

**Elephant
Armor®**



Frequently Asked Questions

What is unique about GST International's Elephant Armor®?

- Unlike other mortars, Elephant Armor® (EA) is a single component, fiber based, zero polymer, engineered ductal mortar. It is very easy to use, even in remote places – Just Add Water.
- EA contains no polymers, allowing it to accept stains, tints, or any other color pigments (other than white).
- In addition to the mechanical bond, our fiber creates a fully engaged molecular bond within the mortar matrix, providing extremely high tensile and flexural strength. This also means EA has vastly superior bond strength to anything on the market.
- Elephant Armor® is a 'highly ductile mortar', which allows the overlay or repair to 'Flex Without Failure'.
- Elephant Armor® is highly resistant to de-icing salts and freeze/thaw.
- Elephant Armor® inhibits propagation of existing cracks through the surface.
- Elephant Armor® contains a patented low embodied energy high cementitious formulation, a green technology that reduces our carbon footprint through resource conservation and reduced landfill waste.

How many square feet per 50lb bag does Elephant Armor® cover?

When using a **GST Texture Roller** (looped roller), with specially developed **GST ¼" Cap Gauges**, a 50 lb. bag will cover approx. 22 sq. ft. Using ½" gauges with the **GST Texture Roller**, that number goes down to 11 sq. ft. per bag. Total yield per 50 lb. bag of EA is ½ cubic foot.

Are Fiberglass Fibers used in Elephant Armor®?

No, the fibers used are a highly specialized Polyvinyl Alcohol.

Is Elephant Armor® an Exothermic Material?

Yes – **What does that mean?** Heat and sunlight will expedite the cure process.

Can you slow down or speed up the curing process? Yes, colder water in the hot months will extend the working time and warmer water in the cold months will expedite the curing process.

When used in volume (multiple bags), the EA will create a lot of heat and will cure (stiffen up) quickly.

Can Elephant Armor® be stained?

Yes, EA contains no polymers, allowing it to accept stains, tints, or any other color pigments (other than white).

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Can Elephant Armor® be stamped or broomed?

Yes, Elephant Armor® accepts all textures including stamped or broomed. A smooth finish with a GST Squeegee Trowel can also be achieved.

Do I need to use an Elephant Armor® Primer with Elephant Armor®?

Surfaces to be treated with Elephant Armor® must be clean, sound and free from contaminants that can act as a bond breaker (such as oil, grease, dirt, curing compounds, acids, etc.)

Once this is done you must prepare the damaged surface using **one of the following** methods before applying the Elephant Armor®:

1. EA Primer Slurry Bond Coat: The EA Primer/Slurry bond coat serves to enhance the bond strength between the damaged substrate and the Elephant Armor® repair material. The slurry coat, when mixed with 2 parts Elephant Armor® to 1 part EA Primer, provides for easy application on the damaged substrate using a roller or stiff masonry brush. If there is any exposed steel or rebar, apply a rust inhibitor first. Pay special attention to the corners, sides and any exposed rebar.

Elephant Armor® Primer can also be used in a NEAT application. This application conforms to the structural bonding requirements of ASTM C 1059-13, Type II.

However, whether Elephant Armor® Primer is NEAT or in a slurry application, failure *will* occur in the form of a bond-breaker if in either application the EA Primer is improperly used, for example over-applied (pooling) or allowed to dry.

Important! It is crucial that the slurry coat does **not** fully dry before placing the Elephant Armor®. The wet and tacky nature of the slurry coat helps retain moisture in the substrate, preventing premature drying and ensuring a favorable environment for the bond to develop.

[More information on EA Primer Slurry Bond Coat®](#)

2. Saturated Surface Dry (SSD): SSD is a common practice in the concrete repair industry and may also be used with Elephant Armor®, however there are certain considerations that should be kept in mind.

The repair area must be clean and free of all dust, debris, oil and organic stains. Dampen the repair area and place the Elephant Armor® using the appropriate tools and finishing techniques specific to the job. It is important that there is no standing water or pooling on the repair area prior to placement of the Elephant Armor®.

[See more information on SSD.](#)



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Can Elephant Armor® be polished?

Yes, EA can be polished. Please contact your local Elephant Armor® Representative for information.

Can you use a grinder on cured Elephant Armor®?

Yes, Elephant Armor® grinds well. It is the **preferred** method in certain applications such as curb and spall repairs.

Is a special mixer required?

Yes! The **ColloMix Xo55 Duo** (available from your EA dealer) is mandated for mixing Elephant Armor®, due to its high fiber content. The **ColloMix Xo55 Duo** provides the high sheer required for a homogeneous mix.

What is Ecobeton® Vetrofluid and why should we use it?

Ecobeton® Vetrofluid® is a formula of proprietary catalysts and selected silicates that penetrates existing concrete to depths of 1½" on average and penetrates and permanently protects new concrete as a cure up to 3". Vetrofluid® seals the pores of the concrete and becomes a permanent barrier, when applied to either the positive or negative pressure side.

1. Vetrofluid® permanently waterproofs, hardens and protects all types of concrete. In cases where the area to be repaired is severely degraded, an application of Ecobeton® Vetrofluid® should be applied to restore the stability and integrity of the substrate. Allow at least 72 hours for the Vetrofluid® to cure prior to continuing the Elephant Armor® repair. More about Ecobeton-USA® Vetrofluid®.
2. After the Elephant Armor® repair has fully cured a minimum of two hours, it is advisable to apply another light coat of Vetrofluid®. This additional application of Vetrofluid® helps further enhance the longevity of the repair by providing an extra layer of protection and strengthen the bond between the repair material and the substrate.

