VORTEX

EPOXY COATING SUBMITTAL

Featuring

STRUCTURE GUARD®

GREENBOOK / CITY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS APPROVED

City of Los Angeles Approved Products

Select **Lining and Coating**

QUADEX® A VORTEX COMPANY | REPAIR MATERIALS

1-855-WHYDIG1 | www.vortexcompanies.com

REV. 07-19-2025

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CORPORATE PROFILE
Quadex® LLC

CONTACT INFORMATION
18150 Imperial Valley Dr.
Houston, TX 77060
O: 713-750-9081
F: 884-804-7996

WEBSITE
www.vortexcompanies.com

EXPERIENCE
Over 30 years in the sewer and pipe rehabilitation business with over 200,000,000 lbs | 90,718,474 kg 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, that over the years, have been continuously expanded, refined, and improved.

Due to customer and market demands, we quickly moved into the development and manufacture of a full-line of polymeric materials. These products range from 100% solids epoxies, hybrid epoxies, and polyurethane grouts. Unlike the the mega-sized polymeric formulators and manufacturers, we were strategically built for quick formulation and third parting testing, which allows us to bring products to market faster.

Led by some of the industry's foremost authorities in cementitious and polymeric product development, the Vortex Products team is 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, wastewater and stormwater related infrastructure including large diameter pipe, manholes, wetwells, pump stations, junction structures, headworks, treatment facilities, and other severe duty underground utility infrastructure.

Quadex products are formulated and designed with the most advanced technology and are proven with over 30 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), European Standard (EN), German Institute for Standardization (DIN), National Sanitation Foundation (NSF) and other applicable procedures.

VORTEX

Structure Guard®
Technical Data Sheet

TECHNICAL DATA SHEET

Structure Guard®

TECHNICAL DATA

TYPICAL PERFORMANCE CHARACTERISTICS*

CHARACTERISTICS	TEST METHOD	PERFORMANCE
Tensile Strength	ASTM D638	>9,000 psi | 62 MPa
Tensile Elongation	ASTM D638	6.6%
Tensile Modulus	ASTM D638	500 ksi | 3,450 MPa
Flexural Strength	ASTM D790	15,700 psi | 108 MPa
Flexural Modulus	ASTM D790	510 ksi | 3,516 MPa
Compressive Strength	ASTM D695	>18,000 psi | 124 MPa
Compressive Modulus	ASTM D695	535 ksi | 3,690 MPa
Adhesion to Concrete	ASTM D4541	Substrate Failure, >200 psi
Resistance of Plastics to Chemical Reagents (listed in ASTM F1216)	ASTM D543	Completed**
Durometer Hardness (Shore D)	ASTM D2240	87.5
Volatile Content of Coatings	ASTM D2369	No VOCs
Severe Wastewater Analysis Test (SWAT)	ASTM G210	Completed
Taber Abrasion, CS-17 Wheel	ASTM D 4060	1 kg load/1,000 cycles - <80 mg
Adhesion to Blasted Steel	ASTM D4541	>1,000 psi | 6.9 MPa
City of Los Angeles Department of Public Works	Greenbook	Listed - Section SSPWC 211-2 /Epoxy liners SSPWC section 500-2.8.5

**The values stated in inch-pound units are to be regarded as the standard. The values given in international system are for information only.*

*** Completed as part of the City of Los Angeles Greenbook certification*

TECHNICAL INFORMATION

- **Color: Light Bluegreen**
- **Solids - 100% (No Solvents)**
- **No VOCs**
- **Thickenss - 250 mils | 6.4mm WFT in a Single Pass**
- **Finish: Very Smooth (Manning Coefficient: .009)**
- **Flash Point > 250°F | 121°C**
- **Ratio: 2A to 1B by volume**

GREENBOOK / CITY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS APPROVED
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Select Lining and Coating

QUADEX® A VORTEX COMPANY | REPAIR MATERIALS

Corrosion Resistant Epoxy Protective Coating

DESCRIPTION

Quadex® 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

- **Excellent corrosion and abrasion resistance**
- **2 Year shelf life (from date of manufacture)**

CURE TIME @ 70°F | 21°C

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

POT LIFE

- **@ 40°F | 4.4°C — 20 minutes**
- **@ 70°F | 21°C — 10 minutes**
- **@ 92°F | 33.3°C — 5 minutes**

PACKAGING

Structure Guard is available in 5 gallon | 18.9 L pails and 55 gallon | 208 L drums.

YIELD

Structure Guard will yield theoretical coverage of 20 sq. ft per gallon @ 80 mils | 2.03mm thickness. Actual surface coverage will depend on substrate porosity and roughness. A wet film thickness gauge may be used to determine actual coating thickness.

VORTEX

WARRANTY

Quadex, LLC warrants its products to be free of defects in material and workmanship. Unless superseded by project specifications and terms agreed upon in writing between installer and Quadex prior to bid, if within one year from purchase, any Quadex, LLC product is proven defective, the company will replace said product or refund its purchase price at its sole discretion. The company's obligation shall be limited solely to such replacement or refund. There are no other warranties by Quadex, LLC, expressed or implied. There is no warranty if Quadex products are stored or used contrary to Quadex, LLC's written directions.

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 | 21°C (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.

GREENBOOK TEST: PASS

Structure Guard tested in accordance with City of Los Angeles Referral Form BR800097 and successfully conforms to chemical resistance (Pickle Jar) testing requirements in accordance with Greenbook Section SSPWC 211-2. It also meets or exceeds the specifications in SSPWC Section 500-2.8.5 for epoxy liner.

CHEMICAL RESISTANCE

- **Acetic Acid (10%)**
- **Bleach**
- **Butyl Cellosolve**
- **Deionized Water**
- **Ethanol**
- **Hydrogen Sulfide (H_2S)**
- **Lactic Acid (10%)**
- **MEK**
- **Methanol**
- **Nitric Acid (10%)**
- **Nitric Acid (30%)**
- **Sulfuric Acid (20%)**
- **Sodium Hydroxide (50%)**
- **Toluene**
- **Trichloroethane (1,1,1)**
- **Xylene**

Resistance of Plastics to ASTM D543 Completed Chemical Reagents (listed in ASTM F1216)

APPLICATION SYSTEMS

- **Heated Plural Airless Spray Units**
- **Minimum Output 5,000 psi | 345 bar**
- **Product Hose: Min. - Optimum I.D. 0.375 - 0.5 inch | 9.5 - 12.7mm**

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 CSP5 or greater 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 minimum CSP5 or greater.

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 | 345 bar) or ultrahigh (>10,000 psi | 690 bar) pressure water cleaning or water cleaning with sand injection. The resulting anchor profile shall be 3.0-5.0 mils | 0.08-0.13mm and be relative to the coating thickness specified.

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. ACI 506.2-77 - Specifications for Materials, Proportioning, and Application of Shotcrete
B. ASTM - The published standards of the American Society for Testing and Materials, West Conshohocken, PA
C. ASTM C109 - Compressive Strength Hydraulic Cement Mortars
D. ASTM C267 - Standard Test Methods for Chemical Resistance of Mortars, Grouts, and Monolithic Surfacings and Polymer Concretes
E. ASTM C579 - Compressive Strength of Chemically Setting Silicate and Silica Chemical Resistant Mortars
F. ASTM C596 Standard Test Method for Drying Shrinkage of Mortar Containing Hydraulic Cement
G. ASTM C882 - Standard Test Method for Bond Strength of Epoxy-Resin Systems Used With Concrete By Slant Shear
H. ASTM D543 - Resistance of Plastics to Chemical Reagents
I. ASTM D638 - Tensile Properties of Plastics
J. ASTM D695 - Compressive Properties of Rigid Plastics
K. ASTM D790 - Flexural Properties of Unreinforced and Reinforced Plastics
L. ASTM D2240 - Standard Test Method for Rubber Property—Durometer Hardness
M. ASTM D2369 - Volatile Content of Coatings
N. ASTM D2584 - Volatile Matter Content
O. ASTM D4060 - Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser
P. ASTM D4541 - Pull-off Strength of Coatings Using a Portable Adhesion Tester
Q. ASTM D7234 Pull-Off Adhesion Strength of Coatings on Concrete Using Portable Pull-Off Adhesion Testers
R. ASTM G210 - Severe Wastewater Analysis Test (SWAT)
S. Greenbook - City of Los Angeles Department of Public Works
T. NACE - The published standards of National Association of Corrosion Engineers (NACE International), Houston, TX
U. NACE SP0188-2006 Discontinuity (Holiday) Testing on New Protective Coatings on Conductive Substrates
V. NASSCO – National Association of Sewer Service Companies, Marriottsville, MD – Manhole Assessment Condition Program (MACP) and Pipeline Assessment Condition Program (PACP)
W. SSPC - The published standards of the Society of Protective Coatings, Pittsburgh, PA.
X. SSPC SP-13/NACE No. 6 – Surface Preparation of Concrete

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. No less than three weeks prior to bid date, Manufacturers or vendors of products not currently listed in the Specification must submit proof that any proposed material will meet the guidelines and requirements of this specification. Material approvals shall be made by the engineer in Addendum released prior to bid, officially naming approved Manufacturer and material once satisfied that the Specification requirements have been met.

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

A. Heavy Infiltration
   1. Injection grouting material shall be used to address heavy infiltration following Manufacturer's instructions. Injection grouting material shall be Quadex I&I Guard® Family of products as manufactured by Quadex or alternative approved material(s).
   2. Heavy infiltration means infiltration that meets the definition of a "runner" or "gusher", as defined by NASSCO's Pipeline Assessment Certification Program.
      a. Runner - water running into the sewer through a faulty joint or infrastructure wall. A continuous flow will be visible.
      b. Gusher - water entering the infrastructure "under pressure" through a defect or faulty joint.

B. Mild to Moderate Infiltration
   1. All fast setting materials furnished shall be formulated to be applied in dry powder form, with no prior mixing of water, directly to active leaks under hydrostatic pressure in pipes, manholes, wet wells 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®.

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. Cementitious materials shall consist of rapid setting cements, NSG aggregates, and various accelerating agents. Cementitious materials shall not contain chlorides, gypsum, or metallic particles. Mastic materials shall consist of 100% Solid epoxy with no solvents or VOC's. Approved invert repair and patching material shall be Quadex Hyperform® or Quadex Structure Guard®-RS or Structure Guard®-FM. Approved mastic material shall exhibit the following minimum physical properties:

1. Tensile Strength
   ASTM D638-14
   4150 psi | 28.6 MPa
2. Compression Strength
   ASTM D695-13
   9650 psi | 66.5 MPa

Approved Cementitious materials shall exhibit the following minimum physical properties:

1. Compressive Strength (ASTM C109)
   30 mins: >1200 psi | 8.3 MPa
   1 hour: >2500 psi | 17.2 MPa
   1 day: >4000 psi | 27.6 MPa
2. Shrinkage (ASTM C596)
   0%
3. Bond Strength (ASTM C882)
   28-Day: >3000 psi | 20.7 MPa

3.3 PROTECTIVE COATING

Polymer protective coating and lining materials shall be specifically designed for protecting manholes, water, wastewater and stormwater structures from severe hydrogen sulfide environments. Liner materials shall be 100% solids epoxy containing no VOC's, PFAS' or isocyanates and capable of building 250 mils | 6.4mm in a single application. All epoxy lining materials must be applied using plural component spray equipment capable of heating product and material lines, approved by the manufacturer. Approved material shall be Quadex Structure Guard® or preapproved equal. Epoxy materials shall meet the following minimum physical properties:

1. Resistance of Plastics to Chemical Reagents (listed in ASTM F1216) (ASTM D543)
   Completed
2. Tensile Strength (ASTM D638)
   >9,000 psi | 62 MPa
3. Tensile Elongation (ASTM D638)
   6.6%
4. Tensile Modulus (ASTM D638)
   500 ksi | 3,450 MPa
5. Compressive Strength (ASTM D695)
   >18,000 psi | 124 MPa
6. Compressive Modulus (ASTM D695)
   535 ksi | 3,690 MPa
7. Flexural Strength (ASTM D790)
   15,700 psi | 108 MPa
8. Flexural Modulus (ASTM D790)
   530 ksi | 3,650 MPa
9. Durometer Hardness (Shore D) (ASTM D2240)
   87.5
10. Volatile Content of Coatings (ASTM D2369)
    No VOCs
11. Taber Abrasion, CS-17 Wheel (ASTM D 4060)
    1 kg load/1,000 cycles - <80 mg
12. Adhesion to Blasted Steel (ASTM D4541)
    >1,000 psi | 6.9 MPa
13. Adhesion to Concrete (ASTM D4541)
    Substrate Failure
14. Severe Wastewater Analysis Test (SWAT) (ASTM G210)
    Completed
15. City of Los Angeles Department of Public Works (Greenbook)
    Section SSPWC 211-2 / Epoxy liners SSPWC section 500-2.8.5

3.4 PENETRATION TREATMENT

When requested by Project Specification, Flex Guard® is to be installed as a base coat application at all penetrations. Recommended that Owner/Engineer consider adding to project specifications when chance of dissimilar movement between host structure and penetrating services and laterals.

3.5 INTERNAL CHIMNEY SEAL

When requested by Project Specification, Chimney Guard™ is to be installed over top Structure Guard® application in top 18-inches | 450mm extending onto the ring and cover. Recommended that Owner/Engineer consider adding to project specifications when MH will be subjected to freeze-thaw, cyclical traffic loading, or high likelihood of I&I exposure.

3.6 RE-SURFACING MATERIALS

When requested by Project Specification, Quadex re-surfacing materials (GeoKrete®, AluminaLiner® or QM-1s Restore®) to be installed at a minimum 0.5-inch | 12.7mm as a re-surfacing material prior to epoxy application. Recommended that Owner/Engineer consider adding to project specifications when host surface is degraded.

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. SSPC-SP CAB Abrasive Blast Cleaning of Concrete and Cementitious Materials – Thorough Blast Cleaning,
   C. ASTM D-4258 Standard Practice for Surface Cleaning Concrete for Coating and ASTM-D-4259 Standard Practice for Abrading Concrete,
   D. ICRI Technical Guideline No. 03732 Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays.
   E. NACE/SSPC Standards for the surface preparation of steel.
   F. Resulting surface profile of the prepared concrete substrate shall be (as described in ICRI Technical Guideline No. 03732):
      i. For application of cementitious invert repair and patching materials; at least a CSP3.
      ii. For application of coating products: at least a CSP5.
      iii. For application of cementitious re-surfacing materials; at least a CSP5.
   G. 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. When existing infrastructure is re-surfaced with Quadex mortar materials identified in 4.1/E/i, application may take place no sooner than 24 hours following re-surfacing material application.
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 | 4.4° and 48.9°C. If introducing heat, it is recommended that a heating source such as an electric heater be used. If using gas fueled heat source, then heat must be indirectly introduced into the infrastructure, preventing moisture / fuel residue from being introduced at the the application point.
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.
F. Host Substrate or Cementitious underlayment must be at concrete moisture content of 4.5% or below as measured following ASTM F2170 before installation of the Structure Guard®.
G. Application Conditions: Concrete Substrate or Cementitious underlayment must be at an 80% relative humidity or below before installation of the Structure Guard. Relative Humidity in the environment of application must be at an 85% relative humidity or below before installation of Structure Guard. We recommend to NOT apply Structure Guard if the surface temperature is within 5°F | 2.78°C of the air dew point. Ideally, the surface temperature should be at least 5°F | 2.78°C above the dew point temperature during all stages of the coating process.

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).

- The preparation of the resulting surface shall be verified by testing tensile strength of the prepared substrate following ASTM 7234 and results recorded and documented in installation logs. As structures increase in size, additional test locations beyond the recommendation of three may be warranted.

E. Resulting surface profile shall be at least a CSP5 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 (refer to section 3.1). 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 (>= 9.5). 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 as presented in 3.2 of this Section 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).

E. It is strongly encouraged that all inside angles approaching or exceeding 90-degree to include wall, ceiling and floor intersections, penetrations and similar features recieve sufficient preparation material so as to round or fillet the hard corners.

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 Wet Film thickness of 80 mils | 2.0mm to surface profile of CSP5 or greater or 125 mils | 3.2mm minimum wet film thickness to surface profiles of CSP-7 or greater. In all existing infrastructure, including those receiving an underlay, the coating product shall be applied to a minimum wet film thickness of 125 mils | 3.2mm to surface profile of CSP5 or greater.
F. Subsequent topcoating or additional coats of the coating product(s) shall occur within the product's recoat window of 2 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.
J. Upon assessment, it may be necessary to incorporate key ways and/or construction joints/expansion joints to help facilitate designed installation and increased longevity of the epoxy coating product. Such practice is particularly important for large structures, those with long / flat walls, extreme directional change, or when lining convex surfaces.

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, delamination, 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 SP0188-2006 Discontinuity (Holiday) Testing on New Protective Coatings on Conductive Substrates. 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 in Section 6.1.C.
   A. Surface shall first be dried.
   B. An induced holiday shall then be made on to the coated concrete surface to ensure proper operation of the test unit and shall serve to determine the minimum/maximum voltage to be used to test the coating for holidays within each structure. For coatings over 80 mils | 2.0mm: Per NACE SP0188-2006 the spark tester shall be initially set at 100 volts per 1 mil (25 microns | 0.0254mm) of applied film thickness and may be adjusted as necessary to detect the induced holiday.

      Voltage shall not exceed 100 volts per mil (25 microns | 0.0254mm) of applied coating system thickness or 10,000 volts without manufacturer's written approval, in conformance with Section 1, General which states:

      1.5. To prevent damage to a coating if a high-voltage spark tester is being used, the total film thickness and dielectric strength of the coating system shall be considered in selecting the appropriate voltage for detection of discontinuities.
      1.6 The coating manufacturer shall be consulted to obtain the following information, which can affect the accuracy of the tests described in this standard to determine discontinuities:
         A. The length of time required to adequately dry or cure the applied coating prior to testing. Solvents retained in an uncured coating may form an electrically conductive path through the film to the substrate.

B. Whether the coating contains electrically conductive fillers or pigments that may affect the normal dielectric properties. For coatings 80 mils | 2.0mm or less: Refer to NACE SP0188-2006, Section 4, Table 1 for voltage suggestions.
C. All detected and induced holidays shall be marked and repaired by abrading the coating surface with grit disk paper or other hand tooling method. After abrading and cleaning, additional protective coating material can be hand applied to the repair area. All touch-up/ repair procedures shall follow the protective coating manufacturer's recommendations.
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 D4541 Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers or ASTM D7234 Pull-Off Adhesion Strength of Coatings on Concrete Using Portable Pull-Off Adhesion Testers. If intending to evaluate adhesion performance post-installation, host surface should be adhesion tested and results reported prior to lining activities, establishing benchmark value(s).
   A. 20 mm loading fixtures (dolly/stud) shall be used on curved infrastructure such as circular manholes. 50 mm loading fixtures (dolly/stud) shall be used on flat infrastructure as allowed by ASTM.
   B. For each test structure, recommended to include no more than 10% of the total count of lined structures unless further concerns are noted, a minimum of three dollies shall be affixed to the coated surface; one at the cone (top) area, one at the mid-section and one near the invert (bottom) of the structure.
   C. For larger structures a minimum of three dollies shall be affixed to the coated surface at random locations within each 1,000 square foot | 92.9 square meter area or as otherwise agreed upon.
   D. 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 1,000 psi | 69 bar) 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 prior to meeting specified minimum adhesion strength shall be deemed a non-test and require retesting.
   E. 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.
   F. Tests failing within the substrate, even if failing to meet specified adhesion requirements, shall be considered passing as the Contractor has no control over the performance of the existing infrastructure (ASTM D7234 Appendixes X1). 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.
   G. All adhesion testing shall be performed by qualified personnel using calibrated equipment as specified by the applicable ASTM standard(s).
   H. 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.
   I. Adhesion test locations in up to 10% of the total count of lined structures shall be repaired by the Contractor at no cost to the Owner. If the Contractor is directed by the Owner/Engineer to test on structures exceeding 10% of the lined structures, repairs to passing structures will be paid for by Owner at a negotiated rate agreed upon between the Owner and Contractor. Repairs to structures where testing fails, 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 when properly stored/handled, installed/applied. 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.

