



SIKA® STADIUM CAPABILITIES SYSTEMS AND SOLUTIONS

BUILDING TRUST



ROOT CAUSES OF DAMAGE



Problems in stadiums are usually caused by a combination of factors. It is critical to understand what some of the possible factors are in order to design a proper repair and protection solution. The first and most important step is to diagnose the root cause of the deterioration.

Common Problems: Stadiums



BLEACHER EDGE SPALLS



FAILED DECK COATINGS



POOR CONCRETE COVER



SEALANT ADHESION FAILURE



SEATING AREA REPAIR



RAIL POST DEGRADATION



UNDERSIDE SPALLING



INSUFFICIENT CAPACITY

Requirements before the Repair

Start with the condition Survey

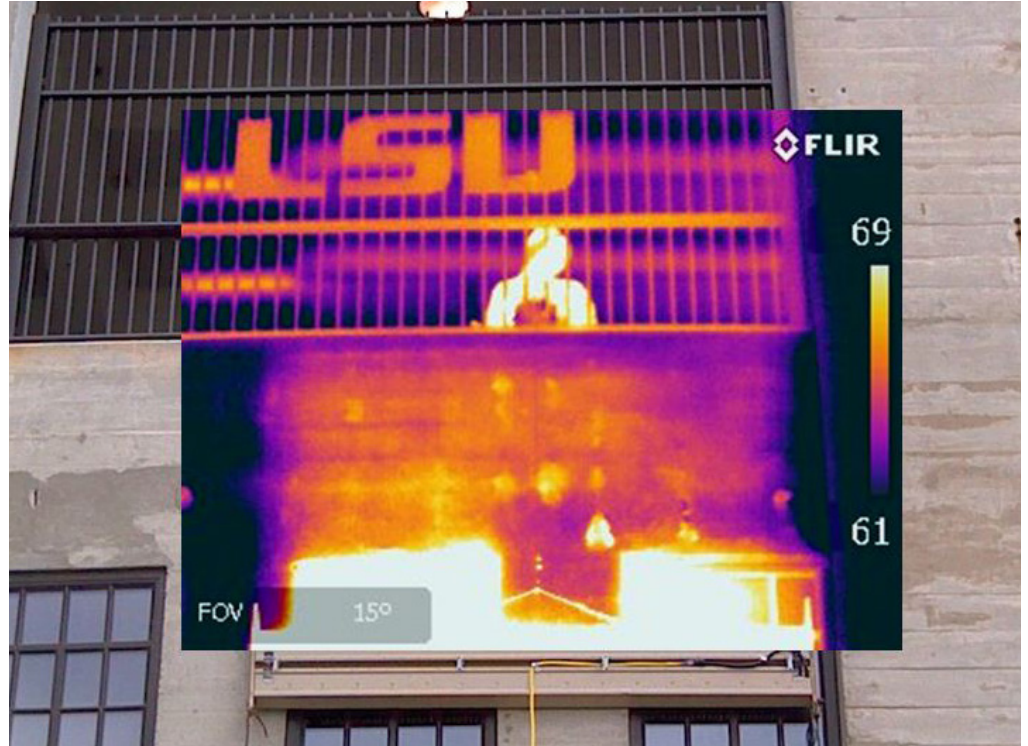
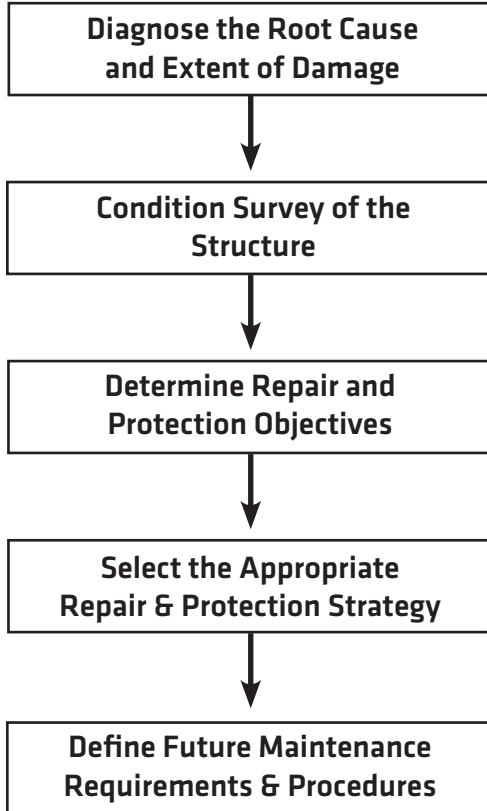
A thorough condition survey is critical to ensure a successful project. This testing should always be conducted by a qualified professional.

