

CEVA® Expansion Joint Systems Installation Guide

This document contains general instructions and recommended practices for the application/installation of CEVA® Expansion Joint Systems. This guide will cover the recommended tools, materials, surface preparation and basic installation procedures. Aside from surface preparation, accurate sizing of the preformed closed cell foam joint material is extremely important. If the joint is not sized properly and the surface is not prepared correctly, the material may not perform as desired with the movement of the structure. For assistance in sizing, surface preparation, application or inspection, please contact a Chase representative. CEVA® Expansion Joint Systems are offered in two different configurations: CEVA® 100 (Fig. 1) for architectural applications and CEVA® 250 (Fig. 1.1), which incorporates the use of elastomeric concrete, for roadway/bridge deck applications.

Fig. 1 CEVA® 100 System

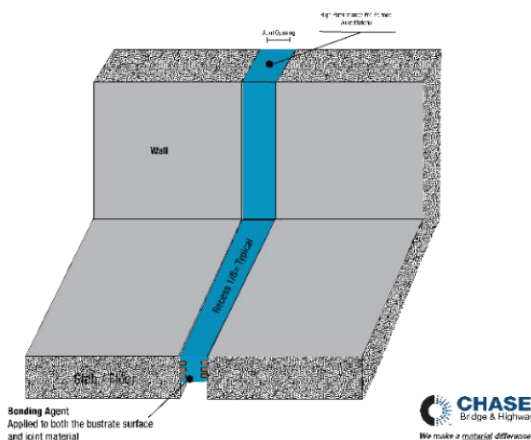
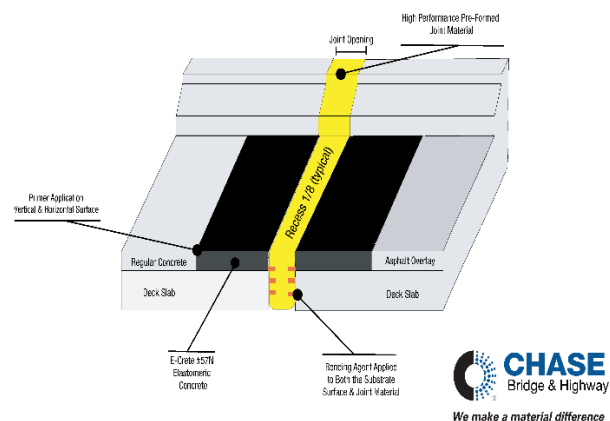


Fig 1.1 CEVA® 250 System



Recommended Tools for Installation:

- Low speed drill
- 1 gal spiral mixing paddle
- 5 gal pail, 2 gal mixing bucket
- Wooden paint sticks
- Duct tape
- Poly sheeting or roofing paper
- Serrated knife
- Disposable paint brushes
- 2" margin trowel
- Teflon coated heating iron (for making welds in the field)
- Insulation board (width of board should match the joint opening)
- Rubber gloves, rags and clean-up solvents (denatured alcohol recommended)

Other tools may be used based on individual job requirements, past experience and preference.

CEVA® Materials Required:

- CEVA® Expansion Joint Foam (Phyzite 380, Metazeal or Metazeal AJ depending on application).
- Eva-Pox Bonder #1
- ECrete 57N (for CEVA® 250 System which incorporated elastomeric concrete header)

Packaging and Storage

CEVA[®] Expansion joint materials should be stored in original, unopened containers prior to installation.

- The products must be stored in a cool, dry place away from direct sunlight.
- ECrete 57N and Eva-Pox Bonder #1 MUST not freeze and should be stored at temperatures between 50°-95° F (10° – 35° C).
- The high performance preformed joint material (Phyzite 380, Metazeal, Metazeal AJ or Eva-Seal) should be stored in the original packaging, out of direct sunlight and in cool temperatures prior to installation.
- DO NOT shrink wrap or use any type of metal or restrictive banding.
- Shrink wrap should be removed from pallet when materials arrive. Unused joint material should be recoiled and placed back in original packaging while awaiting use.

Substrate Types

CEVA[®] Expansion Joint systems can be used with a variety of different substrate types including new/old concrete, steel, elastomeric concrete or, in some instances, a combination of the mentioned materials.

