



STRONGWARN SWADA 1000/2000 Installation Procedures

Fluid Applied Detectable Warning Surfaces

The STRONGWARN SWADA 1000/2000 System is a seamless, fluid applied detectable warning surface that complies with the ADAAG and CSAS standards and guidelines. STRONGWARN is a three component, pre-packaged system suitable for both new construction and retrofit applications. The installation does not require fasteners, adhesives or milling to undercut the platform. STRONGWARN maintains its original skid resistance and provides an anti-slip surface in both wet and dry conditions. The system is sustainable, easy to install, cost effective and requires minimal maintenance. The breathability of the system prolongs the in-service lifespan of the structure. Currently, STRONGWARN is utilized extensively by transit authorities with installations nationwide.

THE FOLLOWING IS A GUIDELINE TO PREPARE THE SUBSTRATE:

- Inspect the concrete substrate to determine its general condition including previously applied products, concrete defects, soundness, chemical damage, presence of contaminants and excess moisture.
- Determine the best method or combination of methods of mechanical surface preparation: scarify, shot blast or diamond grind to open the concrete pore structure. Prepare the surface to an ICRI Concrete Surface Profile (CSP) profile of 3 to 5. Refer to the ICRI Technical Guide # 310.2R-2013 for "Selecting and Specifying Concrete Surface Preparation."
- Remove all previous silicone coated surfaces, concrete curing compounds and release agents, sealers, dirt, adhesives, oil, grease, wax, fatty acids, hydraulic fluid, cutting oils, paint, films, existing coating, laitance, glaze, efflorescence, bond-inhibiting curing compounds, form release agents and all other contaminants that will inhibit or prevent formation of a penetrating bond within the substrate.
- For penetrating contaminants, scrub area using a heavy-duty degreaser. Follow with a pressure wash of up to 4,000 psi. Repeat until the substrate is cleaned to the depth of the penetration and area of migration or remove and replace the entire section.
- Carefully sound out the entire structure. Replace all non-durable, unsound, damaged, deteriorated, delaminated, cracked, weak, loose, spalled and rust stained concrete. Excavate all areas cracking due to corrosion of reinforcing steel.
- Perform all structural repairs using the STRONGCRETE repair mortars. Eliminate and restore all surface irregularities, surface air voids, fins, honeycombs, bugholes, spalls, cracks and deteriorated joints. Leave no voids.
- Address as per specifications slope and areas of transition.
- No ponding water conditions.
- Allow repairs to fully cure.
- Profile all repairs via mechanical means.
- A dedicated power wash at up to 4,000 psi is required prior to the crack treatment.
- Maintain dust free conditions throughout the installation as all contaminants will inhibit bond formation.

NEW CONCRETE:

New concrete pours, as an industry standard, are required to cure for 28 days. Mechanical surface preparation may begin at 21 days or if the concrete has achieved at least 80% of its design strength. The surface preparation will open the pores and eliminate the excess moisture within the slab that is not part of the hydration process. Concrete, unless at approximately 8% moisture via a moisture meter, if coated too soon, may have elements of their internal chemistry migrate to the surface which acts as a de-bonder. ASTM F-2170 is an In situ Relative Humidity (RH) Test and is the most accurate as it provides, not only the surface, but a picture of the overall moisture condition of the slab. This test is affected by the dew point, outside elements and is dependent upon the surface temperature of the concrete. New concrete is required to have attained enough strength to support itself and has to be dried sufficiently.



EQUIPMENT AND TOOLS:

- Mold segments
- Jiffy heavy-duty mixer Model PS-1
- Variable speed industrial drill
- Thin width flexible mason’s brush with synthetic bristles
- Soft broom
- 8" - 12" medium to hard nap rollers with handle
- 8" - 12" square or rounded steel trowel
- Power washer
- Air blower
- Scale
- Mister
- Strong plastic material
- Heavy-duty 2" duct tape
- 5 gallon mixing containers
- Premeasured containers for smaller batches

JOB SITE SURVEY:

- Evaluate the existing substrate for signs of efflorescence. It is a sign of excessive moisture and can result in the failure of the bond.

ENVIROMENTAL CONDITIONS:

All materials are mixed, applied and cured at the job site. Minimum environmental conditions are required to facilitate proper curing and performance of the products and systems. Ensure conditions are as follows during all stages of the installation:

Ambient	Minimum	Maximum
Temperature	> 45°F	90°F
Relative Humidity	20% rh	85% rh
Wind	N/A	30 mph
Substrate (Not frost laden)		
Temperature	> 50°F	85°F
Relative Humidity	N/A	75% rh
MVER	N/A	6 lbs.*
<ul style="list-style-type: none"> • Do not apply materials if rain is anticipated prior to full cure of each stage of the installation. • Air and substrate temperatures must remain above 50°F and rising during the mixing, installation, and curing process of all steps of the STRONGWARN SWADA 1000/2000 Fluid Applied System and remain above freezing for 24 hours or until fully cured. 		

* Moisture vapor emission rates (MVER) in excess of 6lbs/1000 sq/ft/per 24 hr. period per ASTM F-1869, or an rh in excess of 75% per ASTM F-2170 may result in delamination, discoloration or improper curing without proper treatment.