Surveys often consist of performing one or more of the following:

- Visual inspection for condition of the concrete, sealants and coatings
- Spall and delamination survey
- Chloride and carbonation testing
- Reinforcement mapping and cover measurements
- Half-cell corrosion potential mapping
- Corrosion rate assessment
- Petrographic analysis

The results of these tests should serve as the basis for selecting a strategy that will meet the project requirements. Sika can help develop a repair and protection strategy and be your single source for a comprehensive solution.

INTERPRETING THE RESULTS



Infrared thermography used to detect voids, delaminations and other defects in the concrete structure

Once the probable causes of deterioration have been identified, it is essential that a thorough investigation be conducted to determine the existing condition of the stadium structure. This appraisal should be carried out by a design professional with specific experience in concrete restoration.

Developing a successful rehabilitation program requires an overall assessment, with the types of distress, and their causes and extent carefully evaluated and understood. Only then can a repair and protection strategy be developed.

Appraisals should include both the topside and underside of decks, columns and beams, as well as all other concrete elements.

FOCUS ON:

- Crack patterns and size
- Spalling concrete
- Location of movement joints
- Ponding of surface water
- Carbonation range and extent
- Waterproofing membrane Conditions
- Petrographic examination of cores (to check for ASR, etc.)
- Previous repair locations
- Delaminating or hollow concrete
- Location of drains
- Chloride content and depth profile
- Depth of concrete cover over rebar
- Concrete permeability

CONCRETE REPAIR

SikaTop® AND Sikadur® SYSTEMS

Sika offers a complete range of high performance, premium quality repair mortars for every application from cosmetic to structural repair on stadiums.

Our repair mortars are compatible with Sika repair and protection materials to ensure that both the visual signs of damage and the latent deterioration are addressed, extending the life of the structure.

Sikadur epoxy resin technology include both low modulus and high modulus formulations with viscosity ranges from super low sealer/healers to gel paste anchoring solutions.



Spall repairs on a bleacher edge with SikaQuick® VOH

SikaTop®, SikaQuick®, SikaRepair®, SikaCem® and Sikacrete®

- Proven excellence over 30 years of on-site performance
- Repair mortars and concretes suitable for application by hand, form and pour/pump, machine spray wet or dry in thickness from 1/8" to full depth
- One and two component polymer modified cementitious mortars
- Unique epoxy/cement reinforcement primer and bonding agent (Sika Armatec 110 EpoCem)
- Available with migrating/penetrating corrosion inhibitor (Sika FerroGard) to reduce incipient anode corrosion ("ring halo" effect) where active chlorides present in the parent concrete accelerate corrosion around the new repair
- Exciting and new pre-packaged, self-consolidating concrete, Sikacrete: a full range of pre-extended concrete materials that eliminate adding stone on the job



Cracks in concrete injected with ultra low-viscosity Sikadur® injection epoxy

Sikadur® Structural Repair Resins

- Three decades of proven performance
- 100% solids high or low modulus range of structural bonding and injection resins
- Extended pot life grades for more working times
- Super low viscosity, moisture tolerant epoxy penetrating systems for topical slab protection against chlorides and water penetration

TOTAL CORROSION MANAGEMENT

Sika is able to offer a comprehensive package of corrosion management solutions that range from assistance with root cause analysis and monitoring to supply of corrosion inhibitors and cathodic protection.

Sika® FerroGard®-903

Sika FerroGard-903 is a unique surface applied corrosion inhibitor that penetrates the concrete cover to the reinforcing steel, reducing the corrosion rate and extending the service life of a structure.

- Reduces active corrosion
- Delays the onset of corrosion and reduces corrosion rate
- Proven penetration up to 3 inches (75 mm) in 28 days

Sika® FerroGard®-908

Sika FerroGard-908 is a dual-functional corrosion inhibitor and penetrating sealer.

