



Global Sealer Technologies

Elephant Armor[®]



The World's Most Amazing Cementitious Repair and Overlay Product!



Lake Street Bridge – Reno, NV

- Fiber reinforced: Superior flexural and tensile strength as thin as 1/4".
- High ductility, allowing the overlay or repair to 'FLEX' without failure.
- Resists de-icing salts, freeze/thaw.
- Superior tensile strain capacity over other cement based products for improved crack resistance.
- Superior bond strength to that of other fiber and acrylic based mortars.
- Ideal as a structural underlayment.
- Prevents the propagation of existing cracks through the surface.
- Highly impermeable and abrasion resistant.
- Unparalleled as a stampable overlay.

Available in 3 Formulations



Just Add Water

PATENTED



The World's Most Amazing Cementitious Repair and Overlay Product!

Can Your Concrete Do This?



What Sets Elephant Armor® Apart From Every Other Repair and Overlay Mortar in the Industry?

Unlike other mortars, Elephant Armor® is a single component, fiber based, zero polymer, engineered ductal mortar. 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 our product has vastly superior bond strength to anything on the market and will significantly reduce the potential for failure.

Elephant Armor's ability to flex and take movement is a result of our unparalleled volume of fiber loading within our patented design matrix. These unique characteristics allow Elephant Armor® to be placed directly over severely broken and degraded surfaces. Even in heavily trafficked areas, Elephant Armor® will greatly reduce the risk for spalling and delamination, eliminating the need for traditional remove and replace practices. Elephant Armor's unmatched durability, efficiency and reliability will significantly reduce costs in the repair and restoration of our failing infrastructure.

Our patented Elephant Armor® Engineered Ductile Mortars contain a low embodied energy high cementitious formulation. This green technology product reduces our carbon footprint, through resource conservation and reduced landfill waste. 🌱

Ideal for infrastructure repair and overlay use on concrete walkways, driveways, curbs, ramps, slabs, spalls, cracks, bridges, parking structures, tunnels, dams, industrial plants or anywhere a high strength concrete repair mortar is required.

Active Runway or Busy Highway, Elephant Armor® is the Permanent Solution

GST International's Elephant Armor® is designed to limit catastrophic failure no matter what material it is applied over. Its ability to micro-fracture and flex over moving surfaces, reduces the potential for structural cracking. Surfaces include: concrete, asphalt, steel, wood and EPS structural foam. More importantly, it is the only product on the market that can be applied over existing cracks and limit the propagation of those cracks through the new Elephant Armor® surface.



Street Repair – City of Sebastopol, CA

It is no longer necessary to follow traditional **Remove and Replace** methods of repair for failing concrete roadways. By significantly reducing the time of repair, a new lifecycle can be achieved with minimal environmental impact. This will also reduce repair costs by as much as 75%.



Failing broken and degraded concrete panel.



Elephant Armor® being applied using a roller.



Repair completed with a broom finish.



After three years of continuous service.

Significant cost savings without the need for deconstruction – Annacis Island, Vancouver, BC



Distressed concrete road in high traffic industrial area.



The area is primed with Elephant Armor® Primer and large cracks filled with Elephant Armor®.



Place and finish Elephant Armor® (see page 11 for recommended tools).



Roadway repaired for use in a matter of hours. Traffic volume in excess of a hundred trucks per hour.

Sidewalk Trip and Fall Hazard Repair— Los Angeles, CA

Trip and fall hazards are an extremely common problem in almost every city. Elephant Armor® allows you to permanently repair a trip and fall hazard, extending the lifecycle and giving you the look and longevity of a newly poured sidewalk.



A trip and fall liability hazard.



The area was resurfaced with Elephant Armor® without deconstructing the failed surface.



Finished repair with a new lifetime of service. Open for use within two hours of placement.

