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**Roof & Gutter**

SILICONE  
SEALANT  
**TECHNICAL  
MANUAL**

## **LASERLITE ROOF AND GUTTER SILICONE SEALANT TECHNICAL MANUAL**

### **1. Sealant Considerations**

The performance and long term durability of an application involves careful consideration so that the product(s) of choice meets not only the specification but can also continue to accommodate the movement, temperature changes and have long term adhesion and compatibility to the chosen substrates and ancillary products to ensure optimum performance. We will give recommendations for each application or project as required upon request.

A movement accommodation factor (MAF) is also an important consideration when selecting a particular sealant for an application. It describes the sealant's capacity to accommodate and transfer movement within and from the joints of buildings via compression, expansion and shear deformation. These include thermal movements, wind load, snow load, impact or point loads. The sealant through its life expectancy will then be subjected to fatigue. It will require resistance against all of the loads and movements placed upon it as well as variable climate conditions including exposure to extreme variations in temperature, rain, snow and UV. It should be able to maintain its elasticity and adhesion without failure or breaking down. It must maintain its performance to ensure that the expected life of the sealant and its intended function is maintained. The information confirming the MAF of a particular sealant can be found on each of the products TDS.

### **2. Product Laserlite Roof and Gutter Silicone Sealant**

*Laserlite Roof and Gutter Silicone Sealant* is high-performance neutral cure silicone rubber when exposed to moisture and humidity at room temperature. Due to its non-sag, non-flow able features, it may be applied overhead or on sidewall joint surface. It presents no offensive odor during curing application and will not corrode metals. Discoloration of copper based metals may occur when hermetically sealed. Moreover, it can adhere well on alkaline material such as mortar and white cement.

*Laserlite Roof and Gutter Silicone Sealant* is a one-component neutral (oxime) curing sealant. This sealant starts curing upon exposure to moisture in the air as it is extruded from the cartridge. Unlike conventional sealants, it gives off no acetic acid odor and is also suitable for use with various types of metal, concrete and stone, in addition to glass and tile.

Features:

- One-component paste-liked silicone sealant
- Superior adhesiveness on various materials
- As its neutral basis, no corrosion for many substances and low oxime odor
- General purposes for sealing and bonding with various types of materials
- Curing at room temperature and easy handling
- Excellent elasticity and long term durability
- Weather ability resistance at -50 to 150°C
- Color: Black, White, Translucent, Grey

### **3. Suggested Application Laserlite Roof and Gutter Silicone Sealant**

- General purpose sealing and bonding applications.
- Perfect to use on: general metal roof, Polycarbonate, uPVC, and FRP/skylight application.

- Suitable for various substrates such as Glass - Metals - Sashes – Marbles - Mortar – Stone– Certain Plastics

Note:

- Do not use for structural glazing.
- Please do pre-test on the substrate prior to sealant application.
  - Neutral sealant may cause discoloration on copper-based substrate.
- Appropriate for movement joints maximum  $\pm 25\%$
- It can't be used as interior fire stop system applications.
- Do not use with direct food and drinking water contact application.

#### 4. Technical Data

*Laserlite Roof and Gutter Silicone Sealant* has superior resistance to weather and temperature. Its unique weather ability enables it to maintain its physical properties. The cured sealant will not harden in cold to  $-50^{\circ}\text{C}$  or soften with heat to  $150^{\circ}\text{C}$ .

Do not exceed more than 5 minutes when applying sealant into the gap as it will start to skin at the surface within 5 minutes. It will affect bonding strength to the substrate.

*Laserlite Roof and Gutter Silicone Sealant* will cure up to 5 mm depth in 24 hours, maximum bonding strength will be achieved after approximately 7 days.

#### Typical Properties:

##### *Laserlite Roof and Gutter Silicone Sealant*

Properties		Result	Test Method
Before Curing	Appearance	Paste	-
	Fluidity	Non-Sagging	
	Skin Over Time at $23^{\circ}\text{C}/50\% \text{RH}$ (min)	7-9	
After Curing	Density $23^{\circ}\text{C}$ ( $\text{g}/\text{cm}^3$ )	1.05	ASTM D792
	Hardness shore A	18	ASTM C920
	Tensile Strength (MPa)	1.0	ASTM D412
	Elongation at Break (%)	620	ASTM D412

Curing condition:  $23-25^{\circ}\text{C}$ , 50-55% RH, 7 days

These values are not intended for use in preparing specification.

