Appearance	Flowable paste, gray		
Viscosity[1] 10.0/s, (Pa-s @ 23°C)	15		
Thixotropic Index 10.0/s : 1.0/s (@ 23°C)	3.8		
CURED PROPERTIES AT 150°C	1 hour		
Die Shear Adhesive Strength[2] (psi)	930		
Specific Gravity (23°C)	2.6		
Hardness - Shore A	91		
Tensile Strength (psi)	800		
Elongation (%)	36		
Lap Shear Adhesive Strength (psi) (bare aluminum)	115		
Lap Shear Adhesive Strength (psi) (chromate/aluminum)	173		
Thermal Resistance at 0 psi cure pressure[3] (mm^2K/W) (~ 2.5 mil bondline thickness)	54		
Thermal Resistance at 10psi cure pressure[3] (mm^2K/W) (~ 1.75 - 2.00 mil bondline thickness)	38		
Bulk Thermal Conductivity[4] (W/mK)	1.6		
CTE (ppm/°C)	130		
Weight Loss (150°C, 3hr) (%)	0.3		
CURED PROPERTIES AT 80°C	1 hour	30 min	15 min
Die Shear Adhesive Strength[2] (psi)	925	800	450
Thermal Resistance at 10psi cure pressure[3] (mm^2K/W) (~ 1.75 - 2.00 mil bondline thickness)	37	36	37
Specific Gravity (23°C)	2.6	2.6	2.6
Hardness - Shore A	91	91	91
Tensile Strength (psi)	740	790	700
Elongation (%)	40	38	39

RELIABILITY TESTING - Adhesion	SilCool LTR3295		
	Initial Cure Conditions	T-0 Adhesion	After 250 hours 85% RH / 85°C
Die Shear Adhesion (psi)	1 hour at 150°C	912	1527
	1 hour at 80°C	925	1505

RELIABILITY TESTING - Thermal Performance	SilCool LTR3295		
	Initial Cure Conditions	T-0 Thermal Resistance	After 250 hours 85% RH / 85°C
Thermal Resistance at 10psi cure pressure[3] (mm^2K/W) (~ 1.75 - 2.00 mil bondline thickness)	1 hour at 150°C	36	35
	Initial Cure Conditions	T-0 Thermal Resistance	After 250 hours 85% RH / 85°C
Thermal Resistance at 10psi cure pressure[3] (mm^2K/W) (~ 1.75 - 2.00 mil bondline thickness)	1 hour at 80°C	37	37
	30 min at 80°C	36	35
	15 min at 80°C	36	35

1. Parallel plate geometry under simple shear oscillation (Cari-Med Rheometer, CSL2500, TA Instruments)
2. Testing done on assemblies of silicon die to chromate-coated aluminum panels, 10-psi assembly pressure, 1-2 mil bondline thickness. Adhesion measured 3 days after cure. Dage 4000.
3. Testing done on sandwich assemblies of either silicon die to chromate coated aluminum (Si-TIM-Cr/Al) or silicone die to silicon substrates (Si-TIM-Si). Netzsch LFA 447 Nanoflash.
4. Bulk sample measurement (Netzsch TCA300 micro flash), thickness 2.05mm, extrapolated to 25°C

Note: Test results. Actual results may vary.

Instructions for Use

SilCool LTR3295 silicone adhesive is a highly filled, thermally conductive material, and filler settling may occur during storage. If filler settling has occurred, the filler must be mixed back into the material to form a uniform mixture prior to use. Hand mixing can be performed using a clean, flat blade spatula. Alternatively, a low shear mixer can be utilized. Mixing the material will often result in air entrapment. In this case, a subsequent de-air step under vacuum is recommended prior to use.

DE-AIRATION

Air entrapped during mixing should be removed to eliminate voids in the cured product. Expose the mixed material to a vacuum of about 29 inches (25mm) of mercury. The material should expand, crest, and recede to about the original level as the bubbles break. Degassing is usually complete about two minutes after frothing ceases.

COMPATIBILITY

SilCool LTR3295 silicone adhesive should cure in contact with most clean and dry surfaces. However, certain materials, such as butyl and chlorinated rubber, sulfur-containing materials, amines and certain metal soap-cured RTV silicone rubber compounds can cause cure inhibition. Cure inhibition is characterized by a gummy appearance of the RTV silicone adhesive at the interface between it and the substrate. Latex gloves should not be used near this product. It is recommended that a sample patch test be performed with the silicone adhesive to determine if a barrier coating or other inhibition-preventing measures are necessary before using the material.

SURFACE PREPARATION

The performance of any adhesive system is highly dependent upon surface preparation. In order to maximize the adhesion properties of SilCool LTR3295 silicone adhesive and minimize the potential for cure inhibition, all parts should be as clean and dry as possible prior to the application of the silicone adhesive. Surfaces should be thoroughly cleaned with a suitable solvent to remove dirt, oil, grease and other contaminants. Particular attention should be paid to those areas that will come in direct contact with the adhesive during the curing process.

Instructions for Use (continued)

BONDING

SilCool LTR3295 silicone adhesive generally offers excellent adhesion to a wide variety of substrate materials without the use of a primer. For best adhesion, surfaces to be bonded should be thoroughly clean and dry. If a solvent is used to clean the substrates prior to use, steps must be taken to ensure the solvent has completely evaporated prior to application of the silicone rubber compound. For difficult-to-bond-to substrates or where more aggressive chemical adhesion is desired, a Momentive Performance Materials silicone primer may be used. For more details on priming and adhesion, please refer to the Momentive Performance Materials product data sheet on silicone primers.

CURING

SilCool LTR3295 silicone adhesive typically cures very rapidly when exposed to elevated temperatures. The actual cure time may be affected by many variables including but not limited to the cross-sectional thickness of the silicone adhesive, the cure temperature used, the thermal properties of the overall assembly, the type and efficiency of the oven and the oven loading. Cure temperatures below 80°C are not recommended and cure temperatures above 200°C need to be tested. SilCool LTR3295 silicone adhesive should be cured in a well ventilated oven. For more detailed information on curing properties, contact Momentive Performance Materials.

THAWING

In the case of bulk cans of SilCool LTR3295 silicone adhesive, remove from 0-5°C storage and allow the material to come to room temperature before opening the container. This is an important step to avoid condensation in the material. Thoroughly mix the material before using, as described above. The mixing step is often needed since filler may have settled during storage at these temperatures. After mixing a vacuum de-air step is recommended to remove any air entrapment. Once the material has thawed, it should be used completely. Multiple freeze thaw cycles should be avoided.

In the case of semco or syringe packages of SilCool LTR3295 silicone adhesive, remove from -40°C storage and place tip down at 0-5°C for 1 hour. After the 1-hour hold at 0-5°C, move the package to ambient conditions, tip down, and allow the material to reach room temperature. Once the material is at room temperature, it can be used. Once the material has thawed, it should be used completely. Multiple freeze thaw cycles should be avoided.

Patent Status

SilCool LTR3295 silicone adhesive is the subject of one or more pending US and foreign patent applications.

Nothing contained herein shall be construed to imply the nonexistence of any relevant patents or to constitute the permission, inducement or recommendation to practice any invention covered by any patent, without authority from the owner of the patent.

Product Safety, Handling and Storage

Customers considering the use of this product should review the latest Material Safety Data Sheet and label for product safety information, handling instructions, personal protective equipment if necessary, and any special storage conditions required. Material Safety Data Sheets are available at www.momentive.com or, upon request, from any Momentive Performance Materials representative. Use of other materials in conjunction with Momentive Performance Materials products (for example, primers) may require additional precautions. Please review and follow the safety information provided by the manufacturer of such other materials.

Limitations

Customers must evaluate Momentive Performance Materials products and make their own determination as to fitness of use in their particular applications.

Emergency Service

Momentive Performance Materials maintains an around-the-clock emergency service for its products. The American Chemistry Council (CHEMTREC), Transport Canada (CANUTEC), and the Chemical Emergency Agency Service also maintain an around-the-clock emergency service for all chemical products:

Location	Momentive Performance Materials Products	All Chemical Products
Mainland U.S., Puerto Rico	518.233.2500	CHEMTREC: 800.424.9300
Alaska, Hawaii	518.233.2500	CHEMTREC: 800.424.9300
Canada	518.233.2500	CANUTEC: 613.996.6666 (collect) or CHEMTREC: 800.424.9300
Europe, Middle East, Africa	+32.(0)14.58.45.45 (Belgium)	CHEMTREC: +1-703.527.3887 (collect)
Latin America, Asia/Pacific, all other locations worldwide	+518.233.2500	CHEMTREC: +1-703.527.3887 (collect)
At sea	Radio U.S. Coast Guard, which can directly contact Momentive Performance Materials at 518.233.2500 or CHEMTREC at 800.424.9300.	

DO NOT WAIT. Phone if in doubt. You will be referred to a specialist for advice.

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Principal Locations

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