Concrete Surfaces:

- Fresh concrete must be “fully” cured for a minimum of twenty (20) days or per agency specification.
- Concrete should achieve 80% of design strength before surface preparation begins.
- Concrete should be clean and sound with any spalled areas repaired per Agency specifications.
- The concrete surface must be mechanically abraded by grinding (Zek Wheel or Rip Disc) or sandblasting (medium grit).
- Surface must be clean and free of any dirt, dust or debris prior to application of Eva-Pox Bonder #1

Elastomeric Concrete (ECrete 57N):

- The vertical face of the nosing MUST be sandblasted to expose the aggregate and remove the glossy finish.
- Within 8 hours after application, ECrete 57N can be brush blasted or wire brushed to remove the glossy finish.
- Surface must be clean and free of any dirt, dust or debris prior to application of Eva-Pox Bonder #1

Steel Surfaces:

- Steel MUST be clean and sound
- Sandblasted to near white metal finish (SPCC-10 or better).
- No rust can be present in the area that Eva-Pox Bonder #1 is to be applied over.
- Surface must be clean and free of any dirt, dust or debris prior to application of Eva-Pox Bonder #1
- IF ANY SPECIALTY STEEL (GALVANIZED OR STAINLESS) IS PRESENT, CONTACT CHASE TECHNICAL TEAM FOR RECOMMENDATIONS.

Surface Preparation Procedures

- Removal of existing expansion joint material is necessary prior to installation of replacement joint seal.
- When installing the CEVA[®] 250 System, removal of surrounding header material must be completed. Any spalling or unsound materials must be removed and cut out prior to installation of new concrete or elastomeric concrete headers are poured.
 - Saw cutting to required depth is necessary
 - After completion of saw cutting, remove header material from both sides of the joint opening using jack hammer or similar device.
 - The profile of the blockout should be similar to 50 grit sandpaper.
 - Remove all dirt, dust or debris by using oil/water free air compressor or vacuum.
- Patch any spalling or damaged areas with Agency approved concrete repair material.



Sandblasting or mechanical grinding is recommended to ensure that all concrete surfaces are free of all grease, curing compounds, existing coatings, etc. Sandblasting should be accomplished using medium grit material. Grinding should be done using a Desco Rip Disk or Zek Wheel style attachment. Freshly poured concrete should be allowed to cure for twenty (20) days (for a standard mix; all concrete must achieve 80% cure) before sandblasting and installation. Steel surfaces must be sandblasted to near white metal finish (SPCC-10). All surfaces should be wiped down with denatured alcohol after sandblasting to remove any dirt, dust or debris left behind immediately prior to application of the bonder.

Joint Opening Preparation

Once the surface is properly prepared, the size of the joint opening should be verified. Ensure that the material onsite is oversized per Chase recommendations. Place the foam seal material lengthwise next to the joint opening and make sure the material is the proper length and is approx. 25% oversized for the opening.

In systems using ECrete 57N for nosing of the header, forming the joint area is the next step.

- Use insulation board (Fig. 2) or wood (covered in polyethylene sheeting to prevent adhesion of the material) between the concrete headers. The insulation board or wood should match the width of the desired joint opening.
- Apply spill protection along the edges of the area to be filled in with elastomeric concrete or blockout area. Roofing paper or polyethylene sheeting (Fig 2.1) can be used and should be secured with duct tape.

Fig. 2: Insulation Board used in joint opening



Fig 2.1: Polyethelene sheeting for easy clean-up



CEVA® Eva-Pox Bonder #1 Application

CEVA systems utilize a single bonding agent (Eva-Pox Bonder #1) that is suitable for bonding both ECrete 57N and the CEVA® closed cell foam to the substrate. Bonder #1 is a 100% solids, two-component modified epoxy adhesive.

- Separately, mix Part A and B thoroughly to ensure material is homogeneous.
- Scrape contents of both containers into a clean, dry 2 ½ gal bucket and mix together with a low speed mixer (400 rpm) until uniform color is achieved. Mixing typically takes around five (5) minutes to complete. The bonder comes in beige or gray depending on preference and application.
- For the CEVA® 250 System, this material needs to be applied to the blockout areas that are going to have ECrete 57N installed.
 - It should be applied at approx. 20 mils to vertical and horizontal surfaces.
 - Eva-Pox Bonder #1 should still be “wet” when the ECrete 57N material is added (approx. 30 minutes at 70°F).
- For the CEVA® 100 System, bonder is applied to both the foam joint seal and the vertical face of the joint opening.
 - Eva-Pox Bonder #1 is the primary adhesive for this system and should only be applied to the vertical face of the substrate and the sides (with groove marks called ESP or Engineered Surface Protection grooves).

- Eva-Pox Bonder #1 should not be applied on horizontal surfaces and the foam joint seal should only be in contact on the sides. If three sides are glued with the Bonder, the seal will not be able to perform as desired.

