

Product Description

SHARPIE MODIFIED SILICONE LM is one-component type, Low Modulus Modified Silicone [Si-Hybrid] sealant formulated using Advanced Non- Bleed Silicone Technology to reduce or eliminate Dirt Pickup, Surface Streaking, and substrate staining.

This product is a Neutral Cure sealant which does not emit odors associated with acetoxy cure sealant, and is virtually non- corrosive to metal. It cures upon exposure to atmospheric moisture at room temperature.

SHARPIE MODIFIED SILICONE LM is a Low Modulus Adhesive Sealant, with high Elongation, which makes it suitable for use as a premium weather sealant in Façade Modules Joints of Aluminum Panels, Coated Panels, Metal, Stone, Tiles, Concrete, Mortar and Prefabricated Housing/ Panels.



Typical Performance Properties

Performance

- Durability – Cured Modified Silicone Rubber exhibits excellent long term resistance to natural weathering including: Extreme Temperatures, Ultraviolet Radiation, rain and snow, with negligible change in elasticity.
- Good elasticity and restoration prevents movement of substrate on thermal change condition
- Primer-less Adhesion – Suitable for use with numerous construction- related materials, including: fluoropolymer and powder coated paints, conversion-coated and anodized aluminum, brick, terra-cotta, ceramic and porcelain materials, concrete and natural stones, prefabricated housing/ panels and cold storage panels.
- **Chemical Resistance***
- **Fungal Resistance**
- **Excellent Paint-ability:** Allows adhesion of most paints
- **Non-Stain, Non-Bleed to ASTM C1248:** Polymer-Based Sealant with Low Dirt Pick- Up
- Even after vulcanization, has initial flexibility gives strong resistance against the continuous restore and elongation
- **± 50% Joint Movement Capability,** low stress on the bond
- Thermal Stability (Cured State) – Once cured, the material remains flexible over a range of -30°C to 90°C.



SHARP CHEMICAL IND. CO., LTD. is an exclusive licensee of SHARPIE. SHARP CHEMICAL IND. CO., LTD. provides versatile materials as the starting point for its 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.

Typical Performance Properties (continued)

Aesthetics

- Premium Formulation - special formulation offers a cleaner modified silicone option when sealing visible building joints. The cured sealant has a reduced tendency to attract airborne contaminants and minimize the subsequent streaking that can occur when rainwater washes over joints. The reduced dirt pickup characteristic allows it to be used as a substitute for organic sealants but with the delivery of traditional silicone weatherability and long life performance. In addition, the potential for staining from fluid migration is effectively reduced when sealing natural stones, including: marbles, granites and limestones.
- Finish - matte finish produces a non-glossy surface appearance.

Application

- Stable Consistency (uncured state) – supplied as a lightweight paste, the consistency of which remains relatively unchanged over a wide temperature range. The paste may be easily gunned and tooled under hot and cold conditions.
- Extended Work Life – Designed to allow the user sufficient time for installation and tooling.
- Low Sag or Slump – Useful for application to horizontal, vertical or overhead surfaces.

Basic Uses

SHARPIE MODIFIED SILICONE LM is recommended for the following applications:

Natural Stone

- Useful on natural stones when staining from migration in undesired

Façade Elements

- Useful on façade elements where the appearance of a clean façade is desired.
- Useful on Prefabricated concrete panels/ expansion joints when high joint movement capability
- Joints of exterior wall panels/ boards, roof materials, metal plate/ siding.
- Joints of wooden panels
- Terminal sealing of waterproofing sheet
- Repair of cracks of mortar/ concrete
- Watertight and Airtight for interior joints

Weatherproofing

- Between dissimilar or similar materials in either new or remedial sealing applications
- Around window perimeters and punched openings

Chemical Resistance*

- Refer to Chemical Resistance Information.

Excellent Paint-ability

- Paint-ability on cured sealants with most paint types.
- However, due to wide variety of paint, we strongly suggest a peel-ability test before application.
- MSC1-14 has larger movement capability than the paint film. Cracking/ crazing of paint film may occur with movement in joint.