#### 5. Application Guidance

This chapter contains information on the correct storage, handling and application of our sealants. The applicator must read and thoroughly understand this chapter, and strictly follow the requirements outlined herein.

When using *Laserlite Roof and Gutter Silicone Sealant* always keep a record of the batch numbers for all of the sealants applied. This will enable not only for a record to be kept for quality control and assurance purposes but will also facilitate ease in checking retained samples and other information if required. Keep attention to batch number is visible and that the material is within its stated shelf life. It is always advisable to manage stock on a first in first out basis and therefore have available the freshest material. Products that are within shelf life should be kept out of direct sunlight and away from high heat and humidity. Store each product in accordance with the recommended storage conditions for that product.

The optimum temperature for any application should be between 12°C and 35°C (54°–95°F). However, application can be done at temperatures between 5°C and up to 40°C (41°–104°F) but care should be taken if the ambient air temperature is 5°C or lower as condensation and moisture may form or be present on the substrate leading to a loss of adhesion. Always check the condition of the substrate prior to application. It should be confirmed that the substrate temperature is not above 50°C due to thermal transmission and heat gain which will lead to poor curing and adhesion and may result in the material cured properties being adversely affected. If the conditions noted above are found, then all application should be stopped until such times as the recommended application and substrate temperatures can be achieved.

Below is the recommended substrate preparation and application procedure used for the application of sealants:

- a) Ensure that the substrate, as well as the sealant, is the same as those that have been tested and that they match the adhesion, compatibility or stain test reports and recommendations. Substrates should be in good condition and undamaged and be representative of those tested.
- b) For non-porous surfaces use the two-cloth cleaning method and ensure that the surface is free from dust, dirt, oil and grease and all other contamination. The two-cloth cleaning method has proven to give the best results for non-porous substrates. Firstly, apply the correct chosen cleaning solvent to the first cloth. This should be done after the solvent has been dispensed into a container with a long narrow nozzle which allows for the solvent to be dispensed onto the cloth without allowing any contamination to be introduced into the solvent. Use the first cloth to clean the substrate and then wipe the substrate with the second cloth. If there is any dirt or contaminants on the second cloth, then the entire procedure needs to be repeated. When the first or second cloth becomes dirty they need to be reversed to expose a clean area. Once all areas of the cloth are contaminated the cloth needs to be discarded and changed. Confirmation that the substrate is cleaned correctly is when the second cloth is used and there is no visible sign of dirt or contaminants present. When cleaning a porous substrate, the use of solvents is not recommended as they can be absorbed into the substrate and have an adverse effect on the adhesion of the sealant and may also affect the cured properties. Ensure that all dust and loose materials are removed by either manual or mechanical cleaning with a brush or grinder to leave a sound solid joint. In the event that there is contamination from oils, grease or other materials on the sealant that will affect the adhesion of the sealant, it should be removed until a clean non-contaminated area can be seen. Alternatively, the use of high-pressure water cleaning is an effective method but because water is accumulated in the porous substrate ensuring that the entire area is completely dry prior to any application must be ensured.
- c) When applying the sealant, ensure that there are no contaminants on the area to be sealed. Therefore, avoid touching either the substrate on the areas to be sealed once they have been cleaned. If there are signs of dirt or contamination before sealing, then the substrate require cleaning again.
- d) When applying the sealant ensure that the joint is completely filled and that there is no air entrapment. This can be achieved by applying a continuous pressure and by pushing the sealant into the joint by having a small amount of sealant in front of the application nozzle at all times. Do not exceed more than 5 minutes when applying sealant into the gap as it will start to skin at the surface within 5 minutes. It will affect bonding strength to the substrate.
- e) It is recommended to dry tool the sealant and not to use any liquids but at times and for certain applications wet tooling may be required and so ensure that any liquids used are

- f) compatible with the sealants. If necessary, use a spatula or other tooling implement to smooth and shape the sealant surface. Ensure that the tooling solution is not applied directly to the substrate. Tool the sealant so that it is pressed into the joint. It is not recommended to scoop excess sealant from the joint until it has been firstly tooled into the joint ensuring that the sealant fully wets out the joint interfaces.
- g) When using masking tape, be sure to remove the tape immediately after tooling. Inspect the unit or sealing location when application work is complete. Make sure that the units are stored in the required conditions and the sealed joints at the site are allowed to properly cure. Inspect to verify that the sealant is curing properly. *Laserlite Roof and Gutter Silicone Sealant* will cure up to 5 mm depth in 24 hours, maximum bonding strength will be achieved after approximately 7 days.