- Reduces active corrosion
- Increases resistivity of concrete
- Repels water and chloride ions
- Contains silane sealer and amino alcohol corrosion inhibitor



Application of Sika® FerroGard® 903



Exposed steel due to corrosion



Severely damaged concrete columns accelerated by lack of adequate cover

Sika® FerroGard® 650, 670 AND 675

Sika FerroGard galvanic anodes consist of a zinc core surrounded by a specially formulated cementitious mortar. The zinc core corrodes preferentially to the surrounding rebar it is attached to, providing galvanic protection to the reinforcing steel.

Sika® FerroGard® Anodes

- Corrosion prevention for “ring anodes” adjacent to spall repairs
- Placed at the perimeter of the repair
- Use at the interface of new full-depth slab replacement or partial depth areas
- Highly chloride contaminated concrete



Sika® FerroGard® Anodes used to prevent corrosion of rebar in reinforced concrete



Sika® FerroGard® anodes installed onto an existing slab



Sika® Repair mortar used to embed Sika® FerroGard® anodes

STADIUM DECK WATERPROOFING

Sikalastic® AND Sikagard® SYSTEMS

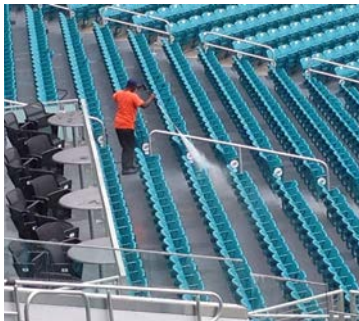
Unprotected concrete decks exposed to rainfall, freeze-thaw, carbonation and deicing salts will deteriorate. “Passive” protection originally provided by the cement paste around the reinforcing steel will progressively be destroyed and unseen corrosion of embedded steel will occur, often resulting in spalls, cracks and leaks.

Sika provides comprehensive solutions to waterproofing problems with maximum protection. Sika’s wide range of polyurethanes and epoxies are designed to make concrete and masonry impermeable to water, while offering flexibility to handle all of your parking deck waterproofing needs.

Protection Systems for Stadium Decks

Sika Selection Guide

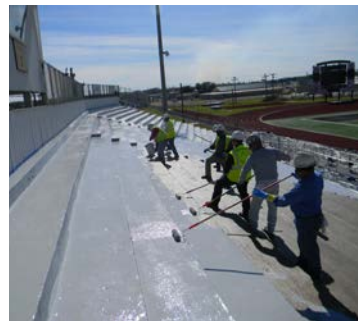
System	Technology	Coats (excluding primer)	Application Days	VOCs	Crack Bridging/Modulus	Features
Sikalastic® 720/745 Traffic	2-component polyurethane	2-3	1-2	below 10	1/16" dynamic	fast cure, low odor
Sikalastic® 390/391/395	2- component polyurethane	2-3	2-3	below 10	1/16" dynamic	low odor
Sikalastic® 710/715/735 AL	1-component polyurethane	3-4	3-4	below 250	1/16" dynamic	no pot life restrictions, enhanced UV stability with aliphatic top coat
Sikalastic® 710 Lo-VOC/715 Lo-VOC /736 AL Lo-VOC	1-component polyurethane	3-4	3-4	below 100	1/16" dynamic	no pot life restrictions, enhanced UV stability with aliphatic top coat
Sikalastic® 22 Lo-Mod Hybrid	polyurethane waterproofing with epoxy wear coat	2-3	2-3	below 10	1/16" dynamic	flexible waterproofing, high abrasion resistance, optional top coat
Sikadur® Epoxy Broadcast Overlay	epoxy	1	1	below 100	low modulus	high abrasion resistance
Sikadur® 55 SLV	low viscosity epoxy	1	1	below 150	high modulus	healer/sealer
Sikagard® 705 L	100% silane sealer	2	1	below 350	not applicable	transparent sealer
Sikagard® 706 Thixo	silane based impregnation cream	1	1	below 350	not applicable	transparent sealer
Sikagard® 740	40% silane sealer	2-3	1	below 350	not applicable	transparent sealer