Applicable Standards

SHARPIE MODIFIED SILICONE LM modified silicone Sealant meets or exceeds the test requirements of:

- JIS A 5758 F-20LM-8020
- American Society for Testing & Materials International:
- ASTM C920 Standard Specification for Elastomeric Joint Sealants; Type S, Grade NS, Class 50, Use T, A, M

Suggested References

In addition to the guidelines provided on this datasheet, SHARP CHEMICAL IND. CO., LTD. recommends that designers and users of SHARPIE MODIFIED SILICONE LM familiarize themselves with the latest editions of following industry guidelines and best practices:

- 1) ASTM C1193 Standard Guide for Use of Joint Sealants.
- 2) ASTM C1472 Standard Guide for Calculating Movement and Other Effects When Establishing Sealant Joint Width.
- 3) SWR Institute's Applying Liquid Sealants Applicator Training Program.

Packaging

SHARPIE MODIFIED SILICONE LM is available in the configurations:

- 320 ml plastic caulk cartridges [10-Pcs per Box] or 600 ml foil sausages [12-Pcs per Box]
- Cartridges are dispensed using a single component hand or air-pressured caulking gun.
- Cartridges are designed for convenience in shipping and are easily handled by warehouse workers and mechanics on scaffolds and staging.

Colors

SHARPIE MODIFIED SILICONE LM is available in Colors: BEST 50's 50- Color Selections

Technical Product Properties

Based on JIS A 5758 or JIS A 1439

Viscosity	23 °C; 10 rpm	300 ~ 500 Pa.s
Density		1.39 g/ml
Extrudability	23 °C	8 to 5 sec
Tack- Free Time	23 °C	60 minutes
Loss of Volume		1.4 %
Service Temperature		-30 °C to 90 °C
Cure Rate	5 °C, 50 %RH	> 10 Days
[Thickness 6 mm]	23 °C, 50 %RH	Approx. 2 to 3 Days
	50 °C, 50 %RH	Approx 1 to 2 Days

Cured property after 23°C, 7 Days

Elastic Recovery	67 %
50% Tensile Stress	0.11
Tensile Strength	1.06 MPa
Elongation at break	900 %
Hardness, Shore A	12
Cohesion properties at maintained extension	No Failure
Cohesion properties after compression, heating/ tension cooling	No Failure
Durability (8020)	Pass

Tensile Properties

[On Substrate: Aluminum; With Primer P-50]

Curing Condition	Test Condition	50 % Tensile Stress [N/mm ²]	Maximum Tensile Stress [N/mm ²]	Elongation at Break [%]
After Curing	23 °C	0.14	0.95	780
After Heating @ 80 °C	23 °C	0.17	0.74	620
After Water Immersion	23 °C	0.11	0.43	690

Technical Product Properties

Based on ASTM C 920

Hardness, Shore A	ASTM C 661	20	
Tack- Free Time	ASTM C 679	Pass	
Adhesion & Cohesion under Cyclic Movement	ASTM C 719	No Bond Failure, Class 50	
Effects of Heat Aging	ASTM C 1246	1.1 %; No cracking and chalking	
Effects of Accelerated Weathering	ASTM C 793	No cracks after UV exposure and bend test	
Adhesion- In- Peel	ASTM C 794	31.24 N (7.02 lbf)	
Staining	ASTM C 1248	No Surface Stain	
Chemical Resistance	Adopted ANSI Z124.3: 1995 (Section 5.2)	Household bleach Urine/ urea (6% uric acid)	No Effect
Fungal Resistance	Adopted ISO 846: 1997	No Growth	

Technical Services

Additional technical information and literature may be available. Laboratory testing & application engineering are available upon request. Contact SHARP CHEMICAL IND. CO., LTD. Technical services for additional information. SHARP CHEMICAL IND. CO., LTD. is an exclusive licensee of SHARPIE. SHARP CHEMICAL IND. CO., LTD. provides versatile materials as the starting point for its 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.

