

Sealing expansion joints

Dow Corning® 902 Rapid Cure Silicone Joint Sealant

“Dow Corning 902 Rapid Cure Silicone Joint Sealant is dry to the touch in just 30-40 minutes, and it develops its strength at the same rate throughout its mass. The seal is not ruptured, and the roadway can be completely opened to traffic immediately.”

— Joe Cathey,
President
Silicone Specialties, Inc.

Rapid cure sealant demonstrates remarkable success

A silicone joint sealant installed to test its performance as a replacement for preformed compression seals in Oklahoma bridges is demonstrating remarkable success. Officials with the Oklahoma Department of Transportation (DOT) are so pleased with the performance of the silicone joint sealant that they have approved the product for other installations and have added the sealant to the department's Qualified Products List.

The success resulting from the installation of the silicone joint sealant in three test joints stands in marked contrast to the widespread failure of the preformed compression seals that had originally been installed.

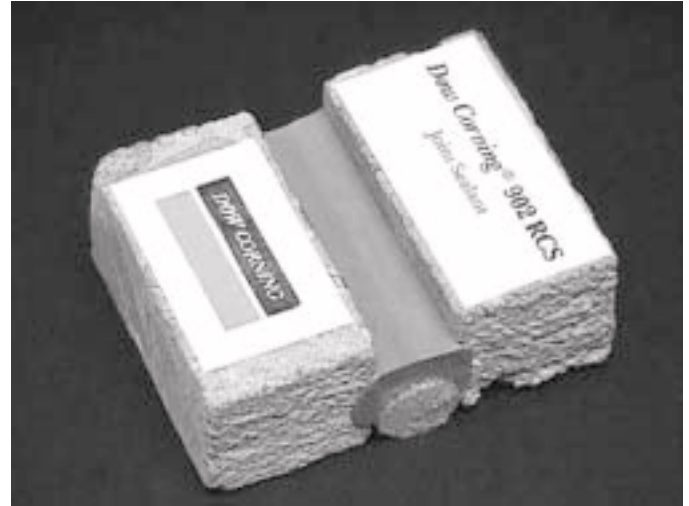
Bridges in Oklahoma are typical of the majority built from the late 1960s on, in that preformed rubber compression seals were utilized in either fixed or expansion joints. Unfortunately, these seals – like many tested throughout this period – typically failed after only a few years. Failure can lead to the leakage of water, de-icing salts and debris, which can rust or corrode the substructure components, columns and piers of a bridge.

Failures often resulted because of a bridge's excessive movement, heavy shock loading from industrial vehicles and expansion and contraction during cold and warm weather. Compounding the problems due to failure of the compression seals were the difficulties associated with their repair or replacement.

“Once the preformed seal is compressed and set, it cannot be altered,” explains Frank Chiles, former Oklahoma DOT division engineer. “Thus, if the joint expands due to movement, shock loading or weather, the seal will not expand sufficiently to accommodate this movement. Eventually, the dirt, debris and water will push the seal through the bottom of the structure.”

Likewise, replacement was not considered an alternative. “We believed the compression seals would simply fail again, so we decided not to replace them because of the wasted time and expense,” adds Chiles.

In November 1989, Silicone Specialties, Inc., of Tulsa, a distributor of pavement joint sealants manufactured by Dow Corning, contacted the Oklahoma DOT to select trial sites for a new sealant, *Dow Corning® 902 Rapid Cure Silicone Joint Sealant*. The self-leveling, cold-applied, ultra-low modulus, 100 percent silicone sealant was specifically designed for joints that experience thermal expansion and/or vertical movement due to traffic loading.



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Rapid cure sealant – *continued*

Chiles says the Oklahoma DOT chose three renovation projects for the new sealant – sites with extreme movements where compression seals had failed. “We chose these sites because they experienced severe movement and shock loading problems,” he adds.

Two sites were steel-to-steel expansion joints on the Broken Arrow Expressway (U.S. 51/64) bridges over I-44 and 21st Street in Tulsa. The third involved a concrete-to-concrete expansion joint on the Keystone Expressway over Lincoln Street, also in Tulsa.

“One-part sealants cure from the top down, and that process can take as long as 21 days to complete,” explains Joe Cathey, SSI president. When the material forms a skin, heavy traffic often causes enough movement to rupture the seal. So the joint is doomed before the sealant has a chance to fully cure.

“In contrast, *Dow Corning* 902 Rapid Cure Silicone Joint Sealant is dry to the touch in just 30-40 minutes, and it develops its strength at the same rate throughout its mass,” continues Cathey. “The seal is not ruptured, and the roadway can be completely opened to traffic immediately.”

Since installation of the sealants, the system has been demonstrating remarkable success. “We’ve been extremely pleased with the results to date,” says Ed Kellogg, Oklahoma DOT division engineer. “The joints have not required any repair or maintenance whatsoever and have been performing their function very effectively. The system is also much easier, faster and more economical to install and maintain than compression seals,” Kellogg adds.

According to Kellogg, 902 Rapid Cure Silicone Joint Sealant was installed at a much lower cost than competing systems. While preformed seals cannot be used in joints that have skewed over time, 902 Rapid Cure Silicone Joint Sealant easily accommodates variations in joint width. The self-leveling material requires no tooling, and conforms to irregular joint faces. Because it is an ultra-low modulus product, 902 Rapid Cure Silicone Joint Sealant withstands the wide range of movement typically encountered in bridge expansion joints.

The sealant has been laboratory tested for joints up to 3 inches wide, although actual field installations have shown excellent performance in joints up to 4 inches wide. And as a 100 percent silicone, the sealant is virtually unaffected by exposure to weather, ultraviolet light and extreme temperatures.

FOR MORE INFORMATION

For product information or for Material Safety Data Sheets (MSDS), please see your Dow Corning representative or distributor, or write to or call Dow Corning Customer Service, (517) 496-6000.

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