Sikalastic® 710 system installed on bleacher area



Sikalastic® 720 system application



Sikalastic® 715 placed on concrete seating structure

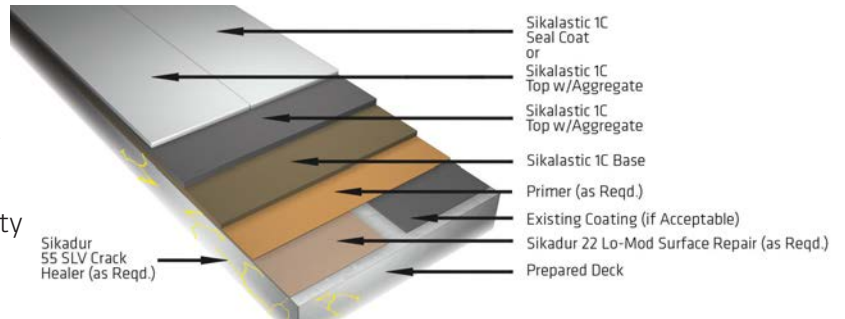


Sikadur® 55 SLV crack healer/sealer applied to seating area

STADIUM TRAFFIC DECK SOLUTIONS

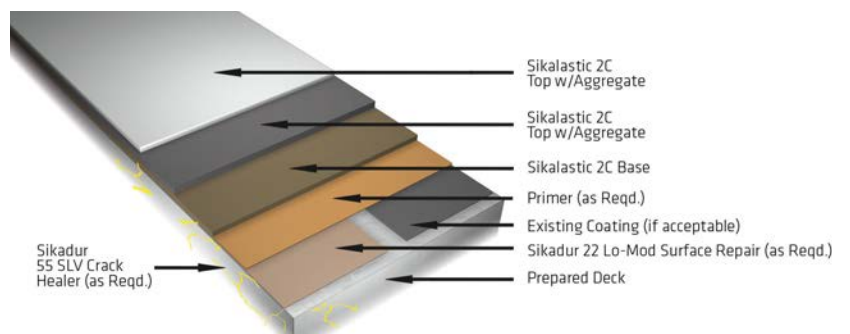
Sikalastic® 710/715 AND 710 Lo-VOC/715 Lo-VOC TRAFFIC SYSTEMS

- Single-component, elastomeric, waterproofing traffic system
- Excellent crack-bridging properties and flexibility even at low temperatures
- Excellent resistance to abrasion and wear
- Impervious to water and deicing salts
- Available aliphatic and top coats



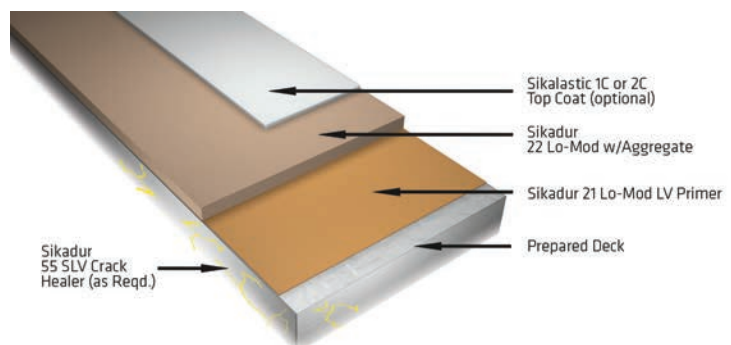
Sikalastic® 720/745 AND 390/391/395 TRAFFIC SYSTEMS

- Two-component, elastomeric, waterproofing traffic system
- Low odor, solvent-free formulation
- Fast turnaround system minimizes downtime
- Excellent crack-bridging properties as well as abrasion and chemical resistance



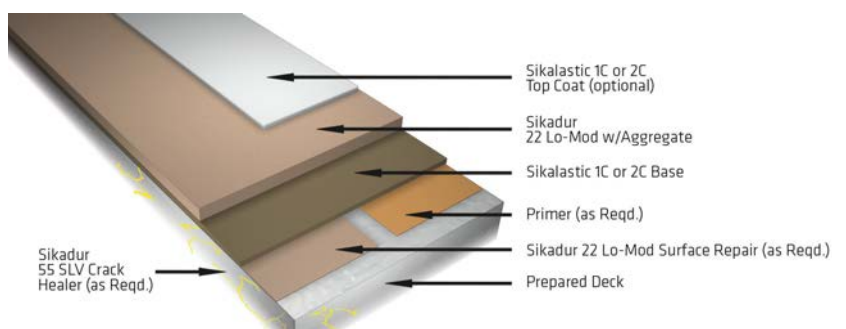
Sikadur® EPOXY BROADCAST OVERLAY SYSTEM

- Two-component, fast curing epoxy protection system
- Superior resistance to abrasion and wear
- Excellent durability
- Optional polyurethane top coats
- Solvent-free, fast turnaround