Paintability			
Classified	General	Adhesion	Non- Stain
Single Layer	Acrylic Resin Lithin	O	O
Finish	Elast Lithin	O	Δ
Multi- Layer	Acrylic Silicone	O	Δ
Finish	Elastic Spray Lithin [Waterproof]	O	Δ
Thick Layer	Synthetic Stucco	O	O
Finish			
Water- Based Paint		O	Δ
Solvent- Based Paint		O	Δ
Oil- Based Paint		X	X

Note:

Do Not Applied on Oil- Based or Phthalic Oxidatively- Polymerized Paint

For Water- Based, Beware of Water Repellency

Adhesion:

O: Good Δ: Normal X: Bad

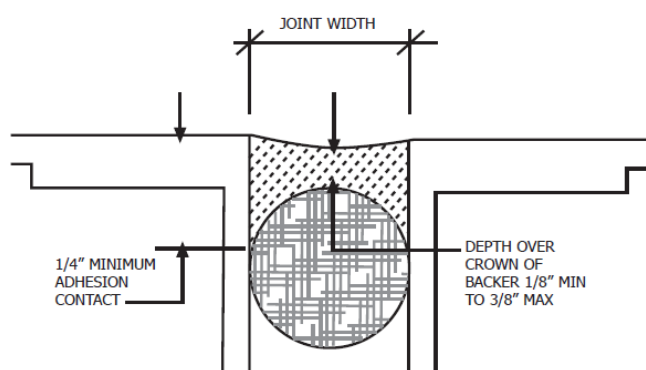
Non- Stain:

O: Good [Maybe Sticky] Δ: Slight [But No Effect] X: Bad

Design Criteria

SHARPIE MODIFIED SILICONE LM can be applied to joints between 6mm and 50mm wide, and applied between 6mm and 25mm deep.

Joints which are expected to experience continual cyclic movement should be designed such that the sealant is applied to an optimum width to depth ratio of 2:1, subject to the overriding recommended minimum sealant depths of: (a) 6mm for accurately formed, non-porous surfaces such as metal, (b) 10mm for precast concrete, in-situ concrete, brick and other porous surfaces.



Installation:

Sealants may not adhere or maintain long-term adhesion to substrates if the surface is not prepared and cleaned properly before sealant application. Using proper materials and following prescribed surface preparation and cleaning procedures is vital for sealant adhesion. IN ALL CASES IT IS IMPORTANT TO CONFIRM THE ACCEPTABILITY OF EACH SEALANT-SUBSTRATE COMBINATION WITH A LAB OR SITE ADHESION TEST PRIOR TO PROCEEDING WITH PROJECT INSTALLATION. Install back- up material or joint filler as specified. Apply SHARPIE MODIFIED SILICONE LM modified silicone

sealant in a continuous operation, horizontally in one direction and vertically from the bottom to the top of the joint opening. A positive pressure adequate to properly fill and seal the joint width should be employed. Tool or strike SHARPIE MODIFIED SILICONE LM modified silicone sealant with light pressure to spread the material against the back-up material and the joint surfaces.

The light- weight consistency of SHARPIE MODIFIED SILICONE LM modified silicone sealant Silicone Sealant responds easily to light tooling pressure and facilitates void-free placement. A tool with a concave profile is recommended to keep SHARPIE MODIFIED SILICONE LM modified silicone sealant within the joint.

Excess sealant should be cleaned from metal and plastic surfaces while still incurred using a solvent. On porous surfaces the excess sealant should be allowed to progress through the initial cure or set-up. It should then be removed by abrasion or other mechanical means.

Application

Porous substrates should be cleaned where necessary by grinding, saw cutting, blast cleaning (sand or water), mechanical abrading or combination of these methods to provide a sound, clean surface for sealant application. Dust, loose particles, etc. should be blown out of joints with oil- free compressed air or vacuum cleaned. Clean all metal and plastic procedures. Detergent or soap and water treatments are not recommended. In all cases where used, solvents should be wiped dry with a clean cloth or lintless paper towels. Cleaning solvents should not be allowed to air dry or evaporate without wiping. Architectural coating, paints and plastics should be cleaned with a solvent approved by the manufacturer of the product. Cleaning of all surfaces should be done after two to three hours after the sealant is applied.

Surface Preparation

Clean all concrete, masonry and stone joints of all contaminants impurities. Concrete form release agents, water repellents, concrete laitance, all old sealants and other surface treatments and protective coatings are examples of materials which must be removed from the joint surfaces to obtain proper sealant adhesion.

Masking

The use of masking tape is recommended where appropriate to ensure a neat job and to protect adjoining surfaces. Do not allow masking tape to touch clean surfaces to which the silicone sealant is to adhere. Masking tape should be removed immediately after the finish tooling of SHARPIE MODIFIED SILICONE LM modified silicone sealant is accomplished and before the sealant begins to cure.