## Sealing

### 1. Preparation of joints and cleaning of work surfaces

Since the demands placed on silicone sealants are higher than on other sealing material, it is absolutely essential that great care is taken in preparing the joint surface. Chips and cracks should be fixed, accumulated gravel and stones should be removed and cold joints should be warmed. Dirt can be removed using an air compressor or wiping with a cloth. Moisture, laitance and oil will prevent adhesion and cause interface separation and thus must be completely removed. Make absolutely certain that the joint surface or gap joint is clean and dry before moving onto the next step.

### 2. Application of masking tape is recommended

Apply masking tape to both sides of the joint to prevent the sealant from adhering to the area around the joint and to ensure a clean finish in the sealant-filled areas. Even pressure should be applied to the tape as it is affixed to prevent it from separating. Also, be careful to make sure that the tape does not extend into the joint area.

### 3. Insertion of back-up material where required

Back-up material is required to ensure that the joint is of the appropriate depth and as a bond breaker to prevent triangular adhesion (adhesion of the sealant to the bottom of the joint) of the sealant. This material is also used to eliminate internal stress and increase durability. The best results can be obtained with back-up material by using a polyethylene foam containing no oils or solvents and which does not adhere to the silicone sealant.

### 4. Filling

Cut the nozzle to the desired size at a 45° angle. Puncture the base of the nozzle inner seal and then insert the cartridge into the caulking gun. When using with an air gun, be sure to set the pressure at a safe and proper level. Pressure should be around 30 – 40 psi.

### 5. Tooling

Tooling must be done after filling the joints with sealant. This step ensures a clean finish by hermetically sealing the sealant to the joint surface and preventing surface irregularities. The push-up method is ideal for tooling because it also removes bubbles in the sealant.

## 6. Removal of masking tape

Once you have completed the tooling step, the masking tape should be removed quickly while it is still possible. An efficient way to remove masking tape is to wind it around a large-diameter bar-shaped object.

## 7. Curing

Once the above steps have been completed, the joint surfaces must be carefully cured until they have completely hardened.

## 6. Maintenance

In accessible areas, inspections must be carried out annually to check for cracks or gaps between the sealant and substrate. Where this has occurred, the unsound sealant must be raked out, the substrate prepared, and the joint filled with fresh sealant.

## 7. Curing Procedure

All room-temperature-cure silicone sealants materials require contact with moisture in the air to cure. Both the temperature and level of moisture should be controlled to optimize the sealant cure. Humidity levels greater than 80% are not recommended and the sealant cure rate may be negatively impacted at levels close to above this figure.

One part or single component silicone sealants cure from the outside on the surfaces that are exposed to the air and the cure goes inwards. The time required for complete curing will be dependent on the size of the joint, the temperature and humidity during the cure. In closed or confined conditions where the sealant is not exposed to moisture in the air or where the sealant cure byproducts cannot be released may not only lead to a much slower cure but may possibly not allow the sealant to cure and reach the required physical properties at all.

## 8. Shelf Life and Storage Handling

The handling and storage of *Laserlite Roof and Gutter Silicone Sealant* on site is the responsibility of the installer. *Laserlite Roof and Gutter Silicone Sealant* have a shelf life of 12 months from the date of manufacturing if stored in unopened packaging under dry, cool conditions at temperatures of between 5°C and 25°C. The product must be stored out of direct sunlight.

"Since the sealant is cured based on contact with moisture, opened product should be ugcrgf "immediately and properly after used to prevent curing of the remaining sealant.

## 9. Packaging

*Laserlite Roof and Gutter Silicone Sealant* come in 300 ml cartridges suitable for use with appropriate caulking gun.