SHARPIE

Modified Silicone M Sealant

MSC1-01

Product Description

SHARPIE Modified Silicone M Sealant, MSC1-01, is one- component type, Medium Modulus, Modified Silicone (Hybrid Polymer) sealant formulated using Advanced Silicone Technology to reduce or eliminate Dirt Pickup, Surface Streaking, and substrate staining.

SHARPIE MSC1-01 is specially formulated for sealing joints in Cleanroom Environment Class 1 (ISO3), in compliance to Semiconductor Cleanrooms Standard.

Most Suitable for

- Façade Modules Joints of Aluminum Panels, Coated Panels, Metal, Stone, Tiles, Concrete, Mortar, Prefabricated Housing/ Panels, Cold Storage Room, Cleanroom Class 1 and below, ACMV Duct Work, Non- Fire Rated Wall Penetrations, Dry Wall and Concrete Masonry Wall applications.

SINGAPORE GREEN BUILDING PRODUCT SGBC EXCELLENT

Typical Performance Properties

Performance

- **Non-Bleed; Non-Staining** to most Porous Substrates
- **Reduced Dirt Pick-Up & Streaking** for External Façade
- **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
- **Primerless Adhesion** – Primerless adhesion to many substrates and finishes. May be considered a candidate 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***
- **Mold Resistance**
- **Excellent Paint-ability** – Allows adhesion of most paints
- Even after vulcanization, has initial flexibility gives strong resistance against the continuous restore and elongation
- Good durability
- **± 50 % Joint Movement Capability**, low stress on the bond
- **Low Out Gassing – Suitable for Cleanroom Environment Class 1 in Pharmaceutical, Semiconductor and Healthcare**
- Thermal Stability (Cured State) – Once cured, the material remains flexible over a range of -20°C to 90°C.

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.

continued

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.

Basic Uses
SHARPIE MODIFIED SILICONE M is recommended for the following applications:

Natural Stone
- Useful on natural stones when staining from migration is 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.
- 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 glazing and sealing applications
- Around window perimeters and punched openings

Cleanroom
- Suitable for application within Cleanroom, e.g. Operation theater, Semi-conductors, Wafer Fab, Pharmaceutical

Chemical Resistance*
- Refer to Chemical Resistance Information.

Excellent Paint-ability
- Paint-ability on cured sealants with most paint types.

Applicable Standards
SHARPIE MODIFIED SILICONE M modified silicone Sealant meets or exceeds the test requirements of:
- JIS A 5758 F-20HM

American Society for Testing & Materials International:
- ASTM C920 Standard Specification for Elastomeric Joint Sealants; Type S, Grade NS, Class 50, Use A

U.S. Federal Specifications: (widely referenced but cancelled Sept. 1996)
- TT-S-001543A Sealing Compound: Silicone Rubber Base (for Caulking, Sealing & Glazing in Buildings and Other Structures)
- TT-S-00230C Sealing Compound: Elastomeric Type, Single Component (for Caulking, Sealing & Glazing in Buildings and Other Structures)

Canadian General Standards Board (currently inactive) CGSB-19.13-M87 Sealing Compound, One-Component, Elastomeric, Chemical Curing
Singapore Green Building Council – SGBP 3767, Excellent

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 M 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 M is available in the configurations:
- 320 ml plastic caulking cartridges [10 pieces per box]
  - 600 ml aluminium foil sausages [12 pieces per box]
  - Both packings are dispensed using a single component hand or air-pressured caulking gun.

Colors
SHARPIE MODIFIED SILICONE M is available in 8 Standard Colors:
White, Ivory, Brown, Black, Beige, Gray, Light Gray, Aluminium Gray

Customized colors can be arranged.

Please check with Local Sales Representatives for further details.

SHARPIE

Modified Silicone M Sealant

シャープ化学工業株式会社 SHARP CHEMICAL IND. CO.,LTD.

MSC1-01

Technical Product Properties

Slump	Longitudinal	5 °C	0 mm
		50 °C	0 mm
	Lateral	5 °C	0 mm
		50 °C	0 mm
Elastic Recovery			75 %
Tensile Properties		23 °C	0.5 N/mm²
		- 23 °C	0.5 N/mm²
50% Tensile Stress			0.35
Tensile Strength			1.10 MPa
Elongation at break			400 %
Cohesion Properties at maintained extension			No Failure
Cohesion Properties after compression [Heating / Tension Cooling]			No Failure
Cohesion Properties at maintained extension at immersion in water			No Failure

Density		1.39 g/ml
Extrudability	5 °C	8 sec
	23 °C	3 sec
Tack- Free Time	23 °C	1 Hour
Loss of Volume		2.5 %
Service Temperature		-20 °C to 90 °C
Hardness, Shore A		30
Fungal Resistance		Pass
Staining		No Surface Stain
Chemical Resistance		No Effect
Cure Rate [Thickness 6 mm]	5 °C, 50 %RH	> 10 Days
	23 °C, 50 %RH	Approx. 2 to 3 Days
	50 °C, 50 %RH	Approx 1 to 2 Days

***Tests based on JIS A 5758 & JIS A 1439

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

Curing Condition	Test Condition	50 % Tensile Stress [N/mm²]	Maximum Tensile Stress [N/mm²]	Elongation at Break [%]
After Curing	23 °C	0.48	0.81	260
After Heating @ 80 °C	23 °C	0.51	0.92	250
After Water Immersion	23 °C	0.34	0.72	350

Paint-ability

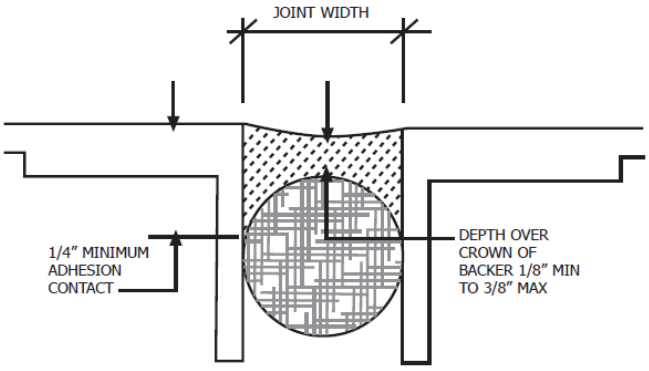
Classified	General	Adhesion	Non- Stain
Single Layer Finish	Acrylic Resin Lithin	O	O
	Elast Lithin	O	Δ
Multi-Layer Finish	Acrylic Silicone	O	Δ
	Elastic Spray Lithin [Waterproof]	O	Δ
Thick Layer Finish	Synthetic Stucco	O	O
Water- Based Paint		O	Δ
Solvent- Based Paint		O	Δ
Oil- Based Paint		X	X

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 M 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 ACCEPTIBILITY OF EACH SEALANT-SUBSTRATE COMBINATION WITH A LAB OR SITE ADHESION TEST PRIOR TO PROCEEDING WITH PROJECT INSTALLATION. 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.

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 M modified silicone sealant is accomplished and before the sealant begins to cure.
Install back- up material or joint filler as specified. Apply SHARPIE MODIFIED SILICONE M 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 M 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 M 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 M 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.

Priming

SHARPIE MODIFIED SILICONE M 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 M:

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 M. 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.

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 M 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.

SHARPIE MODIFIED SILICONE M 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.

Maintenance

No maintenance is needed. If silicone sealant becomes damaged, replace damaged portion. Clean surfaces in damaged area and repair with fresh silicone sealant.

Storage and Shelf Life

SHARPIE MODIFIED SILICONE M 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 CONSTITUE 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.

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.

Technical Services

The above enclosed system is designed to help you select system for typical system.
For more information on SHARPIE MODIFIED SILICONE M modified silicone sealant, simply return the product information request sheet via FAX and E-mail.

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