

**JOINT SEALING SYSTEM (PREFORMED SILICONE) :**

DESCRIPTION. This item consists of handling, testing, preparing surfaces, placing and bonding a preformed silicone joint seal with adhesive to concrete bridge deck joints as indicated in the plans. All components used must belong to a single system from an approved manufacturer.

MATERIALS: The preformed silicone joint seal used for this item shall conform to the following specifications:

Table 1  
Physical Properties of Preformed Silicone Gland

Preformed Silicone Seal Property	ASTM Test Method	Value
Durometer (Shore A)	D2240	55 +/- 5
Tensile Strength	D 412	1000 psi. minimum
Elongation	D 412	400% minimum
Tear (die B)	D 624	100 ppi. minimum
Compression set at 212°F, 70 hrs	D 395	30% maximum
Heat Aged Properties	D 573	5pt max loss on Durometer
Tensile and Elongation max % Loss		10 max % Loss
Color	Visual	Black

The color of the preformed silicone seal shall be black, made by the addition of Carbon Black fillers which increases UV resistance, tensile strength, and abrasion wear properties.

The locking adhesive shall be non-sag, high modulus silicone adhesive conforming to the following specifications:

Table 2  
Physical Properties of the Silicone Locking Adhesive

Property	Test Method	Typical Value
Tensile Strength	ASTM D 412	200 psi min. (1.38 MPa)
Elongation	ASTM D 412	450% min
Tack Free Time	ASTM C 679	20 min. max.
Cure Time ¼" bead	ASTM C 679	24 hrs. max.
Resistance to U.V.	ASTM C 793	No cracking, chalking, or degradation

VOC (g/L)	ATSM D 3960	0
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Any rips, tears, or bond failure will be cause for rejection.

The two part epoxy primer must be supplied for application to the vertical faces of the joint opening. The supplied primer must be equally as effective when bonded to concrete or steel. This primer must meet the following criteria:

Table 3  
Physical Properties of Preformed Silicone Joint System Primer

Adhesive Property	Test Method	Value
Viscosity (cP)	ASTMD2196	44
Color	Visual	Light Amber
Solids (%)	ASTMD 4209	41
Specific Gravity	ATSM D 1217	0.92
Product Flash Point (°F, T.C.C.)	ATSM D 56	48
Package Stability	N/A	One year in tightly sealed containers
Cleaning	N/A	Mineral Spirits
VOC (g/L)	ATSM D 3960	520

**CONSTRUCTION REQUIREMENTS:**

Do not start installing the Joint Seal System on the project until a trained factory representative is on the job site to provide direction and assistance throughout the installation work. Notify the Joint Seal manufacturer of the scheduled installation a minimum of 2 weeks in advance. The factory representative must be present for the installation of the first Joint Seal and succeeding Joint Seals until the Contractor becomes proficient in the work. The minimum temperature in which you can install the Joint Seal is 40° F and rising ambient air temperature. The joint surface must be completely dry before installing the Joint Seal. The Joint Seal cannot be installed immediately after precipitation or if precipitation is forecasted for the day. Joint preparation and installation of Joint Seal must be done during the same day. Traffic

must not be allowed to pass over a joint after sandblasting has occurred. Prior to installation on steel surfaces, sandblast the vertical faces of armor plate to a near-white condition. Concrete joint faces must also be sandblasted in order to remove fines, laitance and unsound concrete from the exterior surface. Using dry and oil free compressed air, blow joint area clean to remove all sand and debris. Wipe clean armor plate or concrete joint header with a cloth saturated in De-Natured Alcohol. Mix together A and B components of Primer and then apply to the vertical joint interfaces. Allow primer 30 minutes to dry. Unroll joint seal and place adjacent to joint opening. Clean the seal with a cloth saturated with De-Natured Alcohol, focusing on each side of the seal (top and bottom) where the adhesive will be bonded. Joint preparation, priming and installation of Joint Seal must all be done the same day. Traffic shall not be allowed to pass over a primed joint surface. Using a standard caulking gun, a 3/8" diameter bead of Locking Adhesive shall be applied to both sides of the vertical face of the joint. This bead of adhesive shall be placed approximately 1" below the top of the joint elevation. Insert the Joint Seal into the joint opening in an inverted "V" shape by folding it by hand. The Joint Seal shall be inserted above the 3/8" bead of locking adhesive. Gently push the Joint Seal downward while maintaining contact of the sides of the joint seal to the joint header. Position the Joint Seal to the proper depth which is when the top of the Joint Seal is 1" below top of the road surface. Apply a second bead of locking adhesive along each side of the Joint Seal to the top of the serrations, and no higher. This second bead of adhesive should be in contact with the seal and the armor plate or concrete header. The Locking Adhesive must be 'tooled' at least twice with a tongue depressor to ensure complete contact with the vertical edge. The second bead of adhesive should look smooth with no air voids or bubbles. In the event of a visible air void, more adhesive must be applied. Allow 60 minutes before allowing traffic over a newly installed Joint Seal, unless directed otherwise by an approved representative. Vertical curbs, directional changes and field splices require the Locking Adhesive as a bonding agent.

#### APPROVAL and TESTING:

Manufacturer must provide test report stamped and signed by a professional engineer showing the preformed silicone seal passing a joint elongation test. The test consists of installing the preformed silicone seal to a steel surface. The preformed seal must be installed using the same methods used when installing it in the field, including primer and recommended adhesive volumes. It shall be allowed to cure for a maximum of 7 days under natural atmospheric conditions. It shall be placed in a tensile/elongation machine with a movement capacity of at least 15 inches. The tensile elongation machine shall be engaged at a movement rate 1/4 inch per second minimum until joint failure. Failure is defined as a loss of adhesion to the steel surface, or cohesive separation of the preformed seal. The joint opening at failure is recorded. The joint opening at failure must equal or exceed two times the maximum joint opening of that particular model of the preformed seal. For example, if the particular model is rated for a maximum of 5" joint opening, the minimum passing value of the opening at failure is 10". Test shall be video recorded which should be made available to the DOT upon request. The joint seal system manufacturer must have 15 successful installs of 4 years of longer documented. The

manufacturer must provide DOT with contact information of a state representative who can confirm these installs.

MEASUREMENT: Prefomed Silicone Joint Sealing System, will be measured for payment per linear foot which includes all materials, labor, equipment, tools, and incidentals necessary to complete the work. Design quantities may be adjusted by the engineer to facilitate sealing of joints.

PAYMENT:

Payment for Prefomed Silicone Joint Sealing System will be made at the contract unit price per linear foot.

Payment will be made under:

<u>Item No.</u>	<u>Pay Item</u>	<u>Pay Unit</u>
	Joint Sealing System (Prefomed Silicone)	Linear Foot