QUADEX®
A VORTEX COMPANY

REPAIR MATERIALS

STRUCTURE GUARD®

EPOXY COATING SUBMITTAL FEATURING STRUCTURE GUARD®

Rev. 03-12-2020

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REPAIR MATERIALS

COMPANY HISTORY

CORPORATE PROFILE	**Quadex® LLC**
ADDRESS	18150 Imperial Valley Dr. Houston, TX 77060 O: 713-750-9081 F: 884-804-7996
WEBSITE	vortexcompanies.com
EXPERIENCE	Over 20 years in the sewer and pipe rehabilitation business with over 125,000,000 lbs. of material installed.
CUSTOMERS	Washington Suburban Sanitary Commission (WSSC) Metropolitan Sewer District of St. Louis City of Austin City of Hot Springs City of Melbourne City of Pinellas Park Little Rock Wastewater Utility City of Memphis City of Boston City of Fort Worth City of Huntsville Miami-Dade Water & Sewer National Forest Service US Navy, WA DC Navy Yard City of St. George, UT Town of Breckenridge, CO

OUR BUSINESS

Quadex®, LLC was founded in 1991 and is one of the most respected names in the protective coatings and linings sector of the raw, potable, storm and wastewater rehabilitation industry. We began by manufacturing a complete line of cementitious products and continue to refine our existing products as well as developing new products that keep Quadex at the forefront of the infrastructure protection and restoration industry.

Our staff and team of "Licensed Applicators" are dedicated to providing only the highest quality products and equipment utilized to rehabilitate aging, damaged, or structurally compromised infrastructure. Quadex products and equipment, as well as our network of "Licensed Applicators" that use them, work to protect and restore the structural integrity of water related infrastructure including large diameter pipe, manholes, wetwells, pump stations, junction structures, headworks and other severe duty underground utility infrastructure.

Quadex products are formulated and designed with the most advanced technology and are proven with over 25 years of successful installations. Our products offer an unmatched combination of corrosion resistance, structural compressive and flexural strengths, impermeability, bonding, workability, application thickness and quick return-to-service. Our specialized lining products provide a permanent seal against corrosion, infiltration, and exfiltration, and support a service life of 50-100 years. To ensure the performance of each product, we verify the results of our in-house studies through independent third party laboratory testing following American Society for Testing and Materials (ASTM) and other applicable procedures.

Commitment to Delivering World Class Epoxies

In an effort to deliver proven, high performance epoxy coatings, Quadex has expanded our offerings beyond cements and mortars into a broad range of polymer coatings and products.

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STRUCTURE GUARD®
TECHNICAL DATA SHEET

STRUCTURE GUARD®

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TECHNICAL DATA SHEET

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QUADEX® A VORTEX COMPANY | REPAIR MATERIALS

Typical Performance Characteristics

- Color: Light Bluegreen
- Finish: Very Smooth (Manning Coefficient: .009)
- Flash Point > 250°F (121°C)
- Ratio: 2A to 1B by volume

CHEMICAL RESISTANCE

- Deionized Water
- Methanol
- Ethanol
- Toluene
- Xylene
- Butyl Cellosolve
- MEK
- 10% Lactic Acid
- 10% Acetic Acid
- 70% Sulfuric Acid
- 50% Sodium Hydroxide
- Bleach
- 1,1,1 Trichloroethane
- 10% Nitric Acid
- 30% Nitric Acid

CORROSION RESISTANT EPOXY PROTECTIVE COATING

DESCRIPTION

Structure Guard® is a 100% solids, high-build epoxy coating formulated to provide long-term corrosion protection and structural enhancement for manholes, pump stations, treatment plants or any wastewater infrastructure subject to high levels of corrosion and/or abrasion to include both municipal and industrial applications. Structure Guard sets fast for a quick return-to-service in the most aggressive and turbulent environments. It finishes smooth to enhance flow and is utilized as an interior or exterior pipe lining.

FEATURES AND BENEFITS

- 100% Solids, No VOCs
- Spray applied at 250 mils in a single pass
- Excellent corrosion and abrasion resistance

APPLICATION SYSTEMS

- Heated Plural Airless Spray Units
- Minimum Output 5000 psi
- Product Hose: Min. - Optimum I.D. 0.375 - 0.5 inch

CURE TIME (at 70°F or 21°C)

- Re-coat — 2 hours
- Light Loading — 1 hour
- Immersion — 4 hours
- Full Chemical Cure — 24 hours

POT LIFE

- 40°F (4°C) 20 minutes
- 70°F (24°C) 10 minutes
- 92°F (33°C) 5 minutes

PACKAGING

Structure Guard is available in 5 gallon pails and 55 gallon drums.

QUADEX® REPAIR MATERIALS

TYPICAL COATING REQUIREMENTS

With Structure Guard®, only 1 coat is needed to attain finished thickness. If additional coats are called for they must be applied before the previous coat has completely cross-linked, typically for 2 hours @ 70°F (higher temperatures/humidity will shorten this window). If re-coating is needed, brush blast before applying the next coat. Before re-coating, clean and dry surface thoroughly to remove all contamination, including amine blush or condensation. Small areas may be abraded by sanding or wire brushing.

The same requirements apply when overlapping seams of adjacent coating sections to create a continuous protective film. If the coating surface to be overlapped at the seam cannot be brush blasted, use a non-impact means, such as power brushing or sanding, to create adequate mechanical profile.

YIELD

Structure Guard will yield theoretical coverage of 20 sq. ft per gallon @ 80 mils thickness. Actual surface coverage will depend on substrate porosity and roughness. A wet film thickness gauge may be used to determine actual coating thickness.

SURFACE PREPARATION

Coating performance is largely determined by the degree of surface preparation. MORE IS BETTER.

EXISTING CONCRETE AND MASONRY substrates must be prepared in a manner that provides a uniform, sound, clean, neutralized surface with sufficient profile suitable for the specified coating. The substrate must be free of all contaminants, such as oil, grease, rust, scale or deposits and have a surface profile equivalent to a CSP3 to CSP5 in accordance with ICRI Technical Guideline No. 03732. This can generally be achieved by abrasive blasting, shot blasting, high pressure water cleaning, water jetting, acid etch, hot water/steam cleaning or a combination of methods.

NEW CONCRETE AND MASONRY SUBSTRATES must be profiled to achieve a CSP4.

STEEL surfaces may require "Solvent Cleaning" (SSPC-SP 1) to remove oil, grease and other soluble contaminants. Chemical contaminants may be removed according to SSPCSP 12/NACE No. 5. Identification of the contaminants, along with their concentrations, may be obtained from laboratory and field tests as described in SSPC-TU 4 "Field Methods for Retrieval and Analysis of Soluble Salts on Substrates". Surfaces to be coated should then be prepared according to SSPC-SP 5/NACE No.1 "White Blast Cleaning" for immersion service or SSPC-SP 10/NACE No. 2. "Near White Blast Cleaning" for all other service. In certain situations, an alternate procedure may be to used such as high (>5,000 psi) or ultrahigh (>10,000 psi) pressure water cleaning or water cleaning with sand injection. The resulting anchor profile shall be 2.5-5.0 mils and be relative to the coating thickness specified.