Sikalastic® 22 LO-MOD HYBRID DECK SYSTEM

- One or two-component, elastomeric, water proofing base coat
- Low odor, solvent free, low VOC, primerless and fast turnaround options
- Low-modulus epoxy-based wear coat
- Full broadcast or seeded aggregate wear coat options



STRUCTURAL STRENGTHENING

Sika® CarboDur® AND SikaWrap® SYSTEMS

Sika CarboDur and SikaWrap are carbon fiber reinforced polymer (CFRP) systems consisting of strips, rods, wraps and accessories for upgrading, repairing and seismically retrofitting concrete structures.

SikaWrap® PreSaturated SYSTEMS

- All of the benefits of conventional FRP
- No need to saturate fabrics on site
- Fast and easy application cuts labor in half
- Increases efficiency by 50%
- Factory controlled quality
- Consistent resin to fabric ratio
- Less mobilization and clean up

REASONS FOR STRENGTHENING WITH CarboDur® AND SikaWrap® INCLUDE:

- Changes of use
- Excessive deflection of beams
- Errors in construction or design
- Modifications to structural system
- Increased loading requirements
- Damage from aging and corrosion
- Seismic upgrade
- Vehicle impact
- Structural cracking
- Blast hardening

ADDITIONAL BENEFITS OF STRENGTHENING WITH Sika® CarboDur® AND SikaWrap® SYSTEMS INCLUDE:

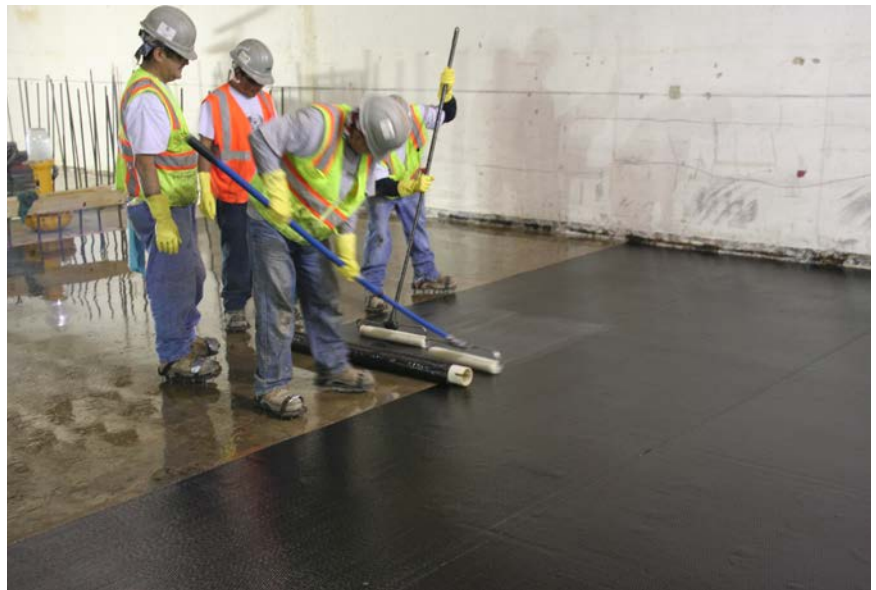
- No reduction of headroom
- Speed and simplicity of installation
- Significant reduction of parking downtime
- No changes in structural appearance
- Suitable for application in very confined spaces
- Can be covered with coatings after application
- Can be applied in any length
- Proven technology



