TECHNICAL BULLETIN # 81

PECORA 300SL/301NS SILICONE PAVEMENT SEALANT AIRFIELD USE

Silicone based pavement joint sealants have been used extensively in airfield applications for a number of years. The use of a 100% silicone based sealant in traffic applications was initially met with skepticism because of the difference in physical properties when compared to traditional joint sealing materials, ie., rubberized asphalt, neoprene, urethane. These more traditional materials do indeed have greater abrasion resistance and ultimate tensile strength, however, recessing of the silicone based sealant in the joint reduces exposure to abrasion and the need for high abrasion resistance. Furthermore, most traditional joint sealants exhibit a high modulus of elasticity, which somewhat limits the movement capability of the sealant. While traditional pavement joint sealant will resist heavy traffic because of inherent mechanical properties they may fall short in maintaining a seal in applications experiencing high movement. Silicone based materials however, posses the ultra-low modulus necessary when sealing applications experiencing high movement. Airfield pavements fall into this high movement category.

The five basic criteria a sealant must meet for airfield applications are:

- ✓ Resistance to ultra-violet light
- ✓ Wide service temperature range
- ✓ Cyclic movement capability
- ✓ Jet Fuel / oil resistance
- ✓ Jet blast resistance

ASTM D 5893 (*Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements*) provides thorough test criteria for silicone sealant use on concrete pavement but does not directly address airfield applications. Pecora has chosen to use ASTM D 5893 along with selected Pecora test methods for jet fuel resistance and jet blast resistance to certify Pecora 300SL/301NS Silicone pavement sealant for use on airfield applications. Test reports are available for ASTM D-5893, SS-S-200E Jet Blast and Flame Resistance, and Pecora test method for jet-fuel resistance. Pecora 300SL/301NS complies with specifications as stated in FAA Engineering Brief No. 36.

Being that no ASTM test method exists for jet fuel resistance for one component silicone based materials, Pecora has adopted a standard commonly used and accepted. The standard consists of laboratory testing which reproduces conditions created when a jet fuel spill occurs. Internal test results have shown Pecora 300SL/301NS silicone pavement sealant to perform within acceptable limits. Some swelling of sealant initially occurs with the swelling dissipating upon the drying of the jet fuel with no associated bond loss.

Practical design of expansion joints should be carried out using a safety factor of 2 to 3. This would translate into joint designs requiring +/- 25% movement. This safety factor is needed to compensate for variation in joint width and overall joint movement across multiple slabs. A minimum joint width of ¼" is acceptable with a minimum of 3/8" being preferable. Sealant should be recessed a minimum of 3/8 " with a minimum sealant depth of ¼" in joints less than 3/8 " in width. Joints wider than ½" should have a maximum of 3/8" sealant depth at the center of the joint. Concrete spans should be sufficient to account for the designed safety factor of 2 to 3 based on maximum movement capability of sealant (+100/-50%).