WARRANTY

Quadex® warrants its products to be free of defects in material and workmanship. Within one year from purchase, if any Quadex product is proven defective, Quadex will replace said product or refund its purchase price, at Quadex's sole discretion. Quadex's obligation shall be limited solely to such replacement or refund. There are no other warranties by Quadex, expressed or implied. There is no warranty if Quadex products are used contrary to Quadex's written directions.

PHYSICAL PROPERTIES

Tensile Strength	ASTM D638	8,700 psi
Tensile Elongation	ASTM D638	2.2%
Tensile Modulus	ASTM D638	500,000 psi
Flexural Strength	ASTM D790	15,400 psi
Flexural Modulus	ASTM D790	507,000 psi
Compressive Strength	ASTM D695	13,300 psi
Compressive Modulus	ASTM D695	535,000 psi
Adhesion to Concrete	ASTM D4541	>2000 psi (substrate failure)
Adhesion to Blasted Steel	ASTM D4541	>3000 psi

Physical properties were evaluated on compounds cured for 5 days at 25°C / 50% relative humidity.

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REPAIR MATERIALS

SPECIFICATION:

STRUCTURE RESTORATION & PROTECTIVE EPOXY MATERIALS INSTALLATION

CORRODED STRUCTURE RESTORATION & PROTECTIVE MATERIALS INSTALLATION SPECIFICATION

1.0 General

These specifications set standards of quality and design for rehabilitating deteriorated masonry, concrete or metal structures using high build 100% solids epoxy; and the use of said epoxy for the protection of new structures.

1.1 References

A. ASTM D638 - Tensile Properties of Plastics
B. ASTM D790 - Flexural Properties of Unreinforced and Reinforced Plastics
C. ASTM D695 - Compressive Properties of Rigid Plastics
D. ASTM D4541 - Pull-off Strength of Coatings Using a Portable Adhesion Tester
E. ASTM D2584 - Volatile Matter Content
F. ASTM D543 - Resistance of Plastics to Chemical Reagents
G. ASTM C267 - Standard Test Methods for Chemical Resistance of Mortars, Grouts, and Monolithic Surfacings and Polymer Concretes
H. ASTM C109 - Compressive Strength Hydraulic Cement Mortars
I. ACI 506.2-77 - Specifications for Materials, Proportioning, and Application of Shotcrete
J. ASTM C579 - Compressive Strength of Chemically Setting Silicate and Silica Chemical Resistant Mortars
K. SSPC SP-13/NACE No. 6 – Surface Preparation of Concrete
L. ASTM - The published standards of the American Society for Testing and Materials, West Conshohocken, PA
M. NACE - The published standards of National Association of Corrosion Engineers (NACE International), Houston, TX
N. NASSCO – National Association of Sewer Service Companies, Marriottsville, MD – Manhole Assessment Condition Program (MACP) and Pipeline Assessment Condition Program (PACP)
O. SSPC - The published standards of the Society of Protective Coatings, Pittsburgh, PA

1.2 Submittals

A. Product Data
   A. Technical data sheet on each product used.
   B. Safety Data Sheet (SDS) for each product used.
   C. Copies of contractor's certification of good standing letter from the manufacturer of the submitted coating.

2.0 Definitions

The term "approved" shall mean that the proposed material shall meet or exceed each of the performance criteria set forth in this specification. Manufacturers and vendors of various name brand materials must submit proof that any proposed material will meet the guidelines and requirements of this specification. Material approvals shall be made by the engineer no less than two weeks prior to bid date.

3.0 Approved Materials

When more than one product is used in composite with other(s), all materials shall be from the same manufacturer.

3.1 Infiltration Control

All fast setting materials furnished shall be designed to be applied in dry powder form, with no prior mixing of water, directly to active leaks under hydrostatic pressure in

manholes or related structures. Materials shall consist of rapid setting cements, siliceous aggregates, and various accelerating agents. Material shall not contain chlorides, gypsum, or metallic particles. Approved infiltration control material shall be Quadex Quad-Plug as manufactured by Quadex.

A. Specifications: Infiltration Control Materials
   1. Compressive Strength (ASTM C109)
      30 mins: 1850 psi
   2. Bond Strength (ASTM C321)
      28-Day: >80 psi
   3. Set Time 30 seconds

3.2 Invert Repair and Patching

All material furnished shall be designed to fill large voids in structure walls and to repair or reconstruct inverts where no hydrostatic pressure exists. Material shall consist of rapid setting cements, NSG aggregates, and various accelerating agents. Material shall not contain chlorides, gypsum, or metallic particles. Approved invert repair and patching material shall be Quadex Hyperform or Structure Guard RS Patch as manufactured by Stag Technologies.

Approved material shall exhibit the following minimum physical properties:

1. Compressive Strength (ASTM C109)
   30 mins: >1200 psi
   1 hour: >2500 psi
   1 day: >4000 psi
2. Bond Strength (ASTM C882)
   28-Day: >3000 psi
3. Shrinkage (ASTM C666)
   0%

3.3 Protective Coating

Polymer protective coating and lining materials shall be specifically designed for protecting manholes and other related wastewater structures from severe hydrogen sulfide environments. Liner materials shall be 100% solids epoxy containing no VOC's or isocyanates and capable of building 200 mils in a single application. All epoxy lining materials must be applied using plural component spray equipment approved by the manufacturer. Approved material shall be Quadex Structure Guard or preapproved equal. Epoxy materials shall meet the following minimum physical properties:

1. Tensile Strength ASTM D638
   8,700 psi
2. Flexural Strength ASTM D790
   15,400 psi
3. Compressive Strength ASTM D695
   13,300 psi
4. Shore D Hardness ASTM D2240
   75
5. Elongation
   2.2%
6. Taber Abrasion ASTM 4060
   < 100 mg loss (1kg load @1000 cycles)

4.0 Surface Preparation for Mortars or Cementitious Underlayment

4.1 Structure Cleaning and Preparation

Surfaces to be coated shall be cleaned sufficiently to provide a sound, clean, uniform and pH neutralized surface suitable for the specified coating product(s).

1. Excessive debris, sediment, root intrusion or other foreign materials which may impact the effectiveness of the surface preparation process shall be removed prior to the commencement thereof.
2. Oils, grease, incompatible existing coatings, waxes, form release, curing compounds, efflorescence, sealers, salts, or other contaminants which may affect the

performance and adhesion of the coating to the substrate shall be removed in accordance with SSPC-SP 1 – Solvent Cleaning or other suitable method.

