

**Ceva® 250 System Armorless Joint System**  
Expansion Joint System  
for Bridge & Parking Garage Applications

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**A. General**

The work shall consist of furnishing and installing a high performance, closed cell, preformed seal in accordance with the details shown on the plans and the requirements of the specifications.

Manufacturer shall have a minimum ten (10) years experience specializing in the design and manufacture of closed cell foam expansion control systems

**B. Quality Control**

Manufacturer shall be ISO-9001:2000 certified and shall provide written confirmation that a formal Quality management System and Quality Processes have been adopted in the areas of, (but not limited to) Engineering, Manufacturing, Quality Control and Customer Service for all processes, products and their components. Alternate manufacturers will be considered provided they submit written proof that they are ISO 9001:2000 certified prior to the project bid date.

**C. Product**

Provide a bridge or parking garage joint seal that consists of either:

impermeable closed-cell, low density, resilient, non-extrudable, ethylene vinyl acetate foam material with a hindered amine light stabilizer. Bridge/Parking joint seal shall be held in place by a two component 100% solids epoxy adhesive. The design of the seal shall be capable of accommodating movement and variations in joint widths through compression and tension of its shape. Enhanced Surface Preparation (E.S.P.) shall be grooves 1/8" (3mm) wide by 1/8" deep (3mm) and spaced between 1/4" (6mm) to 1/2" (13mm) apart and run along the entire length of the bond surfaces of the seal to ensure an effective and quality surface for adhesion. Provide seal profile that satisfies project requirements including movement and water tightness. Install all components utilizing manufacturer's recommended adhesive for complete installation.

**or**

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impermeable closed-cell, low density, resilient, non-extrudable, ethylene vinyl acetate foam material with carbon black added as a U.V. stabilizer. Bridge/Parking joint seal shall be held in place by a two component 100% solids epoxy adhesive. The design of the seal shall be capable of accommodating movement and variations in joint widths through compression and tension of its shape. Enhanced Surface Preparation (E.S.P.) shall be grooves 1/8" (3mm) wide by 1/8" deep (3mm) and spaced between 1/4" (6mm) to 1/2" (13mm) apart and run along the entire length of the bond surfaces of the seal to ensure an effective and quality surface for adhesion. Provide seal profile that satisfies project requirements including movement and water tightness. Install all components utilizing manufacturer's recommended adhesive for complete installation.

or

impermeable closed-cell, low density, resilient, non-extrudable, polyethylene foam material with carbon black added as a U.V. stabilizer. Bridge/Parking joint seal shall be held in place by a two component 100% solids epoxy adhesive. The design of the seal shall be capable of accommodating movement and variations in joint widths through compression and tension of its shape. Enhanced Surface Preparation (E.S.P.) shall be grooves 1/8" (3mm) wide by 1/8" deep (3mm) and spaced between 1/4" (6mm) to 1/2" (13mm) apart and run along the entire length of the bond surfaces of the seal to ensure an effective and quality surface for adhesion. Provide seal profile that satisfies project requirements including movement and water tightness. Install all components utilizing manufacturer's recommended adhesive for complete installation.

The elastomeric concrete material shall be field mixed and consist of a two component elastomer and pregraded aggregate mix. Install all components utilizing manufacturer's 100% solid epoxy bonding agent/primer and recommended 100% solid epoxy lubricant/adhesive for complete installation.

#### **D. Component and Materials**

The Contractor shall furnish a manufacturer's certification that the materials proposed will meet the requirements as set forth in the specification.

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1. Joint Seal Profile

The seals shall be manufactured of low density closed cell cross linked Ethylene Vinyl Acetate Polyethylene Copolymer nitrogen blown material utilizing hindered amine light stabilizer for U.V. stability exhibiting the physical properties listed in the table below:

PHYSICAL PROPERTIES	TEST METHOD	REQUIREMENT
Elongation at break	ASTM D3575; Suffix: T	225% avg.
Tensile Strength, psi (kPa)	ASTM D3575; Suffix: T	115 psi +/- 20%
Tear Resistance	ASTM D624	10 – 20 lbs/inch
Density	ASTM D3575; Suffix W, Method A	2.7 – 3.4 lbs/ft <sup>3</sup>
Water Absorption	ASTM D3575; Suffix L	0.035 lbs/ft <sup>2</sup> avg.
Compression Deflection	ASTM D3575	25% 6 psi avg. 50% 16 psi avg.
Weather / Deterioration	ASTM G154	3000 hours No Effect
Compression Set 50% compression for 22 hours @ 73° F (23° C) 2 hr recovery 50% compression for 22 hours @ 73° F (23° C) 24 hour recovery	ASTM D3575; Suffix: B	10% set 9% set
Extrusion ( specimen compressed 60% of original thickness with 3 restrained sides)	ASTM D545	Extrusion on free side does not exceed 0.25 inches (6.4mm)
Operating Temperature	In House	160° F (71° C) max.
Movement Range Compression Tension Shear (Horizontal & Vertical)	In House	50% 25% 50%±