MTSU – Murfreesboro, TN

A sidewalk repair demonstration was performed at Middle Tennessee State University in conjunction with their CIM program to compare traditional **Remove and Replace** repair methods with Elephant Armor® encapsulation. The study proved that using Elephant Armor® reduced the repair time by over 80% and significantly lowered the repair cost. This also reflects minimal impact on businesses and homeowners.



A severely cracked and degraded sidewalk.



Applying Elephant Armor® using GST's specialty rollers and tools. (see page 11)



Finished project opened to foot traffic within an hour of completion.

Sidewalk Repair – Minneapolis, MN

Elephant Armor® was used on this sidewalk repair to eliminate multiple trip and fall hazards. Working around utility covers often requires deconstruction of existing concrete. Elephant Armor® allows the contractor to reconstruct without removing the failed sidewalk panel.



Severely degraded sidewalk causing trip hazard.



No forming was necessary to extend the life cycle.



Open for use in less than 2 hours.

City Street Spall Repair – Los Angeles, CA

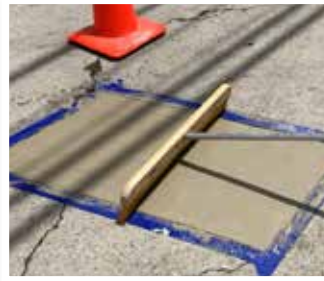
Elephant Armor's **Fill and Cap** procedure allows you to permanently and efficiently repair deep spalls in city streets, sidewalks and highways, allowing for a quick return to service. Major cracks or depressions are pre-filled, then a quarter inch structural cap is placed over the top.



Cracked and spalled concrete.



Cracks are pre-filled with Elephant Armor®.



Structural cap is placed, and a broom finish is applied.



Spall repair one year after placement.

Post Office ADA Ramp Resurfacing – Salem, OR



Elephant Armor® rolled over pre-primed surface using 1/4" gauge.



Overlay being finished using traditional finishing tools.

Curb Repair – Vancouver, BC – Brock White Construction Materials, CSG Group



Damaged curb was repaired without deconstruction or forming.



Unprecedented performance with over 5 years of continuous traffic abuse.

Sea Wall Repair – New London, CT



Removal of loose debris, pressure washing, and steel remediation are part of the reconstruction of this sea wall. Proper preparation before Elephant Armor® is installed will ensure longevity and lessen future degradation. Workers were able to reconstruct without any deconstruction by applying the Elephant Armor® in 2" lifts, eliminating the use of forms. Elephant Armor® was applied with trowels and then rolled into place. The final finish was achieved with smooth rollers* (*see page 11). Because Elephant Armor® can be rolled on instead of troweled, considerable labor savings are attained. This method of reconstruction drastically reduced the overall cost of the project, in comparison to deconstruction and rebuild.

Sea Wall Repair for National Park Service – San Francisco, CA



Severely degraded sea wall repaired three years ago using Elephant Armor®

This historic Sea Wall in San Francisco which had been severely damaged by long term exposure to salt water, was given new life by encapsulating it with Elephant Armor® Ultra High Performance Mortar. Treated with GST's Stain Block Elite sealer, this historic monument should see decades of new life without future failure.

Sea Wall now impervious to degradation from constant exposure to salt water.

Vertical repairs made easy without deconstruction and forming with Elephant Armor®

Hershey Park Stadium – Hershey, PA

Elephant Armor® for vertical repair in pre-existing structures eliminates traditional demolition.



Vertical Repair of Severely Damaged Concrete – Pittsburg, PA



Severely degraded vertical wall.



A slurry coat primer is applied prior to Elephant Armor® placement.



The degraded wall has been given a new life cycle and a brand new appearance.

The Making of a Wine Cave with Elephant Armor® – Nine Suns Winery, Napa Valley



Spray on Elephant Armor® for a structural and architectural finish, greatly reducing construction costs.

Elephant Armor® has successfully been used in harsh and remote environments where access with conventional methods would be very costly.

