

# Silopren\* LSR 7180

Ultra-clear, High Flame Resistant,  
 Liquid Silicone Rubber

## MARKETING BULLETIN

## ELASTOMERS

Silopren LSR 7180 is a two component liquid silicone rubber that can provide good flame resistance and optical clarity. Silopren LSR 7180 liquid silicone rubber enables luminaries to be equipped with high flame resistance above the UL 94 flame class rating of V-1, which is required for LED lighting applications.

By providing improved flame resistance while maintaining optical clarity and long-term color stability in harsh conditions, this grade is an excellent material to consider for flame-resistance applications in outdoor applications in addition to specialty lighting applications that require clarity and long-term color stability in regards to heat and UV radiation.

In addition, its excellent processability can enable the manufacturing of complex and micro-structure optical parts. Silopren LSR 7180 liquid silicone rubber is f1 rated for outdoor use in accordance with UL 746C. This additional feature can offer significant performance enhancement for SSL design in LED lighting and optical applications.

### Key Features and Typical Benefits

#### Optical Clarity

- 94% transmission
- <1% haze
- Abbe number of approximately 50
- Strong color stability Durability
- High temperature resistance even above 150 °C
- UV light resistance
- Micro-crack resistance
- Equivalent to UL 94 V-1 and 5VA at 6 mm (1)

#### Design Freedom

- High flowability helps to enable complex and micro-structure design
- Enhanced options for part integration
- Reduced weight in design
- Colorability due to optical clarity

#### Productivity

- Excellent processability for injection molding
- Reduced waste in the coldrunner-based LSR injection process

### Potential Applications

Silopren LSR 7180 liquid silicone rubber is an excellent candidate to consider for the following articles, and particularly those in LED light and optic management:

- Primary and secondary lenses
- Light guides
- Sheets and films
- Other illumination optic

#### Typical Physical Properties

	A Component	B Component
Appearance	Optical Clarity	Optical Clarity
Viscosity in Pa·s, $\dot{\gamma} = 10 \text{ s}^{-1}$ at 23 °C	60	30
Mix Ratio by Weight	1:1	
Mixed Viscosity in Pa·s, $\dot{\gamma} = 10 \text{ s}^{-1}$ at 23 °C	43	

The pot-life of the mixture of the two components (closed vessel) at 20 °C is usually two days. Increased temperatures reduce the pot-life.

Typical properties are average data and are not to be used as or to develop specifications.  
 (1) The results are based on UL Yellow Card, V-1 and 5VA at 6.0 and 8.0 mm.

**Typical Properties of the Vulcanizate**

Vulcanization: 15 min. at 130 °C press cure

Basic			
Density	JIS K 6249	g/cm <sup>3</sup>	1.06
Shore A hardness	JIS K 6249		76
Shore D hardness	JIS K 6249		25
Tensile strength	JIS K 6249	N/mm <sup>2</sup>	10.8
Elongation at break	JIS K 6249	%	80
Tear strength	JIS K 6249	N/mm	8
Optical			
Transmittance (2 mm)	400mm	%	93
Transmittance (2 mm)	700mm	%	94
Refractive Index		(n <sub>D</sub> <sup>25</sup> )	1.41
Haze	D 1003	%	< 1
Thermal			
CTE linear (40-90 °C)		ppm/°C	270
Linear Shrinkage	JIS K 6249	%	2.7
Others			
Water Absorption	D 570	%	< 0.1
Curing Data	10' at 110 °C	T60 [min]	1.8

Typical properties are average data and are not to be used as or to develop specifications.

**Test Performance Data**

**Flame Resistance Performance - UL**

Silopren LSR 7180 liquid silicone rubber carries a high UL 94 flame resistance rating of V-1 and 5VA. Silopren LSR 7180 also carries the f1 designation for outdoor use with respect to ultraviolet light, water exposure and immersion in accordance with UL 746C.

Flammability UL 94	1mm	Class, UL 94	HB
Flammability UL 94 V	6mm	Class, UL 94	V-1
Flammability UL 94 5V	6mm	Class, UL 94	5VA

(1) The results are based on the official UL Yellow Card E56745.

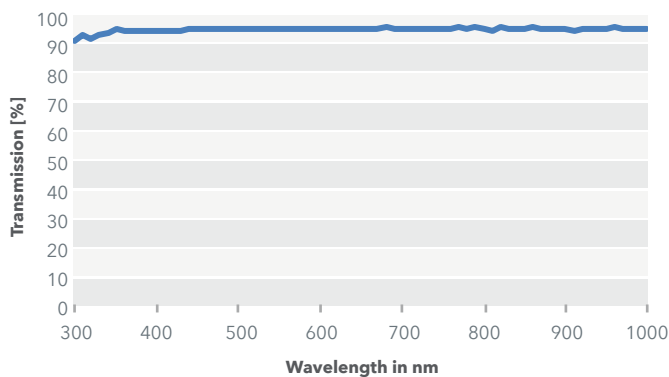
**Light Transmission**

Silopren LSR 7180 liquid silicone rubber features a consistent transmission level of approximately 94% at 2 mm over a wide range of wavelengths in both visible and non-visible light.

