



CONSTRUCTION SILICONE

Insulating Glass, Facade,
Curtain Wall
Window & Door



MF899

Silicone Structural
Sealant

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RTV, Neutral, One-Part Silicone Sealant for Structural Glazing

◆ DESCRIPTION / APPLICATIONS

TG Sealant MF899 Silicone Structural Sealant, a one-part, RTV neutral-cure, architectural grade sealant, designed specifically for the structural bonding of glass, metal, and other building components. It can also be used to adhere stiffening elements to building panels and for other similar adhesive applications. It easily extrudes in any weather and cures at ambient temperature by reaction with moisture in the air to form a durable, flexible silicone rubber seal.

◆ TYPICAL PERFORMANCE

- Excellent adhesion to a wide range of substrates including coated glass, galvanized steel, masonry, anodized and polyester paint coated aluminium and stainless steel and other porous and non-porous substrates.
- High ultimate tensile strength makes it ideally suited for structural bonding application.
- Excellent weathering characteristics and high resistance to ultra-violet radiation, heat and humidity.
- Excellent temperature stability: -60°C to 180°C.
- High level of mechanical properties.
- High elasticity and high modulus.
- Resistant to ozone.

◆ TECHNICAL DATA - TYPICAL PROPERTIES

TEST ITEMS	TECHNICAL DATA	TEST RESULT	STANDARD	
Test Conditions: T (23±2)°C, (50±5) % R.H.				
Density, g/cm ³	—	1.43	GB/T 13477.2	
Sag, mm	≤3	0	GB/T 13477.6	
Extrusion Property, s	≤10	1.8	GB 16776	
Tack-free Time, h	≤3	2.5	GB/T 13477.5	
Curing Time, d	—	7 ~ 14	—	
Adhesion Time, d	—	14 ~ 21	—	
Application Time, min	—	20	—	
Test Conditions: 21d placed at T (23±2)°C, (50±5)% R.H.				
Range of Temperature Resistance, °C	—	-50 ~ 180	—	
Hardness, Shore A	20 ~ 60	45	GB/T 531	
10% Modulus	—	0.15	GB 16776	
20% Modulus	—	0.23		
40% Modulus	—	0.39		
Thermal Aging	Thermal Weight Loss, %	≤1	3.1	
	Fracturing	No	No	
	Pulverizing	No	No	
Tensile Adhesion Property	Tensile Adhesion Strength	23°C, MPa	≥0.60	GB 16776
		90°C, MPa	≥ 0.45	
		-30°C, MPa	≥ 0.45	
		Immersion in Water, MPa	≥ 0.45	
		Water-UV Radiation, Mpa	≥ 0.45	
		Adhesion Failure Area, %	≤5	
Elongation Under Max. Tensile Strength at 23°C, %		≥ 100	325	
Test Conditions : 28d placed at T (23±2)°C, (50±5)% R.H.				
Adhesion after Radiation of Artificial Light through Glass and Immersion in Water	ΔXmean	≥ 0.75	0.8	ETAG 002
	Cohesion Failure Area, %	≥ 90	95	JG/T 475

NaCl Atmosphere	ΔX_{mean}	≥ 0.75	0.92	ETAG 002 JG/T 475
	Cohesion Failure Area, %	≥ 90	100	
SO ₂ Atmosphere	ΔX_{mean}	≥ 0.75	0.9	
	Cohesion Failure Area, %	≥ 90	100	
Adhesion after Cleaning Detergent	ΔX_{mean}	≥ 0.75	0.82	
	Cohesion Failure Area, %	≥ 90	98	
Remarks: ΔX_{mean} means the specific value of the Adhesion Strength after Aging and that at standard condition.				

◆ INSTALLATION

For structural glazing application, TG-SEALANT MF899 Silicone Structural Sealant should be factory-applied. Factory application helps ensure optimal sealing conditions and performance. Job-site application should only be carried out for remedial work, or when the glazing design does not allow otherwise.