Priming

SHARPIE MODIFIED SILICONE LM modified silicone sealant has primer-less adhesion characteristics to many common construction materials; however, some materials such as concrete, mill finish aluminum, galvanized steel and other materials with variable surface characteristics often require priming. In view of unpredictable surface characteristics, preliminary adhesion test should be made to check adhesion to the specific materials to be used on the project. For difficult-to-bond substrates, use of a primer (SHARPIE Primer P-32 / P-50) is suggested.

Joint Backer Materials

Backer materials, typically the backer rod, provides the following benefits to aide in the correct application of SHARPIE MODIFIED SILICONE LM:

- 1) Controls and provide the desired sealant depth.
- 2) Creates a formed joint cavity that allows for the desired hourglass sealant shape.
- 3) Provides a firm backup that helps attain full wetting of the substrates when the sealant is tooled.
- 4) Acts as a bond breaker to eliminate adhesion on the backside of a joint (three-sided adhesion).

A non-gassing polyethylene, polyolefin or a polyurethane foam rod is the recommended back-up material for use with SHARPIE MODIFIED SILICONE LM. If the joint is too shallow to allow foam rod, use a polyethylene tape (as a bond breaker to eliminate three-sided adhesion).

On porous substrate applications, a closed cell backer rod is recommended (open cell backer materials absorb and hold water which can affect long-term sealant adhesion on these materials). The Backer rod should be 25-50% greater (confirm with manufacturer of backer rod as to type selected) than the width of the joint, thereby providing continuous pressure against the joint walls; and expanding and contracting with the joint movement without pushing the sealant out of the joint during the compression cycle or falling away during the extension cycle. Rubber backup materials may stain the sealant and are not recommended, unless tested and verified for compatibility.

SHARPIE MODIFIED SILICONE LM modified silicone sealant should not be applied or used:

- As a structural adhesive in Structural Glazing applications
- Under exceedingly hot or cold conditions (see Sealant Application section for additional information).
- On wet, damp, frozen or contaminated surfaces.
- On excessively basic or acidic substrates.
- Concrete surfaces which contain residual form oil or other bond breaking contaminants that may interfere with sealant adhesion.
- Unpredictably absorptive surfaces such as marble or limestone, unless a standard of appearance has been agreed upon by the seller and the purchaser as a result of testing for stain or discoloration.
- Due to the inherent variability of natural materials it is recommended that stain testing be performed on all natural stone types prior to use to ascertain the visual acceptability of any particular sealant-stone combination. Contact SHARP CHEMICAL IND. CO., LTD. Technical services for additional information
- Some materials that bleed plasticizers or oils can cause a discoloration on the surface of sealants. When sealing to or over items such as: rubberized gaskets, bituminous-based materials, butyl or oil-based products, oily woods, tapes, etc., SHARP CHEMICAL IND. CO., LTD. recommends that compatibility testing be performed prior to application to confirm the suitability of these materials when in contact with each other.
- This material requires atmospheric moisture to cure from paste to rubber and may not attain its listed final cured rubber properties when used in designs or applications where the silicone is encapsulated and without access to atmospheric moisture.
- Silicone materials are hydrophobic in nature and if inadvertently over-applied onto adjacent joint surfaces (even if removed immediately), can create a waterproofing effect on some substrate types even when the substrate is wet. See section on Masking.

SHARP CHEMICAL IND. CO., LTD. can provide lab and field adhesion testing information and suggestions to user upon request.

Difficult or nearly impossible to see on a joint substrate, frost is likely to develop on substrates when temperatures drop near the freezing point. Since frost and moisture will interfere with proper sealant adhesion, it is important to confirm that substrates are dry prior to application of the sealant.

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.sharpchem.co.jp or, upon request, from any SHARP CHEMICAL IND. CO., LTD. representative. Use of other materials in conjunction with SHARP CHEMICAL IND. CO., LTD. sealants products (for example, primers) may require additional precautions. Please review and follow the safety information provided by the manufacturer of such other materials.

Limitations

SHARPIE MODIFIED SILICONE LM modified silicone sealant is not recommended:

- For use underwater or in other applications where the product will be in continuous contact with water.
- For use in food contact applications.

Disposal

Dispose according to local authority regulations. Do not dispose down drains or into local waterways.