Do you mix Elephant Armor® the same way you mix other concrete products?

No, the amount of water required is very specific. You have to be consistent with your water measurements every time. For a 50 lb bag, you typically use between 5.5 - 6.5 qts. (5.2 - 6.2 liters) of water – no more. All of the water should be poured in at one time; the water does not need to be slowly mixed in. Elephant Armor® recommends having one individual dedicated to the mixing of the material for larger projects, ensuring consistent color and material rheology.

The exact measurement of water allows for an efficient mixing process. Two bags of Elephant Armor® (100 lbs.) can be mixed in a **GST EA 70 Quart Mixing Bucket** in less than 90 seconds, realizing additional labor savings.

Excessive water and/or over-working the material, may cause the fibers to be exposed on the surface.

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Does Elephant Armor® need to be 'fluffed up' prior to mixing?

Yes, due to transportation and storage EA may become compacted. It's recommended that the bag be 'rolled' prior to placing material in the **EA 70 Quart Mixing Bucket**. Once the EA is in the bucket, prior to adding the water, dry mix (fluff) the EA using the **ColloMix Xo55 Duo** ensuring proper water integration. [Watch our EA Mixing Video.](#)

Do I need any special tools to place Elephant Armor®?

Yes! Unlike traditional concrete, you will need a **GST International Texture Roller** to properly spread Elephant Armor®, and a **GST International Squeegee Trowel** for finishing. You can use standard industry cementing tools once the Elephant Armor® has achieved initial set.

What happens when you try to use a metal trowel instead of a Texture Roller to spread EA?

The metal trowel will 'grab and pull' the material away from the repair, as opposed to the texture roller forcing the material into the repair, which ensures a proper bond.

How much pressure do you need to spread out Elephant Armor® using a Texture Roller?

Appropriate pressure of the **GST Texture Roller** will vary due to the flowability/workability of the Elephant Armor® and the specific application.

Are there additional considerations when working with Elephant Armor®?

- Always have several extra 5-gallon buckets of water around your work station to keep your tools clean, as EA is fast setting.
- Immediately upon completion of mixing Elephant Armor®, spin the ColloMix paddles in a bucket of water to clean them.
- Pump up spray bottles are also required: one with clean water and another with **Ecobeton Vetrofluid**. [Read more about Ecobeton Vetrofluid.](#)
- Approximately 2 hours after final placement, and the product achieves final set (lightens in color), it's strongly recommended that you apply a light coat of **Ecobeton Vetrofluid** on the completed repair.

Can Elephant Armor® be used to make counter tops or water features?

Yes, counter top or water-feature construction are examples of reverse-casting. EA is used extensively in the manufacturing of outdoor kitchen industry. These are just a couple of the many possible uses for Elephant Armor®.

What is the PSI rating of Elephant Armor®?

Over 4000 psi in 4 hours, with the ultimate strength at 28 days of approximately 7000 psi.

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What is the recommended thickness of overlays using Elephant Armor®?

Elephant Armor® is highly structural at 1/4" - 1/2". For thicker overlays, consult your local EA representative.

Can Elephant Armor® be used for vertical or overhead repairs?

Yes, EA is currently used extensively on bridge, tunnel, seawalls and many other vertical and overhead repairs. Contact your local Elephant Armor® Representative for project specific details.

What are the benefits of using Elephant Armor®?

EA eliminates the need for the full de-construction/re-construction process, realizing substantial labor & material savings. This also allows for a quick return to service.

How long has Elephant Armor® been around?

Elephant Armor® has been in development for over the last twenty-seven years, and has been commercially available since 2013.

What is the ideal size of a mixing container?

GST 70 qt. Mixing Buckets are ideal for mixing up to two bags at a time. The use of 5 gal. buckets, except when mixing less than half a bag, is not recommended.

Can a Hippo mixer or 1/2" drill be used to mix Elephant Armor®?

No! The ColloMix Xo55 Duo (available from your EA dealer) is mandated for mixing Elephant Armor®, due to its high fiber content. The ColloMix Xo55 Duo provides the high sheer required for a homogeneous mix.

What is the recommended practice for larger projects?

Larger jobs where you will be mixing multiple bags (or pallets) should have a crew of at least 5 people. Each person should have a dedicated task with at least 1 person dedicated to mixing EA, and at least two people focused on finishing. One person should be a floater and responsible for cleaning tools and supporting the rest of the crew.

What is the recommended practice for 'deep fill' (greater than 2")?

If a deep fill is required, the preferred method is to **Fill and Cap** the spall in at least two layers, with the final cap layer not to exceed 1/2" thick. Since EA will create heat in volume, it is extremely important to time when the final cap gets placed. If the volume has attained initial set and hasn't created a lot of heat, the final cap can be placed immediately. If it has begun to create heat, it is critical to wait until the initial fill has fully set and cooled before placing the final cap. You don't want to place the final cap on the initial EA fill if it is still creating heat, as it will 'cook' the cap and make it impossible to finish properly.



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Can small spalls which exceed 2" in depth be filled in a single pass?

Yes, as long as the area does not exceed 12" in diameter. For larger areas, the 'fill and cap' method is recommended.

Can Elephant Armor® be placed over an existing Segmental Paver System?

Yes, Elephant Armor® can absolutely be placed over an existing paver system, as long as the pavers have **never been sealed**. This proven two step practice has been utilized in this type of application in the past. A highly flowable 'wet fill' mix is poured to fill the chamfers of the pavers which will leave a smooth and level surface for the placing the 1/4" overlay. This overlay will accept any standard concrete finish. The pavers don't have to be grouted or mortar set as the initial 'wet fill' will lock them down and tie them together.