SikaWrap® PreSaturated 100G glass fabric being unrolled



SikaWrap® PreSaturated 103C carbon fabric applied to column



SikaWrap® fabrics strengthening a concrete slab



Flexural strengthening of beam with Sika® CarboDur® strips



Strengthening concrete column with SikaWrap® fabric

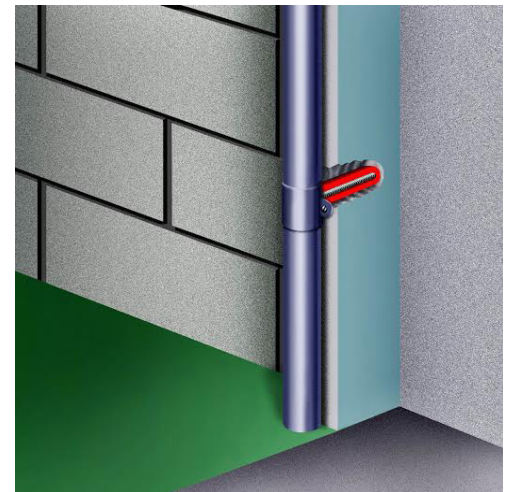
CHEMICAL ANCHORING

HIGH PERFORMANCE ANCHORING ADHESIVES

CHEMICAL ANCHORING

Sika Corporation has a comprehensive range of anchoring products. For all your chemical anchoring installations on any building structure, this wide range of product offering has a solution that will fit you application requirements. Some of the highlights of this product range are:

- AC-308 Evaluation Reports for cracked and Un-cracked Concrete
- Meets ASTM C 881
- Design software for engineers
- Epoxy and Epoxy Acrylate products - solutions with wide range of chemistries
- Easy to use - Does not require special tools



AnchorFix® RANGE OVERVIEW

Sika Anchorfix Product	Cartridge Sizes (ml)	Approvals	Non-cracked Concrete	Cracked Concrete	Selismic	Threaded Rod	Rebar	Dry Concrete	Damp Concrete
AnchorFix®-3001	250, 600, 1500	ICC ES ESR-3608, NSF-61-9, ASTM C 881	✓	✓	✓	✓	✓	✓	✓
AnchorFix®-2	300, 850	IAPMO UES ER-0306, NSF 61-9	✓			✓		✓	✓
AnchorFix®-500	600, 1500 10 Gal kits	ASTM C 881	✓			✓	✓	✓	
AnchorFix®-2 Arctic	850	ETA	✓			✓	✓	✓	✓
AnchorFix®-1	300	ETA	✓			✓		✓	✓

JOINT SEALING

HIGH PERFORMANCE JOINT SEALANTS

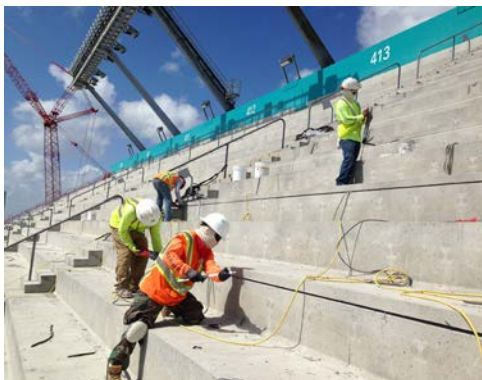


Sikaflex® SEALANTS

Sikaflex sealants are a complete range of one component moisture-cure and two component chemical-cure polyurethane sealants for overhead, vertical and horizontal joints. They offer permanent thermal and dynamic movement capability for most joints with elastic durability of up to +100/ -50% joint movement.

Sikaflex® 2C NS EZ Mix:

- Two component, 3 day full cure
- Capable of ± 50% joint movement
- Cold weather accelerator available
- Easy to mix, gun and tool



Sikaflex® 2c NS EZ Mix, two component, polyurethane sealant application

OUTSTANDING FEATURES INCLUDE:

- Fast tack-free time
- Extreme tear resistance
- 30 year history of performance
- Compatibility with Sikalastic Traffic and Sikagard Coating Systems
- Elastic durability to below -20°F (-29°C)
- High chemical resistance



Sikaflex® 2c SL two component, self-leveling sealant applied to joints

Sikasil® SEALANTS

Sikasil sealants are ultra low modulus silicones for sealing joints in curtain walls, windows, metal and concrete structures. Excellent for low temperature placement and offer excellent flexibility for dynamic and thermal joint movement

Sikasil® 728 SILICONES:

- Available in one component non sag, self leveling, and a two component, rapid cure self leveling silicone.
- Capable of +100/-50% joint movement capability