Storage and Shelf Life

SHARPIE MODIFIED SILICONE LM modified silicone sealant should be stored in sealant containers at temperatures at between 15 to 27°C. Please avoid exposure to humidity or temperature above 50°C for long time. Please avoid contamination of water and alcohol.

The product is very sensitive to air, therefore containers must be kept tightly sealed after opening.

Refer to the “Use Before Date” on the packaging before use. In cases where shelf life has been exceeded, the local SHARP CHEMICAL IND. CO., LTD. representative should be contacted for further information, prior to intended use of this material.

Limited Warranty

SHARP CHEMICAL IND. CO., LTD. warrants that its product will conform to SHARP CHEMICAL IND. CO., LTD. specifications at the time of application or use. The product must be stored in accordance with SHARP CHEMICAL IND. CO., LTD. recommendations, and used or applied before the earliest of (i) the indicated “Use Before Date”, (ii) one year form date or purchase, or (iii) expiration of such other period or recommended storage time stated in the SHARP CHEMICAL IND. CO., LTD. literature. If notified, in writing, of a claim within two weeks of the product’s use or applications, SHARP CHEMICAL IND. CO., LTD. will, at its option, replace the purchase price of SHARP CHEMICAL IND. CO., LTD. product which does not satisfy the forgoing warranty. THE FOREGOING SHALL CONSTITUTE THE SOLE AND EXCLUSIVE REMEDY FOR DEFECTS OR FAILURE OF THE PRODUCT, AND THE SOLE AND EXCLUSIVE LIABILITY OF SHARP CHEMICAL IND. CO., LTD..

Limitation of Liability

SHARP CHEMICAL IND. CO., LTD. shall in no event, whether the claim is based on warranty, contract, tort, strict liability, negligence or otherwise, be liable for incidental or consequential damages, or for any damages in excess of the amount of the purchase price.

Note: For further information, contact a SHARP CHEMICAL IND. CO., LTD. field representative.

THE MATERIALS, PRODUCTS AND SERVICES OF SHARP CHEMICAL IND. CO., LTD. INC., THEIR SUBSIDIARIES AND AFFILIATES DOING BUSINESS IN LOCAL JURISDICTIONS (collectively “SUPPLIERS”), ARE SOLD BY THE RESPECTIVE LEGAL ENTITY OF THE SUPPLIER SUBJECT TO SUPPLIERS’ 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. ALTHOUGH ANY INFORMATION, RECOMMENDATIONS, OR ADVICE CONTAINED HEREIN IS GIVEN IN GOOD FAITH, SUPPLIERS MAKE NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, (i) THAT THE RESULTS DESCRIBED HEREIN WILL BE OBTAINED UNDER END-USE CONDITIONS, OR (ii) AS TO THE EFFECTIVENESS OR SAFETY OF ANY DESIGN INCORPORATING SUPPLIERS’ PRODUCTS, MATERIALS, SERVICES, RECOMMENDATIONS OR ADVICE. AFOREMENTIONED EXCLUSIONS OR LIMITATION OF LIABILITY ARE NOT APPLICABLE TO THE EXTENT THAT THE END-USE CONDITIONS AND/OR INCORPORATION CONDITIONS CORRESPOND TO THE RECOMMENDED CONDITIONS OF USE AND/OR OF INCORPORATION AS DESCRIBED BY SUPPLIER IN ITS PRODUCT DATA SHEET AND/OR PRODUCT SPECIFICATIONS. EXCEPT AS PROVIDED IN SUPPLIERS’ STANDARD CONDITIONS OF SALE, SUPPLIERS AND THEIR REPRESENTATIVES SHALL IN NO EVENT BE RESPONSIBLE FOR ANY LOSS RESULTING FROM ANY USE OF ITS MATERIALS, PRODUCTS OR SERVICES DESCRIBED HEREIN.

Each user bears full responsibility for making its own determination as to the suitability of Suppliers’ materials, services, recommendations, or advice for its own particular use. Each user must identify and perform all tests and analyses necessary to assure that its finished parts incorporating Suppliers’ products, materials, or services will be safe and suitable for use under end-use conditions. 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 Suppliers’ Standard Conditions of Sale or this Disclaimer, unless any such modification is specifically agreed to in a writing signed by Suppliers. 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 of Suppliers or any of its subsidiaries or affiliates 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.