JOINTS:

Address at pre-installation conference and field mock-up.

New Construction:

- Locate horizontal joints in multiples of 4’. This will configure best with mold placement on the platform.

Existing Joints:

- Carry the joint through the dome array by saw cutting.
- For joints wider than ½", place duct tape over the joint prior to mold placement. Remove tape along with the overlapping domes when fully cured.
- Lay out molds in a pattern that avoids or overlaps joint placement.

OVERVIEW:

- Conduct a pre-installation conference with all parties in attendance at the project site to review the mechanical surface preparation, structural repair specifications and procedures, discuss all details regarding joints, crack isolation and detailing, transition zones, flashing and any other conditions prior to commencing work.
- Using the same equipment as in the construction procedures, install an on-site 2’ x 4’ single mold field mock-up. Include all components of the specified system for owner, architect and engineer approval of the following: surface preparation and details, installation procedures and technique, aesthetics of the finish, adhesion, texture and color, slip resistance, actual coverage rates and functionality before proceeding with the installation.
- Precondition material to 65°F - 75°F prior to mixing.
- Power wash at recommended psi of the substrate to remove all contaminants.
- Substrate is saturated surface dry.
- No ponding water.
- Work according to the approved field mock-up.
- Honor all joints according to application specifications. Expansion, pour and control joints are continued up through the underlayment and template to the original joint.
- Provide sufficient ventilation to achieve optimal performance and a full and continuous cure.
- Follow all environmental conditions.



INSTALLATION:

- Outline the field area with heavy duty duct tape as per the specification.
- Dampen the surface with potable water to a saturated surface dry condition.
- Allow moisture to penetrate into the substrate.
- Leave no ponding water.
- Maintain this status throughout the installation of the #82 Dome.
- Immediately place each mold segment along the platform edge.
- All mold sections must be flushed with the substrate.
- Apply weight where possible or when required.
- Mist with potable water beneath the mold sections to maintain these conditions throughout the installation.

#82 TRUNCATED DOME:

Unit: One 5 gallon pail of # 82 DOME Liquid and eight 32.5 lbs. bags of # 82 DOME Powder.

Unit Yield: 400 sq. ft. of dome array

MIXING RATIO:

- Five quarts #82 Liquid and two 32.5 lb. bags of #82 Powder
- Micro adjust liquid up to a maximum of 5.5 quarts in the field
- The yield is approximately 100 sq. ft. of domes

MIXING:

- Pre-mix the #82 Liquid for 2 minutes.
- Use a 400 rpm drill with a mounted Jiffy mixer.
- Place at ¾ depth of the pail.
- Do not create a vortex or aerate the material.
- Pour the #82 Liquid into a clean mixing container.
- Gradually add the powder to the liquid. Never reverse this step.
- Scrape the sides of the container until no dry powder is visible.
- Continue to mix for 2 minutes until mixture is lump-free.
- The working time is 15-20 minutes at 75°F.

PLACEMENT:

- Evenly pour a thin ribbon of the #82 mixture in the middle of the exposed surface of the molds.
- Using a steel finishing trowel, work mixture into mold cavities.
- Work towards mold perimeter.
- Trowel material in both directions until exposed dome surfaces are smooth.
- Immediately remove all excess material from the surface.
- Mold must remain flexible during curing process.
- Allow domes to fully cure.
- Do not touch or move the mold sections as it may break the bond.
- Follow all environmental conditions to achieve optimal performance and a full and continuous cure.

CURING:

- Use the mock-up as a guideline for cure times specific to the environmental conditions at the time of installation.
- When the #82 DOME mix has sufficiently cured, lift one mold corner to evaluate.
- Dome will be firm to the touch inside mold section.
- Carefully with a peeling action, lift the entire mold section.
- All domes should be well bonded to the substrate.
- Domes must be fully cured prior to #32 FIELD application.

MINIMUM CURING TIME GUIDELINES:

- 50°F - 55°F: 12 to 24 hours or until fully cured
- Above 55°F: 6 to 12 hours or until fully cured
- 65°F-75°F: 6 to 8 hours or until fully cured

MOLD SECTIONS:

- Power wash at 2,000 psi using a turbo tip.
- Clean both sides of the mold section immediately after being pulled up.
- Remove all cured material without damaging the orifices and sections.
- Store flat and out of the direct sun for reuse.



#32 FIELD:

Unit: One 5 gallon pail of #32 Pre-Pigmented Liquid and two 55 lbs. bags of # 32 Powder

Unit Yield: 200 sq. ft. at 30 wet mils per coat. 60 wet mils required

MIXING RATIO:

- Two and one half gallons #32 Liquid and one 55 lb. bag of #32 Powder
- Yield is approximately 100 sq. ft. of dome array at 30 mils

MIXING:

- Pre-mix the #32 Liquid for 2 minutes.
- Use a 400 rpm drill with a mounted Jiffy mixer.
- Place at $\frac{3}{4}$ depth of the pail.
- Do not create a vortex or aerate the material.
- Pour 2 gallons into a clean mixing container.
- Gradually add the powder to the liquid. Never reverse this step.
- Scrape the sides of the container until no dry powder is visible.
- Continue to mix for 2 minutes until mixture is lump-free.
- Once the mixture is a smooth, homogeneous blend, add in the remaining $\frac{1}{2}$ gallon of liquid.
- Mix for 1 minute.
- The mixture has a pot life of 20 minutes at 75°F.
- Do not attempt to re-mix or re-use any material that has begun to set.