◆ JOINT DESIGN AND DIMENSIONS

As a general rule, structural sealant joints made with TG-SEALANT MF899 Silicone Structural Sealant should have a width between 6mm and 15mm. However, the exact width is determined by the structural calculations. The width (dimension) of the structural sealant joint should also be calculated to accommodate thermal and dynamic movements but as a rule should not be less than 6mm and ideally in a 3:1 ratio (width:depth).

Table.2 Joint Design for Sealant Application

Depth (mm)	Width (mm)					
	6	9	12	15	20	25
6	16.4	10.9	8.2	6.5	4.9	3.9
9	N.R	7.3	5.4	4.3	3.2	2.6
12	N.R	N.R	4.1	3.2	2.4	1.9

◆ APPLICABLE STANDARDS

- ASTM C920
- ETAG 002
- GB 16776
- JC/T 475

◆ APPLICATION METHODS

Install the backing materials, setting blocks and spacer tapes as specified. Apply TG-SEALANT MF899 in a continuous operation using positive pressure to properly fill and seal the joint. Tool the sealant with slight pressure to spread it against the backing materials and the joint surfaces. A tool with a concave profile is recommended to keep the sealant within the joint.

OPTIMAL GLAZING CONDITIONS

Ideally, all glazing should be done in- factory and within the following conditions of temperature and humidity:

Temperature conditions : 5°C to 40 °C.

Humidity conditions : 40% to 95%

Recommended temperatures range: 15°C and 30°C .

Any combination of the above conditions will ensure a cure schedule sufficient to allow transportation of the glazed modules within 21 days, depending on joint configuration. Consult TG-SEALANT for specific advice.

PREPARATORY WORK / INSTALLATION

Sealant 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 . TG-SEALANT can provide quality control information and suggestions to user upon request.

- Use clean, fresh solvent as recommended by the sealant manufacturer 's test report. When handling solvents , refer to manufacturer 's MSDS for information and handling, safety and personal protective equipment. Isopropyl Alcohol (IPA) is commonly used and has proven useful for most substrates encountered in SSG systems.

- Use clean, white cloths free of lint or other lint-free wiping materials.

- Use a clean, narrow blade putty knife when tooling structural sealant in the cavity .

- Use primer when required.

PRIMER

TG-SEALANT MF899 Silicone Structural Sealant will bond to many clean surfaces without primer . For difficult to bond substrates , the use of a primer should be evaluated .When properly used, primers help assure strong and consistent adhesion to surfaces that maybe difficult to bond . Most primers are blend or organic and inorganic chemicals , resins and solvents . Never apply primer to glass sur face.

MASKING AND TOOLING

Areas adjacent to joints may be masked to ensure neat sealant lines. Do not allow masking tape to touch clean surfaces to which the sealant is to adhere . Tooling should be completed in one continuous stroke within 5 minutes after sealant application and before a skin forms. Remove masking tape immediately after tooling and before the sealant has started to form a skin .

CLEANING PROCEDURES

- Remove all loose material (such as dirt and dust) , plus any oil , frost or other contaminants from the substrates to which the structural silicone will be adhered .

- Do not use detergent to clean the substrate as residue may be left n the surface.

- Clean the substrates receiving the sealant as follows: Using a two-rag wipe technique . Wet one rag with solvent and wipe the surface with it, then use the second rag to wipe the wet solvent from the surface before it evaporates. Allowing solvent to dry on the surface without wiping with a second cloth can negate the entire cleaning procedure because the contaminants may be re-deposited as the solvent dries.

- When cleaning deep , narrow joints , wrap the cleaning cloth around a clean, narrow-blade putty knife . This permits force to be applied to the clean surface.

- Clean only as much area as can be sealed in one hour. If cleaned areas are again exposed to rain or contaminants, the surface must be cleaned again .