3. Choice of surface preparation method(s) should be based upon the condition of the structure and concrete or masonry surface, potential contaminants present, access to perform work, and the required cleanliness and profile of the prepared surface to receive the repair and/or coating product(s).
4. Surface preparation method, or combination of methods, that may be used include high-pressure water cleaning, water jetting, abrasive blasting, shot blasting, grinding, scarifying, detergent water cleaning, steam or hot water cleaning and others as referenced in industry accepted standards such as:
   A. SSPC SP-13/NACE No. 6 Surface Preparation of Concrete,
   B. ASTM D-4258 Standard Practice for Surface Cleaning Concrete for Coating and ASTM-D-4259 Standard Practice for Abrading Concrete,
   C. ICRI Technical Guideline No. 03732 Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays.
   D. NACE/SSPC Standards for the surface preparation of steel.
   E. Resulting surface profile of the prepared concrete substrate shall be (as described in ICRI Technical Guideline No. 03732):
      i. For application of cementitious materials; at least a CSP2.
      ii. For application of coating products: at least a CSP4.
   F. All loose debris materials resulting from the cleaning of the structure shall be removed prior to application of the cement based coating.

5.0 Epoxy Rehabilitation

5.1 Coating Application Equipment

Manufacturer approved heated plural component spray equipment.

5.2 Pre-Application Inspections

A. Unless prior approval has been received from the manufacturer, new Portland cement concrete structures shall have a minimum cure of 28 days. Should earlier coating be required, coating product manufacturer shall recommend specifications including appropriate cure assessment testing and use of specialty primers and sealers.
B. All active infiltration must be stopped prior to surface coating.
C. Temperature of the surface to be coated should be maintained between 40° and 120°F.
D. Specified surfaces should be shielded to avoid exposure of direct sunlight or other intense heat source. Where varying surface temperatures do exist, coating installation should be scheduled when the temperature is falling versus rising.
E. Prior to commencing surface preparation, Contractor shall inspect all surfaces specified to receive the coating and notify Owner, in writing, of any noticeable disparity in the site, structure or surfaces which may interfere with the work, use of materials or procedures as specified herein.

5.3 Surface Preparation

A. Concrete and/or mortar damaged by corrosion, chemical attack or other means of degradation shall be removed so that only sound substrate remains.
B. Oils, grease, incompatible existing coatings, waxes, form release, curing compounds, efflorescence, sealers, salts, or other

contaminants which may affect the performance and adhesion of the coating to the substrate shall be removed.

C. Choice of surface preparation method(s) should be based upon the condition of the structure and concrete or masonry surface, potential contaminants present, access to perform work, and required cleanliness and profile of the prepared surface to receive the coating product(s).

D. Surface preparation method, or combination of methods, that may be used include high pressure water cleaning, water jetting, abrasive blasting, shot blasting, grinding, scarifying, hot water blasting and others as referenced in NACE No. 6/SSPC SP-13 Surface Preparation of Concrete. Whichever method(s) are used, the work shall be performed in a manner that provides a uniform, sound, clean neutralized surface suitable for the specified coating product(s).

E. Resulting surface profile shall be at least a CSP 4 in accordance with ICRI Technical Guideline No. 03732.

F. Prior to the application of the coating product, all infiltration shall be eliminated by use of appropriate repair material(s), such as hydraulic cements and/or repair mortars. Consult with manufacturer when compatibility issues arise.

G. When all loose, contaminated, and unsound debris has been removed, the surface shall be etched with a solution of 20% muriatic acid to clean and open the pores of the substrate.

- The surface shall be washed again with a dilute solution of chlorine to remove microbiological growth residing on the substrate surface.
- The surface shall be tested with litmus paper at various points throughout the structure to ensure that the pH is within acceptable limits (not to exceed 8.5). If the surface does not meet the pH requirements, the above steps shall be repeated until the surface pH is within acceptable limits. All tests results will be retained for review by the engineer.

5.4 Application of Repair and Resurfacing Products

A. Approved repair products may be used to fill voids, bug holes, and other surface defects which may affect the performance or adhesion of the coating product(s).

B. Resurfacing products shall be used to repair or rebuild surfaces to provide a concrete or masonry substrate suitable for the coating product(s) to be applied. These products shall be installed to minimum thickness as recommended within manufacturer's published guidelines. Should structural rebuild be necessary, these products shall be installed to a thickness as specified by the Project Engineer.

C. Repair and resurfacing products shall be handled, mixed, installed and cured in accordance with manufacturer guidelines.

D. All repaired or resurfaced surfaces shall be inspected for cleanliness and suitability to receive the coating product(s).

5.5 Application of Epoxy Coating Product(s)

A. Application procedures shall conform to the recommendations of the coating product(s) manufacturer, including environmental controls, product handling, mixing, application equipment and methods.

B. Spray equipment shall be specifically designed to accurately ratio and apply the coating product(s) and shall be in proper working order.

C. Prepared surfaces shall be coated via spray application of the coating product(s)

described herein unless otherwise recommended by the coating product manufacturer.

D. Coating thickness shall be in relation to the profile of the surface to be coated as recommended by the coating product manufacturer.

E. In all new concrete and masonry structures, the coating product(s) shall be applied to a minimum dry film thickness of 80 mils to surface profiles of CSP-4 to CSP-6 or 125 mils minimum dry film thickness to surface profiles of CSP-7 or greater.

F. Subsequent topcoating or additional coats of the coating product(s) shall occur within the product's recoat window or 4 hours. Additional surface preparation procedures will be required if this recoat window is exceeded.

G. Coating product(s) shall interface with adjoining construction materials / components throughout the structure to effectively seal and protect substrates from attack by corrosive elements and to ensure the effective elimination of infiltration into the sewer system.

H. Procedures and materials necessary to affect the interface between dissimilar materials and the coating product shall be as recommended by the coating product(s) manufacturer.

I. Flow shall be stopped, bypassed or diverted as necessary for application of the coating product(s) to the invert/flowline.

6.0 Quality Control - Epoxy

The quality and performance of the material and the workmanship of the applicator shall be maintained by one or more of the following measures to be determined and specified by the engineer or owner.

6.1 Visual Inspection

All structures will be visually inspected for pinholes, cracks, delaminations, bug holes, and unfinished surfaces.

1. During application, a wet film thickness gauge, meeting ASTM D4414 – Standard Practice for Measurement of Wet Film Thickness of Organic Coatings by Notched Gages, shall be used. Measurements shall be taken, documented and attested to by Contractor for submission to Owner.
2. High voltage holiday detection for coating systems installed in corrosive environments, when it can be safely and effectively employed, shall be performed to ensure monolithic protection of the substrate. After the coating product(s) have cured in accordance with manufacturer recommendations, all surfaces shall be inspected for holidays in accordance with NACE RP0274 High-Voltage Electrical Inspection of Pipeline Coatings or ASTM D4787 Standard Practice for Continuity Verification of Liquid or Sheet Linings Applied to Concrete Substrates. All detected holidays shall be marked and repaired according to the coating product(s) manufacturer's recommendations.