*By using Elephant Armor® on the **Slide Mountain KTVN Tower Base Repair**, located at 10,000 ft in the Sierra Nevada Mountains, there was a 75% reduction in costs vs the traditional repair method specified.*



Spalled concrete with exposed rebar.



Elephant Armor® applied with rollers and trowels.



Slide Mountain KTVN Tower

Finished repair.

Barge Repair – Matson Inc



Existing surface cleaned, prepared and primed with Elephant Armor® Overlay Primer.



Elephant Armor® overlay is rolled and finished over existing primed concrete to a thickness of 1/2".



This permanent repair can be done at a fraction of the cost and at a significantly reduced time frame.



Elephant Armor® offers endless opportunities for unique and difficult repair situations due to its exceptional compressive, flexural and tensile strength capabilities. Working with Matson Inc., one of the world's largest trans oceanic shipping companies, GST International has developed a new and unique system for repairing the degrading steel decks on their ocean going ships and barges.

Once the steel on these barge decks degrades due to the constant exposure to seawater, the traditional method of repair has been to pour a 3" to 4" steel reinforced concrete topping slab over the failing surface. While this protects the failing steel, it also adds a tremendous amount of weight, severely restricting the amount of payload the ships can carry. With the Elephant Armor® overlay system, these barges can be resurfaced using a minimal amount of material to achieve a better and more permanent repair. The decks require only 1/2" of the Elephant Armor® material, (placed in 2, 1/4" lifts) thereby not restricting the payload weights that can be transported. This permanent repair can be done at a fraction of the cost and at a significantly reduced time frame.

Over 1,000,000 lineal feet placed in Nashville, TN

Elephant Armor® Ultra-High Performance Asphalt Repair is a single component, black, all cementitious, fiber reinforced, fast setting mortar that is ideal as a micro-trenching reinstatement material. For high rate production, it can be placed with a pump system specifically designed for this application. 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.

- Elephant Armor® Engineered Ductile Mortars contain Proprietary High Performance Fibers meeting requirements of ASTM C-1116.
- It offers high early and superior bond strength.
- Unlike other reinstatement materials, Elephant Armor® can be easily milled.
- Unlike other reinstatement materials, Elephant Armor® does not emit offensive chemical or toxic odors.



Elephant Armor® Asphalt Repair & Micro-Trenching Reinstatement Material

Elephant Armor® Asphalt Repair being line-pumped into roadway micro-trench for fiber optic cable installation, using a volumetric mixer for an odor free, environmentally friendly, cost effective solution.



Elephant Armor[®] Ultra High Performance Mortar/Overlay

Unparalleled as a Stampable Overlay

- readily accepting all forms of pigments and stains.
- allows the accelerated use of stamps, skins and rollers, greatly reducing labor and expense.
- can be placed over new or existing flexible substrates such as plywood or masonite.



For best results, use Elephant Armor® Tools & Accessories



9" (230mm) and 18" (450mm)
Smooth Roller



9" (230mm), 9½" (240mm) and 18" (450mm)
Textured Roller



Elephant Armor® Cure provides an effective curing membrane that will dry to a clear (non-yellowing) membrane.



Elephant Armor® Primer is a high solids, acrylic polymer latex bonding agent specifically designed to be used with Elephant Armor® on any concrete or asphalt surface.



Elephant Armor® Overlay Primer is a ready to use, rewettable polyvinyl acetate bonding agent, which bonds Elephant Armor® mortars to properly prepared concrete, and between Elephant Armor lifts. It can also be used to bond to wood and EPS foam.



Elephant Armor® Delay to increase working time. (comes with measuring scoop)



Expandable Aluminum Roller Frame
(rollers not included)



Showing Expandable Roller Frame at 9" to 18" with ¼" and ½" depth gauges (sold separately)



Aluminum Roller
with ¼", ½" and ¾" Depth Gauges
(sold separately)



¼" and ½" Roller Depth Gauges
for 9", 9½" and 18" rollers

ColloMix Xo 55 Duo
Heavy work – made lighter
The counter-rotating hand-held mixer makes lots of mixing jobs easier and quicker. There is no counter-torque on the user and the machine is easy to move even in heavy and viscous material. You can generally count on being finished in just half the time.