ECCrete 57N Application

For the CEVA® 250 System, ECCrete 57N (elastomeric concrete) is installed as the header material to give the joint additional flexibility under traffic conditions. See the ECCrete 57N TDS for additional information.

- Premix Part A and B separately for approximately ten (10) seconds to ensure homogeneous mix.
- Add Part A and Part B together into a clean, dry 5-gallon bucket and mix until uniform color is achieved with no “marbling” of the material.
- Slowly add Part C (specialized blend of aggregate) to the 5-gallon bucket and mix thoroughly until there is no visible uncoated aggregate.

Pour the ECCrete 57N into the blackout area for the header (Fig. 3.1). The Bonder #1 that was previously applied in to the vertical and horizontal surfaces should still be wet when ECCrete is applied. The ECCrete 57N is a self-leveling material but a trowel can be used to achieve a desired finish when necessary.

Fig 3 Bonder #1 Application



Fig 3.1 ECCrete 57N Installation



After the ECCrete 57N has reached its initial set time (45 – 60 minutes at 70°F), the insulation board or wood form can be removed. Traffic can resume at this time or the contractor can continue to install additional foam joint seals.

Foam Joint Seal Installation

For both of the CEVA® Expansion Joint Systems, the installation of the foam joint seals are similar. The vertical faces of the joint opening must be prepped and have Bonder #1 applied prior to the insertion of the foam.

- Whether the vertical face in contact with the foam is ECCrete 57N or concrete, the surface must be profiled using a mechanical abrasion process.
 - This can be achieved using either sand blasting equipment or mechanical grinders. Chase recommends using a Zek Wheel attachment or other highly abrasive attachment.
- After abrading the surface to the equivalent of 100 grit sandpaper, the surfaces must be cleaned so that they are free of any dirt, dust or debris that could interfere with the adhesion of the Bonder #1.
 - Steel and concrete surfaces can be wiped down with denatured alcohol, vacuumed or blown compressed air (oil and moisture free).
- Once the joint opening surfaces have been prepped, the opening width should be reverified to ensure the materials onsite are sized properly.
- Lay out the joint material next to the joint opening and confirm appropriate length and width of the foam seal.
- If there is to be any heat welding done in the field, now is when that process should be done.

- **Heat Welding:** All directional changes require heat welding of the foam material. (Fig. 4 & 4.1) This should be done using a Teflon coated heating iron heated to 350°F. Heat Welding is done by placing the ends of the foam against the preheated Teflon coated heating iron for a minimum of 10 seconds but not more than 20 seconds. Immediately place the ends together tightly and apply pressure for at least 30 seconds. After approximately 15 minutes, test the weld by pulling the two sections apart. If the weld breaks, cut off at least 1" from each end and attempt the process again. All heat welds should be allowed to cool for approximately 20 minutes before the joint seal is installed.

Fig 4 Heat Welding



Fig 4.1 Directional Changes



- Install spill protection on both sides of the joint opening for easier clean-up after installation of joint seals and to prevent Bonder #1 from getting on surrounding surfaces.
 - Polyethylene sheeting or roofing paper secured with duct tape is recommended. Care must be taken to ensure the spill protection does not protrude into the opening which could interfere with the Bonder application.
- A four-person crew is recommended for the installation of the foam joint seal. Two people will apply the epoxy adhesive to the joint material and to the vertical face of the substrate. The other two people will be inserting the joint material into the joint opening and cleaning any excess Bonder from the top surface of the high performance foam.
 - Care must be taken to remove and excess epoxy adhesive from the exposed surface of the foam as it can cause the foam to become brittle and inhibit movement.
- Using a 1 gallon spiral mixing paddle and a drill, premix separately the Eva-Pox Bonder #1 Parts A and B individually for approximately 30 seconds until uniform.
- Pour the contents of the Part A and Part B into a clean dry container and mix for 10 minutes until there is no "marbling" of the material and is a uniform consistency.
- Apply the Bonder #1 to both the vertical faces of the substrate and to the sides of the foam joint seal. The sides have grooves cut into them to provide additional surface area for an excellent bond with the prepared substrate.
 - Bonder #1 can be applied in a variety of ways depending on preference and joint opening of the project. Paint brush, margin trowel and gloved hand are the most common application methods.
 - The Bonder should be applied at 40 mils on both the substrate and joint material (Fig. 5) taking care to ensure the grooves are filled with the adhesive. No Bonder should be applied to the top or bottom of the joint seal as this can hinder the movement and performance of the expansion joint.
 - Bonder #1 should be applied at a depth of 1/2" lower than the dimensions of the joint seal itself. The seal should be recessed 1/8" – 1/4" below the surface to ensure no damage occurs by foot or vehicular traffic.



Fig 5 Bonder #1 Application



- Installation of the foam joint seal is the next step. Starting at an intersection or one end of the joint opening, the material should be worked into the joint opening using a “loop” or “serpentine” procedure. (Fig. 6 & 7) This is important in order to not stretch the joint during the installation process.
 - Start recessing the material into the opening then move down 2-3 feet and insert the joint into the opening taking care to recess the material 1/8” –1/4” below the surface of the substrate or ECrete 57N nosing.
 - Continue down the joint then come back and work the loops into the opening.

• **Fig 6 “Loop” or “Serpentine” Installation**



- **Fig 7 “Loop” or “Serpentine” Installation**

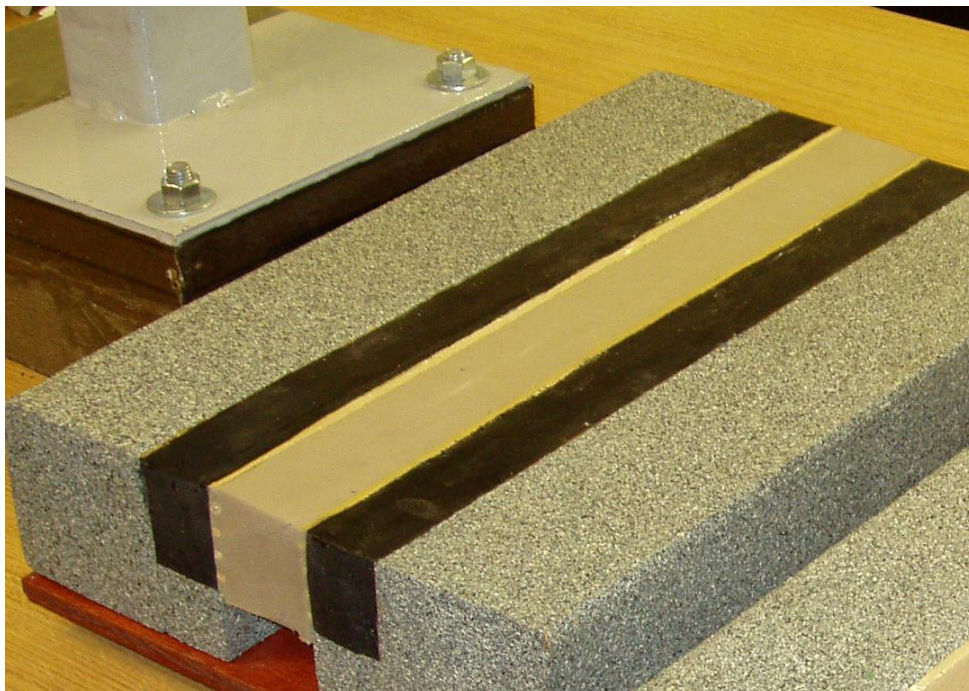


- After a section of the joint has been installed and recessed into the opening, the surface of the material must be cleaned. A thick layer of excess adhesive can cause cracking and impede the movement of the foam joint seal with the substrate.
 - This should be done continuously throughout the installation process to avoid the Bonder #1 curing on top of the foam joint seal.
 - Once the Bonder becomes tacky, it can be extremely difficult to remove from the surface of the joint seal.
 - Bonder can be scraped off using a margin trowel or putty knife. It is beneficial to leave a small bead of adhesive along the top edges of the joint, this is best accomplished by using a putty knife or trowel. NO solvents should be used to remove the Bonder from the surface of the joint seal.
 - Surrounding concrete and joint materials can be cleaned off using denatured alcohol.
- Upon completion of the cleanup, the spill protection can be removed exposing the newly constructed or replaced joint.
- The CEVA® Expansion Joint System can be returned to service immediately after the spill protection is removed.
 - In applications subject to dynamic movement (bridge deck applications) due to traffic loading, it is recommended that the Bonder #1 is allowed to reach its initial set time (approx. 3 hours at 75°F) prior to resuming traffic.

CEVA® 100 System Sample (Beige Bonder #1 and Physzite 380)
Notice thin bead of Bonder on surface of foam and ESP grooves filled with Bonder #1.



CEVA® 250 System Sample (Beige Bonder #1 and Physzite 380 With ECrete Header)



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