Structure Guard®
Safety Data Sheets

Structure Guard®

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name	• Structure Guard® 100% Solids Epoxy - Part A
Trade Name	• RD 1000
Company	• Quadex LLC, 564 W. 9320 S., Sandy, UT 84070
Company Contact	• Matthew Peterson
Company Phone	• 844-782-4832
Emergency	• Domestic Shipments and to Canada: 1-800-633-8253 • International Shipments: 1-801-629-0667

2. HAZARDS IDENTIFICATION

GHS Ratings			
	Carcinogen	• 2	• Limited evidence of human or animal carcinogenicity
Hazard Statement(s)			
	H351	• Suspected of causing cancer	
Precautionary Statement(s)			
	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		
Pictogram			

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Cas #	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 MEASURE

If inhaled remove to fresh air. If breathing is difficult, give oxygen. Obtain medical advice if there are persistent symptoms. 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.	• Epoxy Resin 25085-99-8
OSHA Exposure Limits	• Not Established.
ACGIH Exposure Limits	• Not Established.
Other Exposure Limits	• Not Established.

Chemical Name / CAS No.	• Barium Sulfate 7727-43-7
OSHA Exposure Limits	• 15 mg/m^3 TWA (total dust); 5 mg/m^3 TWA (respirable fraction)
ACGIH Exposure Limits	• 5 mg/m^3 TWA (inhalable fraction, particulate matter containing no asbestos and <1% crystalline silica)
Other Exposure Limits	• NIOSH: 10 mg/m^3 TWA (total dust); 5 mg/m^3 TWA (respirable dust)

Chemical Name / CAS No.	• Titanium Dioxide 13463-67-7
OSHA Exposure Limits	• 15 mg/m^3 TWA (total dust)
ACGIH Exposure Limits	• 10 mg/m^3 TWA
Other Exposure Limits	• Not Established.

Chemical Name / CAS No.	• Silica 67762-90-7
OSHA Exposure Limits	• Not Established.
ACGIH Exposure Limits	• Not Established.
Other Exposure Limits	• Not Established.

Use appropriate engineering control such as process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended 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 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 Point	• 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
Hazard Class	• 9

15. REGULATORY INFORMATION

OSHA:29 CFR 1910.1200 Hazardous 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 | 10 to 20 % 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	• Product and Company Identification: Synonyms changes from the previous Physical & Chemical Properties: Multiple Properties version in section(s): Transport Information: Material Transportation Information Regulatory Information: United States.	

Structure Guard®

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name	• Structure Guard® Catalyst – Part B
Trade Name	• RD 1000
Company	• Quadex LLC, 564 W. 9320 S., Sandy, UT 84070
Company Contact	• Matthew Peterson
Company Phone	• 844-782-4832
Emergency	• Domestic Shipments and to Canada: 1-800-633-8253 • International Shipments: 1-801-629-0667

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
Hazard Statement(s)			
	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	

2. HAZARDS IDENTIFICATION (CONTINUED)

Precautionary Statement(s)		
	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	
Pictogram		

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Cas #	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 MEASURE

If inhaled remove to fresh air. If breathing is difficult, give oxygen. Obtain medical advice if there are persistent symptoms. 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. 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.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

Chemical Name / CAS No.	• Paratertiarybutylphenol 98-54-4
OSHA Exposure Limits	• Not Established.
ACGIH Exposure Limits	• Not Established.
Other Exposure Limits	• Not Established.

Chemical Name / CAS No.	• Amine 1477-55-0
OSHA Exposure Limits	• Not Established.
ACGIH Exposure Limits	• 0.1 mg/m^3 Ceiling
Other Exposure Limits	• NIOSH: 0.1 mg/m^3 Ceiling

Chemical Name / CAS No.	• 1,5-Pentanediamine, 2 methyl 15520-10-2
OSHA Exposure Limits	• Not Established.
ACGIH Exposure Limits	• Not Established.
Other Exposure Limits	• Not Established.

Chemical Name / CAS No.	• Silica 67762-90-7
OSHA Exposure Limits	• Not Established.
ACGIH Exposure Limits	• Not Established.
Other Exposure Limits	• Not Established.

Chemical Name / CAS No.	• nonyl phenol 84852-15-3
OSHA Exposure Limits	• Not Established.
ACGIH Exposure Limits	• Not Established.
Other Exposure Limits	• 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 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 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	• Paratertiarybutylphenol 98-54-4 Oral LD50: 3,250 QL/kg (Rat) Dermal LD50: 2,318 mg/kg (Rabbit) • Amine 1477-55-0 Oral LD50: 660 mg/kg (Rat) Dermal LD50: 2 g/kg (Rabbit) Inhalation LC50: 700 ppm (Rat) • nonyl phenol 84852-15-3 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 (40 CFR 372.65)	• Haxardous Chemical “Irritant”, Sensitizer • 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 Information: 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 %

15. REGULATORY INFORMATION (CONTINUED)

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	• 3
	Flammability	• 1
	Physical hazard	• 0
	Personal Protection:	• H
NFPA Ratings		
	Health	• 3
	Flammability	• 1
	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	• Product and Company Identification: Synonyms changes from the previous Physical & Chemical Properties: Multiple Properties version in section(s): Transport Information: Material Transportation Information Regulatory Information: United States.	

Ancillary Water Stop Products

I & I Guard® -PRF

ADVANTAGES

- **Fast reacting**
- **Easy to use cartridges**
- **No mixing**
- **Self contained packaging**
- **Non Hazardous**
- **No shrinkage**
- **Expands 10 times liquid**

PHYSICAL PROPERTIES

- **VOC content: 0%**
- **Color: Amber**
- **Specific gravity: 1.06 B side, 1.23 A side**
- **Reaction time: 3-5 s**
- **Expansion time: 30 s**

MIX RATIO

1 to 1 by volume

PACKAGING

300ml x 300ml Cartridge

* The values stated in inch-pound units are to be regarded as the standard. The values given in International System are for information only.

QUADEX® A VORTEX COMPANY REPAIR MATERIALS

Fast Acting Grout for High Flow Leakage: 300ml x 300ml Cartridge

DESCRIPTION

I&I Guard®-PRF is a two-part poly urethane grout used to stop high flow infiltration. Easy injection method creating curtain of grout on the outside of underground structures. Super fast cure allows for immediate reduction in infiltration. Best when used in conjunction with Quadex® branded rehab systems.

APPLICATION INFORMATION

Stopping leaks in manholes, vaults, lift stations, pipelines, etc. Can be used to stop leaks up to 50 gallons | 189 liters per minute. Used primarily to stop high inflow and infiltration.

DIRECTIONS

1. **Drill 5/8-inch | 15.88 mm completely through the structure.**
2. **Remove nut from cartridge.**
3. **Slide nut onto static mixing tip.**
4. **Insert static mixing tip in to drilled hole.**
5. **Remove cap plug from cartridge hold the cartridge upright.**
6. **Attach cartridge to static mixing tip by tightening the nut.**
7. **Use cartridge gun by pumping handle to dispense grout.**
8. **Continue to pump handle until the cartridge is empty or until you no longer pump handle.**

SAFETY

Always use safety glasses and protective clothing including gloves when using this product.

STORAGE

Store between 40°F | 4.4°C and 100°F | 37.8°C.

DISPOSAL

Dispose of cartridge in adherence with local regulations.

I & I Guard® -PRF

ADVANTAGES

- **Fast reacting**
- **Easy to use cartridges**
- **No mixing**
- **Self contained packaging**
- **Non Hazardous**
- **No shrinkage**
- **Expands 10 times liquid**

PHYSICAL PROPERTIES

- **VOC content: 0%**
- **Color: Amber**
- **Specific gravity: 1.06 B side, 1.23 A side**
- **Reaction time: 3-5 s**
- **Expansion time: 30 s**

MIX RATIO

1 to 1 by volume

PACKAGING

600ml x 600ml Cartridge

* The values stated in inch-pound units are to be regarded as the standard. The values given in International System are for information only.

QUADEX® A VORTEX COMPANY REPAIR MATERIALS

Fast Acting Grout for High Flow Leakage: 600ml x 600ml Cartridge

DESCRIPTION

I&I Guard®-PRF is a two-part poly urethane grout used to stop high flow infiltration. Easy injection method creating curtain of grout on the outside of underground structures. Super fast cure allows for immediate reduction in infiltration. Best when used in conjunction with Quadex® branded rehab systems.

APPLICATION INFORMATION

Stopping leaks in manholes, vaults, lift stations, pipelines, etc. Can be used to stop leaks up to 50 gallons | 189 liters per minute. Used primarily to stop high inflow and infiltration.

DIRECTIONS

1. **Drill 5/8” hole completely through the structure.**
2. **Remove nut from cartridge.**
3. **Slide nut onto static mixing tip.**
4. **Insert static mixing tip into the drilled hole and insert cartridge into the Quadex® OneGun®.**
5. **Remove cap plug from cartridge and hold the Quadex OneGun upright.**
6. **Attach cartridge to static mixing tip by tightening the nut.**
7. **Pull trigger on Quadex OneGun to dispense grout.**
8. **Continue to pull trigger until the cartridge is empty or until the OneGun automatically seizes.**

SAFETY

Always use safety glasses and protective clothing including gloves when using this product.

STORAGE

Store between 40°F | 4.4°C and 100°F | 37.8°C.

DISPOSAL

Dispose of cartridge in adherence with local regulations.

I & I Guard® -PRF

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name	• I&I Guard®-PRF Part A
Trade Name	• I&I Guard®-PRF APK
Company	• Quadex LLC, 564 W. 9320 S., Sandy, UT 84070
Company Contact	• Matthew Peterson
Company Phone	• 844-782-4832
Emergency	• Domestic Shipments and to Canada: 1-800-633-8253 • International Shipments: 1-801-629-0667

2. HAZARDS IDENTIFICATION

GHS Ratings			
	Inhalation Toxicity	• Acute Tox. 1	• Gases<=100ppm, Vapors<=0.5mg/l, Dusts&mists<=0.05mg/l
	Skin Corrosive	• 2	• Reversible adverse effects in dermal tissue, Draize score: >=2.3 < 4.0 or persistent inflammation
	Eye Corrosive	• 2A	• Eye irritant: Subcategory 2A, Reversible in 21 days
	Respiratory Sensitizer	• 1	• Respiratory sensitizer
	Skin Sensitizer	• 1	• Skin sensitizer
	Carcinogen	• 2	• Limited evidence of human or animal carcinogenicity
Hazard Statement(s)			
	H315	• Causes skin irritation	
	H317	• May cause an allergic skin reaction	
	H319	• Causes serious eye irritation	
	H330	• Fatal if inhaled	
	H334	• May cause allergy or asthma symptoms or breathing difficulties if inhaled	
	H351	• Suspected of causing cancer	

2. HAZARDS IDENTIFICATION (CONTINUED)

Precautionary Statement(s)		
	P201	• Obtain special instructions before use
	P202	• Do not handle until all safety precautions have been read and understood
	P260	• Do not breathe dust/fume/gas/mist/vapours/spray
	P261	• Avoid breathing dust/fume/gas/mist/vapours/spray
	P264	• Wash ... thoroughly after handling
	P271	• Use only outdoors or in a well-ventilated area
	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
	P284	• Wear respiratory protection
	P285	• In case of inadequate ventilation wear respiratory protection
	P310	• Immediately call a POISON CENTER or doctor/physician
	P320	• Specific treatment is urgent (see ... on this label)
	P321	• Specific treatment (see ... on this label)
	P362	• Take off contaminated clothing and wash before reuse
	P363	• Wash contaminated clothing before reuse
	P302+P352	• IF ON SKIN: Wash with soap and water
	P304+P340	• IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
	P304+P341	• IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing
	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
	P337+P313	• If eye irritation persists, get medical advice/attention
	P342+P311	• Call a POISON CENTER or doctor/physician

2. HAZARDS IDENTIFICATION (CONTINUED)

Precautionary Statement(s)		
	P405	• Store locked up
	P403+P233	• Store in a well ventilated place. Keep container tightly closed
	P501	• Dispose of contents/container to ...
Signal Word	• Danger	
Pictogram		

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Cas #	Weight Concentration %
Polymeric Diphenylmethane Diisocyanate	• 9016-87-9	• 50.00% - 60.00%
4,4'Diphenylmethane Diisocyanate	• 101-68-8	• 30.00% - 40.00%
Diphenylmethane	• 5873-54-1	• 1.00% - 5.00%
Proprietary		• 0.10% - 1.00%

4. FIRST AID MEASURE

If inhaled remove to fresh air. If breathing is difficult, give oxygen. Get medical attention immediately if symptoms occur. Consult a physician immediately if symptoms such as shortness of breath or asthma are observed. A hyper-reactive response to even a minimal concentration of diisocyantes may develop in sensitiesed persons. This product is a respiratory irritant and potential respiratory sensitise: repeated inhalation of vapor or aerosol at levels above occupational exposure limit could cause respiratory sensitisation.

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. Sever allergic skin reactions, bronchiospasm and anaphylactic shock possible. 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).	
Water may be used if no other available and then in copious quantities. Reaction between water and hot isocyante may be vigorous.	
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 spill with non spark tools. No information available.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

Chemical Name / CAS No.	• Polymeric Diphenylmethane Diisocyanate 9016-87-9
OSHA Exposure Limits	• Not Established.
ACGIH Exposure Limits	• Not Established.
Other Exposure Limits	• Not Established.

Chemical Name / CAS No.	• 4,4'Diphenylmethane Diisocyanate 101-68-8
OSHA Exposure Limits	• Not Established.
ACGIH Exposure Limits	• 0.005 ppm TWA (listed under Methylene bisphenyl isocyanate (MDI))
Other Exposure Limits	• NIOSH: 0.005 ppm TWA (listed under Methylene bisphenyl isocyanate); 0.05 mg/m^3 TWA 0.020 ppm Ceiling (10 min); 0.2 mg/m^3 Ceiling (10 min)

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION (CONTINUED)

Chemical Name / CAS No.	• Diphenylmethane 5873-54-1
OSHA Exposure Limits	• Not Established.
ACGIH Exposure Limits	• Not Established.
Other Exposure Limits	• Not Established.

Chemical Name / CAS No.	• Proprietary
OSHA Exposure Limits	• Not Established.
ACGIH Exposure Limits	• Not Established.
Other Exposure Limits	• Not Established.
Use appropriate engineering control such as process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended. 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. 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

Specific Gravity (SG)	• 1.230
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 Polyurethane Resins especially at elevated temperatures. STABLE. Polyuethane Resins under uncontrolled conditions. Acids. Amines. Metals. Water. Carbon Dioxide (CO2), carbon monoxide (CO), oxides of nitrogen (NOx), dense black smoke. Hydrocarbons. Hydrogen cyanide (hydrocyanic acid). Hazardous polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

Mixture Toxicity	• Inhalation Toxicity LC50: 0mg/L
Component Toxicity	• 9016-87-9 — Polymeric Diphenylmethane Diisocyanate Oral LD50: 49 g/kg (Rat) Inhalation LC50: 490 mg/m3 (Rat) • 101-68-8 — 4,4'Diphenylmethane Diisocyanate Inhalation LC50: 369 mg/m3 (Rat)
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.

13. DISPOSAL CONSIDERATIONS

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

14. TRANSPORT INFORMATION

NA 3082, OTHER REGULATED SUBSTANCES, LIQUID, N.O.S. (Methylene Diphenyl Diisocyanate).
DOT Class 9
DOT Packaging Class III
Marine Polutent: No

15. REGULATORY INFORMATION

SARA III: Sec311 & 312
CA PROP. 65 NOTICE: This product does not contain any chemicals known by the State of California to cause cancer, birth defects or any other reproductive harm.

Canadian Regulatory Information	• WHMIS; Class 9 • 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). • 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: 5873-54-1 Diphenylmethane 1 to 5 % • The following chemicals are classified under SARA 313 Toxic Release Inventory (TRI): 9016-87-9 Polymeric Diphenylmethane Diisocyanate — 50 to 60% 101-68-8 4,4'Diphenylmethane Diisocyanate — 30 to 40% 5873-54-1 Diphenylmethane — 1 to 5%
Country	• EU
Safety Phrase	• None
Regulation	• REACH (EU) SUBSTANCES OF VERY HIGH CONCERN Toxic Substance Control Act (TSCA)
All Components Listed	• EU - No • TSCA - Yes

16. OTHER INFORMATION

Further Information	• HMIS® is a registered trade and service mark of the NPCA.	
HMIS® Ratings		
	Health	• 2
	Flammability	• 1
	Physical hazard	• 1
NFPA Ratings		
	Health	• 2
	Flammability	• 1
	Instability	• 1
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	• Product and Company Identification: Synonyms changes from the previous Physical & Chemical Properties: Multiple Properties version in section(s): Transport Information: Material Transportation Information Regulatory Information: United States.	