**Mandatory for mixing
Elephant Armor® Mortars!**



GST 2 Gallon Pump-up Sprayer
for application of Elephant Armor® Cure and Primer



GST Sprayer Tips
for GST 2 gallon pump-up sprayer

DESCRIPTION

Elephant Armor® is a single component, cementitious, fiber based, medium to fast setting, zero polymer, repair and overlay engineered ductal mortar. In addition to a mechanical bond, our fiber creates a fully engaged molecular bond within our patented mortar matrix, providing extremely high tensile and flexural strength. It can be placed with a textured roller (*preferred method*) or traditional placement tools.

FEATURES / BENEFITS:

- Fiber reinforced: Superior flexural and tensile strength as thin as ¼”.
- High ductility, allowing the overlay or repair to ‘FLEX’ without failure.
- Resists de-icing salts, freeze/thaw.
- Superior tensile strain capacity over other cement based products for improved crack resistance.
- Superior bond strength to that of other fiber and acrylic based mortars.
- Ideal as a structural underlayment.
- Prevents the propagation of existing cracks through the surface.
- Highly impermeable and abrasion resistant.
- Unparalleled as a stampable overlay.

SHELF LIFE

2 years in original unopened package if stored in a humidity controlled environment. Cannot be exposed to moisture.

PACKAGING

- 10 lb (4.5 kg) plastic pails
- 50 lb (22.7 kg) plastic lined bags

COVERAGE/YIELD

A 50 lb (22.7kg) bag of Elephant Armor® Mortar will yield approximately 0.38 ft³ (0.01 m³) of material.

Applied at the following thicknesses, one 50 lb (22.7 kg) bag of Elephant Armor® Mortar will cover:

- ¼” (6.3mm) – 18.75 ft² (1.74 m²)
- ½” (12.7mm) – 9.3 ft² (.86 m²)

Note: Coverage rates are approximate

PRIMARY APPLICATIONS

Walkways, curbs, ramps, slabs, spalls, cracks, bridges, ICF walls, parking structures, tunnels, dams, industrial plants or anywhere a high strength concrete repair mortar is called for. Structural monolithic underlayment or overlay for interior and exterior applications.

DIRECTIONS FOR USE

Surface Preparation: Repair surfaces must be clean, sound, and free from contaminants that can act as a bond breaker (such as oil, curing compounds, acids, and dirt).

Mechanical preparation options:

1. Fastest method for vertical and overhead preparation: Pressure washing, hydro blasting or sand blast to remove the cream of the concrete, paints or other contaminants. If pressure washing, hydro blasting or sand blasting does not remove contaminates go to step #2.
2. Fastest method for horizontal preparation: Mechanical grind the concrete surface using metal bonded tooling (16 grit or 35 grit) using walk behind grinders with vacuum systems. Hand held grinders with shrouds, vacuum and metal coarse wheel.

Priming – For best practices refer to **Primer Application Guidelines** on our website.

A Slurry/Bond Coat is a blend of Elephant Armor® with enough undiluted Elephant Armor® Acrylic Primer to make a paint-like consistency. If there is any exposed steel or rebar, first apply a rust inhibitor. Work slurry into the repair area or substrate with a stiff masonry brush coating the entire area. Pay special attention to the corners, sides and any exposed rebar. Place Elephant Armor® prior to the slurry coat becoming tack-free. Elephant Armor® Acrylic Primer can also be used in a NEAT application. This application conforms to the structural bonding requirements of ASTM C 1059-13, Type II.