A. Test voltage shall typically be 100 volts per mil of coating system thickness, but may require calibration in the field.

B. Detection of a known or induced holiday in the coating product shall be confirmed to ensure proper operation of the test unit.

C. In instances where high voltage holiday detection is not feasible a close visual inspection shall be conducted and all possible holidays shall be marked and repaired as described above.

D. Documentation of areas tested, equipment employed, results and repairs made shall be submitted to the Owner/ Engineer by Contractor.

3. Optional – Adhesion Testing is a destructive test method and should be used in moderation as an evaluation tool. Testing shall be conducted in accordance with ASTM D7234 Pull-Off Adhesion Strength of Coatings on Concrete Using Portable Pull-Off Adhesion Testers.

   A. For each test manhole a minimum of three 20 mm dollies shall be affixed to the coated surface; one at the cone area, one at the mid section and one near the bottom of the structure.
   B. For larger structures a minimum of three 20 mm dollies shall be affixed to the coated surface at random locations within each 1000 square foot area or as otherwise agreed upon.
   C. The adhesive used to attach the dollies to the coating shall be rapid setting with tensile strengths in excess of at least twice the anticipated failure point (generally at least 1000 psi) and permitted to cure in accordance with manufacturer recommendations. The coating and dollies shall be adequately cleaned and prepared to receive the adhesive. Failure of the dolly adhesive shall be deemed a non-test and require retesting.
   D. Prior to performing the pull test, the coating shall be scored to the substrate, or within 10 mils of the substrate surface, by mechanical means without disturbing the dolly or coating system bond within the test area.
   E. Any areas detected to have inadequate bond strength shall be evaluated by the Project Engineer. Further bond tests may be performed in that area to determine the extent of potentially deficient bonded area and repairs shall be made by Contractor.
   F. All adhesion testing shall be performed by qualified personnel using calibrated equipment as specified by the applicable ASTM standard(s).
   G. All adhesion testing shall be documented and submitted in a consistent format detailing location, test values, description of the failure point/mode, scoring method employed, adhesive used, cure time of coating and adhesive and other data as deemed necessary by the owner/ engineer.
   H. All adhesion test locations shall be repaired by the Contractor at no cost to the Owner.

7.0 Warranty

Product manufacturers shall warrant all materials to be free of defects, product design, and workmanship for a period of one year from date of purchase. Manufacturer will provide replacement materials for any product proven to be defective when applied in accordance with manufacturer's recommendations. Manufacturer's obligation shall be limited solely to product replacement.

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100% SOLIDS EPOXY - PART A

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1. PRODUCT AND COMPANY IDENTIFICATION

Product Name	Structure Guard® 100% Solids Epoxy - Part A
Revision Date	08-2019
Product Code	SE1000 A
Trade Name	RD 1000
Company	Stag Technologies, 564 W. 9320 S., Sandy, UT 84070
Company Contact	Matthew Peterson
Company Phone	844-STAGTEC
Emergency	800-535-5053

2. HAZARDS IDENTIFICATION

GHS Ratings:	
Carcinogen	2 - Limited evidence of human or animal carcinogenicity
GHS Hazards:	
H351	Suspected of causing cancer
GHS Precautions:	
P201	Obtain special instructions before use
P202	Do not handle until all safety precautions have been read and understood
P281	Use personal protective equipment as required
P308+P313	If exposed or concerned: Get medical advice/attention
P405	Store locked up
P501	Dispose of contents/container to ...
Signal Word	Warning

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	Cass #	Weight Concentration %
Epoxy Resin	25085-99-8	73.40%
Barium Sulfate	7727-43-7	10.00% – 20.00%
Titanium Dioxide	13463-67-7	5.00% - 10.00%
Silica	67762-90-7	1.00% - 5.00%

4. FIRST AID MEASURES

If inhaled remove to fresh air. If breathing is difficult, give oxygen. Obtain medical advice if there arepersistent symptons. Rinse immediately with plenty of water for at least 15 minutes. Ensure adequate flushing of the eyes by separating the eyelids with fingers. Remove contacts if present and easy to do. Continue Rinsing. Get medical attention, if irritation or symptoms of overexposure persists. Immediately wash skin with soap and plenty of water. If swallowed, call a physician immediately. Only induce vomiting at the instruction of a physician. Never give anything by mouth to an unconscious person.

5. FIRE FIGHTING MEASURES

Flash Point	N/A
LEL	N/A
UEL	N/A

Not applicable

Foam, Carbon dioxide (CO2) or dry chemical or water spray (water stream may be ineffective) .

No information available

Not available

Firefighters, and others exposed, wear self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

Stop leak. Dike or contain spill. Pump into slavage tanks and/or absorb with suitable material. Use sparkless shovel to remove material. Evacuate area and keep unnecessary and unprotected personnel from entering the spill area. Use appropriate containment and clean up immediately. Stop leak, Dike and contain spill.Prevent spilled material from entering the ground, water and/or air by using appropriate containment methods.

7. HANDLING AND STORAGE

Avoid breathing vapor. Avoid contact with eyes, skin and clothing. Keep away from heat and flame. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling. Avoid exposure to heat, light, and air for prolonged periods of time. Store in a cool, dry well ventilated area away from sources of heat and incompatable materials. Eliminate all ignition materials and incompatible materials. Collect spill with non spark tools. No information available.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

Chemical Name / CAS No.	OSHA Exposure Limits	ACGIH Exposure Limits	Other Exposure Limits
Epoxy Resin 25085-99-8	Not Established	Not Established	Not Established
Barium Sulfate 7727-43-7	15 mg/m³ TWA (total dust) 5 mg/m³ TWA (respirable fraction)	5 mg/m³ TWA (inhalable fraction, particulate matter containing no asbestos and <1% crystalline silica)	NIOSH: 10 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable dust)
Titanium Dioxide 13463-67-7	15 mg/m³ TWA (total dust)	10 mg/m³ TWA	Not Established
Silica 67762-90-7	Not Established	Not Established	Not Established

Use appropriate engineering control such as process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Good general ventilation should be sufficiant to control airborne levels. Where such systems are not effective wear suitable personal protective equipment, which preforms satisfactory and meets OSHA or other recgonized standards. Consult with local procedures for selection, training, and maintenance of the personal protective equipment. Always use adaquate ventilation that comply with local regulations.

Eye/face Protection:
Wear appropriate protective glasses or splash goggles as described by 29 CFR 1910.133, OSHA eye and face rotection reulation, or the Europena standard EN 166.

Skin Protection:
Chemical-resistant gloves and chemical goggles, face-shield and synthetic apron or coveralls should be used to prevent contact with eyes, skin or clothing.