I & I Guard® -PRF

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name	• I&I Guard®-SSF Part B
Trade Name	• I&I Guard®-PRF APK 3.1:1-2
Company	• Quadex LLC, 564 W. 9320 S., Sandy, UT 84070
Company Contact	• Matthew Peterson
Company Phone	• 844-782-4832
Emergency	• Domestic Shipments and to Canada: 1-800-633-8253 • International Shipments: 1-801-629-0667

2. HAZARDS IDENTIFICATION

GHS Ratings			
	Oral Toxicity	• Acute Tox. 4	• Oral>300+<=2000mg/kg
	Skin Corrosive	• 2	• Reversible adverse effects in dermal tissue, Draize score: >=2.3 < 4.0 or persistent inflammation
	Eye Corrosive	• 2B	• Mild eye irritant: Subcategory 2B, Reversible in 7 days
	Respiratory Sensitizer	• 1	• Respiratory sensitizer
	Skin Sensitizer	• 1B	• Skin sensitizer
	Carcinogen	• 2	• Limited evidence of human or animal carcinogenicity
Hazard Statement(s)			
	H302	• Harmful if swallowed	
	H315	• Causes skin irritation	
	H317	• May cause an allergic skin reaction	
	H320	• Causes eye irritation	
	H334	• May cause allergy or asthma symptoms or breathing difficulties if inhaled	
	H351	• Suspected of causing cancer	

2. HAZARDS IDENTIFICATION (CONTINUED)

Precautionary Statement(s)		
	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.
	P280	• Wear protective gloves/protective clothing/eye protection/face protection
	P281	• Use personal protective equipment as required
	P285	• In case of inadequate ventilation wear respiratory protection
	P321	• Specific treatment (see ... on this label)
	P330	• Rinse mouth.
	P362	• Take off contaminated clothing and wash before reuse
	P301+P312	• IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
	P302+P352	• IF ON SKIN: Wash with soap and water
	P304+P341	• IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing
	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
	P337+P313	• If eye irritation persists, get medical advice/ attention
	P342+P311	• Call a POISON CENTER or doctor/physician
	P405	• Store locked up.
	P501	• Dispose of contents/container to ...
Signal Word	• Danger	
Pictogram		

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Cas #	Weight Concentration %
Catalyst	• 98-94-2	• 1.00% - 5.00%
Proprietary	• 6846-50-0	• 1.00% - 5.00%

4. FIRST AID MEASURE

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	• 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	
Extinguishing Media	• In case of fire use the following suitable extinguishing agent.
In case of fire, the following can be released:	• Nitrogen Oxide (NOx) • Carbon Dioxide • Carbon Monoxide (CO)
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.	• Catalyst 98-94-2
OSHA Exposure Limits	• Not Established.
ACGIH Exposure Limits	• Not Established.
Other Exposure Limits	• Not Established.

Chemical Name / CAS No.	• Proprietary 6846-50-0
OSHA Exposure Limits	• Not Established.
ACGIH Exposure Limits	• Not Established.
Other Exposure Limits	• Not Established.

Use appropriate engineering control such as process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended 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.
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.

9. PHYSICAL & CHEMICAL PROPERTIES

Boiling Range	• 100 to 282°C
Specific Gravity (SG)	• 1.058
Lbs VOC/Gallon Less Water	• 0.04
Lbs VOC/Gallon Less Exempt	• 0.04
% VOL by Volume	• 0.04

10. CHEMICAL STABILITY & REACTIVITY INFORMATION

Stable, Hazardous polymeraization will not occur. STABLE. Oxidizing Agents. No Data Found. None known, other than Sec. #2 and Sec #5. Hazardous polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

Mixture Toxicity	
Component Toxicity	
Oral	• N.D.A.
Dermal	• N.D.A.
Inhalation	• N.D.A.

12. ECOLOGICAL INFORMATION

No ecotoxicity data was found for the product.

13. DISPOSAL CONSIDERATIONS

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

14. TRANSPORT INFORMATION

UN-Number	• Not Applicable
DOT, ADR, IMDG, IATA	• Not Applicable
Packaging Group	• Not Applicable
Hazard Class	• Not Applicable

15. REGULATORY INFORMATION

EPCRA-Emergency Planning and Community Right-to-Know-Act
SARA 311/312 Hazards: Acute Health Hazards
SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established 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:
111-46-6 2,2' -oxtbisethanol; diethylene glycol 1.5%

The following chemicals are classified under SARA 313 Toxic Release Invetnory (TRI):
111-46-6 2,2' -oxtbisethanol; diethylene glycol 1.5%

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

16. OTHER INFORMATION

Further Information	• HMIS® is a registered trade and service mark of the NPCA.	
HMIS® Ratings		
	Health	• 2
	Flammability	• 1
	Physical hazard	• 1
NFPA Ratings		
	Health	• 2
	Flammability	• 1
	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	• Product and Company Identification: Synonyms changes from the previous Physical & Chemical Properties: Multiple Properties version in section(s): Transport Information: Material Transportation Information Regulatory Information: United States.	

I & I Guard® -SCF

Low Viscosity, Polyurethane Injection Product for Soil Stabilization

TYPICAL FIELD (IN-GROUND) PROPERTIES

Density, pcf	50
Compressive Strength, psi	2590
Compressive Modulus, psi ASTM D 1621 (in sand)	35,946
Shear Strength, psi	1355
Shear Modulus, psi ASTM D 732 (in sand)	4500
Tensile Strength, psi	TBD
Tensile Modulus, psi ASTM D 638 (in sand)	TBD

Test results are obtained from stabilizer and water mixture injected into granular media in a confined environment comparable to injection below grade.

TBD = to be determined

DESCRIPTION

I & I Guard®-SCF is a low viscosity, polyurethane injection product designed to stabilize soil. It migrates through loose soil and into below-grade voids. As it comes into contact with moisture in the soil, I & I Guard-SCF reacts and expands to form a rigid foam polymer. The foam encapsulates loose soil, fills voids, and forms a solid, water-tight barrier.

DISTINGUISHING CHARACTERISTICS

- **Pre-catalyzed – no mixing on-site**
- **30:1 expansion ratio**
- **Stable foam expansion**
- **Activated in the presence of moisture**
- **Contains no solvents**
- **Contains no TDI**

APPLICATIONS

- **Low Viscosity for Good Penetration**
- **Encapsulates and Strengthens Loose Soil**
- **Forms a Water-tight Barrier to Stop Water Migration**

TYPICAL LIQUID PROPERTIES (24-130)

- **Viscosity: 780 cps**
- **Specific Gravity: 1.12**
- **Weight/Gallon: 9.3 lbs.**
- **Appearance: clear, light brown liquid**
- **Shelf Life: 6 months**

TYPICAL REACTION PROPERTIES

- **Hand Mix @ 72°F**
- **100 grams Stabilizer : 10 grams Water**
- **Cream (s): 35**
- **Rise (s): 300**

WARRANTY

Quadex, LLC warrants its products to be free of defects in material and workmanship. Unless superseded by project specifications and terms agreed upon in writing between installer and Quadex prior to bid, if within one year from purchase, any Quadex, LLC product is proven defective, the company will replace said product or refund its purchase price at its sole discretion. The company's obligation shall be limited solely to such replacement or refund. There are no other warranties by Quadex, LLC, expressed or implied. There is no warranty if Quadex products are used contrary to Quadex, LLC's written directions.

Before I&I Guard-SCF

After I&I Guard-SCF

SAFE HANDLING OF LIQUID COMPONENTS

Avoid prolonged breathing of vapors. In case of chemical contact with eyes, flush with water for at least 15 minutes and get medical attention.

STORAGE AND USE OF CHEMICALS

Keep temperature of chemical at 70°F for several days before use. Cold chemical can cause pump cavitation or other process problems due to higher viscosity at lower temperatures. Absolutely no thinners should be added to this 100% solids system. Viscosity can be reduced by an increase in temperature. This product is sensitive to exposure to moisture. Keep drums tightly closed when not in use and under nitrogen pressure of 2 - 3 psi after they have been opened.

I & I Guard® -SCF

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name	• I&I Guard®-SCF
Trade Name	• I&I Guard®-SCF
Company	• Quadex LLC, 564 W. 9320 S., Sandy, UT 84070
Company Contact	• Matthew Peterson
Company Phone	• 844-782-4832
Emergency	• Domestic Shipments and to Canada: 1-800-633-8253 • International Shipments: 1-801-629-0667

2. HAZARDS IDENTIFICATION

GHS Classification		
	Skin Irritation	• Category 2
	Acute Toxicity, Inhalative	• Category 4
	Sensitization of Respiratory Airways	• Category 1
	Eye Irritation	• Category 2
	Carcinogenicity	• Category 2
	Sensitization of the Skin	• Category 1
	Specific Target Organ Toxicity (Repeated Exposure)	• Category 2
	Specific Target Organ Toxicity (Single Exposure)	• Category 3
GHS Label	*Pictogram* 	
Signal Word	• Danger and Warning	
Hazard Statement(s)		
	• May cause an allergic skin reaction.	
	• Causes skin irritation.	
	• Harmful if inhaled.	
	• Causes serious eye irritation.	
	• May cause respiratory irritation.	
	• May cause allergy or asthma symptoms or breathing difficulties if inhaled.	
	• May cause damage to organs through prolonged or repeated exposure.	
	• Suspected of causing cancer.	

2. HAZARDS IDENTIFICATION (CONTINUED)

Precautionary Statements	
	• Do not breathe fume/gas/mist/vapors/spray.
	• Wear protective gloves/eye protection/face protection.
	• IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
	• IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
	• IF ON SKIN: Wash with plenty of soap and water.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Components	Cas #	Weight %
Diphenylmethane-4,4'-diisocyanate (MDI)	• 101-68-8	• Trade Secret
Diphenylmethane-2,4'-diisocyanate (MDI)	• 5873-54-1	• Trade Secret
P-MDI	• 9016-87-9	• Trade Secret
Diphenylmethane Diisocyanate (MDI) Mixed Isomers	• 26447-40-5	• < 4%
Tertiary Amine Trade Secret	• Proprietary	• < 51%

4. FIRST AID MEASURE

First Aid Procedures	
General	• Remove contaminated clothing.
Inhalation	• Remove affected individual to fresh air and keep person calm. Assist in breathing if necessary. Immediate medical attention required.
Skin Contact	• Wash affected areas with soap and water. Seek medical attention for irritation.
Eye Contact	• Rinse for at least 15 minutes with water. Immediate medical attention required.
Ingestion	• Rinse mouth and drink plenty of water. Do not induce vomiting. Immediate medical attention required.

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media	• Water, dry chemicals, CO_2
Unsuitable Extinguishing Media	• High volume water jet
Special hazards arising from the chemical	• At temperatures above 400°F, MDI can polymerize/decompose causing pressure build-up in closed containers and possibly rupture. Avoid water contamination in closed containers which may cause rupture (CO_2 is evolved).
Precautions for Fire-Fighters	• Firefighters should be equipped with self-contained breathing apparatus and turnout gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment, and emergency procedures	• Clear area. Ensure adequate ventilation. Wear suitable personal protective clothing and equipment.
Environmental Precautions	• Do not discharge into drains/surface waters/groundwater.
Methods and material for containment and cleanup	• Remove mechanically; cover remainder with wet, absorbent material (e.g. sawdust, chemical binder based on calcium silicate hydrate, sand). After approx. one hour transfer to waste container and do not seal (evolution of CO_2). Keep damp in a safe ventilated area for several days.
Spill area can be decontaminated with the following recommended decontamination solution	• Decontamination Solution #1: 8-10% sodium carbonate and 2% liquid soap in water • Decontamination Solution #2: Liquid/yellow soap (potassium soap with ~15% anionic surfactant): 20 ml; Water: 700 ml; Polyethylene glycol (PEG 400): 350 ml

7. HANDLING AND STORAGE

Precautions for safe handling	• Provide sufficient air exchange and/or exhaust in work rooms. Occupational exposure limits should not be exceeded (refer to Section 8). Contact with skin and eyes and inhalation of vapors must be avoided. Keep away from foodstuffs, drinks, and tobacco. Wash hands before breaks and at end of work.
Conditions for safe storage, including any incompatibilities	• Keep container tightly closed and protect against moisture. Segregate from bases. Store from 32°F – 110°F.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits	Type	Value
P-MDI	• OSHA PEL	• CLV 0.02 ppm 0.2 mg/m^3
Diphenylmethane-4,4'-diisocyanate (MDI)	• OSHA PEL	• CLV 0.02 ppm 0.2 mg/m^3
Exposure Controls		
Respiratory Protection	• Respiratory protection required in insufficiently ventilated working areas and during spraying. An air-fed mask, or for short periods of work, a combination of charcoal filter and particulate filter is recommended.	
Hand, Eye, Skin, Body Protection	• Chemical resistant protective gloves should be worn to prevent all skin contact. Wear eye/face protection. Wear suitable protective clothing.	

9. PHYSICAL & CHEMICAL PROPERTIES

Appearance	• Liquid
Color	• Brown
Odor	• Slightly aromatic
Odor Threshold	• Not Established
pH	• Not Established
Melting Point/Freezing Point	• 3°C
Boiling Point/Boiling Range	• 625°F
Flash Point	• 390°F
Evaporation Rate	• Not Established
Flammability	• N/A
Upper/Lower Flammability or Explosive Limits	• N/A
Vapor Pressure	• 0.00016 mmHg
Vapor Density	• Not Established
Relative Density	• 1.13
Solubility(ies)	• Reacts with Water
Partition cCoefficient (Noctanol/Water)	• Not Established
Auto-ignition Temperature	• N/A
Decomposition Temperature	• Not Established

10. CHEMICAL STABILITY & REACTIVITY INFORMATION

Chemical Stability	• Polymerizes at about 20°C with evolution of CO_2
Possibility of Hazardous Reactions	• Exothermic reaction with amines and alcohols; reacts with water forming CO_2; in closed containers, risk of bursting owing to increase of pressure
Conditions to Avoid	• Avoid moisture
Incompatible Materials	• Water, alcohols, strong bases, amines
Hazardous Decomposition Products	• By high heat or fire; CO, CO_2, NO_x, benzene, toluene, aliphatic fragments and traces of HCN.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity	• LC50: 490mg/kg , vapor, 4hr rat
Chronic Toxicity	• 2 years, inhalation; NOAEL: 0.2mg/m^3, (rat, Male/Female, 6hrs/day 5 days/week)
Likely Routes of Exposure	• Skin, inhalation
Symptoms related to physical, chemical and toxicological characteristics	• Minor skin irritation; asthma-like symptoms
Delayed and immediate effects and chronic effects from short and long-term exposure	• Possible sensitization
Numerical Toxicity Measures	• Not available

12. ECOLOGICAL INFORMATION

Ecotoxicity	• LC0: >1,000mg/l (Zebra fish 96 hrs) LC0: >3,000mg.l (Killifish 96hrs)
Persistence and Degradability	• 0%
Bioaccumulative Potential	• Does not bioaccumulate.
Mobility in Soil	

13. DISPOSAL CONSIDERATIONS

Waste Disposal	• Incinerate or dispose of in a licensed facility. Do not discharge substance/product into sewer system. Do not burn empty drums or cut open with gas or an electric torch as toxic decomposition products may be liberated. Do not reuse empty containers.

14. DISPOSAL CONSIDERATIONS

Land Transport		
	USDOT	• Not classified as dangerous good
	China	• Not classified as dangerous good
Sea Transport	*IMDG*	• Not classified as dangerous good
Air Transport	*IATA/ICAO*	• Not classified as dangerous good
Further Information	• DOT: This product is regulated if the amount in a single receptacle exceeds the Reportable Quantity (RQ). Refer to Section 15 for the RQ of this product.	

15. REGULATORY INFORMATION

Relevant Safety, Health, and Environmental Regulations	
Inventory Status	• TSCA listed
US Regulations	• Not regulated
US Superfund Amendments and Reauthorization Act (SARA) Title III Section 313 information	• Methylene Bis Phenylisocyanate 101-68-8 5000 lbs. See SDS – A Component (Same as Diphenylmethane diisocyanate (MDI) Polymeric Diphenylmethane diisocyanate 9016-87-9 See SDS – A Component

16. OTHER INFORMATION

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Issue Date	• Not available.
This Data Sheet Contains	• Product and Company Identification: Synonyms changes from the previous Physical & Chemical Properties: Multiple Properties version in section(s): Transport Information: Material Transportation Information Regulatory Information: United States.

I & I Guard®-MSF

Soil Stabilization Foam

TYPICAL RESIN PROPERTIES

I & I Guard-MSF - Side A

- **Viscosity: 120 cps**
- **Specific Gravity: 1.12**
- **Weight/gallon: 9.35 lbs**
- **Appearance: light brown liquid**
- **Shelf Life: 6 months**

I & I Guard-MSF - Side B

- **Viscosity: 10 cps**
- **Specific Gravity: 0.9**
- **Weight/gallon: 7.5 lbs.**
- **Appearance: light yellow liquid**
- **Shelf Life: 6 months**

TYPICAL REACTION PROPERTIES

Hand mix at 72°F, 25 grams Stabilizer : 1 grams Water

Weight %Activator	Cream (s)	Rise (s)
0.5	22	240
1.0	20	180
4.0	17	100
10.0	3	60

The above values are average values obtained from laboratory experiments and should serve only as guidelines.

DESCRIPTION

I & I Guard®-MSF (Soil Stabilization Foam) is a low viscosity, polyurethane injection resin, designed to stabilize soil. When mixed with catalyst and injected, it migrates through loose soil and into below-grade voids. As it comes into contact with moisture in the soil, I & I Guard-MSF reacts and expands to form a rigid foam. The foam encapsulates loose soil, fills voids, and forms a solid, water-tight barrier.

DISTINGUISHING CHARACTERISTICS

- **Stabilize soil before excavation**
- **Seawall stabilization and strengthening**
- **Stabilize and remediate water through earthen dams**
- **Seal leaks in sub-grade walls**
- **Soil strengthening for tie back anchors**

UNIQUE ADVANTAGES

- **Contains no solvents**
- **Very low viscosity for good penetration**
- **Cure time controlled by catalyst ratio**
- **Encapsulates and strengthens loosesoil**
- **Forms a water-tight barrier to stopwater migration**
- **Good resistance to chemicals**
- **Contains no TDI**
- **1200 psi compressive strength (ASTM D1621) in sand**

STORAGE AND USE OF CHEMICALS

Store chemicals at 70°F for several days before use. Cold chemicals can cause poor mixing, pump cavitation or other process problems due to higher viscosity at lower temperatures. Absolutely no thinners should be added to this 100% solids system. Viscosity can be reduced by an increase in temperature. The 'A' component is sensitive to exposure to moisture. Keep drums tightly closed when not in use and under nitrogen pressure of 2 - 3 psi after they have been opened. Prolonged exposure to temperatures below 50°F can cause the 'A' component to freeze. Do not store in direct sunlight.

WARRANTY

Quadex, LLC warrants its products to be free of defects in material and workmanship. Unless superseded by project specifications and terms agreed upon in writing between installer and Quadex prior to bid, if within one year from purchase, any Quadex, LLC product is proven defective, the company will replace said product or refund its purchase price at its sole discretion. The company's obligation shall be limited solely to such replacement or refund. There are no other warranties by Quadex, LLC, expressed or implied. There is no warranty if Quadex products are used contrary to Quadex, LLC's written directions.

SAFE HANDLING OF LIQUID COMPONENTS

Use caution in removing bungs from the container. Loosen the small bung first and let any built up gas escape before completely removing. Avoid prolonged breathing of vapors. In case of chemical contact with eyes, flush with water for at least 15 minutes and get medical attention For further information refer to publication AX-205 "Guidance for Working with MDI and PMDI – Things You Should Know" published by The Center For The Polyurethanes Industry, 700 2nd Street, NE, Washington, DC 20002 (www.americanchemistry.com).

ADDITIVE GUIDELINES

Wt % Activator	Oz. Activator Per Gal. Soil Stabilizer
0.5	0.6
1	1.3
4	5.0
10	12.5

NOTES: I & I Guard®-MSF - Side B is a catalyst that causes the soil stabilizer to react with ambient moisture. Once activated, QRM migration SSF - Side A will react with any available water, including humidity in the air. To minimize loss caused by its reaction with ambient moisture, mix and use material in small batches. If a crust forms on the top of the mixed material, it will act as a temporary seal and inhibit curing of the liquid below the crust. If a crust forms, leave it intact until the liquid under the crust has been pumped. Once I & I Guard-MSF - Side A has been activated with I & I Guard-MSF - Side B, it should never be left in pumps or stored for more than a few hours.