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Ph: 800-356-6007 Fx: 518-346-1110 www.chaseconstructionproducts.com

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The seals shall be manufactured of low density closed cell cross linked Ethylene Vinyl Acetate Polyethylene Copolymer nitrogen blown material utilizing carbon black for U.V. stability exhibiting the physical properties listed in the table below:

PHYSICAL PROPERTIES	TEST METHOD	REQUIREMENT
Elongation at break	ASTM D3575; Suffix: T	225% avg.
Tensile Strength, psi (kPa)	ASTM D3575; Suffix: T	115 psi +/- 20%
Tear Resistance	ASTM D624	10 – 20 lbs/inch
Density	ASTM D3575; Suffix W, Method A	2.7 – 3.4 lbs/ft <sup>3</sup>
Water Absorption	ASTM D3575; Suffix L	0.035 lbs/ft <sup>2</sup> avg.
Compression Deflection	ASTM D3575	25% 6 psi avg. 50% 16 psi avg.
Weather / Deterioration	AASHTO T42 Accelerated Weathering	No deterioration
Compression Set 50% compression for 22 hours @ 73° F (23° C) 2 hr recovery 50% compression for 22 hours @ 73° F (23° C) 24 hour recovery	ASTM D3575; Suffix: B	10% set 9% set
Extrusion ( specimen compressed 60% of original thickness with 3 restrained sides)	ASTM D545	Extrusion on free side does not exceed 0.25 inches (6.4mm)
Operating Temperature	In House	160° F (71° C) max.
Movement Range Compression Tension Shear (Horizontal & Vertical)	In House	50% 25% 50%±

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The seals shall be manufactured of low density closed cell Polyethylene material exhibiting the physical properties listed in the table below:

PHYSICAL PROPERTIES	TEST METHOD	REQUIREMENT
Elongation at break	ASTM D3575; Suffix: T	175% avg.
Tensile Strength, psi (kPa)	ASTM D3575; Suffix: T	101 psi min.
Tear Resistance	ASTM D624	16.0 lbs/inch min
Density	ASTM D3575; Suffix W, Method A	2.12 lbs/ft <sup>3</sup> avg.
Water Absorption	ASTM D3575; Suffix L	0.03 lbs/ft <sup>2</sup> avg.
Weather / Deterioration	AASHTO T42 Accelerated Weathering	No deterioration
Compression Set 25% compression for 22 hours @ 73° F (23° C) 1/2 hr recovery 25% compression for 22 hours @ 73° F (23° C) 24 hour recovery	ASTM D3575; Suffix: B	9% set 3.6% set
Extrusion ( specimen compressed 60% of original thickness with 3 restrained sides)	ASTM D545	Extrusion on free side does not exceed 0.25 inches (6.4mm)
Operating Temperature	In House	212° F (100° C) max.
Movement Range Compression Tension Shear (Horizontal & Vertical)	In House	50% 25% 50%±

2. Adhesive

The low density closed cell cross linked seal shall be installed utilizing a 100% solids two component moisture insensitive modified epoxy adhesive which meets ASTM C-881 Type I & II Grade 2 Class B & C and the requirements of the properties listed below:

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Properties (uncured):

	<b>Part A</b>	<b>Part B</b>	<b>Mixed</b>
Color (Beige or Gray):	White/White	Carmel/Gray	Beige/Gray
Shelf Life	2 Years	2 Years	
Mixing ratio (By Vol)	3	1	3:1
Specific Gravity	1.47	1.15	
Density (lbs/gal) @ 77 ° F (25 ° C)	12.0 +/-0.5	9.7 +/-0.2	11.6 +/-0.2
Viscosity (cps) @ 77 ° F (25 ° C)	35,000	33,000	26,000
Pot Life (200 gms)			32-36 minutes
Initial Set @ 77 ° F			1 ½ - 2 Hours
Initial Cure			8-12 hours
Full Chemical Cure			7 days

Properties after Cure:

<b>TEST</b>	<b>TEST METHOD</b>	<b>REQUIREMENT</b>
Compressive Strength	ASTM D695	7000 psi
Tensile Strength	ASTM D638	3500 psi
Elongation at Break	ASTM D638	3-5%
Shore D hardness	ASTM D2250	85±5
Water Absorption	ASTM D570	0.25%
Bond Strength	ASTM C-882	430 psi min
Lap Shear		2000 psi min

Ambient temperatures as low as 20F, Eva-Pox Cold Cure Bonder #41 is available and meets ASTM C-881, Type II Grade 2 Class A.