Respiratory Protection:
A NIOSHair purifying respirator with an organic vapor cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air purifying respirators is limited. Use a positive presure air supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known or any other circumstance where air purifyig respirator may not provide adequate protection.

9. PHYSICAL & CHEMICAL PROPERTIES

Boiling Range	2500 to 3000 °C
Specific Gravity (SG)	1.426
Lbs VOC/Gallon Less Water	0.00
Lbs VOC/Gallon Less Exempt	0.00
% VOL by Volume	0.00

10. CHEMICAL STABILITY & REACTIVITY INFORMATION

Stable, Hazardous polymeraization will not occur. STABLE. Strong acids, caustics, oxidixers, Avoid uncontrolled exposure to Epoxy Resin, Amine.
No Data Found
None known, other than Sec. #2 and Sec #5
No Data Found
Hazardous polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

Mixture Toxicity
Component Toxicity

Eyes	Respiratory System
Effects of Overexposure	
CAS Number	13463-67-7
Description	Titanium Dioxide
% Weight	5 to 10%
Carcinogen Rating	Titanium Dioxide: NIOSH: potential occupational carcinogen IARC: Possible human carcinogen OSHA: listed
Avoid breathing vapors	
Oral	N.D.A.
Dermal	N.D.A.
Inhalation	N.D.A.

12. ECOLOGICAL INFORMATION

No ecotoxicity data was found for the product

Component Ecotoxicity

13. DISPOSAL CONSIDERATIONS

Dispose of in accordance with applicable local/municipal, state/provincial and federal regulations.

14. TRANSPORT INFORMATION

UN3082 Enviromentally Hazardous Substance, Liquid N.O.S. (Epoxy Resin)
Packaging Group III Hazardous Class 9

15. REGULATORY INFORMATION

OSHA:29 CFR
1910.1200 Haxardous
Chemical "Irritant", Sensitizer
State of California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): WARNING!

This product contains the following chemicals which are listed by the State of California as carcinogenic or a reproductive toxin:

13463-67-7	Titanium Dioxide	5 to 10 % Carcinogen

The following chemicals are classified under SARA 313 Toxic Release Invetnory (TRI):
- None

Country	EU
Regulation	REACH (EU) SUBSTANCES OF VERY HIGH CONCERN Toxic Substance Control Act (TSCA)
All Components Listed	EU - No TSCA - Yes
Safety Phrase	None

16. OTHER INFORMATION

Further information	HMIS® is a registered trade and service mark of the NPCA.
HMIS® ratings	Health: 1 Flammability: 1 Physical hazard: 2 Personal Protection: B
NFPA ratings	Health: 0 Flammability: 0 Instability: 0
Disclaimer	The information provided in this Safety Data Sheet is correct to the best of our knowledge information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification, The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.
Issue date	Not available.
This data sheet contains changes from the previous version in section(s)	Product and Company Identification: Synonyms Physical & Chemical Properties: Multiple Properties Transport Information: Material Transportation Information Regulatory Information: United States.

STRUCTURE GUARD®
SAFETY DATA SHEET

CATALYST - PART B

QUADEX® A VORTEX COMPANY | REPAIR MATERIALS

1. PRODUCT AND COMPANY IDENTIFICATION

Material Name	Structure Guard® Catalyst - Part B
Revision Date	08-2019
Product Code	SE1000 B
Trade Name	RD 1000
Company	Stag Technologies, 564 W. 9320 S., Sandy, UT 84070
Company Contact	Matthew Peterson
Company Phone	844-STAGTEC
Emergency	800-535-5053

2. HAZARDS IDENTIFICATION

GHS Ratings:

Oral Toxicity	Acute Tox. 2	Oral>5+<=50mg/kg
Skin corrosive	2	Reversible adverse effects in dermal tissue, Draize score: >= 2.3 < 4.0 or persistent inflammation
Eye corrosive	1	Serious eye damage: Irreversible damage 21 days after exposure, Draize score: Corneal opacity >= 3, Iritis > 1.5
Skin sensitizer	1	Skin sensitizer
Reproductive toxin	2	Human or animal evidence possibly with other information

GHS Hazards:

H300	Fatal if swallowed
H315	Causes skin irritation
H317	May cause an allergic skin reaction
H318	Causes serious eye damage
H361	Suspected of damaging fertility or the unborn child

GHS Precautions:

P201	Obtain special instructions before use
P202	Do not handle until all safety precautions have been read and understood
P261	Avoid breathing dust/fume/gas/mist/vapours/spray
P264	Wash thoroughly after handling
P270	Do not eat, drink or smoke when using this product
P272	Contaminated work clothing should not be allowed out of the workplace
P280	Wear protective gloves/protective clothing/eye protection/face protection
P281	Use personal protective equipment as required
P310	Immediately call a POISON CENTER or doctor/physician
P321	Specific treatment (see ... on this label)
P330	Rinse mouth
P362	Take off contaminated clothing and wash before reuse
P363	Wash contaminated clothing before reuse
P301+P310	IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
P302+P352	IF ON SKIN: Wash with soap and water
P305+P351+P338	IF IN EYES: Rinse continuously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing
P308+P313	IF exposed or concerned: Get medical advice/attention
P332+P313	If skin irritation occurs: Get medical advice/attention
P333+P313	If skin irritation or a rash occurs: Get medical advice/attention
P405	Store locked up
P501	Dispose of contents/container to ...
Signal Word	Danger

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	CAS number	Weight Concentration %
Paratertiarybutylphenol	98-54-4	30.00% - 40.00%
Amine	1477-55-0	20.00% - 30.00%
1,5-Pentanediamine, 2 methyl	15520-10-2	20.00% - 30.00%
Silica	67762-90-7	10.00% - 20.00%
nonyl phenol	84852-15-3	1.00% - 5.00%

4. FIRST AID MEASURES

If inhaled remove to fresh air. If breathing is difficult, give oxygen. Obtain medical advice if there are persistent symptons. Rinse immediately with plenty of water for at least 15 minutes. Ensure adequate flushing of the eyes by separating the eyelids with fingers. Remove contacts if present and easy to do. Continue Rinsing. Get medical attention, if irritation or symptoms of overexposure persists. Immediately wash skin with soap and plenty of water. If swallowed, call a physician immediately. Only induce vomiting at the instruction of a physician. Never give anything by mouth to an unconscious person.

5. FIRE FIGHTING MEASURES

Flash Point	134°C (273°F)
LEL	N/A
UEL	N/A

Not applicable
Foam, Carbon dioxide (CO2) or dry chemical or water spray (water stream may be ineffective) .
No information available
Not available
Firefighters, and others exposed, wear self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

Stop leak. Dike or contain spill. Pump into slavage tanks and/or absorb with suitable material. Use sparkless shovel to remove material. Evacuate area and keep unnecessary and unprotected personnel from entering the spill area. Use appropriate containment and clean up immediately. Corrosive. Avoid personal contact and breathing vapor or mist. Stop leak. Dike and contain spill. Prevent spilled material from entering the ground, water and/or air by using appropriate containment methods.