MIXING PROCEDURES FOR TWO PART I & I GUARD GROUTS

Directions For Use Mixing Ratio: One 32 oz. bottle per 5 gallons of I & I Guard-MSF equals 5% mix ratio. Two 32 oz. bottles is the maximum dose at 10%. Only mix the amount of material that can be used within 12 hours. Thoroughly mix materials using a low-speed drill with a mixing paddle.

ASTM D732 — SHEAR PUNCHING STRENGTH

PRODUCT	PEAK LOAD (LBF.)	PEAK STRESS (PSI)	MODULUS (PSI)
I & I Guard-MSF with Catalyst	500	901	1533

ASTM D1621 — COMPRESSIVE PROPERTIES

PRODUCT	YIELD LOAD @10% (LBF.)	YIELD LOAD @20% (LBF.)	COMPRESSIVE YIELD STRENGTH @10% (LBF.)	COMPRESSIVE YIELD STRENGTH @20% (LBF.)	COMPRESSIVE MODULUS (PSI)
I & I Guard-MSF with Catalyst	2,490	3,070	910	1,120	11,300
I & I Guard-MSF without Catalyst	2,640	3,610	1,260	1,740	9,500

ASTM D638 — TENSILE PROPERTIES

PRODUCT	PEAK STRESS (PSI)	% ELONGATION
I & I Guard-MSF with Catalyst	450	12.3
I & I Guard-MSF without Catalyst	220	6.4

I & I Guard® -MSF

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name	• I&I Guard®-MSF
Trade Name	• I&I Guard®-MSF Activator
Company	• Quadex LLC, 564 W. 9320 S., Sandy, UT 84070
Company Contact	• Matthew Peterson
Company Phone	• 844-782-4832
Emergency	• Domestic Shipments and to Canada: 1-800-633-8253 • International Shipments: 1-801-629-0667

2. HAZARDS IDENTIFICATION

GHS Classification		
	Skin Irritation	• Category 3
	Eye Irritation	• Category 2
GHS Label	*Pictogram* 	
Signal Word	• Warning	
Hazard Statement(s)		
	• May cause skin irritation.	
	• May cause eye irritation.	
	• May cause respiratory irritation	
Precautionary Statements		
	• Do not breathe fume/gas/mist/vapors/spray.	
	• Wear protective gloves/eye protection/face protection.	
	• IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.	
	• IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.	
	• IF ON SKIN: Wash with plenty of soap and water.	

3. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Components	Cas #	Weight %
Tertiary Amine Catalysts	• Proprietary	• Trade Secret
Propylene Carbonate	• 108-32-7	• Trade Secret

4. FIRST AID MEASURE

First Aid Procedures	
Inhalation	• Move to fresh air if symptoms develop. If breathing is difficult, give oxygen and call physician.
Eye Contact	• Flush with water for at least 15 minutes. See a physician if irritation develops.
Ingestion	• Induce vomiting; get medical attention.
Most Important symptoms and effects, acute and delayed	• May cause skin or eye irritation upon contact. Avoid breathing vapors. The dense vapors can displace and reduce breathing air in confined or unventilated spaces causing asphyxiation. Overexposure may cause tremors, confusion, irritation, and may result in cardiac sensitization.
Indication of immediate medical attention and special treatment, if applicable	• N/A
Skin Contact	• Wash with soap and water at first opportunity.

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media	• Water, dry chemicals, CO_2
Unsuitable Extinguishing Media	• None
Special hazards arising from the chemical	• None
Precautions for Fire-Fighters	• A self-contained breathing apparatus should be worn to protect against toxic and irritating vapors.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment, and emergency procedures	• Clear area. Ensure adequate ventilation. Wear suitable personal protective clothing and equipment.
Environmental Precautions	• Do not discharge into drains/surface waters/groundwater.
Methods and material for containment and cleanup	• Absorb with sawdust, etc., and shovel into container. Waste material should be disposed of under conditions which meet federal, state, and local environmental regulations.

7. HANDLING AND STORAGE

Precautions for safe handling	• Store between 65°F and 85°F out of sunlight. Relieve pressure slowly when opening container. Under no circumstances should empty drums be burned or cut open with an electric or gas torch.
Conditions for safe storage, including any incompatibilities	• Keep tightly sealed.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits	Type	Value
Tertiary Amine Catalysts[1]	• TWA	• None established
Propylene Carbonate	• TWA	• None established
[1]Not listed as a carcinogen (NTA, IARC, OSHA)		
Exposure Controls		
Respiratory Protection	• The specific respirator selected must be based on contamination levels of this material found in the workplace and the working limits of the respirator. A supplied air, full-face mask, positive pressure or continuous flow respirator or a supplied air hood is required when airborne concentrations are unknown or exceed threshold limit values. A positive pressure, self-contained breathing apparatus can be used in emergencies or other unusual situations. Full-face air purifying respirators equipped with organic vapor cartridges can be used in certain situations, see OSHA standard 29CFR 1910.134. All equipment must be NIOSH approved and maintained.	
Hand, Eye, Skin, Body Protection	• Wear goggles or chemical safety glasses and chemically resistant rubber or plastic gloves. Avoid eye and skin contact. Eye wash system and showers should be available.	

9. PHYSICAL & CHEMICAL PROPERTIES

Appearance	• Liquid
Color	• Yellow
Odor	• Ammoniacal odor
Odor Threshold	• N/A
pH	• N/A
Melting Point/Freezing Point	• <32°F
Boiling Point/Boiling Range	• 140°F
Flash Point	• >300°F
Evaporation Rate	• Slower than ether
Flammability	• No
Upper/Lower Flammability or Explosive Limits	• N/A
Vapor Pressure	• N/A
Vapor Density	• N/A

9. PHYSICAL & CHEMICAL PROPERTIES (CONTINUED)

Relative Density	• 0.92 g/mL
Solubility (Water)	• Slightly soluble in water
Partition Coefficient (Noctanol/Water)	• N/A
Auto-Ignition Temperature	• >500°F
Decomposition Temperature	• >500°F

10. CHEMICAL STABILITY & REACTIVITY INFORMATION

Chemical Stability	• Stable
Possibility of Hazardous Reactions	• N/A
Conditions to Avoid	• Temperatures over 85°F
Incompatible Materials	• Isocyanates and other chemicals that react with hydroxyl groups.
Hazardous Decomposition Products	• When burned, CO, CO_2, NOx aliphatic fragments, halogens, halogen acids and possibly carbonyl halides.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity	• May cause skin irritation.
Chronic Toxicity	• Not available.
Likely Routes of Exposure	• Skin
Symptoms related to physical, chemical and toxicological characteristics	• May cause skin irritation.
Delayed and immediate effects and chronic effects from short and long-term exposure	• May cause skin irritation; avoid contact with eyes.
Numerical Toxicity Measures	• Not available.

12. ECOLOGICAL INFORMATION

Ecotoxicity	• Not a marine pollutant.
Persistence and Degradability	• No known significant effects.
Bioaccumulative Potential	• Does not bioaccumulate.
Mobility in Soil	

13. DISPOSAL CONSIDERATIONS

Waste Disposal	• B component drums can be sent to drum reconditioners or disposed of as ordinary industrial waste in compliance with pertinent regulations

14. DISPOSAL CONSIDERATIONS

UN Number	• Not regulated.
UN Proper Shipping Name	• Not regulated.
Transport Hazard Class(es)	• Not regulated.
Packing Group, if Applicable	• Not regulated.
Marine Pollutant (Y or N)	• N
Special Precautions	• None

15. REGULATORY INFORMATION

Relevant Safety, Health, and Environmental Regulations	
Inventory Status	• All components TSCA listed.
US Regulations	• No ingredients listed.
US Superfund Amendments and Reauthorization Act (SARA) Title III Section 313 information	• No ingredients listed.

16. OTHER INFORMATION

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Issue Date	• Not available.
This Data Sheet Contains	• Product and Company Identification: Synonyms changes from the previous Physical & Chemical Properties: Multiple Properties version in section(s): Transport Information: Material Transportation Information Regulatory Information: United States.

I & I Guard® -MSF

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name	• I&I Guard®-MSF
Trade Name	• I&I Guard®-MSF Stabilizer
Company	• Quadex LLC, 564 W. 9320 S., Sandy, UT 84070
Company Contact	• Matthew Peterson
Company Phone	• 844-782-4832
Emergency	• Domestic Shipments and to Canada: 1-800-633-8253 • International Shipments: 1-801-629-0667

2. HAZARDS IDENTIFICATION

GHS Classification		
	Skin Irritation	• Category 2
	Acute Toxicity, Inhalative	• Category 4
	Sensitization of Respiratory Airways	• Category 1
	Eye Irritation	• Category 2
	Carcinogenicity	• Category 2
	Sensitization of the Skin	• Category 1
	Specific Target Organ Toxicity (Repeated Exposure)	• Category 2
	Specific Target Organ Toxicity (Single Exposure)	• Category 3
GHS Label	*Pictogram* 	
Signal Word	• Danger and Warning	
Hazard Statement(s)		
	• May cause an allergic skin reaction.	
	• Causes skin irritation.	
	• Harmful if inhaled.	
	• Causes serious eye irritation.	
	• May cause respiratory irritation.	
	• May cause allergy or asthma symptoms or breathing difficulties if inhaled.	
	• May cause damage to organs through prolonged or repeated exposure.	
	• Suspected of causing cancer.	

2. HAZARDS IDENTIFICATION (CONTINUED)

Precautionary Statements	
	• Do not breathe fume/gas/mist/vapors/spray.
	• Wear protective gloves/eye protection/face protection.
	• IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
	• IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
	• IF ON SKIN: Wash with plenty of soap and water.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Components	Cas #	Weight %
Diphenylmethane-4,4'-diisocyanate (MDI)	• 101-68-8	• Trade Secret
MDI Mixed Isomers	• 26447-40-5	• Trade Secret
P-MDI	• 9016-87-9	• Trade Secret

4. FIRST AID MEASURE

First Aid Procedures	
General	• Remove contaminated clothing.
Inhalation	• Remove affected individual to fresh air and keep person calm. Assist in breathing if necessary. Immediate medical attention required.
Skin Contact	• Wash affected areas with soap and water. Seek medical attention for irritation.
Eye Contact	• Rinse for at least 15 minutes with water. Immediate medical attention required.
Ingestion	• Rinse mouth and drink plenty of water. Do not induce vomiting. Immediate medical attention required.

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media	• Water, dry chemicals, CO_2
Unsuitable Extinguishing Media	• High volume water jet
Special hazards arising from the chemical	• At temperatures above 400°F, MDI can polymerize/decompose causing pressure build-up in closed containers and possibly rupture. Avoid water contamination in closed containers which may cause rupture (CO_2 is evolved).
Precautions for Fire-Fighters	• Firefighters should be equipped with self-contained breathing apparatus and turnout gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment, and emergency procedures	• Clear area. Ensure adequate ventilation. Wear suitable personal protective clothing and equipment.
Environmental Precautions	• Do not discharge into drains/surface waters/groundwater.
Methods and material for containment and cleanup	• Remove mechanically; cover remainder with wet, absorbent material (e.g. sawdust, chemical binder based on calcium silicate hydrate, sand). After approx. one hour transfer to waste container and do not seal (evolution of CO_2). Keep damp in a safe ventilated area for several days.
Spill area can be decontaminated with the following recommended decontamination solution	• Decontamination Solution #1: 8-10% sodium carbonate and 2% liquid soap in water • Decontamination Solution #2: Liquid/yellow soap (potassium soap with ~15% anionic surfactant): 20 ml; Water: 700 ml; Polyethylene glycol (PEG 400): 350 ml

7. HANDLING AND STORAGE

Precautions for safe handling	• Provide sufficient air exchange and/or exhaust in work rooms. Occupational exposure limits should not be exceeded (refer to Section 8). Contact with skin and eyes and inhalation of vapors must be avoided. Keep away from foodstuffs, drinks, and tobacco. Wash hands before breaks and at end of work.
Conditions for safe storage, including any incompatibilities	• Keep container tightly closed and protect against moisture. Segregate from bases. Store from 32°F – 110°F.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits	Type	Value
P-MDI	• OSHA PEL	• CLV 0.02 ppm 0.2 mg/m^3
Diphenylmethane-4,4'-diisocyanate (MDI)	• OSHA PEL	• CLV 0.02 ppm 0.2 mg/m^3
Exposure Controls		
Respiratory Protection	• Respiratory protection required in insufficiently ventilated working areas and during spraying. An air-fed mask, or for short periods of work, a combination of charcoal filter and particulate filter is recommended.	
Hand, Eye, Skin, Body Protection	• Chemical resistant protective gloves should be worn to prevent all skin contact. Wear eye/face protection. Wear suitable protective clothing.	

9. PHYSICAL & CHEMICAL PROPERTIES

Appearance	• Liquid
Color	• Brown
Odor	• Slightly aromatic
Odor Threshold	• Not Established
pH	• Not Established
Melting Point/Freezing Point	• 3°C
Boiling Point/Boiling Range	• 625°F
Flash Point	• 390°F
Evaporation Rate	• Not Established
Flammability	• N/A
Upper/Lower Flammability or Explosive Limits	• N/A
Vapor Pressure	• 0.00016 mmHg
Vapor Density	• Not Established
Relative Density	• 1.118
Solubility(ies)	• Reacts with Water
Partition cCoefficient (Noctanol/Water)	• Not Established
Auto-ignition Temperature	• N/A
Decomposition Temperature	• Not Established

10. CHEMICAL STABILITY & REACTIVITY INFORMATION

Chemical Stability	• Polymerizes at about 20°C with evolution of CO_2
Possibility of Hazardous Reactions	• Exothermic reaction with amines and alcohols; reacts with water forming CO_2; in closed containers, risk of bursting owing to increase of pressure
Conditions to Avoid	• Avoid moisture
Incompatible Materials	• Water, alcohols, strong bases, amines
Hazardous Decomposition Products	• By high heat or fire; CO, CO_2, NO_x, benzene, toluene, aliphatic fragments and traces of HCN.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity	• LC50: 490mg/kg , vapor, 4hr rat
Chronic Toxicity	• 2 years, inhalation; NOAEL: 0.2mg/m^3, (rat, Male/Female, 6hrs/day 5 days/week)
Likely Routes of Exposure	• Skin, inhalation
Symptoms related to physical, chemical and toxicological characteristics	• Minor skin irritation; asthma-like symptoms
Delayed and immediate effects and chronic effects from short and long-term exposure	• Possible sensitization
Numerical Toxicity Measures	• Not available

12. ECOLOGICAL INFORMATION

Ecotoxicity	• LC0: >1,000mg/l (Zebra fish 96 hrs) LC0: >3,000mg.l (Killifish 96hrs)
Persistence and Degradability	• 0%
Bioaccumulative Potential	• Does not bioaccumulate.
Mobility in Soil	

13. DISPOSAL CONSIDERATIONS

Waste Disposal	• Incinerate or dispose of in a licensed facility. Do not discharge substance/product into sewer system. Do not burn empty drums or cut open with gas or an electric torch as toxic decomposition products may be liberated. Do not reuse empty containers.

14. DISPOSAL CONSIDERATIONS

Land Transport		
	USDOT	• Not classified as dangerous good
	China	• Not classified as dangerous good
Sea Transport	*IMDG*	• Not classified as dangerous good
Air Transport	*IATA/ICAO*	• Not classified as dangerous good
Further Information	• DOT: This product is regulated if the amount in a single receptacle exceeds the Reportable Quantity (RQ). Refer to Section 15 for the RQ of this product.	

15. REGULATORY INFORMATION

Relevant Safety, Health, and Environmental Regulations	
Inventory Status	• TSCA listed
US Regulations	• Not regulated
US Superfund Amendments and Reauthorization Act (SARA) Title III Section 313 information	• Methylene Bis Phenylisocyanate 101-68-8 5000 lbs. See SDS – A Component (Same as Diphenylmethane diisocyanate (MDI) Polymeric Diphenylmethane diisocyanate 9016-87-9 See SDS – A Component

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Issue Date	• Not available.
This Data Sheet Contains	• Product and Company Identification: Synonyms changes from the previous Physical & Chemical Properties: Multiple Properties version in section(s): Transport Information: Material Transportation Information Regulatory Information: United States.

Quad-Plug®

TYPICAL PERFORMANCE CHARACTERISTICS*

- **Compressive Strength (ASTM C39)**
  30 min. >1,500 psi | 10.34 MPa
- **Bond Strength (ASTM C882)**
  28 day >500 psi | 3.45 MPa

* The values stated in inch-pound units are to be regarded as the standard. The values given in International System are for information only.

RECOMMENDED FOR

- **Sewer Pipes and Manholes**
- **Concrete Tanks**
- **Elevator Pits**
- **Cisterns**
- **Basements**
- **Concrete & Masonry Walls**

FEATURES AND BENEFITS

- **Stops running water immediately**
- **Non-Shrink, expands as it sets**
- **Contains no calcium chloride**
- **Non-Metallic**
- **Sulfate resistant**
- **Easily applied**
- **No Mixing**

QUADEX® A VORTEX COMPANY REPAIR MATERIALS

Fast Setting Waterstop

DESCRIPTION

Quad-Plug® is a blended material formulated to instantly stop running water or seepage in all types of concrete and masonry structures.

PACKAGING

Quad-Plug is supplied in a 50 lb. | 11.34 kg. plastic pail.

YIELD

Quad-Plug will yield approximately 0.49 cu. ft. | 0.014 cu. m. per pail.

APPLICATION INFORMATION

To Seal Running Water or Leaks
Prepare crack or hole by chipping out loose material to a minimum depth and width of 0.75 in. | 19.05 mm. Using a rubber gloved hand, place a generous amount of dry Quad-Plug to active leak and maintain external pressure for 60 seconds. Repeat until leak stops.

WARRANTY

Quadex, LLC warrants its products to be free of defects in material and workmanship. Unless superseded by project specifications and terms agreed upon in writing between installer and Quadex prior to bid, if within one year from purchase, any Quadex, LLC product is proven defective, the company will replace said product or refund its purchase price at its sole discretion. The company's obligation shall be limited solely to such replacement or refund. There are no other warranties by Quadex, LLC, expressed or implied. There is no warranty if Quadex products are used contrary to Quadex, LLC's written directions.

PRECAUTIONS

Avoid eye contact or prolonged contact with skin. Wash thoroughly after use. Persons using Quad-Plug should wear necessary eye protection, dust mask and rubber gloves. Read all product labels and technical literature.