For applications in which standing salt-water is present, utilize Eva-Pox Under Water Bonder #47.

### 3. Elastomeric Concrete

Material shall be an ambient cure, 100% solids, two component polyurethane with pregraded aggregate mix exhibiting the physical properties listed in the tables below. When properly mixed and poured, the elastomeric concrete cures rapidly, flows and fills any voids, spalls or irregularities forming a monolithic unit.

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Elastomeric cured binder shall meet the following physical properties:

<u>PHYSICAL PROPERTIES</u>	<u>TEST METHOD</u>	<u>REQUIREMENT</u>
Tensile strength	ASTM D638	775 avg., psi
Hardness, Durometer D	ASTM D2240	59 avg.
Water Absorption	ASTM D570	<1% avg.
Elongation	ASTM D638	110% min

Elastomeric cured binder and aggregate shall meet the following physical properties:

<u>PHYSICAL PROPERTIES</u>	<u>TEST METHOD</u>	<u>REQUIREMENT</u>
Compressive Strength	ASTM D695	2100 – 3000 psi
Resilience @ 5% deflection	ASTM D695	90% min
Slant Shear Bond Strength to concrete		250 psi min.
Impact Resistance @ 32°F (0°C)	See Note 1	no cracks
@ -20°F (-29°C)		no cracks
@158°F (70°C)		no cracks

NOTE 1 - Test specimen is a cast disk 2.5" in diameter and 0.375" thick. Specimens are conditioned four hours at test temperatures. A one pound steel ball is dropped onto the center of the specimen through a plastic tube from an initial height of five feet. The drop height is increased by ½ foot intervals until the specimen cracks. Drop is made within ten seconds after removal of specimen from the exposure condition.

#### 4. Bonding Agent/Primer

Provide manufacturers two component, 100% solids epoxy bonding agent. Apply bonding agent to the sides and base of the preformed concrete blockout prior to placement of the elastomeric concrete. Elastomeric concrete shall be placed prior to bonding agent drying/curing. Store, mix and apply in accordance with manufacturer's system data sheet.

Liquid components shall be identified by the following information:

Part A – Resin	Color: White
Part B – Activator	Color: Gray or Carmel
Mixed	Color: Gray or Beige

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**E. Construction Requirements**

The Contractor shall submit product information and necessary details after the award of the contract. At the discretion of the Engineer, the manufacturer may be required to furnish a representative sample of material to be supplied in accordance with the project specifications. Where indicated and noted on the contract plans, install bridge joint seals in a neat and workmanlike manner. All surfaces to receive bridge deck joint seal shall be free from dirt, water and any other loose foreign debris, which may be detrimental to effective joint sealing.

Measure the joint opening width. The low density closed cell material should be sized 25% larger than the joint opening at near neutral but never less than 10% oversized or greater than 35% oversized. The seal profile shall be cut to the correct length for installation. Care should be taken to extend the profile to its full length, without exerting any tension or stretching of the seal. The bond at the splice location is achieved by heat welding. Heatwelds and splices and other directional changes should be cut and made a minimum of fifteen (15) minutes prior to seal installation.

Bridge deck or parking deck joint seal shall be installed in strict accordance with the manufacturers written instructions.

**F. Payment**

The accepted quantity of bridge joint seal will be paid for at the contract unit price per lineal foot. Measurement of the bridge joint seal will be taken horizontally and vertically along the centerline of the joint system between the outer limits indicated on the contract plans.

Payment will be made under:

<u>PAY ITEM</u>	<u>PAY UNIT</u>
Low Density, Closed Cell, Joint Seal	Lineal Foot
Elastomeric Concrete	Cubic Foot

Payment will be full compensation for all work necessary to complete the items including furnishing and installing the bridge joint or parking joint seal, and any miscellaneous patching required.

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