7. HANDLING AND STORAGE

Avoid breathing vapor. Avoid contact with eyes, skin and clothing. Keep away from heat and flame. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling. Avoid exposure to heat, light, and air for prolonged periods of time . Store in a cool, dry well ventilated area away from sources of heat and incompatable materials. Eliminate all ignition materials and incompatible materials. Collect spillwith non spark tools.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

Chemical Name / CAS No.	OSHA Exposure Limits	ACGIH Exposure Limits	Other Exposure Limits
Paratertiarybutylphenol 98-54-4	Not Established	Not Established	Not Established
Amine 1477-55-0	Not Established	0.1 mg/m³ Ceiling	NIOSH: 0.1 mg/m³ Ceiling
1,5-Pentanediamine, 2 methyl 15520-10-2	Not Established	Not Established	Not Established
Silica 67762-90-7	Not Established	Not Established	Not Established
nonyl phenol 84852-15-3	Not Established	Not Established	Not Established

Use appropriate engineering control such as process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Good general ventilation should be sufficiant to control airborne levels. Where such systems are not effective wear suitable personal protective equipment, which preforms satisfactory and meets OSHA or other recgonized standards. Consult with local procedures for selection, training, and maintenance of the personal protective equipment. Always use adaquate ventilation that comply with local regulations.

Eye/face Protection:
Wear appropriate protective glasses or splash goggles as described by 29 CFR 1910.133, OSHA eye and face protection reulation, or the Europena standard EN 166.

Skin Protection:
Chemical-resistant gloves and chemical goggles, face-shield and synthetic apron or coveralls should be used to prevent contact with eyes, skin or clothing.

Respiratory Protection:
A NIOSH air purifying respirator with an organic vapor cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protectionprovided by air purifying respirators is limited. Use a positive presure air supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known or any other circumstance where air purifyig respirator may not provide adequate protection.

9. PHYSICAL & CHEMICAL PROPERTIES

Boiling Point	247 °C
Specific Gravity (SG)	0.970
Lbs VOC/Gallon Less Water	0.00
Lbs VOC/Gallon Less Exempt	0.00
% VOL by Volume	0.00

10. CHEMICAL STABILITY & REACTIVITY INFORMATION

Stable, Hazardous polymeraization will not occur. Will react with Epoxy Resins especially at elevated temperatures. STABLE. Epoxy Resins under uncontrolled conditions. Mineral acids. Organic acid, oxidixers, Reacts with metals until reacted with epoxy. None known. Hazardous polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

Mixture Toxicity:

Oral Toxicity LD50	8mg/kg
Dermal Toxicity LD50	3,216mg/kg
Inhalation Toxicity LC50	2,901mg/L

Component Toxicity:

98-54-4	Paratertiarybutylphenol Oral LD50: 3,250 QL/kg (Rat) Dermal LD50: 2,318 mg/kg (Rabbit)
1477-55-0	Amine Oral LD50: 660 mg/kg (Rat) Dermal LD50: 2 g/kg (Rabbit) Inhalation LC50: 700 ppm (Rat)
84852-15-3	nonyl phenol Oral LD50: 1,300 mg/kg (Rat) Dermal LD50: 2,031 mg/kg (Rabbit)
Eyes	Irritant to the eyes. Corrosive to Eyes
Skin	Irritant to the skin. Corrosive to Skin
Inhalation	Irritant to respiratory tract. Prolonged or excessive inhalation may cause respiratory tract irritation.
Sensitization	Skin sensitization in humans. Avoid breathing vapors.
Oral	N.D.A.
Dermal	N.D.A.
Inhalation	N.D.A.

12. ECOLOGICAL INFORMATION

No ecotoxicity data was found for the product.

Component Ecotoxicity:	
Paratertiarybutylphenol	96 Hr LC50 Pimephales promelas: 4.71 - 5.62 mg/L [flow-through]; 96 Hr LC50 Cyprinus carpio: 6.9 mg/L [static] 48 Hr EC50 Daphnia magna: 3.9 mg/L; 48 Hr EC50 Daphnia magna: 3.4 - 4.5 mg/L [Static] 72 Hr EC50 Desmodesmus subspicatus: 11.2 mg/L
nonyl phenol	96 Hr LC50 Pimephales promelas: 0.135 mg/L [flow-through]; 96 Hr LC50 Lepomis macrochirus: 0.1351 mg/L [flow-through] 48 Hr EC50 Daphnia magna: 0.14 mg/L 96 Hr EC50 Pseudokirchneriella subcapitata: 0.36 - 0.48 mg/L [static]; 72 Hr EC50 Pseudokirchneriella subcapitata: 0.16 - 0.72 mg/L [static]; 72 Hr EC50 Desmodesmus subspicatus: 1.3 mg/L

13. DISPOSAL CONSIDERATIONS

Dispose of in accordance with applicable local/municipal, state/provincial and federal regulations.

14. TRANSPORT INFORMATION

UN2735 Amines, Liquid, corrosive, n.o.s. (Benzene-1,3-Dimethanamine,1,5-Pentanediamine, 2-Mthyl).

DOT Hazard Class 8	DOT Packaging Class II

15. REGULATORY INFORMATION

OSHA:29 CFR 1910.1200	Haxardous Chemical "Irritant", Sensitizer
(40 CFR 372.65)	Supplier Notification Required
TSCA	Ingredients listed
SARA III	Sec311 & 312 Immediate Health Haxard; Sec313 Chemicals above de minimus level: None
CA PROP. 65 NOTICE WARNING	
CANADIAN REGULATORY INFO	WHMIS; Hazard Classification: D2B Skin Sensitizer. Refer to SDS for specific warnings
WHMIS Symbols	Stylized T.
WHMIS Trade Secret Registry Numbers	None
Hazardous Products Act Informtion	This product SDS contains ingredients which are Controlled and/or on the Ingredient Disclosure List (HPA sections 13 and 14).