Quad-Plug®

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name	• Quad-Plug®
Trade Name	• Quad-Plug®
Company	• Quadex LLC, 564 W. 9320 S., Sandy, UT 84070
Company Contact	• Matthew Peterson
Company Phone	• 844-782-4832
Emergency	• Domestic Shipments and to Canada: 1-800-633-8253 • International Shipments: 1-801-629-0667

2. HAZARDS IDENTIFICATION

Emergency Overview		
OSHA Hazards	*This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).*	
GHS Classification		
	Skin corrosion/irritation	• Category 1
	Serious eye damage/ Eye irritation	• Category 1
	Skin sensitization	• Category 1
	Carcinogenicity/inhalation	• Category 1A
	Specific target organ toxicity: Single exposure (respiratory tract irritation)	• Category 3
Precautionary Statement(s): Prevention		
	• Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe dust. Use outdoors in a well ventilated area. Wash any exposed body parts thouroughly after handling. Wear protective gloves/protective clothing/ eye protection/face protection.Contaminated clothing must not be allowed out of the workplace.	
Response	• If exposed or concerned: Immediately get medical advice/attention if you feel unwell or irritation or rash occurs.If on skin: Wash with plenty of water. Take off contaminated clothing and wash it before reuse. If in eyes: Rinse continuously with water for several minutes. Remove contact lenses, if present and easy to do.If inhaled: Remove person to fresh air and keep comfortable for breathing. If swallowed: Rinse mouth. Do not induce vomiting.	

2. HAZARDS IDENTIFICATION (CONTINUED)

Precautionary Statement(s): Storage	
	• Restrict or control access to stockpile areas (store locked up). Engulfment hazard: To prevent burial or suffocation, do not enter a confined space, such as a silo, bulk truck or other storage container or vessel that stores or contains cement without an effective procedure for assuring safety. Store in a well ventilated area. Keep container tightly closed.
Disposal	• Dispose of contents/container in accordance with local/regional/national/international regulations.
HNOC	• None known.
Supplemental Information	• Dispose of contents/container in accordance with local/regional/national/international regulations.
Additional Information	• Overexposure to portland cement can cause serious, potentially irreversible skin or eye damage in the form of chemical (caustic) burns, including third degree burns. The same serious injury can occur if wet or moist skin has prolonged contact exposure to dry portland cement.
Hazard statement(s)	• Causes skin irritation. Causes serious eye damage. May cause respiratory irritation. May cause cancer.
Signal Word	• Danger
Pictogram	

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Cas #	Weight Concentration %
Portland Cement	• 65997-15-1	• 40-100
Admixtures		• 1-15
Monocrystalline Quartz	• 14808-60-7	• 40-70

4. FIRST AID MEASURE

Inhalation	• Remove to fresh air. Administer Oxygen if needed.
Skin Contact	• Rinse with soap and water.
Eye Contact	• Flush with large amounts of water.
Ingestion	• Do not induce vomiting. Never give anything by mouth to an unconscious person. If discomfort or irritation persists, consult a physician.
Most Important Symptoms and Signs of Exposure	• Dust could cause inflammation of eyes and upper respiratory system. Wet cement can dry or cause alkali burns to skin.

5. FIRE FIGHTING MEASURES

Flash point	• None
Special Fire Fighting procedures	• None
Extinguishing Media	• None
Unusual Fire or Explosion Hazard	• None

6. ACCIDENTAL RELEASE MEASURES

Collect dry material using a scoop. Avoid actions that cause dust to become airborne. Avoid inhalation of dust and contact with skin. Wear appropriate personal protective equipment as described in Section 8. Scrape up wet material and place in an appropriate container. Allow the material to "dry" before disposal. Do not attempt to wash down drains. Dispose of waste material according to local, state and federal regulations.

7. HANDLING AND STORAGE

Precautionary Measures	• Avoid contact with eyes, skin and clothing. Do not take internally. Practice good personal hygiene to avoid ingestion. Use only with adequate ventilation. Wash clothing before reuse. Store in dry place and keep sealed until ready to use. FOR PROFESSIONAL USE ONLY. KEEP OUT OF CHILDREN'S REACH.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Skin Protection	• Rubber Gloves, Standard work clothing and shoes.
Respiratory Protection	• Not normally required. Use NIOSH/MESHA approved respirator when needed.
Ventilation	• Local exhaust recommended if necessary. Mechanical exhaust recommend if necessary.
Eye Protection	• Goggles

9. PHYSICAL & CHEMICAL PROPERTIES

Appearance	• Grey and odorless
Odor	• Odorless
Color	• Grey
Vapor Pressure	• Not available.
Vapor Density	• Not available.
Boiling Point	• Not available.
Melting Point	• Not available.
Solubility (water)	• Slight (0.01-1.0%)
Specific Gravity	• Not available.
Evaporation Rate	• Not available.

10. CHEMICAL STABILITY & REACTIVITY INFORMATION

Stability	• Stable
Hazardous Decomposition or Byproducts	• None
Hazardous Polymerization	• Will not occur.
Conditions to Avoid	• Although no hazardous reaction will occur, product should be kept dry.

11. TOXICOLOGICAL INFORMATION

Carcinogenicity	• Not applicable.
Mutagenicity	• Not applicable.
Teratogenicity	• Not applicable.
Reproductive	• Not applicable.

12. ECOLOGICAL INFORMATION

Ecotoxicity	• No data available for product.
Environmental effects	• No data available for product.

13. DISPOSAL CONSIDERATIONS

Disposal Instructions	• Dispose in sanitary land fill in accordance with federal, state, and local regulations.

14. TRANSPORT INFORMATION

Proper Shipping Name	• Not applicable.
UN/NA Number	• Not applicable.
Domestic Hazard Class	• Not applicable.
Surface Freight Classification	• Not applicable.
Label/Placard Required	• Not applicable.

15. REGULATORY INFORMATION

Status under USDOL-OSHA Hazard Communication Rule, 29 CFR 1910.1200	• Quad-Plug is considered a “hazardous chemical” under this regulation, and should be part of any hazard communication program.
Status under CERCLA/ SUPERFUND 40 CFR 117 and 302	• Not listed.
Hazard Category under SARA(Title III), Sections 311 and 312	• Quad-plug qualifies as a “hazardous substance” with delayed health effects.
Status under SARA (Title III), Section 313	• Not subject to reporting requirements under Section 313.
Status under TSCA (as of May 1997)	• Some substances in quad-plug are on the TSCA inventory list.

15. REGULATORY INFORMATION (CONTINUED)

Status under the Federal Hazardous Substances Act	• Quad-plug is a "hazardous substance" subject to statutes promulgated under the subject act.
Status under California Proposition 65	• This product contains up to 0.05 percent of chemicals (trace elements) known to the State of California to cause cancer, birth defects or other reproductive harm. California law requires the manufacturer to give the above warning in the absence of definitive testing to prove that the defined risks do not exist.

16. OTHER INFORMATION

Further Information	• HMIS® is a registered trade and service mark of the NPCA.
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	• Product and Company Identification: Synonyms changes from the previous Physical & Chemical Properties: Multiple Properties version in section(s): Transport Information: Material Transportation Information Regulatory Information: United States.

Patch, Repair and Contouring Materials

Hyperform®

Rapid Set High Early Strength Patching Material

TYPICAL PERFORMANCE CHARACTERISTICS*

- **Compressive Strength (ASTM C39)**
  30 minutes >1,200 psi | 8.27 MPa
  1 hour >2,500 psi | 17.24 MPa
  1 day >4,000 psi | 27.58 MPa
  28 days >7,000 psi | 48.26 MPa
- **Bond Strength (ASTM C882)**
  28 day >3,000 psi | 20.68 MPa
- **Shrinkage (ASTM C596)**
  28 Days ≤ 0.02%

* The values stated in inch-pound units are to be regarded as the standard. The values given in International System are for information only.

FEATURES AND BENEFITS

- **Rapid-setting**
- **High early and ultimate strengths**
- **Non-Shrinking**
- **No Calcium Chloride**
- **Ready to use, just add water**
- **Excellent resistance to freeze thaw**

PRECAUTIONS

Avoid eye contact or prolonged contact with skin. Wash thoroughly after use. Persons using Hyperform should wear necessary eye protection, dust mask and rubber gloves.Read all product labels and technical literature.

WARRANTY

Quadex, LLC warrants its products to be free of defects in material and workmanship. Unless superseded by project specifications and terms agreed upon in writing between installer and Quadex prior to bid, if within one year from purchase, any Quadex, LLC product is proven defective, the company will replace said product or refund its purchase price at its sole discretion. The company's obligation shall be limited solely to such replacement or refund. There are no other warranties by Quadex, LLC, expressed or implied. There is no warranty if Quadex products are used contrary to Quadex, LLC's written directions.

QUADEX® A VORTEX COMPANY | REPAIR MATERIALS

DESCRIPTION

Hyperform® is a one component, rapid setting, high early strength patching material designed for repairing vertical and horizontal concrete and masonry structures.

RECOMMENDED FOR

- **Filling large voids in manhole walls**
- **Reconstructing inverts**
- **Concrete repair and patching**
- **Pipe repair**

PACKAGING

Hyperform is supplied in 60 lb. | 27.2 kg. poly-lined bags or 50 lb. | 22.68 kg. plastic pails.

YIELD

One 60 lb. | 27.2 kg. bag of Hyperform will yield approximately 0.48 cu. ft. | 0.013 cu. m. and will cover 11.5 sq. ft. | 1.07 sq. m. at a 0.5 in. | 12.7 mm thickness.

THICKNESS

When used as a preparation material, prior to the application of a liner product, Hyperform can be installed at a thickness of between 0.25 and 2.0" without sag on overhead, horizontal and vertical surfaces.

APPLICATION INFORMATION

Prepare surface to be patched by removing all loose concrete by using an air or electric hammer. Next, sandblast or water blast surface to clean away all contaminants, such as oil, chemicals, or dust. Then rinse with potable water to remove all remaining dirt, sand and loose debris.

Mix Hyperform with clean potable water at a rate of 1.0 gallon | 3.78 liter per 60 lb. | 27.2 kg. bag. If needed, Hyperform can be extended with 3/8 in. | 9.5 mm aggregate at a rate of 25 lb. | 11.34 kg. per bag.

SETTING TIME

Hyperform, Setting Time, ASTM C266 Initial set 5-10 minutes Final set 10-20 minutes and is ready for an epoxy topcoat within 1 hour. If ambient temperature in the structure at time of cure is below 50°F, additional cure time may be necessary

Hyperform®

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name	• Hyperform®
Trade Name	• Hyperform®
Company	• Quadex LLC, 564 W. 9320 S., Sandy, UT 84070
Company Contact	• Matthew Peterson
Company Phone	• 844-782-4832
Emergency	• Domestic Shipments and to Canada: 1-800-633-8253 • International Shipments: 1-801-629-0667

2. HAZARDS IDENTIFICATION

Emergency Overview: OSHA Hazards	• This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).	
GHS Classification		
	Skin Corrosion/Irritation	• Category 1
	Serious Eye Damage/Eye Irritation	• Category 1
	Skin Sensitization	• Category 1
	Carcinogenicity/Inhalation	• Category 1A
	Specific Target Organ Toxicity: Single Exposure (Respiratory Tract Irritation)	• Category 3
GHS Label elements, including precautionary statements	*Pictogram* 	
Signal Word	• Danger	
Hazard Statement(s)	• Causes skin irritation. Causes serious eye damage. May cause respiratory irritation. May cause cancer.	
Precautionary Statement(s)		
Prevention	• Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe dust. Use outdoors in a well ventilated area. Wash any exposed body parts thouroughly after handling. Wear protective gloves/protective clothing/ eye protection/face protection.Contaminated clothing must not be allowed out of the workplace.	

2. HAZARDS IDENTIFICATION (CONTINUED)

Response	• If exposed or concerned: Immediately get medical advice/attention if you feel unwell or irritation or rash occurs.If on skin: Wash with plenty of water. Take off contaminated clothing and wash it before reuse. If in eyes: Rinse continuously with water for several minutes. Remove contact lenses, if present and easy to do.If inhaled: Remove person to fresh air and keep comfortable for breathing. If swallowed: Rinse mouth. Do not induce vomiting.
Storage	• Restrict or control access to stockpile areas (store locked up). Engulfment hazard: To prevent burial or suffocation, do not enter a confined space, such as a silo, bulk truck or other storage container or vessel that stores or contains cement without an effective procedure for assuring safety. Store in a well ventilated area. Keep container tightly closed.
Disposal	• Dispose of contents/container in accordance with local/regional/national/international regulations.
HNOC	• None known.
Supplemental Information	• Dispose of contents/container in accordance with local/regional/national/international regulations.

Overexposure to portland cement can cause serious, potentially irreversible skin or eye damage in the form of chemical (caustic) burns, including third degree burns. The same serious injury can occur if wet or moist skin has prolonged contact exposure to dry portland cement.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	Cas #	Percent
Portland Cement	• 65997-15-1	• 40-100
Admixtures		• 1-15
Monocrystalline Quartz	• 14808-60-7	• 40-70

4. FIRST AID MEASURE

First aid procedures	
Eye Contact	• Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do so. Seek medical attention immediately.
Skin Contact	• Wash off with plenty of soap and water. Get medical attention if irritation develops and persists.
Inhalation	• If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing. Call a physician if symptoms develop or persist.
Ingestion	• Rinse mouth thoroughly. Do not induce vomiting without advice from poison control center. If ingestion of a large amount does occur, call a poison control center immediately.
Notes to Physician	• Symptoms may be delayed.
General Advice	• Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. FIRE FIGHTING MEASURES

Flammable Properties	• The product is not flammable. No unusual fire or explosion hazards noted.
Extinguishing Media	• Dry chemical, CO_2, or water spray. Alcohol foam.
Suitable Extinguishing Media	• Dry chemical, CO_2, or water spray. Alcohol foam. In the event of fire, use water spray to cool unopened containers. Cool containers exposed to flames with water until well after the fire is out. Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA.
Specific Methods	• None available.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions	• Keep unnecessary personnel away. Keep upwind.
Environmental Precautions	• Do not flush into surface water or sanitary sewer system.
Methods for Containment	• Stop the flow of material, if this is without risk. Dike the spilled material.
Methods for Cleaning Up	• Shovel into labled waste container for reuse or disposal. Wear adequate protective equipment. Area may be washed down with water.

7. HANDLING AND STORAGE

Handling	• Do not get this material in contact with eyes. Avoid contact with skin. Do not empty into drains.
Storage	• Store in dry place and keep sealed until ready to use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits: US. ACGIH Threshold Limit Values			
Components	• Type	• Value	• Form
Portland Cement	• TWA	• 10 mg/m³	
Admixtures	• TWA	• 10 mg/m³	
Occupational Exposure Limits: US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)	• N/A	**Occupational Exposure Limits: US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)**	• N/A
Occupational Exposure Limits: US. OSHA Table Z-3 (29 CFR 1910.1000)	• N/A	**Occupational Exposure Limits: US. OSHA Table Z-3 (29 CFR 1910.1000)**	• N/A

8. EXPOSURE CONTROLS/PERSONAL PROTECTION (CONTINUED)

Engineering Controls	• Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.
Eye / Face Protection	• Do not get in eyes. Chemical goggles are recommended.
Skin Protection	• Avoid contact with the skin. Wear protective gloves. Wear suitable protective clothing as protection against splashing or contamination.
Respiratory Protection	• When workers are facing concentrations above the exposure limit they must use NIOSH/MESHA respirators.
General Hygiene Considerations	• Do not get in eyes. Avoid contact with skin.

9. PHYSICAL & CHEMICAL PROPERTIES

Appearance	• Not available.
Physical State	• Powder
Form Viscous	• Powder
Color	• Grey
Odor	• Odorless
Odor Threshold	• Not available.
pH	• Not available.
Vapor Pressure	• Not available.
Vapor Density	• Not available.
Boiling Point	• Not available.
Melting Point/ Freezing Point	• Not available.
Solubility (Water)	• Slight (0.01 – 1.0%)
Specific Gravity	• 3.15
Relative Density	• Not available.
Flash Point	• Not available.
Flammability limits in air upper, % by volume	• Not available.
Flammability limits in air lower, % by volume	• Not available.
Auto-Ignition Temperature	
Other Data	

10. CHEMICAL STABILITY & REACTIVITY INFORMATION

Chemical Stability	• Stable under normal conditions.
Conditions to Avoid	• Although no hazardous reactions will occur, product should be kept dry.
Incompatible Materials	• Not available.
Hazardous Decomposition Products	• None

11. TOXICOLOGICAL INFORMATION

Toxicological Data	
Components	• Test Results / None
Local Effects	• Irritating to skin. Contact may irritate or burn eyes.
Chronic Effects	• Prolonged inhalation may be harmful. Prolonged exposure may cause chronic effects.
Carcinogenicity	• None

12. ECOLOGICAL INFORMATION

Toxicological Data	
Components	• Test Results / Not available
Ecotoxicity	• Not available.
Environmental Effects	• An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Aquatic Toxicity	• No data available for this product.
Persistence and Degradability	• Not available.

13. DISPOSAL CONSIDERATIONS

Disposal Instructions	• Dispose in sanitary landfill in accordance with federal, state, and local regulations.
Waste from Residues / Unused Products	• Not applicable unused products.

14. TRANSPORT INFORMATION

DOT	• Not regulated as dangerous goods.

15. REGULATORY INFORMATION

US Federal Regulations	• This product is a non "Hazardous Chemical" as defined by theOSHA Hazard Communication Standard 29 CFR 1910.1200. CERCLA/SARA Hazardous Substances - Not applicable.
Drug Enforcement Administration (DEA). List 2, Essential Chemicals (21 CFR 1310.02(b) and 1310.04(f)(2)	• Not regulated.
DEA Essential Chemical Code Number	• Not regulated.
Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures (21 CFR 1310.12(c))	• Not regulated.
DEA Exempt Chemical Mixtures Code Number	• Not regulated.
CERCLA (Superfund) Reportable Qty	• None

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard Categories		
	Immediate Hazard	• No
	Delayed Hazard	• No
	Fire Hazard	• No
	Pressure Hazard	• No
	Reactivity Hazard	• No
Section 302 Extremely Hazardous Substance	• No	
Section 311 Hazardous Chemical	• No	

16. OTHER INFORMATION

Further Information	• HMIS® is a registered trade and service mark of the NPCA.	
HMIS® Ratings		
	Health	• 2
	Flammability	• 0
	Physical hazard	• 0
NFPA Ratings		
	Health	• 2
	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	• Product and Company Identification: Synonyms changes from the previous Physical & Chemical Properties: Multiple Properties version in section(s): Transport Information: Material Transportation Information Regulatory Information: United States.	

Re-Surfacing Products

TECHNICAL DATA SHEET

GeoKrete®

TYPICAL PERFORMANCE CHARACTERISTICS*

- **Compressive Strength (ASTM C39 & C109)**
  28-days >8,000 psi | 55.1 MPa
- **Flexural Strength (ASTM C78)**
  28-days >800 psi | 5.5 MPa
- **Bond Strength (ASTM C882)**
  28-days >3,000 psi | 20.7 MPa
- **Modulus of Elasticity (ASTM C469)**
  28-days = 5.49 x 10^6 psi | 37.8 GPa
- **Chemical Resistance (ASTM C267)**
  0% mass loss in 12 week
  sulfuric acid @ pH 1.0 immersion
- **Chloride Ion Penetration Resistance (ASTM C1202)**
  28-Day < 250 Coulombs (very low)
- **Split Tensile Strength (ASTM C496)**
  28-days >900 psi | 6.2 MPa
- **Shrinkage (ASTM C1090)**
  28-days ≤ 0.02%
- **Freeze Thaw (ASTM C666)**
  No visible damage after 300 cycles
- **Abrasion Resistance (ASTM C1138)**
  6 Cycles at 28 Day – loss <1.0%

* The values stated in inch-pound units are to be regarded as the standard. The values given in International System are for information only.