♦ LIMITATIONS

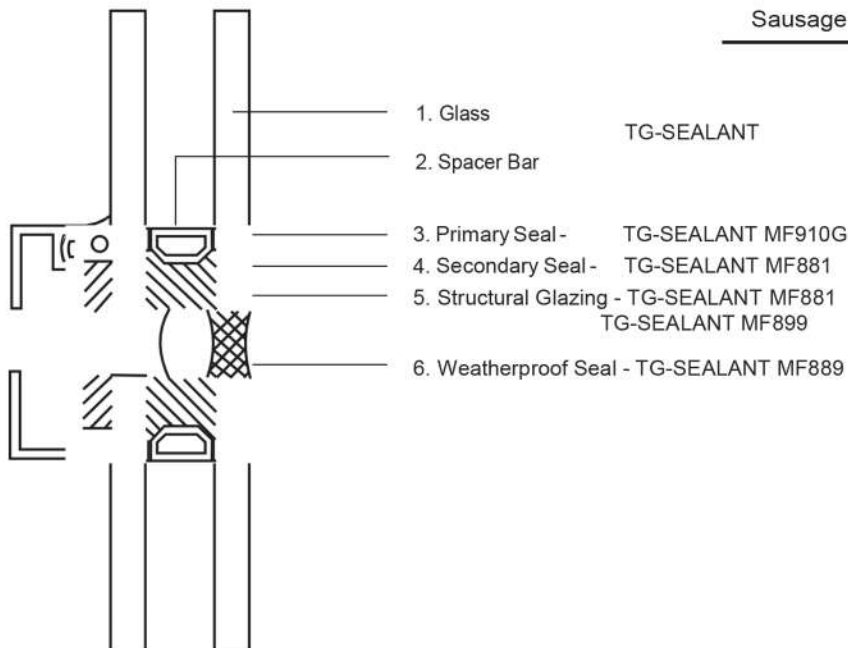
TG-SEALANT MF899 should not be used for structural applications without the prior written approval of TG-SEALANT QC Department. Each project should be specifically and separately approved by TG-SEALANT .

Project specific approval involves the following prerequisites :

- Joint dimension and print reviews.
- Successful laboratory adhesion and compatibility testing to all building components.
- Observance of professional sealant application and workmanship standards.
- Users should always consult TG-SEALANT Technical Service Department for adhesion recommendation.

TG-SEALANT shall not be held liable for any possible claims arising from structural glazing use of TG-SEALANT MF899 for projects which have not been specifically approved by TG-SEALANT .

For projects which have been approved , TG-SEALANT will issue a structural adhesion warranty on a case by case basis at the user's request. It is the user's exclusive responsibility to ensure project compliance with local building regulations . Because of the risk of incompatibility, TG-SEALANT MF899 should not come into contact with , or be exposed to sealants that liberate acetic acid. This product is neither tested nor represented as suitable for medical or pharmaceutical uses.



♦ FIRST AID INFORMATION

Eye Contact: Flush eyes with large amounts of water. If signs/symptoms persist , get medical attention . **Skin Contact:** Remove contaminated clothing and shoes. Immediately flush skin with large amounts of water. Wash contaminated clothing and clean shoes before reuse. **Inhalation:** Remove person to fresh air . If signs/symptoms develop, get medical attention. **If swallowed:** Do not induce vomiting unless instructed to do so by medical personnel. Give person two glasses of water . Never give anything by mouth to an unconscious person. **Keep out of reach children.** Refer to Material Safety Data Sheet (MSDS) and Technical Data Sheet(TDS) for details. **Emergency Telephone Number:** +86 371 67982270

♦ COLORS

Black/ Grey/ White/ Clear

♦ STORAGE

12 months from the date of manufacture, store in a low moisture, dark place below 30 °C in the original unopened packing.

