

Precured Sealant in Renovation Applications

By Jason Bakus

Many different types of liquid-applied sealants have been used over the years in the construction industry. These sealants, which will be referred to as “wet sealants,” include acrylic, polyurethane, polysulfide, silicone, modified silicone, siliconized polyurethane, and other technologies. While these wet sealants have been used successfully for many years in the industry, precured joint sealants are becoming more popular.

Precured joint sealants are produced by extruding sealant material and allowing it to cure to a rubbery, elastomeric product in a controlled manufacturing environment. Precured joint sealants are packaged in cured form, often in rolls, instead of typical liquid form packaging (tubes and pails). They are installed using a thin layer of wet sealant on each side as the adhesive to attach the material to the substrate they are sealing. With the outer edges adhered to the substrate, the middle of the precured sealant, which is not bonded to the substrate, acts as the area for expansion and contraction.

Several types of precured joint sealants have been used in the industry over the years, ranging from polyurethane and polysulfide to silicone. Each type offers unique chemical and physical characteristics. One type is silicone precured joint sealants, which are used in construction applications for several reasons. First, because of their molecular structure and high bond energy, silicones have excellent aging characteristics and are more resistant to ultraviolet light and weathering. Because silicones do not degrade when exposed to the elements, it is possible for manufacturers to produce the material very thin (0.04 to 0.08 in. [1 to 2 mm]). This precured joint sealant minimizes expansion and contraction forces on the substrate and creates the pleasing appearance of a flat profile. Additionally, the movement capability for silicone precured joint sealant can be as high as +200%/–75%. This combination of high movement capability and thin material allows precured silicone sealant to easily handle multidirectional movement. Additional advantages include a wide operational temperature range and a better resistance to color fading.

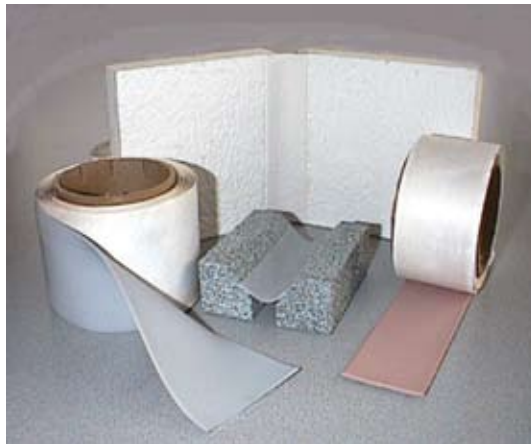


Fig. 1: Precured silicone sealant

Renovation Applications

Over the past 2 decades, precured sealants have been used in the construction industry, mainly for renovation applications. One example of a typical application for a precured sealant is the repair of failed (standard) sealant joints. When precured silicone sealant is used to repair a failed traditional sealant joint, there is no need to remove the old sealant. Installation is easy; the precured sealant is simply applied over the old joint using a thin layer of silicone adhesive on each side of the precured sealant. The precured sealant is then simply pressed into place to ensure intimate contact between it and the adhesive as well as between the adhesive and the substrate. Once it has been pressed into place, any excess adhesive is removed and the installation is complete.

Two of the most important advantages of using precured silicone sealant are a decrease in time required to complete a project and a reduction in overall project cost. Labor costs will be lower because several labor-intensive steps are removed from the process. For example, the old sealant does not need to be removed when using precured silicone sealant. Additionally, the substrate does not need to be abraded to ensure the complete removal of the old sealant. Also, precured sealants do not

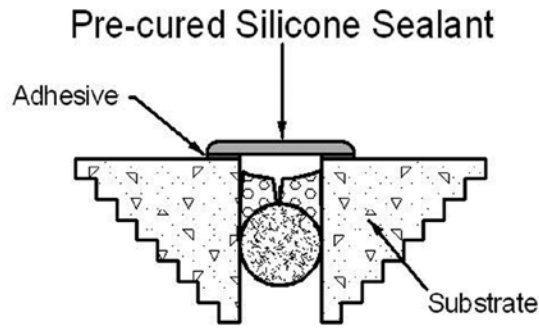


Fig. 2: Repair joint



Fig. 3: Repair joint installation



Fig. 4: EIFS joint repaired using textured pre-cured silicone sealant

need to be tooled after installation. Each of these factors can help reduce project costs when using pre-cured sealant.

This system for repairing failed sealant joints is especially useful with soft substrates such as Exterior Insulation and Finish Systems (EIFS). With EIFS, removal of the old sealant will damage the substrate and ruin the integrity of the joint. Because of this, many EIFS manufacturers recommend the use of pre-cured silicone sealant when repairing EIFS sealant joints. Several pre-cured sealant manufacturers have the ability to produce textured material to match an EIFS system, giving the repaired joint a better appearance.

Bridge Joint Applications

Pre-cured sealants are also used in applications where wet-applied sealant bridge joints have been used in the past. These bridge joints have been used in butt joint applications where the joint depth does not meet the minimum 1/4 in. (6 mm) for bonding to the substrate. This system is commonly found in applications such as leaky aluminum window systems. These wet-applied sealant bridge joints are difficult to install. Additionally, because the industry standard thickness for a wet sealant bridge joint is 1/4 in. (6 mm) and pre-cured silicone sealant is typically produced at a thickness of 0.08 in. (2 mm), the pre-cured sealant is typically more aesthetically pleasing. Furthermore, due to the thin adhesive layer required with the pre-cured sealant system, the adhesive cures rapidly and joint deformation during cure is virtually eliminated.

Compare the cure time of a few hours for the adhesive used with the pre-cured sealant to that of a 1/4 in. (6 mm) thick wet sealant bridge joint, which can take several weeks to cure completely. Indeed, this prolonged cure time frequently causes many wet sealant joints to develop ripples or folds as the joint expands and contracts before the wet sealant reaches complete cure. In addition to an unpleasant aesthetic appearance, this situation damages the integrity of the joint.

Other Applications

Another situation where pre-cured silicone sealants are used instead of wet sealants is one in which the width of the joint is not sufficient to handle the movement it experiences. This occurs frequently in buildings that are lacking an adequate number of expansion joints on the exterior substrate, causing the joints to expand and contract beyond the movement capability of any wet sealant. In this case, pre-cured joint sealant works very well because the material can handle the extreme movement in these types of joints. Another example of this phenomenon is in windows where the opening does not leave adequate space for a working perimeter sealant joint. Because the



Fig. 5: Precured silicone sealant installed in an aluminum window system

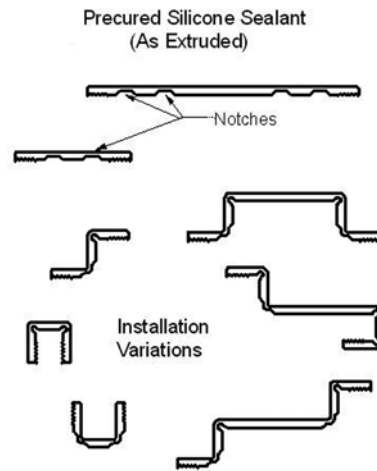


Fig. 6: Installation variations of notched precured silicone sealant

sealant adhesive is only used on the edges of the material, the precured sealant system creates its own artificial joint width to handle the movement. This allows the precured sealant to effectively seal this and similar applications.

Aluminum window systems are also an application where precured sealants have been used to repair many major water intrusion problems. Because most aluminum window systems contain numerous metal-to-metal joints and other potential areas for leaks, when these systems fail, it can be difficult to seal these leaks with traditional wet sealant. Precured sealant can be applied over the leaking areas in these systems and when using a color-matched material, the precured sealant may not be noticeable at all.

Precured sealants are readily available in many standard sizes and colors. Manufacturers also offer custom color and custom design material to fit many different application requirements, including the textured material previously discussed. Besides the aforementioned applications, precured sealants are used successfully in many other applications, including:

- Curtainwall seals;
- Skylights;
- Roofing and parapet seals;
- RV, marine, and transportation seals;
- HVAC system seals; and
- Seals for showers and tubs.

Custom design materials can be produced with one or more notches in the extrusion. These notches allow the precured sealant to follow complex bends on a building in applications such as inside and outside corners, parapet caps, and window mullions. Figure 6 shows some installation variations of the notched material.

Finally, the use of a precured sealant can result in a more energy-efficient building. Buildings often have leaks throughout the structure, most of which are in the joint areas. Because of these leaks, buildings need to be pressurized, resulting in higher heating and cooling costs throughout the year. Many leak areas in a building can be sealed using a precured sealant. Once these leaks are sealed, the amount of air required to keep a building pressurized is drastically reduced. This results in lower heating and cooling costs, making the building much more energy efficient.

This Viewpoint article has been selected by the editors as an offering to the interest of our readers. However, the opinions given are not necessarily those of the International Concrete Repair Institute or of the editors of this magazine. Reader comment is invited.



Jason Bakus is Vice President of Sales & Marketing for Sealex, Inc., which develops and manufactures precured sealants and adhesives. He has a background in chemical engineering and has over 10 years of experience in the silicone and construction industries. He serves as Chair of the Precured Sealant Validation Committee with the Sealant, Waterproofing & Restoration (SWR) Institute. He can be reached by phone: 231-348-5020 or e-mail: jbakus@sealexinc.com.