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AVOIDING JOINT PAIN

By Bob Cusumano

Tilt up concrete buildings are very popular as a form of construction at this time and to the painting contractor, that means dealing with sealant expansion joints. These can provide challenges whether the contractor is installing the caulking material or painting the sealant after its installation by others.

If you are responsible for the sealant installation, then you need to be sure to select a caulking material that has the proper physical properties for the situation at hand. When a sealant is used in joints that are subject to movement, then the amount of expansion and contraction must be considered. Certain sealant materials can accommodate joint movement of 12.5% or higher, often necessary in expansion joints. Other factors that should be considered include adhesion, hardness, abrasion resistance, effective temperature range, and resistance to weathering. The sealant shown in photo 1 suffered excessive shrinkage and created an aesthetic issue.



Photo 1



Photo 2

There are many sealant failures due to the loss of adhesion from one of the surfaces to which the sealant is attached. The interior of the joint must be inspected to ensure that it

is clean and sound. The sealant shown in photo 2 failed because it was applied to an unsound surface whose cohesion was less than the stress applied by the sealant. Joint cleanliness is critical. In a previous article, we discussed the importance of joint design and how the depth of the joint is controlled using backer rod. Another important reason for using backer rod is to prevent a condition known as "three point adhesion". When you install caulking, it should be adhered to the two sides of the joint, but not to the rear. If the sealant is attached to both the sides and the rear of the joint, then its ability to elongate is compromised and sealant failure often occurs. The backer rod either provides a surface that the sealant will not adhere to or will be so flexible that even though the sealant adheres to it, it does allow the sealant to move properly.

When the sealant is applied to a painted surface, then the adhesion of the paint to which the sealant will be applied must first be assessed. Photo 3 shows caulking that failed because it was applied over a primer that had poor adhesion to the concrete tilt up panels. All loose materials, including poorly or marginally adhered previously applied coats of paint, must be removed.



Photo 3



Photo 4

After the expansion joints are sealed, they are often finish painted with the remainder of the exterior of the building and that can present additional challenges. You need to be certain that the paint that is applied can accommodate the movement that occurs in the sealant joints. Photo 4 shows a textured coating that is beginning to crack on a sealant joint. This particular joint is protected from extreme weathering elements and has not yet shown the effects of exposure. Photo 5 shows a similar joint that is exposed, resulting in delamination of the coating.



Photo 5

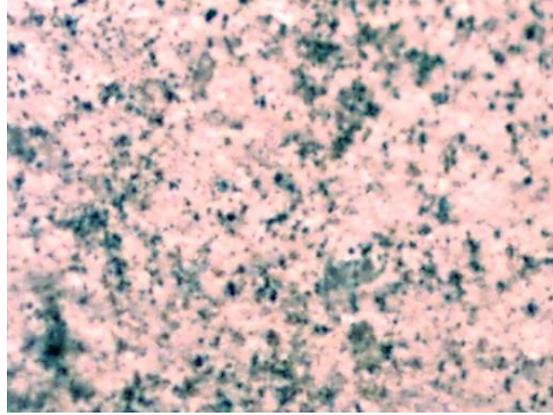


Photo 6

Examination of the rear of the delaminated paint shows that there can be multiple causes of marginal adhesion of the paint to the sealant that leads to ultimate disbonding. Photo 6 shows that this coating was applied over caulking that had collected a great quantity of dirt. Solvent wiping of the joint is often necessary to remove surface contaminants so that the coating can establish good adhesion to the sealant.

Before applying a coating to the joint sealant it is important to ensure that it has properly cured. The coating that delaminated in photo 7 has a thin layer of the sealant material attached to the rear of the coating film. The dark spots are dirt, but the light gray areas are traces of the sealant material. In this instance, the stress on the coating exceeded the cohesive strength of the top layer of sealant material resulting in delamination.



Photo 7



Photo 8

Another potential problem is the compatibility of the coating with the sealant to which it is applied. In some instances, good adhesion cannot be attained such as when applying an acrylic over a silicone caulk. Often, special primers, different from that applied to the adjacent concrete, must be applied to the sealant prior to application of the finish coat.

In other instances, components of the sealant, such as surfactants and plasticizers, may bleed through the applied coating and result in unsightly discoloration. Photo 8 shows

such a condition where the coating over and immediately adjacent to the caulk joint is distinctively darker than the adjacent coating.

Since there are so many potential pitfalls in coating the sealant on expansion joints, it is often preferable to install a sealant that is color matched to the coating that is applied to adjacent concrete panels after the coating is applied. When this option is selected, the sides of the sealant joints should be masked to prevent coating application. If primer or finish coating is applied to the sides of the joint, it must have sufficient adhesion to support the movement of the sealant.

Exterior painting represents a variety of challenges and painting concrete tilt-up buildings is near the top of the list. When involved in these projects, make sure you don't ignore the treatment of sealant joints or you may be faced with an expensive call back.