

# Surface Preparation and Sealant Application

## Introduction

The Dow Corning application procedures outlined in this manual describe the general requirements for installing DOW CORNING Silicone Building Sealants. By following these procedures closely, you will help ensure good sealant performance. To be eligible to receive a Dow Corning warranty, these procedures must be followed. Since DOW CORNING Silicone Building Sealants are applied in many different environments and situations, these procedures are not intended to be a complete and comprehensive quality assurance program.

Following are the basic steps required for proper structural sealant joint preparation and sealant installation:

1. **Cleaning** – joint surfaces must be clean, dry, dust-free and frost-free
2. **Priming** – if required based on testing, primer must be applied to the cleaned surfaces
3. **Applying Sealant** – sealant is applied by “pushing the bead” into the structural joint cavity
4. **Tooling Sealant** – sealant is tooled into the structural joint to ensure it wets out and contacts both sides of the joint and the spacer without any voids in the sealant joint

## Substrate Cleaning Procedure

This section provides information on cleaning solvents and general cleaning procedures for porous and non-porous substrates. One of the key requirements of good sealant adhesion is a clean surface. Proper cleaning is accomplished through the use of the “two-cloth” cleaning method. Always confirm with the supplier of each substrate that the cleaning procedures and solvents are compatible with their material.

### *Organic Solvent Usage*

The proper use of solvents is an important part of the surface preparation requirements for substrates that are to be structurally bonded. Solvents all differ in their effectiveness in removing certain contaminants. Dow Corning will test with the specific solvents selected, and cleaning and priming recommendations will be based on the use of this solvent.

Please be aware that certain aggressive solvents can adversely affect finishes such as polyester powder coated aluminum. Therefore, milder solvents such as IPA (isopropyl alcohol) or high quality white spirit (greater than 98% pure) can be used without damaging the substrate surface. Check with the substrate supplier for solvent compatibility with their materials.

Please follow the solvent manufacturer’s safe handling recommendations and local, state and national regulations regarding solvent usage.

1. Apply masking tape to the surfaces next to the joint to keep excess primer and sealant off areas where they are not intended.
2. Pour primer into a small, clean container and replace and tighten the cap on the primer can to prevent exposure to atmospheric moisture that will contaminate the primer. Do not pour more than a 10-minute supply into the container at a time to ensure that primer does not get contaminated.
3. Depending on the substrate and job conditions, two different methods can be used to apply the primer. The preferred application is to dip a clean, dry, lint-free cloth into the small container of primer and gently wipe a thin film onto the surface. For "hard-to-get-to" areas and rough surfaces, apply the primer in a thin film with a clean brush. **Caution:** Over-priming can cause adhesion loss between the sealant and the primer. If too much primer has been applied, a powdery, chalky, dusty film will form on the surface. Excess primer should be removed by dusting the joint with a clean, dry, lint-free cloth or a non-metallic bristle brush
4. Allow the primer to dry until all the solvent evaporates. This typically takes 5 to 30 minutes, depending upon the temperature and humidity.
5. Inspect the surface for dryness. If too much primer has been applied, a powdery, chalky, dusty film will form on the surface. In this case, remove excess primer with a clean, dry, lint-free cloth or a non-metallic bristle brush before applying sealant.
6. The surface is now ready for application of the sealant. Sealant must be applied the same day the surfaces are primed. Any surfaces primed but not sealed on the same day must be covered to prevent contamination or re-cleaned and re-primed before applying sealant.

### **Sealant Application Procedure**

After cleaning and priming (if required), the sealant may then be gunned into the sealant joint. The spacer may already be in place during the cleaning and priming process or it may need to be installed after the metal substrate has been cleaned and primed. The glass is typically cleaned before it is put in position. It is critical that the sealant fills the entire joint or cavity and firmly contacts all surfaces intended to receive sealant. If the joint is improperly filled, good adhesion will not be achieved, and sealant performance will be weakened. This is critical since the effectiveness of the silicone in structural applications is largely dependent on the sealant bite (contact area).

Sealant should be applied as follows:

- 1) Masking tape should be used to keep excess sealant from contacting adjacent areas where it is not intended to ensure an aesthetically pleasing job.
- 2) Apply the sealant in a continuous operation using a caulking gun or pump. A positive pressure, adequate to fill the entire joint width, should be used. This can be accomplished by "pushing" the sealant ahead of the application nozzle. Care must be taken to ensure complete

### **Factory (Shop) Glazing – One-Component Silicone**

If DOW CORNING 995 Sealant or DOW CORNING 795 Sealant is used, complete cure of the silicone must be achieved before the units are moved or stressed in any way. This will typically require 7-14 days but up to 28 days or more in cold, dry conditions, depending on joint size, temperature, and relative humidity. The time may be shortened in some cases as well (warm, humid conditions).

### **Factory (Shop) Glazing – Two-Component Silicone**

DOW CORNING 983 Sealant cures in deep section within 3 hours and generally achieves full adhesion within 24 hours. However, time to full cure depends on joint design, substrate type, temperature and humidity. For example, adhesion to a metallic fluorocarbon may take several days to achieve full adhesion, although the time can be shortened by priming the fluorocarbon paint with DOW CORNING® Primer C. Another consideration is the effects of temperature over the course of a large project. Full adhesion may occur in 24 hours when the project starts in mid-summer, but may drift out to 48 hours as the temperature decreases in winter. The silicone must not be stressed until full adhesion has developed. It is preferable to allow horizontally glazed units to remain on the fabrication tables until full adhesion develops, especially when no two-sided adhesive tape is used. (Two-sided adhesive tapes can be used to prevent stressing of the sealant when moving and transferring units during the cure period.) Adhesion testing should be carried out to confirm that full adhesion has been achieved. Once full adhesion is verified, units may be moved in a more rigorous manner.

When multiple substrates are glazed on unitized panels, special attention must be given to the support requirements of each substrate.