Elephant Armor® Overlay Primer is a ready to use, rewettable polyvinyl acetate bonding agent, which bonds Elephant Armor® mortars to properly prepared concrete and also between Elephant Armor® lifts. It can also be used for bonding to wood and EPS foam. The Elephant Armor® Overlay Primer must be completely dry and tack free (1-3 hours) prior to placing the Elephant Armor®. Recommended for interior and exterior use that is not subjected to constant moisture, hydrostatic pressure or continuous water saturation.

Elephant Armor® Overlay Primer meets requirements of ASTM C 1059-13, Latex Agents for Bonding Fresh to Hardened Concrete Type I.

Mixing:

Stir the dry contents prior to adding approximately 1¼ - 1½ gal. of water and thoroughly mix with a dual shaft power mixer. (*example: ColloMix Xo 55 Duo, see page 11*) Due to our unique product design, this type of mixer is required to insure sufficient shear capacity needed to properly provide a homogeneous mix. Do not use a dry wall paddle blade. While mixing, ensure there is no unhydrated Elephant Armor® on the sides or bottom of the bucket, as this will alter the water/cement ratio. Continue mixing until the mixture is lump free and has achieved the desired consistency (slump) for your application. When mixing our ten pound buckets or a small amount of Elephant Armor®, a ½” drill or larger, using an egg beater, mortar or Jiffy Bit can be used. Actual mixing time will depend on mixer speed, shear capacity, and desired consistency or flow required.

Application:

- Can be placed with a textured roller (*preferred method*) or traditional placement tools.
- ¼” and ½” gauges are available to be attached to the textured rollers for a more even finish.
- Do not over trowel. Wait for initial set before applying final trowelling or a smooth roller finish. Initial set has begun as soon as the ‘bleed water’ begins to dissipate. Set times will vary with weather conditions.
- Will accept trowelled, broomed, decorative roller or stamped finish.
- Will accept integral powder or liquid colors, acid stain and water based or acrylic stains.
- Elephant Armor® Delay added to the mixing water will allow additional working time. (*Please refer to package instructions*)
- When placing Elephant Armor® Mortar, all patches must have GST Elephant Armor® Cure applied immediately after finishing. If a stain or sealer is going to be applied, do not use Elephant Armor® Cure, water cure for a minimum of two hours.

Clean-Up:

All tools and mixing equipment shall be immediately cleaned with water.

PRECAUTIONS / LIMITATIONS:

- Use required Safety Equipment and Best Practices.
- A feathered edge is not acceptable.
- Do not add more water than recommended.
- Do not over work or over trowel the spall repair or overlay.
- Follow ACI Hot Weather Concreting 305R-99 procedures.
- Do not apply Elephant Armor® Mortar to frozen surfaces, at temperatures below 40° F (4° C).
- Consult the Safety Data Sheet in all cases before use. Available at www.gstinternational.com

KEEP THIS PRODUCT OUT OF THE REACH OF CHILDREN

This product is made from the finest raw materials available and manufactured to proven formulation under strict quality control for its intended use. However, results obtained with the use of this product under a variety of conditions may depend on circumstances beyond our control. GST International, Inc. and the seller therefore disclaim any responsibility for damage of any kind. The only warranty extended, expressed or implied, is for defective material.

GST International shall not be liable for any incidental, consequential or damages arising directly or indirectly from the use of Elephant Armor®.

	Flexural Strength ASTM C 947	Splitting Tensile ASTM C 496	Compressive Strength ASTM C 109
EA Mortar/Overlay	6.6 MPa (950 psi) 28 days	5.8 MPa (845 psi) 28 days	47 MPa (6820 psi) 28 days
EA Asphalt Repair	8.7 MPa (1259 psi) 28 days	5.8 MPa (838 psi) 28 days	44.9 MPa (6510 psi) 28 days
EA DOT	10.6 MPa (1544 psi) 28 days	6 MPa (875 psi) 28 days	47.4 MPa (6870psi) 28 days

Manufactured Under Patent in the USA by Global Sealer Technologies International
GST International, Sparks, NV (775) 829-2626

Authorized Dealer: