

# PHOSCRETE-EJ™

## Expansion Joint System

### General Detail Sheet

#### 1.0 DESCRIPTION

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1.1 **Phoscrete-EJ Expansion Joint System** is the combination of a certified-compatible Phoscrete MPC cementitious concrete nosing material and a certified-compatible joint sealant. Phoscrete-EJ offers unique advantages for owners and contractors in the installation of expansion joints for both rehabilitation and new construction.

1.2 The Phoscrete-EJ expansion joint system of certified-compatible Phoscrete MPC + joint sealant is fast and easy to install and does not require highly specialized contractors. Both nosing and joint sealant materials install fast to quickly to open lanes to traffic. Once demolition and site preparation are properly completed, Phoscrete-EJ helps contractors and bridge maintenance crews easily complete expansion joint installations. For example, two [2] interstate bridge lanes – nosing and seal – can typically be fully open to traffic as soon as three [3] hours after the *first* mix of Phoscrete MPC.

1.3 Phoscrete-EJ allows workers to complete more work in less time, saving the high cost and time of extended lane closures to state and local agencies, contractors, and the driving public.

#### 2.0 PHOSCRETE-EJ CERTIFIED-COMPATIBLE MATERIALS

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2.1 **Phoscrete MPC Nosing Materials** consist of two-component (dry mix + liquid activator) Magnesium-Phosphate Cement concretes that form joint nosings (headers). MPC concretes set fast, allowing for expansion joint seal installation in the same lane closure, and for rapid return to service.

2.1.1 Properties of Phoscrete-EJ Certified-Compatible MPC Concrete Nosing Materials

- High-early and ultimate strengths (compressive, bond, tensile, and flexural).
- Similar thermal coefficient of expansion of MPC concrete to that of the existing concrete deck.
- Easy to mix, place, finish, and cleanup
- Long-lasting and durable in challenging environmental conditions, including resistance to corrosion, deicing salts, and freeze/thaw damage.

2.2 **Joint Sealant Materials** provide a durable watertight seal on concrete pavement joints that experience thermal movement.

2.2.1 Phoscrete-EJ Certified-Compatible Joint Sealants are typically either:

1. Pre-compressed, self-expanding, silicone-impregnated foam that bonds to the cementitious joint nosing material using epoxy adhesive, *or*
2. Pourable, cold-applied silicone joint sealant with backer rod

**PHOSCRETE-EJ™**  
**Expansion Joint System**  
**Certified Compatible Materials**

**3.0 PHOSCRETE-EJ CERTIFIED-COMPATIBLE MATERIALS**

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**3.1 MPC CONCRETE NOSING MATERIALS**

**3.1.1 Phoscrete Formula 1-HC (F1-HC):** MALP (Mono Aluminum Liquid Phosphate) concrete with very high early bond and compressive strength and the ability to set fast even in sub-freezing temperatures. F1-HC is typically traffic-ready after one hour at 70°F (21°C).

**3.1.2 Phoscrete Formula 3-HC (F3-HC)** MKP (Mono Potassium Phosphate) concrete with high early bond and compressive strengths and longer working time for hot temperatures and larger volume pours. F3-HC is typically traffic-ready after two hours at 70°F (21°C).

**3.2 JOINT SEALANT MATERIALS:**

**3.2.1 Willseal® 250B:** Pre-Compressed, self-expanding, tensionless, watertight sealant with a silicone impregnated surface. Willseal's watertight joint allows for up to 100% (±50%) movement and maintains its performance properties over time in harsh environmental conditions. Willseal 250B is particularly suited for joints subject to shear and rapid movements.

**3.2.2 EMSEAL® BEJS (Bridge Expansion Joint System)** is a traffic-durable bridge and roadway expansion joint which provides a primary watertight seal. The system is comprised of a pre-compressed, silicone-and-foam hybrid installed into field-applied epoxy adhesive on the joint faces.

**3.2.3 DOWSIL™ 902 RCS Joint Sealant plus Backer Rod:** A self-leveling, cold-applied, rapid-cure, two-part, easy-to-install, ultra-low-modulus, 100 percent silicone rubber sealant designed to seal expansion joints that experience both thermal and/or vertical movements due to traffic loading.

**3.2.4 DOWSIL™ 888 Silicone Joint Sealant plus Backer Rod:** One component, cold applied, ready-to-use as supplied; dispensed directly from the bulk container into the joint by hand or with an air-powered pump. Effective for sealing transverse contraction and expansion joints, longitudinal, center line, and shoulder joints.

**3.2.5 PECORA® 322FC Silicone Joint Sealant plus backer Rod:** A two-part, cold-applied, self-leveling, fast-curing, ultra-low modulus, 100% silicone material designed for sealing of concrete pavement joints experiencing thermal movement. Pecora 322FC cures to a resilient silicone rubber seal in a very short time when compared to a typical one-part moisture cure sealant.

**Contact Phoscrete regarding compatibility and certification of joint sealants with Phoscrete-EJ.**

**PHOSCRETE-EJ™**  
**Expansion Joint System**  
**Construction Specifications**

**4.0 INSTALLATION PROCEDURE**

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4.1 The Engineer will determine whether the joint opening is adequate for the anticipated movement of the bridge deck structure and within the movement capability of the expansion joint seal

**4.2 NOSING INSTALLATION PROCEDURE**

Use only Phoscrete-EJ certified-compatible MPC concrete nosing materials. The size of the expansion joint block-outs shall be set up in line with the project design. Follow Phoscrete's Expansion Joint Installation and Repair Guides for complete instructions on surface preparation, primer application, admixture usage, mixing, placement, finishing, and curing; and when sealing can begin. Always grind the nosing corner to a 45 degree angle prior to joint sealant installation.

**4.3 JOINT SEAL INSTALLATION PROCEDURE**

Use only Phoscrete-EJ certified-compatible joint sealant materials. Follow Manufacturer's Installation Guide for Expansion Joint Seal Installation and Repair Guide for complete instructions on substrate preparation, installation, and finishing; and time to wait until installation is cured sufficiently to open lanes to traffic.

**4.4 APPLICATION OF JOINT SEAL TO NOSING**

Joint Sealants can be applied against the formed nosing no sooner than 15 minutes following initial set, and when the substrate temperature has cooled below 100°F (40°C).

- Verify that header surface is uniform, clean, and sound
- Use compressed air to clean any loose debris.
- Apply water or alcohol to a clean cloth and wipe the joint walls to the depth of the sealant material plus an additional one inch (1") below.
- Check for appropriate length, width, and depth of the joint material. Pre-compressed materials must arrive in a size smaller than the intended joint opening
- Joint depth must allow for the installed material to be recessed 1/4" from the substrate surface.

**5.0 Traffic Open Times**

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5.1 When installed as a system during the same lane closure, Phoscrete-EJ may typically be opened to traffic one hour after completing installation of joint seal.

**6.0 REPAIR**

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**6.1 NOSING**

Follow procedure above for site preparation and nosing installation. Note that MPC bonds strong to itself with no cold joints in the case of a partial joint repair.

**6.2 JOINT SEALANT**

Cut out the damaged portion of the joint seal, square to the termination point. Abrade the epoxy from the Phoscrete surface. Cut a replacement piece with overlap. Follow installation procedure above applying epoxy, joint splice adhesive and silicone bead.

# PHOSCRETE-EJ™

## Expansion Joint System

### 7.0 CLEAN UP

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#### 7.1 NOSING:

In-between batches, clean tools with a damp cloth towel. When the job is completed, clean tools, buckets, clothes, and boots with water.

#### 7.2 JOINT SEALANT

After work is complete, clean exposed surfaces with a suitable cleaner that will not harm or attack the finish.

### 8.0 Packaging

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#### 8.1 NOSING AND JOINT SEALANT

Refer to Manufacturer's technical data sheets for packaging and coverage.

### 9.0 Storage & Handling

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#### 9.1 NOSING

Refer to Manufacturer's technical data sheet for storage and handling. Dry Mix typically has a 24-month shelf life, and the Liquid Activator has 12-month shelf life if stored in clean, dry locations, out of direct sunlight.

- The two components must be kept in the original, unopened packaging. Avoid contact with moisture.
- Do not use components that have exceeded their shelf life.
- Deliver the material in an undamaged, factory-sealed package. Verify that the manufacturer's labels are intact and legible.
- Labels must include brand, product name, weight, system identification number, and batch number, with verification of date of manufacturing and shelf life.

#### 9.2 JOINT SEALANT

Refer to Manufacturer's technical data sheets for storage and handling

- Labels must include brand, product name, weight, system identification number, and batch number, with verification of date of manufacturing and shelf life.
- Do not use components that have exceeded their shelf life.
- Deliver products to site in Manufacturer's original, intact, labeled containers.
- Handle and protect as necessary to prevent damage or deterioration during shipment, and storage.

### 10.0 Safety

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#### 10.1 NOSING AND JOINT SEALANT

Refer to Manufacturer's Current Safety Data Sheet and Installation Guidelines

**PHOSCRETE-EJ™**  
**Expansion Joint System**

**11.0 Temperature Considerations**

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**11.1 NOSING:**

Typically, MPC concrete nosing materials can be applied at temperatures between -5°F (-20°C) and +105°F (40°C). Refer to Phoscrete’s “Cold Temperature Guidelines” and “Warm Temperature Guidelines” documents and/or contact the Manufacturer for best practices using Phoscrete Fast-Set admixture to speed set time, using Phoscrete Slow-Set admixture or cooled activator jugs to extend working time.

**11.2 JOINT SEALANT:**

Refer to manufacturer’s technical data and installation guide for use in extreme temperatures. Typically, in warm conditions, do not install joint sealant material when substrate, or ambient temperatures are above 95°F (35°C). Typically, in cold conditions, do not install joint sealant material when substrate, or ambient temperatures are below 41°F (5°C). Note that the exothermic reaction of MPC concrete may allow installation of joint sealant in colder ambient temperatures.

**12.0 General Information**

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**12.1 DOCUMENTATION REVIEW**

Installation crews should familiarize themselves with product data and procedures prior to beginning installation.

**12.2 METHOD OF MEASUREMENT**

Measure the area covered by the MPC Concrete in cubic feet, accounting for a minimum depth of 2” or as shown in the contract documents or as required by the Engineer.

**12.3 BASIS OF PAYMENT**

The department will pay for each pay item at the contract unit price per the specified pay unit as follows:

<i>Phoscrete-EJ Certified Compatible Joint Headers</i>	<i>Linear Foot</i>
<i>Phoscrete-EJ Certified Compatible Joint Sealant</i>	<i>Linear Foot</i>

The owner will consider the cost of all materials, equipment, labor, and incidentals necessary for proportioning, mixing, delivery, storage, handling, surface preparation, installation, sampling, and testing of Phoscrete-EJ to be included in the unit price bid.