The following chemicals are classified under SARA 313 Toxic Release Invetnory (TRI):
84852-15-3 nonyl phenol 1 to 5 %

Country	EU
Regulation	REACH (EU) SUBSTANCES OF VERY HIGH CONCERN Toxic Substance Control Act (TSCA)

All Components Listed	EU - No TSCA - Yes
Safety Phrase	None

16. OTHER INFORMATION

Further information	HMIS® is a registered trade and service mark of the NPCA.
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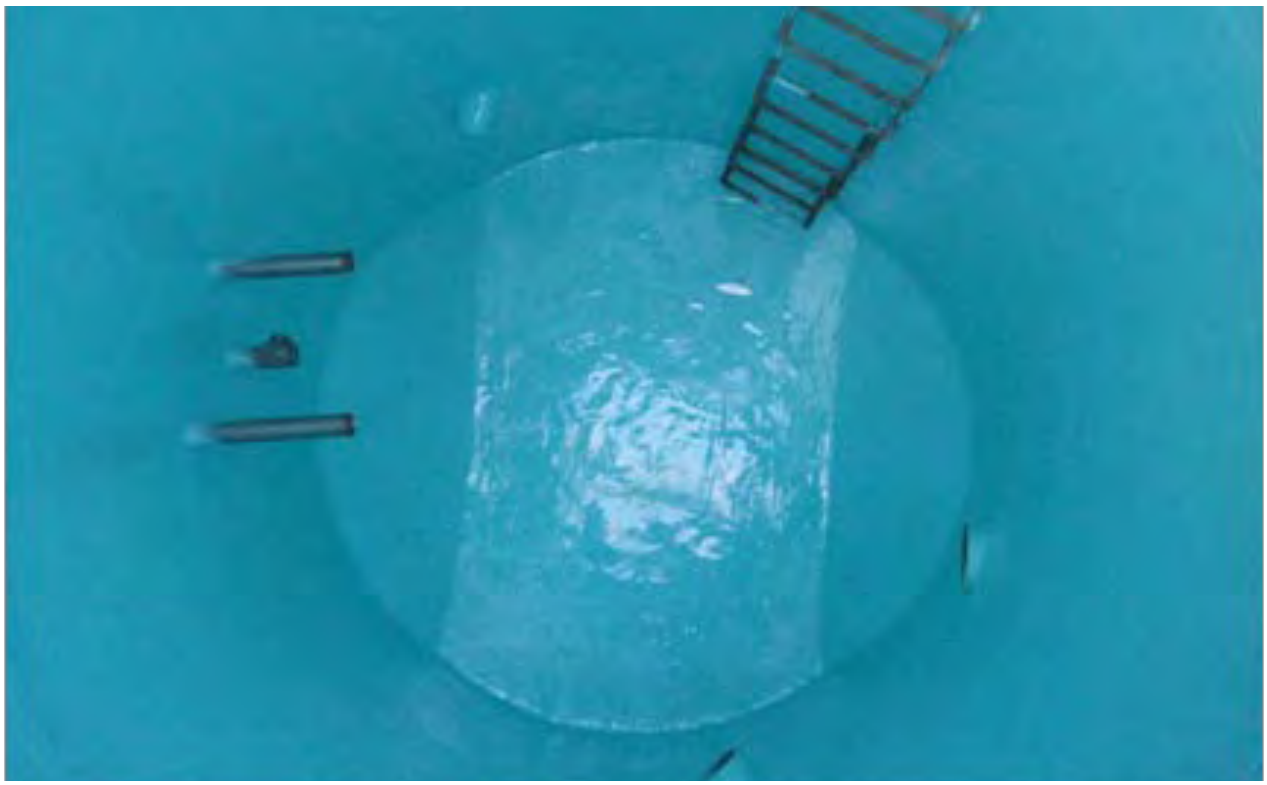
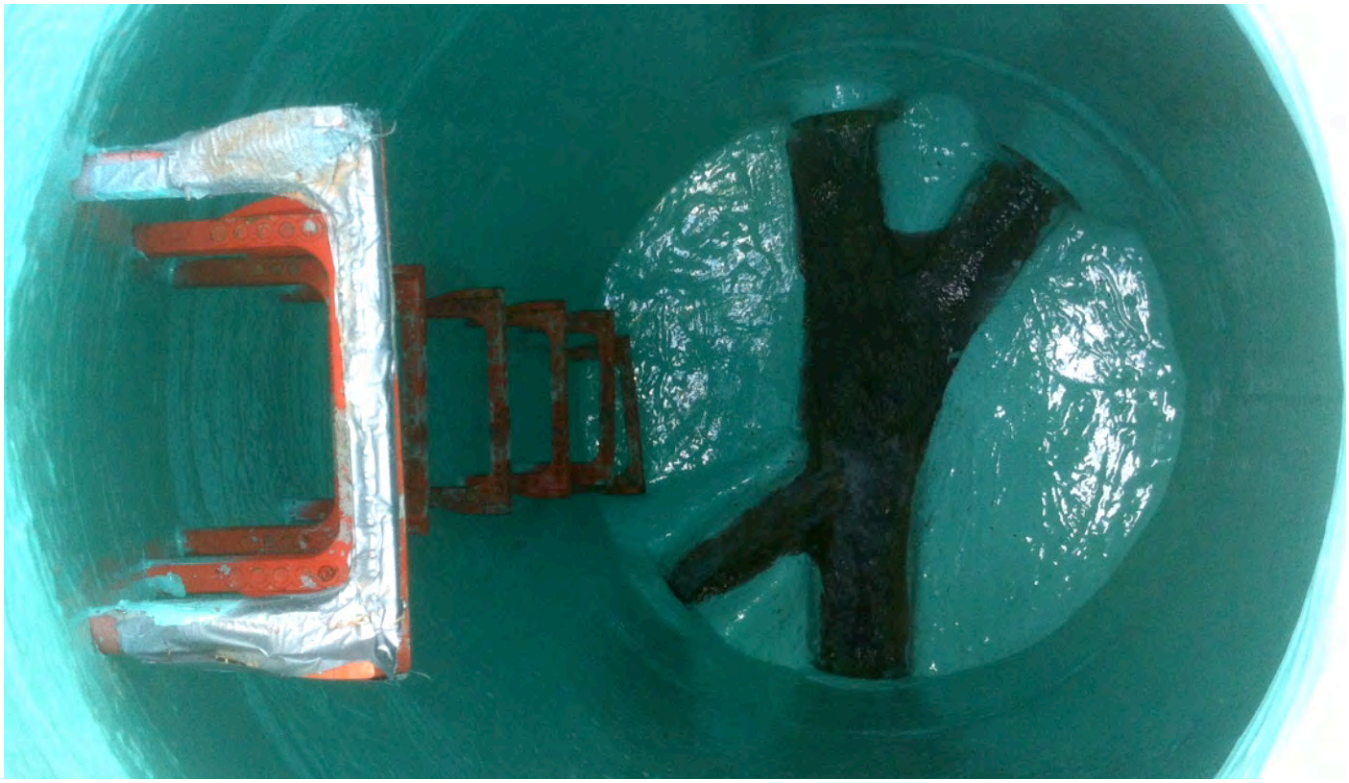
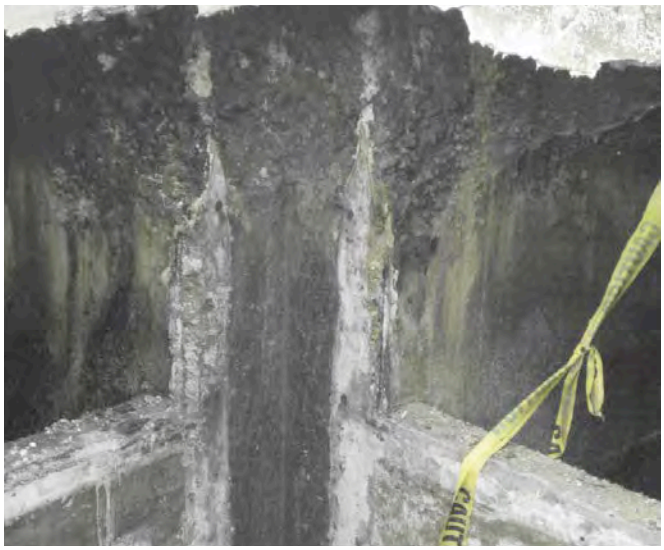
QUADEX®
A VORTEX COMPANY

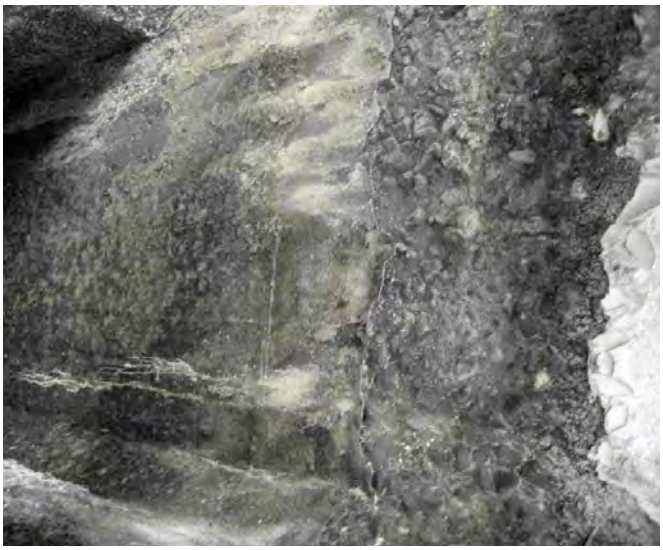
REPAIR MATERIALS

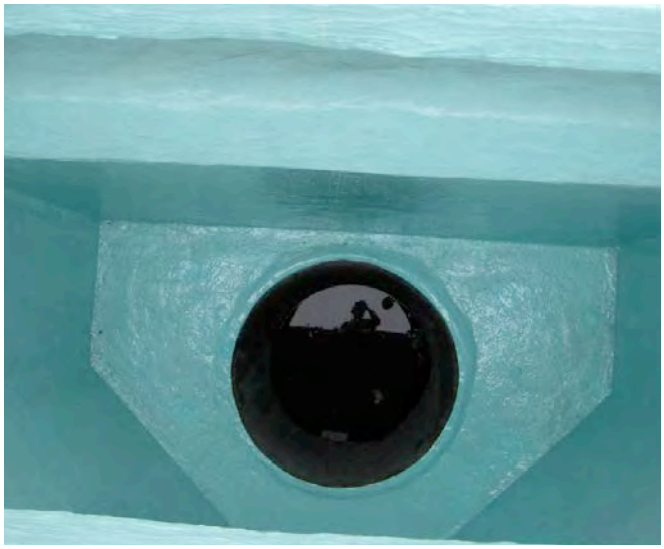
BEFORE & AFTER
INSTALLATION PHOTOS

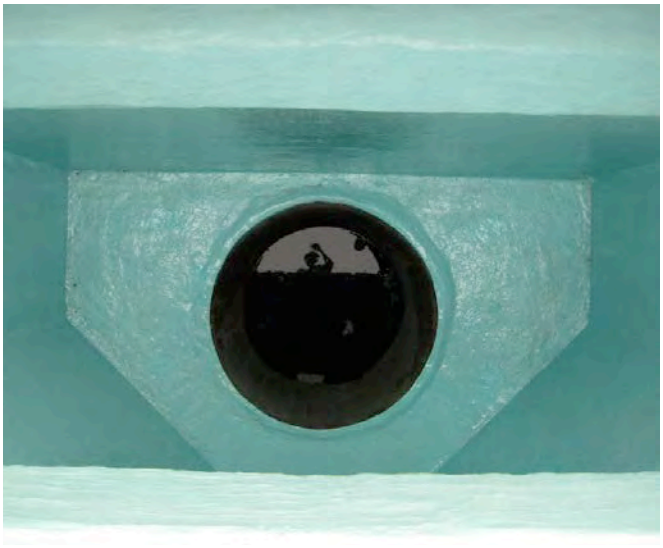


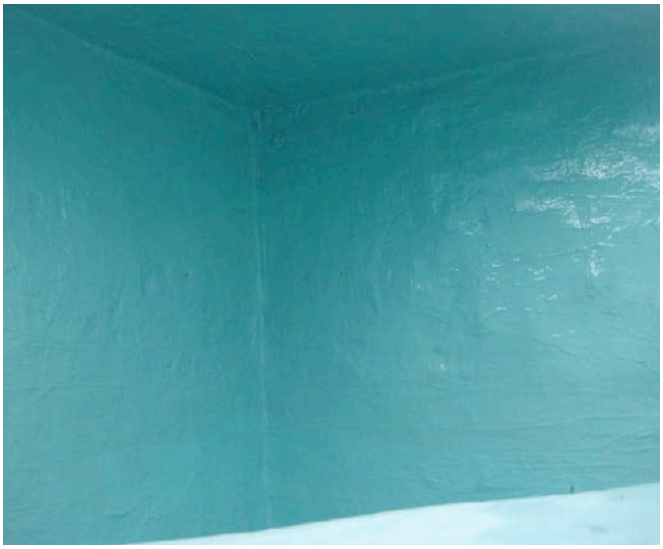


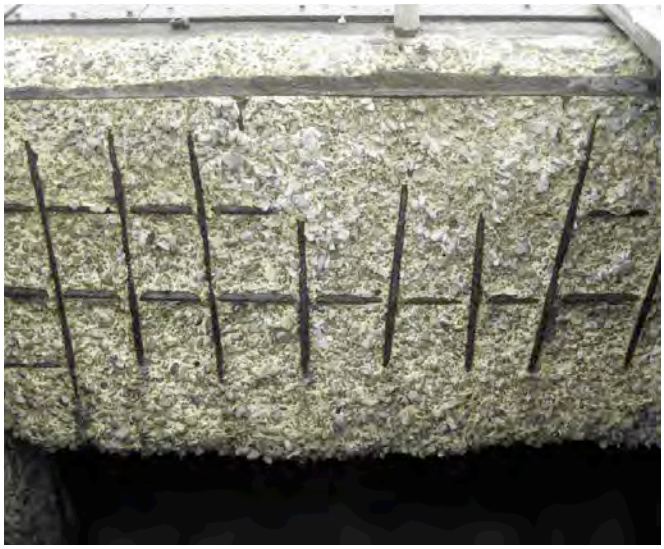












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