PLACEMENT:

- Dampen the surface with potable water to a saturated surface dry condition.
- Allow moisture to penetrate into the substrate.
- Leave no ponding water.
- Maintain this status throughout the installation of the #82 Dome.
- Evenly pour the #32 mixture on the center of the dome array.
- Spread from the interior to the perimeter with a heavy nap roller.
- Completely roll and brush material in both directions to obtain an even 30 wet mil field coat.
- Scrub the first coat into the substrate to fill any pores and voids.
- Leave no puddles.
- Do not allow the mixture to well at the base of the domes.
- Light broom finish.
- Check wet film thickness and follow this installation protocol to ensure correct installed millage requirements are obtained.
- Work to approved field mock-up.
- Allow first coat to fully cure prior to application of second coat.
- Do not dampen between coats.
- Apply second coat. Repeat the above process.
- No excess material should remain at the base of the domes.
- Follow all environmental conditions to achieve optimal performance and a full and continuous cure.

CURING:

75°F: 6 - 8 hours or until fully cured.

#4 SEALER:

Unit: One 5 gallon pail of pre-pigmented #4 SEALER.

Unit Yield: 800 sq. ft. of #4 SEALER at 5 mils. 10 mils required

MIXING:

- Pre-mix the #4 Sealer for 1 minute.
- Use a 400 rpm drill with a mounted Jiffy mixer.
- Place at $\frac{3}{4}$ depth of the pail.
- Do not create a vortex or aerate the material.
- Re-disperse the pigment and eliminate settlement.
- Decant material into a paint tray.
- Application is by dip and roll.
- Mix material prior to each application as pigment settles.



PLACEMENT:

- Apply directly from pail to a dry and fully cured #32 Field surface.
- Install using a medium or hard nap roller.
- Work from the center of the field to the perimeter in both directions.
- Do not allow any material to collect at the base of the domes.
- Allow to cure.
- Apply second coat.
- Let cure overnight.
- Wait a full 24 hours or until fully cured prior to opening to pedestrian traffic.
- Secure the work area with barricades to protect the installation from disturbances.
- Follow all environmental conditions to achieve optimal performance and a full and continuous cure.

CURING:

75°F: 6 - 8 hours or when fully cured.

PRECAUTIONS AND LIMITATIONS:

- Remove all excess material from the surface of the mold so it remains flexible during curing process and for ease of cleaning.
- Prevent any contact with Aluminum, as with all Portland cement based products, to prevent adverse chemical reactions and possible product failure. Follow specifications for potential areas of contact by insulating or coating aluminum bars, rails and posts.
- Excessive moisture transmission can cause coating delamination.
- Efflorescence of the existing substrate can result in the failure of the bond or discoloration of the surface. It is a deposit of a white efflorescent powder residue and is a sign of excessive moisture.
- Minor shade variations, staining, streaking or efflorescence may occur due to cure rate and site conditions or when a fresh coating is exposed to water or excessive moisture prior to curing. Do not apply materials outside environmental conditions or if rain is anticipated before the materials installed are fully cured.
- May reflect working cracks within the substrate. Refer to crack treatment details for crack isolation and repair.
- Do not bridge any joints including expansion joints, control joints or moving joints with the system. During the coating process, brush #32 FIELD and #4 Sealer along edges when possible. Allow to cure. Grind any excess material welled inside the joint and fill with specified HPL caulking material. Pay attention to all details, transitions, terminations and specifications.

SKID RESISTANCE AND CLEANABILITY:

In general the more aggressive the finished surface, the more difficult to clean. The smoother the finished texture, the easier the surface is to clean, but there is a loss of skid resistance.

CLEANING:

Clean all tools with water while still wet immediately after use. If cured, mechanical means will be necessary.

FIRST AID:

Contains Portland Cement CAS # 65997-15-1. Freshly mixed cement products may cause skin injury. Avoid contact with skin where possible and wash exposed areas promptly with water.

Contains sand CAS # 14808-60-7. Avoid breathing dust. Prolonged exposure to dust may cause delayed lung injury (silicosis) or cancer IARC Class 2A. Wear NIOSH approved mask for silica dust.

In case of skin contact, wash thoroughly with soap and water. For eye contact, flush immediately with plenty of water for at least 15 minutes. If ingested, do not induce vomiting and get prompt medical attention. For respiratory problems, remove person to fresh air. Contact a physician.

HEALTH AND SAFETY:

Users must read the current actual Safety Data Sheets before using any products. In case of an emergency, call CHEMTREC at 1-800-424-9300. For further information and advice regarding transportation, handling, storage and disposal of chemical products, the user should refer to the actual Safety Data Sheets containing physical, environmental, toxicological and other safety related data.