**Durability**

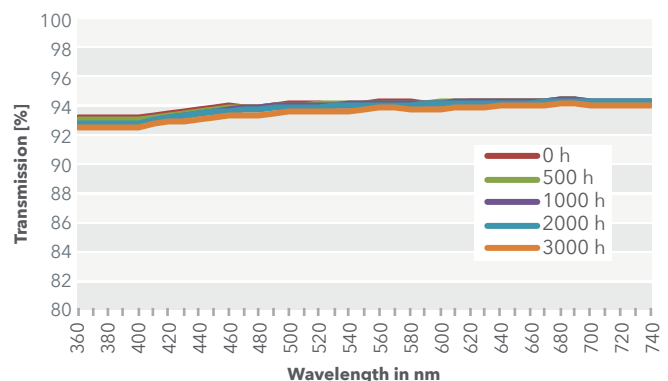
Silopren LSR 7180 liquid silicone rubber typically demonstrates good heat stability, even at higher temperatures, showing long-term color stability with consistent transmission retention and a low yellowness index under thermal and thermal/humid aging test conditions both.

**Figure 1:**  
Light Transmission at 2 mm thickness



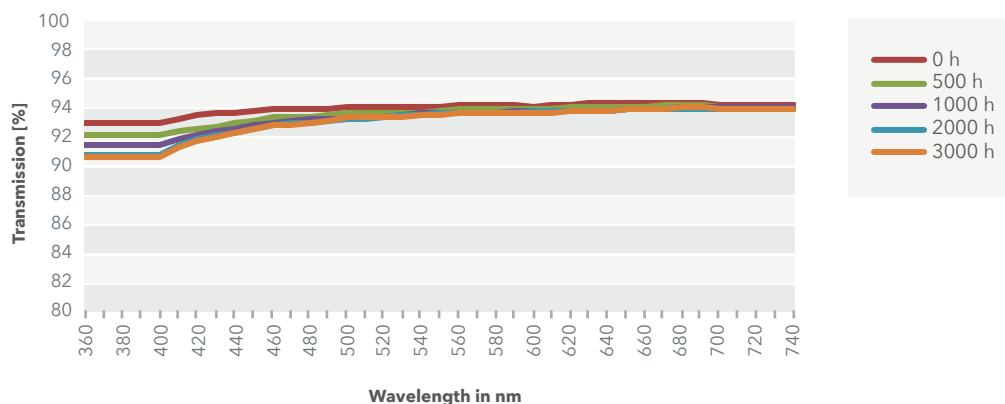
Note: Test data. Actual results may vary.

**Figure 2-1:**  
Light Transmission:  
Thermal Aging over 3,000 h at 150 °C at 2 mm thickness



Note: Test data. Actual results may vary.

**Figure 2-2:**  
**Light Transmission:**  
**Thermal and Humid Aging**  
**over 3,000 h at 85 °C / 85%**  
**RH (relative humidity)**



Note: Test data. Actual results may vary.

**Figure 3:**  
**Thermal aging for 6,480 hours at 150 °C for observed yellowing on a variety of transparent materials, including the LSR 7xxx series**



### General Considerations for Use

Ready-to-use mixtures (of the components A and B) are fed directly to the injection-molding machine from the original containers by means of a metering and mixing unit. The mixture, consisting of the two components in the ratio 1:1, is injected into the heated mold. Because of the low viscosity, the injection speed and injection pressure need to be carefully adjusted so that the injection time can be decreased. At mold temperatures of 110 - 200 °C, the addition-crosslinking silicone rubber generally cures free of dissociation products within a few seconds. Excellent flowability and easy de-molding can enable fully automated production of large numbers of articles in shorter total cycle times.

### Packaging

Silopren LSR 7180 liquid silicone rubber is currently available in a pail kit (18 kg of A and B part - each) and drum kits (180 kg of A and B part - each).

## Patent Status

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.

## Limitations

Customers should review the latest Safety Data Sheet (SDS) and label for product safety information, safe handling instructions, personal protective equipment if necessary, emergency service contact information, and any special storage conditions required for safety. Momentive Performance Materials (MPM) maintains an around-the-clock emergency service for its products. SDS are available at [www.momentive.com](http://www.momentive.com) or, upon request, from any MPM representative.

For product storage and handling procedures to maintain the product quality within our stated specifications, please review Certificates of Analysis, which are available in the Order Center. Use of other materials in conjunction with MPM products (for example, primers) may require additional precautions. Please review and follow the safety information provided by the manufacturer of such other materials.

## Customer Service Centers

### Worldwide

Email: [commercial.services@momentive.com](mailto:commercial.services@momentive.com)

### Americas

+1 800 295 2392  
+1 614 986 2495

### Europe, Middle East, Africa and India

00800 4321 1000  
+40 213 044229

### Asia Pacific

**China**  
800 820 0202  
+86 21 3860 4892

### Japan

0120 975 400  
+81 276 20 6182

### All Other Countries

+60 3 9206 1543

## Disclaimer

FORMULATIONS ARE ILLUSTRATIVE EXAMPLES AND DO NOT REPRESENT COMMERCIALIZED PRODUCTS. They have not been subjected to extensive testing and Momentive makes no representation or warranty of any kind with regard to any such formulations, including, without limitation, concerning the performance, efficacy or safety of any product manufactured using such formulations. EACH USER BEARS FULL RESPONSIBILITY FOR (1) MAKING ITS OWN DETERMINATION AS TO THE SUITABILITY AND LEGAL COMPLIANCE OF ANY FORMULATION, MATERIALS, RECOMMENDATIONS, OR ADVICE FOR ITS OWN PARTICULAR USE, (2) IDENTIFYING AND PERFORMING ALL TESTS AND ANALYSES NECESSARY TO ASSURE THAT ITS FINISHED PRODUCTS BASED UPON EXAMPLE FORMULATIONS AND/OR INCORPORATING MENTIONED PRODUCTS, MATERIALS, OR SERVICES WILL BE SAFE AND SUITABLE FOR USE UNDER END-USE CONDITIONS, AND (3) OBTAINING ANY NECESSARY GOVERNMENT OR REGULATORY CLEARANCE, LICENSE OR REGISTRATION.

Any reference to a third party's materials is not an endorsement of those materials or an endorsement by the third party of Momentive materials. Momentive has not undertaken a comprehensive patent or other intellectual property search on the formulations. No statement contained herein concerning a possible or suggested use of any material, product, service or design is intended, or should be construed, to grant any license under any patent or other intellectual property right covering such use or design, or as a recommendation for the use of such material, product, service or design in the infringement of any patent or other intellectual property right.

BEFORE HANDLING ANY PRODUCTS MENTIONED, REVIEW THE LATEST SAFETY DATA SHEET (SDS) AND LABEL FOR PRODUCT SAFETY INFORMATION, SAFE HANDLING INSTRUCTIONS, PERSONAL PROTECTIVE EQUIPMENT IF NECESSARY, EMERGENCY SERVICE CONTACT INFORMATION, AND ANY SPECIAL STORAGE CONDITIONS REQUIRED FOR SAFETY. MOMENTIVE MAINTAINS AN AROUND-THE-CLOCK EMERGENCY SERVICE FOR ITS PRODUCTS. SDS FOR MOMENTIVE PRODUCTS ARE AVAILABLE AT [WWW.MOMENTIVE.COM](http://WWW.MOMENTIVE.COM) OR, UPON REQUEST, FROM ANY MOMENTIVE REPRESENTATIVE. USE OF OTHER MATERIALS IN CONJUNCTION WITH MOMENTIVE PRODUCTS MAY REQUIRE ADDITIONAL PRECAUTIONS. PLEASE REVIEW AND FOLLOW THE SAFETY INFORMATION PROVIDED BY THE MANUFACTURER OF SUCH OTHER MATERIALS.

THE MATERIALS, PRODUCTS AND SERVICES OF MOMENTIVE PERFORMANCE MATERIALS INC. AND ITS SUBSIDIARIES AND AFFILIATES (COLLECTIVELY "SUPPLIER"), ARE SOLD SUBJECT TO SUPPLIER'S STANDARD CONDITIONS OF SALE, WHICH ARE INCLUDED IN THE APPLICABLE DISTRIBUTOR OR OTHER SALES AGREEMENT, PRINTED ON THE BACK OF ORDER ACKNOWLEDGMENTS AND INVOICES, AND AVAILABLE UPON REQUEST. EXCEPT AS PROVIDED IN SUPPLIER'S STANDARD CONDITIONS OF SALE, SUPPLIER AND ITS REPRESENTATIVES SHALL IN NO EVENT BE RESPONSIBLE FOR ANY LOSS RESULTING FROM ANY USE OF ITS MATERIALS, PRODUCTS OR SERVICES DESCRIBED HEREIN. Nothing in this or any other document, nor any oral recommendation or advice, shall be deemed to alter, vary, supersede, or waive any provision of Supplier's standard Conditions of Sale or this Disclaimer, unless any such modification is specifically agreed to in a writing signed by Supplier.