♦ PACKAGING

Cartridge: 300 ml / 25 pcs/carton

Sausage: 592 ml / 20 pcs/carton

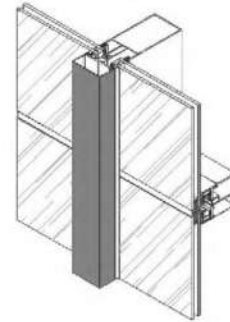
Joint Design--Correct Planning is Essential

In structural glazing, the adhesive joints should be planned and arranged according to optical requirements, but they should also take into consideration changes in the adjacent parts under the effects of temperature and the movement capability of the silicone sealant. The joint design thus combines shape with functionality.

Important

Seven criteria must be observed:

1. The joint seal must be able to freely accommodate tensile and compressive movements between the joint edges. Three-sided adhesion of the sealant must be avoided, because it inevitably results in damage to the joint.
2. The ratio of joint bite C_s to joint thickness t_s should be at least 1:1 and at most 3:1.
3. The minimum joint bite is always 6mm, irrespective of the calculated value.
4. The joint thickness t_s should be at least 6mm.
5. Always round the result up, never down.
6. The structural joints must not be subjected to external loads as a result of forces such as settlements, shrinkage, creep or permanent stress caused by gaskets etc.



Calculating the joint bite C_s

Joint bite C_s as a function of the wind load in supported constructions:

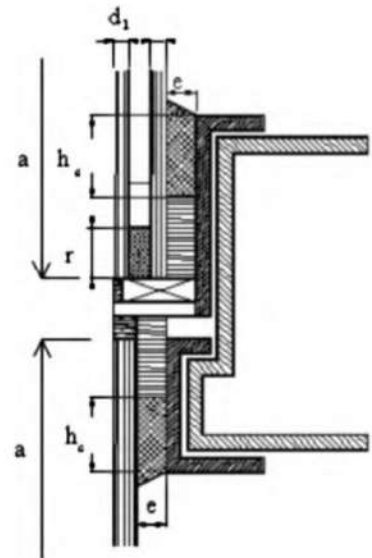
$$C_s = \frac{wa}{2000 f_1}$$

C_s -- minimum bite of the adhesive joint (mm)
 a -- length of the short edge of the glass pane or of the element (mm); with irregularly dimensioned glass element: longest of the short glass panes ¹⁾

w -- maximum wind load to be received (kN/mm^2).

f_1 -- maximum adhesive stress for supported construction, $0.2 \text{N}/\text{mm}^2$.

¹⁾ If the sides of the glass panes are of varying length, then the length of the longest side is used for the calculation.



Calculating the joint thickness t_s

$$t_s \geq \frac{us}{\sqrt{\delta(2+\delta)}} \quad \textcircled{1}$$

t_s -- minimum thickness of the adhesive joint (mm). us -- relative displacement in length of glass panel to adapter frame (mm), relative displacement yield from support construction lateral displacement can be calculated according

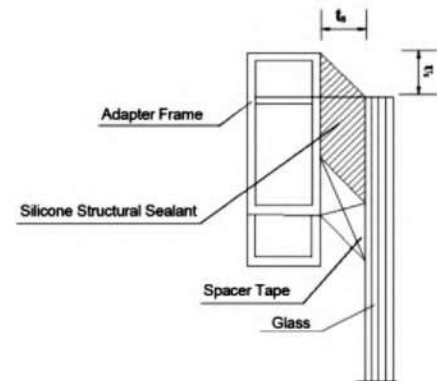
$$us = \theta hg \quad \textcircled{2}$$

to formula $\textcircled{2}$, take into account displacement from temperature difference if necessary.

θ -- elastic layer displacement angle limit value (rad) of support construction subject to wind load standard value.

hg -- glazing height = vertical dimension a or b .

-- adhesive deformation tolerance, elongation subject to tensile stress of $0.14 \text{kN}/\text{mm}^2$.



Silicone Structural Sealant Joint Thickness Drawing