Key Product Used In:

Trenchless TECHNOLOGY 2022 REHAB PROJECT of the YEAR

QUADEX® A VORTEX COMPANY REPAIR MATERIALS

CERTIFIED REDUCED CARBON FOOTPRINT EXCEPTIONAL SERVICES

Fully Structural and Corrosion Resistant Geopolymer Mortar

DESCRIPTION

GeoKrete® geopolymer is formulated to provide corrosion resistant protection in a high hydrogen sulfide environment, restore structural integrity and eliminate the infiltration of groundwater in deteriorated structures. GeoKrete is a factory blended, one-component (just add water), eco-friendly, micro-fiber reinforced geopolymer mortar synthesized from reactive SiO_2 and Al_2O_3 from industrial byproducts, enhanced with monocrystalline quartz aggregate. The GeoKrete geopolymer reaction mechanism is alkali-activated polycondensation which yields superior physical properties and chemical resistance. It can be applied in one pass up to several inches thick on horizontal or vertical surfaces by low pressure spraying or spin cast application process.

RECOMMENDED FOR

Structural restoration of large diameter pipes, culverts and tunnels, including raw, storm and wastewater, consisting of metal, concrete, stone, masonry and others. Other structures such as manholes, wet-wells, and treatment plant structures also benefit from the superior strength and corrosion resistance properties of this advanced geopolymer material.

FEATURES AND BENEFITS

- **Quality controlled, one-component blend for uniform results.**
- **Excellent performance and consistency when pumping long distances.**
- **Resistant to acid attack in wastewater streams with pH as low as 1.0 and temperature exceeding 212°F | 100°C for industrial effluent.**
- **Extremely low permeability**

WARRANTY

Quadex, LLC warrants its products to be free of defects in material and workmanship. Unless superseded by project specifications and terms agreed upon in writing between installer and Quadex prior to bid, if within one year from purchase, any Quadex, LLC product is proven defective, the company will replace said product or refund its purchase price at its sole discretion. The company's obligation shall be limited solely to such replacement or refund. There are no other warranties by Quadex, LLC, expressed or implied. There is no warranty if Quadex products are used contrary to Quadex, LLC's written directions.

SURFACE PREPARATION

Prepare surface to be patched by removing unsound concrete, dirt, dust, oil and other debris using high pressure (3,500 PSI | 241.3 bar) water blasting. Stop active infiltration. Then rinse with potable water to remove all remaining dirt, sand and loose debris. This will provide a clean, damp surface to allow for a good bond.

CURING

Cure in accordance with manufacturer's recommendations.

PRECAUTIONS

Avoid eye contact or prolonged contact with skin. Wash thoroughly after use. Persons using Quadex GeoKrete geopolymer should wear necessary PPE consisting at minimum of eye protection, dusk mask and rubber gloves. Read all product labels and technical literature prior to use.

PACKAGING/YIELD

North America

			1.0-INCH | 25.4MM THICKNESS		
BAG SIZES LBS | KG	BAG MATERIAL	YIELD PER BAG FT^3 | M^3	BAG COVERAGE FT^2 | M^2	MASS COVERAGE LBS/FT^2 | KG/M^2	WATER PER BAG* % BY WEIGHT
60 | 27.2	Multi-Wall Paper	0.54 | 0.015	6.52 | 0.61	9.21 | 44.96	6.7 to 7.9
1,000 | 453.6	Super Sack	9.05 | 0.256	108.6 | 10.1		

*Due to natural deviations in the constituent materials, additional water may be necessary on occasion. Applicators are trained to adjust as needed based upon field performance of the product.

GeoKrete®

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name	• GeoKrete®
Trade Name	• GeoKrete®
Company	• Quadex LLC, 564 W. 9320 S., Sandy, UT 84070
Company Contact	• Matthew Peterson
Company Phone	• 844-782-4832
Emergency	• Domestic Shipments and to Canada: 1-800-633-8253 • International Shipments: 1-801-629-0667

2. HAZARDS IDENTIFICATION

Emergency Overview: OSHA Hazards	• This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).	
GHS Classification		
	Skin Irritation	• Category 2
	Serious Eye Damage	• Category 1
	Specific Target Organ Toxicity: Single Exposure	• Category 3
GHS Label elements, including precautionary statements	*Pictogram* 	
Signal Word	• Danger	
Hazard Statement(s)		
	H315	• Causes skin irritation.
	H318	• Causes serious eye damage.
	H335	• May cause respiratory irritation.
Precautionary Statement(s)		
	P261	• Avoid breathing dust/fume/gas/ mist/vapours/spray.
	P280	• Wear protective gloves/ eye protection/ face protection.
	P305 + P351 + P338	• IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

2. HAZARDS IDENTIFICATION (CONTINUED)

HMIS Classification	
Health Hazard	• 3
Flammability	• 0
Physical Hazards	• 0
NFPA Rating	
Health Hazard: Fire	• 3
Reactivity Hazard	• 0
Potential Health Effects	
Inhalation	• May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.
Skin	• May be harmful if absorbed through skin. Causes skin burns.
Eyes	• Causes eye burns.
Ingestion	• May be harmful if swallowed.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	Cas #	Percent
Portland Cement	• 65997-15-1	• 0-25
Amorphous Silica	• 7631-86-9	• 0-20
Admixtures		• 1-15
Monocrystalline Quartz	• 14808-60-7	• 40-70

4. FIRST AID MEASURE

First aid procedures	*Notes to physician: Symptoms may be delayed.*
Eye Contact	• Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do so. Seek medical attention immediately.
Skin Contact	• Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Wash clothing before reuse. Thoroughly clean shoes before reuse. Seek medical attention immediately.
Inhalation	• If inhaled, remove to fresh air. If not breathing, give artificial respiratation. If breathing is difficult, give oxygen. Get medical attention.
Ingestion	• Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.
Notes to Physician	• Symptoms may be delayed.

5. FIRE FIGHTING MEASURES

Flash Point	• Does not flash.
Auto Ignition Temperature	• Not applicable.
Lower Explosion Limit	• Not applicable.
Upper Explosion Limit	• Not applicable.
Suitable Extinguishing Media	• Use extinguishing agent suitable for type of surrounding fire. Keep containers and surroundings cool with water spray.
Fire and Explosion Hazards	• Not applicable.
Special Fire-Fighting Procedures	• As in any fire, wear pressure demand self-contained breathing apparatus (NIOSH approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions	• Keep unnecessary personnel away. Keep upwind.
Environmental Precautions	• Do not flush into surface water or sanitary sewer system.
Methods for Containment	• Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible.
Methods for Cleaning Up	• Shovel into labled waste container for reuse or disposal. Wear adequate protective equipment. Area may be washed down with water.

7. HANDLING AND STORAGE

Handling	• Do not get this material in contact with eyes. Avoid contact with skin. Do not empty into drains.
Storage	• Store in dry place and keep sealed until ready to use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits: US. ACGIH Threshold Limit Values			
Components	• Type	• Value	• Form
Calcium Oxide CaO	• TWA	• 2 mg/m^3	
Admixtures	• TWA	• 10 mg/m^3 SiO_2	
Silica Amorphous	• TWA	• 10 mg/m^3	
Polypropylene	• TWA	• 10 mg/m^3	

8. EXPOSURE CONTROLS/PERSONAL PROTECTION (CONTINUED)

Occupational Exposure Limits: US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)	• N/A
Occupational Exposure Limits: US. OSHA Table Z-3 (29 CFR 1910.1000)	• N/A
Engineering Controls	• Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.
Eye / Face Protection	• Do not get in eyes. Chemical goggles are recommended. Avoid contact with the skin. Wear protective gloves. Wear suitable protective clothing as protection against splashing or contamination.
Respiratory Protection	• When workers are facing concentrations above the exposure limit they must use NIOSH/MESHA respirators.
General Hygiene Considerations	• Do not get in eyes. Avoid contact with skin.

9. PHYSICAL & CHEMICAL PROPERTIES

Appearance	• Not available.
Physical State	• Powder
Form Viscous	• Powder
Color	• Grey
Odor	• Odorless
Odor Threshold	• Not available.
pH	• Not available.
Vapor Pressure	• Not available.
Vapor Density	• Not available.
Boiling Point	• Not available.
Melting Point/ Freezing Point	• Not available.
Solubility (Water)	• Slight (0.01 – 1.0%)
Specific Gravity	• Not available.
Relative Density	• Not available.
Flash Point	• Not available.

9. PHYSICAL & CHEMICAL PROPERTIES (CONTINUED)

Flammability limits in air upper, % by volume	• Not available.
Flammability limits in air lower, % by volume	• Not available.
Auto-Ignition Temperature	
Other Data	

10. CHEMICAL STABILITY & REACTIVITY INFORMATION

Chemical Stability	• Stable under normal conditions.
Conditions to Avoid	• Although no hazardous reactions will occur, product should be kept dry.
Incompatible Materials	• Not available.
Hazardous Decomposition Products	• None

11. TOXICOLOGICAL INFORMATION

Toxicological Data	
Components	• Test Results / None
Local Effects	• Irritating to skin. Contact may irritate or burn eyes.
Chronic Effects	• Prolonged inhalation may be harmful. Prolonged exposure may cause chronic effects.
Carcinogenicity	• None

12. ECOLOGICAL INFORMATION

Toxicological Data	
Components	• Test Results / Not available
Ecotoxicity	• Not available.
Environmental Effects	• An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Aquatic Toxicity	• No data available for this product.
Persistence and Degradability	• Not available.

13. DISPOSAL CONSIDERATIONS

Disposal Instructions	• Dispose in sanitary landfill in accordance with federal, state, and local regulations.
Waste from Residues / Unused Products	• Not applicable unused products.

14. TRANSPORT INFORMATION

DOT	• Not regulated as dangerous goods.

15. REGULATORY INFORMATION

US Federal Regulations	• This product is a non “Hazardous Chemical” as defined by theOSHA Hazard Communication Standard 29 CFR 1910.1200. CERCLA/SARA Hazardous Substances - Not applicable.
Drug Enforcement Administration (DEA). List 2, Essential Chemicals (21 CFR 1310.02(b) and 1310.04(f)(2)	• Not regulated.
DEA Essential Chemical Code Number	• Not regulated.
Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures (21 CFR 1310.12(c))	• Not regulated.
DEA Exempt Chemical Mixtures Code Number	• Not regulated.
CERCLA (Superfund) Reportable Qty	• None

Superfund Amendments and Reauthorization Act of 1986 (SARA)		
Hazard Categories		
	Immediate Hazard	• No
	Delayed Hazard	• No
	Fire Hazard	• No
	Pressure Hazard	• No
	Reactivity Hazard	• No
Section 302 Extremely Hazardous Substance	• No	
Section 311 Hazardous Chemical	• No	

16. OTHER INFORMATION

Further Information	• HMIS® is a registered trade and service mark of the NPCA.	
HMIS® Ratings		
	Health	• 2
	Flammability	• 0
	Physical hazard	• 0
NFPA Ratings		
	Health	• 2
	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	• Product and Company Identification: Synonyms changes from the previous Physical & Chemical Properties: Multiple Properties version in section(s): Transport Information: Material Transportation Information Regulatory Information: United States.	

TECHNICAL DATA SHEET

AluminaLiner®

TYPICAL PERFORMANCE CHARACTERISTICS

- **Compressive Strength psi (ASTM C39)**
  28-day >9000
- **Flexural Strength psi (ASTM C293)**
  28-day >1000
- **Bond Strength psi (ASTM C882)**
  >2000
- **Freeze-Thaw Durability (ASTM C666)**
  No visible damage after 300 cycles
- **Permeability (ASTM C 1202)**
  350 Coulombs
- **Shrinkage at 95% Humidity (ASTM C596)**
  28-day 0%
- **Sulfide Resistance (ASTM C267)**
  No attack
- **Density**
  135 +/- 5 PCF

RECOMMENDED FOR

Vertical and overhead repairs to concrete or masonry sewer structures such as **manholes, wetwells, pipe and treatment plant structures** where corrosion is a problem.

Calcium Aluminate Sewer Rehabilitation Mortar

DESCRIPTION

AluminaLiner® is a factory blended, one component, fiber reinforced, 100% calcium aluminate cement designed to provide excellent corrosion resistance against typical hydrogen sulfide gas (microbiologically induced) corrosion, add structural integrity and stop groundwater infiltration in sewer structures with a pH of 2 or greater. This unique formulation allows for a monolithic one-pass application up to three inches in thickness by low pressure spraying or centrifugally spinning.

PACKAGING

AluminaLiner is supplied in 60 lb. (27 kg.) poly-lined bags.

YIELD

One 60-lb. bag of AluminaLiner will yield approximately .48 cu. ft. and will cover 11.5 sq. ft. at a 1/2 in. thickness.

FEATURES AND BENEFITS

- **Quality controlled, one-component blend for uniform results**
- **High early and ultimate compressive, flexural and bond strengths**
- **Resistant to sulfide attack**
- **Low permeability**

CURING

Cure in accordance with Quadex recommended curing agent.

QUADEX® A VORTEX COMPANY REPAIR MATERIALS

VORTEX

WARRANTY

Quadex, LLC warrants its products to be free of defects in material and workmanship. Unless superseded by project specifications and terms agreed upon in writing between installer and Quadex prior to bid, if within one year from purchase, any Quadex, LLC product is proven defective, the company will replace said product or refund its purchase price at its sole discretion. The company's obligation shall be limited solely to such replacement or refund. There are no other warranties by Quadex, LLC, expressed or implied. There is no warranty if Quadex products are used contrary to Quadex, LLC's written directions.

PROCEDURE

Prepare surface to be patched by removing unsound concrete, dirt, dust, oil and other debris using high pressure (3500 psi) water blasting. Then rinse with potable water to remove all remaining dirt, sand and loose debris. This will provide a clean, damp surface to allow for a good bond.

Use approximately 0.8 to 1.0 gallons (3.03 to 3.79 liters), of potable water per 60 lb. bag of AluminaLiner®. First add water to mixer, start the mixer and add AluminaLiner until mortar is completely mixed.

Apply AluminaLiner by low pressure spraying on vertical or overhead surfaces to a monolithic thickness of 1/2 to 3 inches in one pass, trowel to smooth surface.

PRECAUTIONS

Avoid eye contact or prolonged contact with skin. Wash thoroughly after use. Persons using AluminaLiner should wear necessary eye protection, dust mask and rubber gloves. Read all product labels and technical literature.

AluminaLiner®

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name	• AluminaLiner®
Trade Name	• AluminaLiner®
Company	• Quadex LLC, 564 W. 9320 S., Sandy, UT 84070
Company Contact	• Matthew Peterson
Company Phone	• 844-782-4832
Emergency	• Domestic Shipments and to Canada: 1-800-633-8253 • International Shipments: 1-801-629-0667

2. HAZARDS IDENTIFICATION

Emergency Overview: OSHA Hazards	• This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).	
GHS Classification		
	Skin Irritation	• Category 2
	Serious Eye Damage	• Category 1
	Specific Target Organ Toxicity: Single Exposure	• Category 3
GHS Label elements, including precautionary statements	*Pictogram* 	
Signal Word	• Danger	
Hazard Statement(s)		
	H315	• Causes skin irritation.
	H318	• Causes serious eye damage.
	H335	• May cause respiratory irritation.
Precautionary Statement(s)		
	P261	• Avoid breathing dust/fume/gas/mist/vapours/spray.
	P280	• Wear protective gloves/eye protection/face protection.
	P305 + P351 + P338	• IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

2. HAZARDS IDENTIFICATION (CONTINUED)

HMIS Classification		
	Health hazard	• 3
	Flammability	• 0
	Physical hazards	• 0
NFPA Rating		
	Health hazard: Fire	• 3
	Reactivity Hazard	• 0
Potential Health Effects		
	Inhalation	• May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.
	Skin	• May be harmful if absorbed through skin. Causes skin burns.
	Eyes	• Causes eye burns.
	Ingestion	• May be harmful if swallowed.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	Cas #	Percent
Calcium Aluminate	• 65997-16-2	• 40-100
Admixtures		• 1-15
Monocrystalline Quartz	• 14808-60-7	• 40-70
Polypropylene	• 9003-07	• 0-5

4. FIRST AID MEASURE

First Aid Procedures	*Notes to physician: Symptoms may be delayed.* *General advice: Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.*
Eye Contact	• Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do so. Seek medical attention immediately.
Skin Contact	• Contact Wash off with plenty of soap and water. Get medical attention if irritation develops and persists.
Inhalation	• If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing. Call a physician if symptoms develop or persist.
Ingestion	• Rinse mouth thoroughly. Do not induce vomiting without advice from poison control center. If ingestion of a large amount does occur, call a poison control center immediately.

5. FIRE FIGHTING MEASURES

Flammable Properties	• The product is not flammable. No unusual fire or explosion hazards noted.
Suitable Extinguishing Media	• Dry chemical, C02, or water spray, Alcohol foam. In the event of fire, use water spray to cool unopened containers. Cool containers exposed to flames with water until well after the fire is out. Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA.
Specific Methods	• None available.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions	• Keep unnecessary personnel away. Keep upwind.
Environmental Precautions	• Do not flush into surface water or sanitary sewer system.
Methods for Containment	• Stop the flow of material, if this is without risk. Dike the spilled material.
Methods for Cleaning Up	• Shovel into labled waste container for reuse or disposal. Wear adequate protective equipment. Area may be washed down with water.

7. HANDLING AND STORAGE

Handling	• Do not get this material in contact with eyes. Avoid contact with skin. Do not empty into drains.
Storage	• Store in dry place and keep sealed until ready to use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits: US. ACGIH Threshold Limit Values	Type	Value
Calcium Aluminate	• TWA	• 10 mg/m3
Admixtures	• TWA	• 10 mg/m3
Monocrystalline	• TWA	• 10 mg/m3
Polypropylene	• TWA	• 10 mg/m3
US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)	Type	Value
N/A		
US. OSHA Table Z-3 (29 CFR 1910.1000)	Type	Value
N/A		
Engineering Controls	• Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.	

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION (CONTINUED)

Personal Protective Equipment	
Eye / Face Protection	• Do not get in eyes. Chemical goggles are recommended.
Skin Protection	• Avoid contact with the skin. Wear protective gloves. Wear suitable protective clothing as protection against splashing or contamination.
Respiratory Protection	• When workers are facing concentrations above the exposure limit they must use NIOSH/MESHA respirators.
General Hygiene Considerations	• Do not get in eyes. Avoid contact with skin.

9. PHYSICAL & CHEMICAL PROPERTIES

Appearance	• Not available.
Physical State	• Powder
Form Viscous	• Powder
Color	• Grey
Odor	• Odorless
Odor Threshold	• Not available.
pH	• Not available.
Vapor Pressure	• Not available.
Vapor Density	• Not available.
Boiling Point	• Not available.
Melting Point/ Freezing Point	• Not available.
Solubility (Water)	• Slight (0.01 – 1.0%)
Specific Gravity	• 3.15
Relative Density	• Not available.
Flash Point	• Not available.
Flammability limits in air upper, % by volume	• Not available.
Flammability limits in air lower, % by volume	• Not available.
Auto-Ignition Temperature	
Other Data	

10. CHEMICAL STABILITY & REACTIVITY INFORMATION

Chemical Stability	• Stable under normal conditions.
Conditions to Avoid	• Although no hazardous reactions will occur, product should be kept dry.
Incompatible Materials	• Not available.