Sikasil®-728 RCS being applied to a horizontal joint

CONCRETE PROTECTIVE COATINGS

Criteria	Sikagard®-570	Sikagard®-550 W Elastocolor	Sikagard®-670 W	SikaTop® 144
Chloride resistance	Excellent	Excellent	Excellent	Excellent
Carbonation resistance	Superior	Superior (tested after 10 years exposure)	Excellent (tested after 10 years exposure)	Good
Crack-bridging capacity	Superior (tested down to 0°C)	Excellent (tested down to 0°C)	Will accept normal hygrothermal movement	N/A
Long-term weathering	Superior	Superior	Excellent	Excellent
Resistance to wind-driven rain	Excellent	Excellent	Excellent	Excellent
Reinforced	Possible	No	No	N/A
Breathability	Yes	Yes	Yes	Yes
Aestehtics	Pigmented	Pigmented	Pigmented	Concrete look
Color	463 Standard colors, color matching available	463 Standard colors, color matching available	463 Standard colors, color matching available	Gray, White

CONCRETE PROTECTIVE COATING

The application of Sikagard coatings to concrete surfaces such as walls and the underside of pre cast members and concrete slabs will provide protection from ingress of carbon dioxide, chlorides and other water-borne salts, and provide resistance to weathering, frost and dirt pick-up. Sikagard coatings are not vapor barriers and will allow vapor transmission through the coating. Sikagard coatings provide a uniform silk finish in over 450 standard colors.

ADDITIONALLY, Sikagard® COATING SYSTEMS PROVIDE:

- Water based, acrylic, non-toxic, VOC compliant coatings
- Dynamic and thermal crack bridging capabilities down to -25°C
- Excellent resistance to dirt pick-up and mildew
- Proven durability results over 15 years in service periods.
- Exceptional UV resistance & color stability



Sikagard® 670W coating applied onto an underside of a seating area

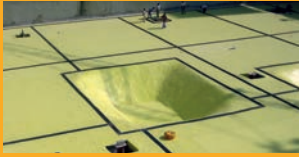


SikaTop® 144 applied onto the concrete structure underneath the bleacher seating



Sikagard® 670W acrylic protective coating spray applied over SikaTop® 144 on the north side of LSU Tiger Stadium

SIKA FULL RANGE SOLUTIONS FOR CONSTRUCTION:



WATERPROOFING



CONCRETE



REFURBISHMENT



SEALING AND BONDING



FLOORING



ROOFING

FOR MORE INFORMATION:



All sales of Sika products are subject to Sika's current Terms and Conditions of Sale available at www.usa.sika.com or by calling 201-933-8800. Prior to each use of any Sika product, the user must always read and follow the warnings and instructions on the product's most current Product Data Sheet, product label and Safety Data Sheet, which are available at www.usa.sika.com or by calling Technical Services at 1-800-933-7452. Nothing contained in any Sika materials relieves the user of the obligation to read and follow the warnings and instructions for each Sika product as set forth in the current Product Data Sheet, product label and Safety Data Sheet prior to product use.

The sale of all Sika products are subject to the following Limited Warranty:

LIMITED MATERIAL WARRANTY

SIKA warrants this product for one year from date of installation to be free from manufacturing defects and to meet the technical properties on the current Product Data Sheet if used as directed within shelf life. User determines suitability of product for intended use and assumes all risks. Buyer's sole remedy shall be limited to the purchase price or replacement of product exclusive of labor or cost of labor.

NO OTHER WARRANTIES EXPRESS OR IMPLIED SHALL APPLY INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. SIKA SHALL NOT BE LIABLE UNDER ANY LEGAL THEORY FOR SPECIAL OR CONSEQUENTIAL DAMAGES. SIKA SHALL NOT BE RESPONSIBLE FOR THE USE OF THIS PRODUCT IN A MANNER TO INFRINGE ON ANY PATENT OR ANY OTHER INTELLECTUAL PROPERTY RIGHTS HELD BY OTHERS.

Our most current General Sales Conditions shall apply. Please consult the Product Data Sheets prior to any use and processing.



RESPONSIBLE CARE
OUR COMMITMENT TO SUSTAINABILITY



ISO 9001
CERTIFIED TO
RC 14001
Certificate # RC 51088

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