10. CHEMICAL STABILITY & REACTIVITY INFORMATION (CONTINUED)

Hazardous Decomposition Products	• None

11. TOXICOLOGICAL INFORMATION

Toxicological Data	
Components	• Test Results / None
Local Effects	• Irritating to skin. Contact may irritate or burn eyes.
Chronic Effects	• Prolonged inhalation may be harmful. Prolonged exposure may cause chronic effects.
Carcinogenicity	• None

12. ECOLOGICAL INFORMATION

Toxicological Data	
Components	• Test Results / None
Ecotoxicity	• Not available.
Environmental Effects	• An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Aquatic Toxicity	• No data available for this product.
Persistence and Degradability	• Not available.

13. DISPOSAL CONSIDERATIONS

Disposal Instructions	• Dispose in sanitary land fill in accordance with federal, state, and local regulations.
Waste from Residues / Unused Products	• Not applicable unused products.

14. TRANSPORT INFORMATION

DOT	• Not regulated as dangerous goods.

15. REGULATORY INFORMATION

US Federal Regulations	• This product is a non “Hazardous Chemical” as defined by theOSHA Hazard Communication Standard 29 CFR 1910.1200. CERCLA/SARA Hazardous Substances - Not applicable.
Drug Enforcement Administration (DEA). List 2, Essential Chemicals (21 CFR 1310.02(b) and 1310.04(f)(2)	• Not regulated.
DEA Essential Chemical Code Number	• Not regulated.

15. REGULATORY INFORMATION (CONTINUED)

Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures (21 CFR 1310.12(c))	• Not regulated.
DEA Exempt Chemical Mixtures Code Number	• Not regulated.
CERCLA (Superfund) Reportable Qty	• None

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard Categories		
	Immediate Hazard	• No
	Delayed Hazard	• No
	Fire Hazard	• No
	Pressure Hazard	• No
	Reactivity Hazard	• No
Section 302 Extremely Hazardous Substance	• No	
Section 311 Hazardous Chemical	• No	

16. OTHER INFORMATION

Further Information	• HMIS® is a registered trade and service mark of the NPCA.	
HMIS® Ratings		
	Health	• 2
	Flammability	• 0
	Physical hazard	• 0
NFPA Ratings		
	Health	• 2
	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	• Product and Company Identification: Synonyms changes from the previous Physical & Chemical Properties: Multiple Properties version in section(s): Transport Information: Material Transportation Information Regulatory Information: United States.	

TECHNICAL DATA SHEET

QM-1s Restore®

TYPICAL PERFORMANCE CHARACTERISTICS

- **Compressive Strength 28 Day**
  (ASTM C39)
  >9,000 psi
- **Flexural Strength (ASTM C293)**
  >1,000 psi
- **Bond Strength (ASTM C882)**
  >1,500 psi
- **Freeze-Thaw (ASTM C666)**
  No visible damage after 300 cycles
- **Permeability (ASTM C1202)**
  350 Coulombs
- **Density**
  132 +/- 5 PCF
- **Shrinkage (ASTM C596)**
  0% @ 28 days

Portland-Based Structural Liner Mortar

DESCRIPTION

QM-1s Restore® is a Portland cement based, single component, high strength, fiber reinforced, shrinkage compensated cement mortar enhanced with a monocrystalline quartz aggregate. QM-1s Restore was designed to structurally repair deteriorated metal, concrete and masonry structures. QM-1s Restore delivers a monolithic one pass vertical surface application up to three inches in thickness by low pressure spraying or centrifugally casting.

RECOMMENDED FOR

Vertical and overhead repairs to concrete or masonry sewer manholes, wetwells, metal pipes, water treatment facilities, tunnels, navigation locks, and dams.

FEATURES AND BENEFITS

- **Quality controlled, one-component blend for uniform results**
- **High early and ultimate compressive, flexural and bond strengths**
- **Resistant to sulfate attack**
- **Low permeability**

PACKAGING

QM-1s Restore is supplied in 60 lb. | 27.2 kg. poly-lined bags.

YIELD

One 60 lb. | 27.2 kg. bag of QM-1s Restore will yield approximately 0.51 cu.ft. | 0.014 cu.m. and will cover 12.2 sq.ft | 1.13 sq.m. at a 1/2-inch | 12.7 mm thickness.

QUADEX® A VORTEX COMPANY REPAIR MATERIALS

PROCEDURE

Prepare surface to be patched by removing unsound concrete, dirt, dust, oil and other debris using high pressure (min 3,500 psi | 241.3 bar) water blasting. Then rinse with potable water to remove all remaining dirt, sand and loose debris. This will provide a clean, damp surface to facilitate bond.

Use approximately .70 to 1.0 gallons (2.64 to 3.78 liters) of potable water per 60 lb. | 27.2 kg. bag of QM-1s Restore®. First add water to mixer, start the mixer and add QM-1s Restore until mortar is completely mixed. Surface should be Saturated Surface Dry (SSD) just prior to material application. Any standing water must be removed.

Apply QM-1s Restore by low pressure spraying on vertical or overhead surfaces to a monolithic thickness of 1/2 to 3-inches | 12.7 to 76.2mm in one pass, trowel to smooth surface.

QM-1s Restore can be top coated with Structure Guard® or Structure Guard®-QS after 24 hours to perform as a composite system.

CURING

Cure in accordance with current ACI and manufacturer recommendations.

WARRANTY

Quadex, LLC warrants its products to be free of defects in material and workmanship. Unless superseded by project specifications and terms agreed upon in writing between installer and Quadex prior to bid, if within one year from purchase, any Quadex, LLC product is proven defective, the company will replace said product or refund its purchase price at its sole discretion. The company's obligation shall be limited solely to such replacement or refund. There are no other warranties by Quadex, LLC, expressed or implied. There is no warranty if Quadex products are used contrary to Quadex, LLC's written directions.

PRECAUTIONS

Avoid eye contact or prolonged contact with skin. Wash thoroughly after use. Persons using QM-1s Restore should wear necessary PPE consisting at minimum of eye protection, dust mask and rubber gloves. Read all product labels and technical literature.

MATERIAL COMPATIBILITY

Structure Guard®-QS can be used in a composite system with Quadex Mortar Materials.

QM-1s Restore®

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name	• QM-1s Restore®
Trade Name	• QM-1s Restore®
Company	• Quadex LLC, 564 W. 9320 S., Sandy, UT 84070
Company Contact	• Matthew Peterson
Company Phone	• 844-782-4832
Emergency	• Domestic Shipments and to Canada: 1-800-633-8253 • International Shipments: 1-801-629-0667

2. HAZARDS IDENTIFICATION

Emergency Overview: OSHA Hazards	• This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).	
GHS Classification		
	Skin Corrosion/Irritation	• Category 1
	Serious Eye Damage/Eye Irritation	• Category 1
	Skin Sensitization	• Category 1
	Carcinogenicity/Inhalation	• Category 1A
	Specific Target Organ Toxicity: Single Exposure (Respiratory Tract Irritation)	• Category 3
GHS Label elements, including precautionary statements	*Pictogram* 	
Signal Word	• Danger	
Hazard Statement(S)	• Causes skin irritation. Causes serious eye damage. May cause respiratory irritation. May cause cancer.	
Precautionary statement(s)		
Prevention	• Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe dust. Use outdoors in a well ventilated area. Wash any exposed body parts thouroughly after handling. Wear protective gloves/protective clothing/ eye protection/face protection.Contaminated clothing must not be allowed out of the workplace.	

2. HAZARDS IDENTIFICATION (CONTINUED)

Precautionary statement(s)	
Response	• If exposed or concerned: Immediately get medical advice/attention if you feel unwell or irritation or rash occurs.If on skin: Wash with plenty of water. Take off contaminated clothing and wash it before reuse. If in eyes: Rinse continuously with water for several minutes. Remove contact lenses, if present and easy to do.If inhaled: Remove person to fresh air and keep comfortable for breathing. If swallowed: Rinse mouth. Do not induce vomiting.
Storage	• Restrict or control access to stockpile areas (store locked up). Engulfment hazard: To prevent burial or suffocation, do not enter a confined space, such as a silo, bulk truck or other storage container OR • Vessel that stores or contains cement without an effective procedure for assuring safety. Store in a well ventilated area. Keep container tightly closed.
Disposal	• Dispose of contents/container in accordance with local/regional/national/international regulations.
HNOC	• None known.
Supplemental Information	• Dispose of contents/container in accordance with local/regional/national/international regulations.
Overexposure to portland cement can cause serious, potentially irreversible skin or eye damage in the form of chemical (caustic) burns, including third degree burns. The same serious injury can occur if wet or moist skin has prolonged contact exposure to dry portland cement.	

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	Cas #	Percent
Portland Cement	• 65997-15-1	• 40-100
Admixtures		• 1-15
Monocrystalline Quartz	• 14808-60-7	• 40-70
Polypropylene	• 9003-07	• 0-5

4. FIRST AID MEASURE

First aid procedures	*Notes to physician: Symptoms may be delayed.*
Eye Contact	• Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do so. Seek medical attention immediately.
Skin Contact	• Wash skin with cool water and pH-neutral soap or mild detergent. Seek medical treatment in all cases of prolonged exposure to wet cement, cement mixtures, liquids from fresh cement products, or prolonged wet skin exposure to dry cement.
Inhalation	• If inhaled, remove to fresh air. If not breathing, give artificial respiratation. If breathing is difficult, give oxygen. Get medical attention.
Ingestion	• Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

5. FIRE FIGHTING MEASURES

Flash Point	• The product is not flammable. No unusual fire or explosion hazards noted.
Suitable Extinguishing Media	• Dry chemical, C02, or water spray, Alcohol foam
Firefighting (Equipment Instructions)	• Use water spray to cool fire-exposed surfaces, protect personnel, and extinguish the fire. For large fires use all purpose-type by manufacturer's recommended techniques. Use carbon dioxide or dry chemical media for small fires. Use approved self-contained breathing apparatus and other protective equipment and/or if conditions warrant.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions	• Wear adequate protective clothing and equipment.
Environmental Precautions	• Do not flush into surface water or sanitary sewer system.
Methods for Containment	• Prevent entry into waterways, sewer, basements or confined areas.
Methods for Cleaning Up	• Collect dry material using a scoop. Avoid actions that cause dust to become airborne. Avoid inhalations of dust and contact with skin. Wear appropriate personal protective equipment.

7. HANDLING AND STORAGE

Handling	• Do not get this material in contact with eyes. Avoid contact with skin. Do not empty into drains.
Storage	• Use care in handling/storage. Keep container tightly closed, and keep dry.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Skin Protection	• Prevention is essential to avoiding potentially severe skin injury. Avoid contact with unhardened QM-1s Restore®. If contact occurs, promptly wash affected area with soap and water. Where prolonged exposure to unhardened QM-1s Restore products might occur, wear impervious clothing and gloves to eliminate skin contact. Wear sturdy boots that are impervious to water to eliminate foot and ankle exposure. Do not rely on barrier carriers; barrier creams should not be used in place of gloves. Periodically wash areas that have come in contact with dry QM-1s Restore, wet cement or concrete fluids with a pH neutral soap. Wash again at the end of work. If irritation occurs, immediately wash the affected area and seek treatment. If clothing becomes saturated with wet concrete, it should be removed and replaced with clean dry clothing.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION (CONTINUED)

Respiratory Protection	• Avoid actions that cause dust to become airborne. Use local or general exhaust ventilation to control exposures below applicable exposure limits. Use NIOSH/MSHA approved (under 30 CFR 11) or NIOSH approved (under 42 CFR 84) respirators in poorly ventilated areas, if an applicable Exposure limit is exceeded, or when dust causes discomfort or irritation. (Advisory: Respirators and filters purchased after June 10, 1998 must be Certified under 42 CFR 84.)
Ventilation	• Use local exhaust or general dilution ventilation to exposure with applicable limits.
Eye Protection	• Where potentially subject to splashes or puffs of cement, wear safety glasses with side shields or goggles. In extremely dusty environments and unpredictable environments, wear unvented or indirectly vented goggles to avoid eye irritation or injury. Contact lenses should not be worn when working with QM-1s Restore or fresh cement products.

9. PHYSICAL & CHEMICAL PROPERTIES

Appearance	• Grey and odorless
Color	• Grey
Odor	• Odorless
Odor Threshold	• Not available.
pH	• Not available.
Vapor Pressure	• Not available.
Vapor Density	• Not available.
Boiling Point	• Not available.
Melting Point/ Freezing Point	• Not available.
Solubility (Water)	• 75%
Specific Gravity	• 2.9
Relative Density	• Not available.
Flash Point	• Not available.
Flammability limits in air upper, % by volume	• Not available.
Flammability limits in air lower, % by volume	• Not available.
Auto-Ignition Temperature	
Other Data	

10. CHEMICAL STABILITY & REACTIVITY INFORMATION

Chemical Stability	• Stable under normal conditions.
Conditions to Avoid	• Although no hazardous reactions will occur, product should be kept dry.
Incompatible Materials	• Not available.
Hazardous Decomposition Products	• None

11. TOXICOLOGICAL INFORMATION

*Please refer to Section 2 for available information on potential health effects.

12. ECOLOGICAL INFORMATION

Ecotoxicity	• No recognized unusual toxicity to plants or animals.
Environmental Effects	• An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Aquatic Toxicity	• No data available for this product.
Persistence and Degradability	• Not available.

13. DISPOSAL CONSIDERATIONS

Disposal Instructions	• Dispose in sanitary land fill in accordance with federal, state, and local regulations.
Waste from Residues / Unused Products	• Not applicable.

14. TRANSPORT INFORMATION

DOT	• Not regulated as dangerous goods.

15. REGULATORY INFORMATION

US Federal Regulations	• This product is a non “Hazardous Chemical” as defined by theOSHA Hazard Communication Standard 29 CFR 1910.1200. CERCLA/SARA Hazardous Substances - Not applicable.
Drug Enforcement Administration (DEA). List 2, Essential Chemicals (21 CFR 1310.02(b) and 1310.04(f)(2)	• Not regulated.
DEA Essential Chemical Code Number	• Not regulated.

15. REGULATORY INFORMATION (CONTINUED)

Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures (21 CFR 1310.12(c))	• Not regulated.
DEA Exempt Chemical Mixtures Code Number	• Not regulated.
CERCLA (Superfund) Reportable Qty	• None

Superfund Amendments and Reauthorization Act of 1986 (SARA)		
Hazard Categories		
	Immediate Hazard	• No
	Delayed Hazard	• No
	Fire Hazard	• No
	Pressure Hazard	• No
	Reactivity Hazard	• No
Section 302 Extremely Hazardous Substance	• No	
Section 311 Hazardous Chemical	• No	

16. OTHER INFORMATION

Further Information	• HMIS® is a registered trade and service mark of the NPCA.	
HMIS® Ratings		
	Health	• 2
	Flammability	• 0
	Physical hazard	• 0
NFPA Ratings		
	Health	• 2
	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	• Product and Company Identification: Synonyms changes from the previous Physical & Chemical Properties: Multiple Properties version in section(s): Transport Information: Material Transportation Information Regulatory Information: United States.	

TECHNICAL DATA SHEET

Structure Guard® -FM

TECHNICAL DATA

TYPICAL PERFORMANCE CHARACTERISTICS*

CHARACTERISTICS	TEST METHOD	PERFORMANCE
Tensile Strength	ASTM D638	4,150 psi | 28.6 MPa
Compression	ASTM D695-13	9,650 psi | 66.5 MPa
Flexural Strength	ASTM D790-15e2	437 ksi | 3,000 MPa
Flexural Modulus	ASTM D790-15e2	8,950 psi | 61.7 MPa
Adhesion Concrete	ASTM D4541-09	Substrate Failure

**The values stated in inch-pound units are to be regarded as the standard. The values given in international system are for information only.*

TECHNICAL INFORMATION

- **Color — Green**
- **Solids — 100% (no solvents)**
- **Volatile Organic Compounds (VOCs) — 0**
- **Thickness — 125 to 250 mils | 3.2 to 6.4mm per coat**
- **Flashp Point — N/A**
- **Number of Components — 2**

Micro-Fiber Reinforced Mastic

DESCRIPTION

Quadex® Structure Guard®-FM is a 100% solids epoxy mastic used to protect new infrastructure and to rehabilitate existing, damaged, infrastructure. Structure Guard-FM is best applied using a trowel.

TYPICAL APPLICATIONS

- **Manholes, wet wells, vaults & septic tanks**
- **Steel substrates**
- **Floor and wall penetrations/cracks**
- **Simple spot repair**
- **Extreme bonding to nearly all substrates**
- **Fast curing**
- **Easy workability**
- **250 mil | 6.4mm build capability with no sag**
- **No mixing means faster application**

CURE TIME @ 70°F | 21°C

- **Re-coat — 2 hours**
- **Water Contact — 4 hours**
- **Final Cure — 24 hours**

POT LIFE

@ 70°F | 21°C — 10 minutes

PACKAGING

- **Net Weight — 2.5 lbs | 1.13kg (usable material)/cartridge**
- **15 lbs | 6.8kg (usable material)/case (6 cartridges)**
- **.75 gallon | 2.85 L kit**

QUADEX® A VORTEX COMPANY REPAIR MATERIALS

VORTEX

WARRANTY

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

RE-COAT

Must be abraided with the equivalent of 36 grit sand paper after 24 hrs.

STORAGE TEMP

70°F | 21°C

SHELF LIFE

24 months unopened

THEORETICAL COVERAGE

- **Per gallon: 6.4 Sq. ft. | 0.6 Sq. m. @ 250 mils | 6.35 mm**
- **Per Liter: 0.16 Sq.m. @ 6.35mm**
- **Per 6 cartridge case: 9.12 Sq. ft. | 0.85 Sq. m. @ 250 mils | 6.35mm**

MIXING RATIO

2 to 1 in prepackaged cartridge. Use with 600 ml x 300 ml cartridge dispenser. Use only the material that the job requires, leaving virtually no wasted material.

.75 gallon | 2.85 L pre measured kit: Pour part B into bucket containing part A. Mix for 3 minutes or until A and B are completely mixed.

APPLICATION EQUIPMENT

Directly applied to substrate from static mixing tip. Use trowel or putty knife to smooth material.

SURFACE PREP

Concrete/Brick: Substrate surface must be Hydro Blasted at 5,000 psi | 345 bar, removing any loose concrete or other material. Must be free of grease and oil. ALL SURFACES MUST BE DRY, CLEAN AND FREE FROM OIL, GREASE AND OTHER CONTAMINANTS!

CLEAN UP

Acetone. Refer to Safety Data Sheet for safety and health information.

ENVIRONMENTALLY SAFE

No harmful VOCs or odors. Disposable packaging and minimal waste.

Structure Guard®-FM

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name	• Quadex® Structure Guard®-FM (Fiber Reinforced Mastic) - Part A
Trade Name	• RE2119A
Company	• Quadex LLC, 564 W. 9320 S., Sandy, UT 84070
Company Contact	• Matthew Peterson
Company Phone	• 844-782-4832
Emergency	• Domestic Shipments and to Canada: 1-800-633-8253 • International Shipments: 1-801-629-0667

2. HAZARDS IDENTIFICATION

GHS Ratings			
	Carcinogen	• 2	• Limited evidence of human or animal carcinogenicity
Hazard Statement(s)			
	H351	• Suspected of causing cancer	
Precautionary Statement(s)			
	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		
Pictogram			

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Cas #	Weight Concentration %
Epoxy Resin	• 25085-99-8	• 74.70%
Barium Sulfate	• 7727-43-7	• 10.00% - 20.00%
Titanium Dioxide	• 13463-67-7	• 1.00% - 5.00%
Silica	• 67762-90-7	• 1.00% - 5.00%

4. FIRST AID MEASURE

If inhaled remove to fresh air. If breathing is difficult, give oxygen. Obtain medical advice if there are persistent symptoms. 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.	• Epoxy Resin 25085-99-8
OSHA Exposure Limits	• Not Established.
ACGIH Exposure Limits	• Not Established.
Other Exposure Limits	• Not Established.

Chemical Name / CAS No.	• Barium Sulfate 7727-43-7
OSHA Exposure Limits	• 15 mg/m^3 TWA (total dust); 5 mg/m^3 TWA (respirable fraction)
ACGIH Exposure Limits	• 5 mg/m^3 TWA (inhalable fraction, particulate matter containing no asbestos and <1% crystalline silica)
Other Exposure Limits	• NIOSH: 10 mg/m^3 TWA (total dust); 5 mg/m^3 TWA (respirable dust)

Chemical Name / CAS No.	• Titanium Dioxide 13463-67-7
OSHA Exposure Limits	• 15 mg/m^3 TWA (total dust)
ACGIH Exposure Limits	• 10 mg/m^3 TWA
Other Exposure Limits	• Not Established.

Chemical Name / CAS No.	• Silica 67762-90-7
OSHA Exposure Limits	• Not Established.
ACGIH Exposure Limits	• Not Established.
Other Exposure Limits	• 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 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 Point	• 2500 to 3000 °C
Specific Gravity (SG)	• 1.398
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, Isocyanates. No Data Found. None known, other than Sec. #2 and Sec #5. Hazardous polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

Mixture Toxicity	• No Data Found
Component Toxicity	• No Data Found
Effects of Overexposure	
CAS Number	• 13463-67-7
Description	• Titanium Dioxide
% Weight	• 1 to 5%
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
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). 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 | 1 to 5 % Carcinogen
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
NFPA Ratings		
	Health	• 1
	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	• Product and Company Identification: Synonyms changes from the previous Physical & Chemical Properties: Multiple Properties version in section(s): Transport Information: Material Transportation Information Regulatory Information: United States.	

Structure Guard®-FM

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name	• Quadex® Structure Guard®-FM (Fiber Reinforced Epoxy Mastic Catalyst) - Part B
Trade Name	• RE211
Company	• Quadex LLC, 564 W. 9320 S., Sandy, UT 84070
Company Contact	• Matthew Peterson
Company Phone	• 844-782-4832
Emergency	• Domestic Shipments and to Canada: 1-800-633-8253 • International Shipments: 1-801-629-0667

2. HAZARDS IDENTIFICATION

GHS Ratings			
	Acute Toxicity - Oral	• 4	• Oral>300+<=2000mg/kg
	Skin corrosion/ irritation	• 2	• Reversible adverse effects in dermal tissue, Draize score: >= 2.3 < 4.0 or persistent inflammation
	Serious eye damage/ eye irritation	• 1	• Serious eye damage: Irreversible damage 21 days after exposure, Draize score: Corneal opacity >= 3, Iritis > 1.5
	Skin sensitization	• 1	• Skin sensitizer
	Reproductive toxicity	• 2	• Human or animal evidence possibly with other information

Hazard Statement(s)		
	H302	• Harmful 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

2. HAZARDS IDENTIFICATION (CONTINUED)

Precautionary Statement(s)		
	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	
Pictogram		

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Cas #	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	• 5.00% - 10.00%
Inert	• Inert	• 5.00% - 10.00%
nonyl phenol	• 84852-15-3	• 1.00% - 5.00%

4. FIRST AID MEASURE

If inhaled remove to fresh air. If breathing is difficult, give oxygen. Obtain medical advice if there are persistent symptoms. 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 adn 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 spill with non spark tools. No information available.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

Chemical Name / CAS No.	• Paratertiarybutylphenol 98-54-4
OSHA Exposure Limits	• Not Established.
ACGIH Exposure Limits	• Not Established.
Other Exposure Limits	• Not Established.

Chemical Name / CAS No.	• Amine 1477-55-0
OSHA Exposure Limits	• Not Established.
ACGIH Exposure Limits	• 0.1 mg/m^3 Ceiling
Other Exposure Limits	• NIOSH: 0.1 mg/m^3 Ceiling

Chemical Name / CAS No.	• 1,5-Pentanediamine, 2 methyl 15520-10-2
OSHA Exposure Limits	• Not Established.
ACGIH Exposure Limits	• Not Established.
Other Exposure Limits	• Not Established.

Chemical Name / CAS No.	• Silica 67762-90-7
OSHA Exposure Limits	• Not Established.
ACGIH Exposure Limits	• Not Established.
Other Exposure Limits	• Not Established.

Chemical Name / CAS No.	• Inert INERT
OSHA Exposure Limits	• Not Established.
ACGIH Exposure Limits	• Not Established.
Other Exposure Limits	• Not Established.

Chemical Name / CAS No.	• nonyl phenol 84852-15-3
OSHA Exposure Limits	• Not Established.
ACGIH Exposure Limits	• Not Established.
Other Exposure Limits	• 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. 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 Point	• 247 °C
Specific Gravity (SG)	• 1.002
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	• 1,957mg/kg
Dermal Toxicity LD50	• 3,216mg/kg
Inhalation Toxicity LC50	• 2,901mg/L
Component Toxicity	• Paratertiarybutylphenol — 98-54-4 Oral LD50: 3,250 µL/kg (Rat) Dermal LD50: 2,318 mg/kg (Rabbit) • Amine — 1477-55-0 Oral LD50: 660 mg/kg (Rat) Dermal LD50: 2 g/kg (Rabbit) Inhalation LC50: 700 ppm (Rat) • nonyl phenol — 84852-15-3 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	
Effects of Overexposure	
CAS Number	• None.
Description	• None.
% Weight	• None.
Carcinogen Rating	• None.
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

UN proper shipping name: Amines, liquid, corrosive, n.o.s.
Transportation Hazardous Shipping Class: 8
UN number: UN2735
Packing Group: II
Hazardous label: 8 Corrosive Substance
Environmental hazards-marine pollutant: Yes

15. REGULATORY INFORMATION

OSHA:29 CFR 1910.1200 (40 CFR 372.65)	• Haxardous Chemical “Irritant”, Sensitizer
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 Information: This product SDS contains ingredients which are Controlled and/or on the Ingredient Disclosure List (HPA sections 13 and 14).

16. OTHER INFORMATION

Further Information	• HMIS® is a registered trade and service mark of the NPCA.	
HMIS® Ratings		
	Health	• 2
	Flammability	• 0
	Physical hazard	• 0
	Personal Protection	• H
NFPA Ratings		
	Health	• 2
	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	• Product and Company Identification: Synonyms changes from the previous Physical & Chemical Properties: Multiple Properties version in section(s): Transport Information: Material Transportation Information Regulatory Information: United States.	

TECHNICAL DATA SHEET

Structure Guard®-FB

TECHNICAL DATA

TYPICAL PERFORMANCE CHARACTERISTICS*

CHARACTERISTICS	TEST METHOD	PERFORMANCE
Tensile Strength	ASTM D638-14	4,150 psi | 28.6 MPa
Compression Strength	ASTM D695-13	9,650 psi | 66.5 MPa
Flexural Strength	ASTM D790-15e2	437 ksi | 3,000 MPa
Flexural Modulus	ASTM D790-15e2	8,950 psi | 61.7 MPa
Coating Pull Off Strength Test	D4541-09	Substrate Failure

**The values stated in inch-pound units are to be regarded as the standard. The values given in international system are for information only.*

TECHNICAL INFORMATION

- **Color — Green**
- **Solids — 100% (No Solvents)**
- **Volatile Organic Compounds (VOCs) — 0**
- **Thickness — 125 to 2,000 mils | 3.2 to 51mm per coat**
- **Finish — Very Smooth or Textured**
- **Flash Point — N/A**
- **Number of Components — 2**

Ultra High Build Micro Fiber Reinforced Mastic

DESCRIPTION

Quadex® Structure Guard®-FB is an ultra high build epoxy mastic, designed to fill gaps and voids in both new infrastructure and existing damaged infrastructure. This 100% solids formula is an ideal underlayment material for use in combination with Quadex Repair Materials. For optimal installation, trowel application is required.

TYPICAL APPLICATIONS

- **Manholes, wet wells, vaults & septic tanks**
- **Steel substrates**
- **Floor and wall penetrations/cracks**
- **Simple spot repair**
- **Extreme bonding to nearly all substrates**
- **Fast curing**
- **Easy workability**
- **2” | 50.8mm build capability with no sag**
- **Void and Gap fill**

CURE TIME @ 70°F | 21°C

- **Re-coat — 1 hour**
- **Water Contact — 4 hours**
- **Final Cure — 24 hours**

POT LIFE

@ 70°F | 21°C — 10 minutes

PACKAGING

¾ gallon | 2.8 L kit

QUADEX® A VORTEX COMPANY REPAIR MATERIALS

VORTEX

WARRANTY

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

RE-COAT

Must be abraided with the equivalent of 60 grit sand paper after 1 hr.

STORAGE TEMP

70°F | 21°C

SHELF LIFE

12 months unopened

THEORETICAL COVERAGE

6.4 sq. ft. per gallon 250 mils | 6.35mm

MIXING RATIO

¾ gallon | 2.8 L pre measured kit: Pour part B into bucket containing part A. Mix for 3 minutes or until A and B are completely mixed. **Do not attempt partial batches. Mix complete kit.**

APPLICATION EQUIPMENT

Directly applied to substrate. Use trowel or putty knife to smooth material.

SURFACE PREP

Concrete/Brick: Substrate surface must be Hydro Blasted at a minimum of 5000 psi | 345 bar, removing any loose concrete or other material. Must be free of grease and oil. ALL SURFACES MUST BE DRY, CLEAN AND FREE FROM OIL, GREASE AND OTHER CONTAMINANTS!

CLEAN UP

Acetone. Refer to Safety Data Sheet (SDS) for safety and health information.

ENVIRONMENTALLY SAFE

No harmful VOCs or odors.

Structure Guard®
-FB

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name	• Quadex® Structure Guard®-FB - Part A
Trade Name	• Quadex® Structure Guard®-FB High Build (Fiber Reinforced Mastic) - Part A
Company	• Quadex LLC, 564 W. 9320 S., Sandy, UT 84070
Company Contact	• Matthew Peterson
Company Phone	• 844-782-4832
Emergency	• Domestic Shipments and to Canada: 1-800-633-8253 • International Shipments: 1-801-629-0667

2. HAZARDS IDENTIFICATION

GHS Ratings			
	Carcinogen	• 2	• Limited evidence of human or animal carcinogenicity
Hazard Statement(s)			
	H351	• Suspected of causing cancer	
Precautionary Statement(s)			
	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		
Pictogram			

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Cas #	Weight Concentration %
Epoxy Resin	• 25085-99-8	• 70.00% - 80.00%
Barium Sulfate	• 7727-43-7	• 10.00% - 20.00%
Inert	• INERT	• 1.00% - 5.00%
Titanium Dioxide	• 13463-67-7	• 1.00% - 5.00%

4. FIRST AID MEASURE

If inhaled remove to fresh air. If breathing is difficult, give oxygen. Obtain medical advice if there are persistent symptoms. 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	• 252°C (486 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. 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.	• Epoxy Resin 25085-99-8
OSHA Exposure Limits	• Not Established.
ACGIH Exposure Limits	• Not Established.
Other Exposure Limits	• Not Established.

Chemical Name / CAS No.	• Barium Sulfate 7727-43-7
OSHA Exposure Limits	• 15 mg/m^3 TWA (total dust); 5 mg/m^3 TWA (respirable fraction)
ACGIH Exposure Limits	• 5 mg/m^3 TWA (inhalable fraction, particulate matter containing no asbestos and <1% crystalline silica)
Other Exposure Limits	• NIOSH: 10 mg/m^3 TWA (total dust); 5 mg/m^3 TWA (respirable dust)

Chemical Name / CAS No.	• INERT
OSHA Exposure Limits	• 15 mg/m^3 TWA (total dust)
ACGIH Exposure Limits	• 10 mg/m^3 TWA
Other Exposure Limits	• Not Established.

Chemical Name / CAS No.	• Titanium Dioxide 13463-67-7
OSHA Exposure Limits	• 15 mg/m^3 TWA (total dust)
ACGIH Exposure Limits	• 10 mg/m^3 TWA
Other Exposure Limits	• 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. 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 Point	• 2500 to 3000°C
Specific Gravity (SG)	• 1.406
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. Hazardous polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

Mixture Toxicity	• No Data Found
Component Toxicity	• No Data Found
Effects of Overexposure	
CAS Number	• 13463-67-7
Description	• Titanium Dioxide
% Weight	• 1 to 5%
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

UN Number: UN3082
UN Proper Shipping Name: Enviromentally Hazardous Substance, Liquid n.o.s.
Technical Name: Epoxy Resin
Transportation Hazardous Shipping Class: 9
Packing Group: III
Hazardous Label: 9, Miscellaneous
Environmental Hazards-Marine Pollutant: Yes

15. REGULATORY INFORMATION

OSHA:29 CFR 1910.1200	• Haxardous Chemical “Irritant”, Sensitizer

16. OTHER INFORMATION

Further Information	• HMIS® is a registered trade and service mark of the NPCA.	
HMIS® Ratings		
	Health	• 1
	Flammability	• 0
	Physical hazard	• 0
	Personal Protection	• C
NFPA Ratings		
	Health	• 1
	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	• Product and Company Identification: Synonyms changes from the previous Physical & Chemical Properties: Multiple Properties version in section(s): Transport Information: Material Transportation Information Regulatory Information: United States.	

Structure Guard® -FB

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name	• Quadex® Structure Guard®-FB - Part B
Trade Name	• Quadex® Structure Guard®-FB High Build (Fiber Reinforced Epoxy Mastic Catalyst) - Part B
Company	• Quadex LLC, 564 W. 9320 S., Sandy, UT 84070
Company Contact	• Matthew Peterson
Company Phone	• 844-782-4832
Emergency	• Domestic Shipments and to Canada: 1-800-633-8253 • International Shipments: 1-801-629-0667

2. HAZARDS IDENTIFICATION

GHS Ratings			
	Acute Toxicity - Oral	• 4	• Oral>300+<=2000mg/kg
	Skin corrosion/ irritation	• 2	• Reversible adverse effects in dermal tissue, Draize score: >= 2.3 < 4.0 or persistent inflammation
	Serious eye damage/ eye irritation	• 1	• Serious eye damage: Irreversible damage 21 days after exposure, Draize score: Corneal opacity >= 3, Iritis > 1.5
	Skin sensitization	• 1	• Skin sensitizer
	Reproductive toxicity	• 2	• Human or animal evidence possibly with other information
Hazard Statement(s)			
	H302	• Harmful 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	

2. HAZARDS IDENTIFICATION (CONTINUED)

Precautionary Statement(s)		
	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+P312	• IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell
	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	
Pictogram		

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Cas #	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	• 5.00% - 10.00%
Inert	• Inert	• 5.00% - 10.00%
nonyl phenol	• 84852-15-3	• 1.00% - 5.00%

4. FIRST AID MEASURE

If inhaled remove to fresh air. If breathing is difficult, give oxygen. Obtain medical advice if there are persistent symptoms. 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 adn 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 spill with non spark tools. No information available.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

Chemical Name / CAS No.	• Paratertiarybutylphenol 98-54-4
OSHA Exposure Limits	• Not Established.
ACGIH Exposure Limits	• Not Established.
Other Exposure Limits	• Not Established.

Chemical Name / CAS No.	• Amine 1477-55-0
OSHA Exposure Limits	• Not Established.
ACGIH Exposure Limits	• 0.1 mg/m^3 Ceiling
Other Exposure Limits	• NIOSH: 0.1 mg/m^3 Ceiling

Chemical Name / CAS No.	• 1,5-Pentanediamine, 2 methyl 15520-10-2
OSHA Exposure Limits	• Not Established.
ACGIH Exposure Limits	• Not Established.
Other Exposure Limits	• Not Established.

Chemical Name / CAS No.	• Silica 67762-90-7
OSHA Exposure Limits	• Not Established.
ACGIH Exposure Limits	• Not Established.
Other Exposure Limits	• Not Established.

Chemical Name / CAS No.	• Inert INERT
OSHA Exposure Limits	• Not Established.
ACGIH Exposure Limits	• Not Established.
Other Exposure Limits	• Not Established.

Chemical Name / CAS No.	• nonyl phenol 84852-15-3
OSHA Exposure Limits	• Not Established.
ACGIH Exposure Limits	• Not Established.
Other Exposure Limits	• 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. 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 Point	• 247°C
Specific Gravity (SG)	• 1.002
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	• 1,957mg/kg
Dermal Toxicity LD50	• 3,281mg/kg
Inhalation Toxicity LC50	• 2,960mg/L
Component Toxicity	• Paratertiarybutylphenol — 98-54-4 Oral LD50: 3,250 µL/kg (Rat) Dermal LD50: 2,318 mg/kg (Rabbit) • Amine — 1477-55-0 Oral LD50: 660 mg/kg (Rat) Dermal LD50: 2 g/kg (Rabbit) Inhalation LC50: 700 ppm (Rat) • nonyl phenol — 84852-15-3 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	
Effects of Overexposure	
CAS Number	
Description	
% Weight	
Carcinogen Rating	
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

UN proper shipping name: Amines, liquid, corrosive, n.o.s.
Transportation Hazardous Shipping Class: 8
UN number: UN2735
Packing Group: II
Hazardous label: 8 Corrosive Substance
Environmental hazards-marine pollutant: Yes

15. REGULATORY INFORMATION

OSHA:29 CFR 1910.1200 (40 CFR 372.65)	• Haxardous Chemical “Irritant”, Sensitizer
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 Information: This product SDS contains ingredients which are Controlled and/or on the Ingredient Disclosure List (HPA sections 13 and 14).

16. OTHER INFORMATION

Further Information	• HMIS® is a registered trade and service mark of the NPCA.	
HMIS® Ratings		
	Health	• 2
	Flammability	• 0
	Physical hazard	• 0
	Personal Protection	• H
NFPA Ratings		
	Health	• 2
	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	• Product and Company Identification: Synonyms changes from the previous Physical & Chemical Properties: Multiple Properties version in section(s): Transport Information: Material Transportation Information Regulatory Information: United States.	

Chimney Seal Products

TECHNICAL DATA SHEET

Chimney Guard™

PHYSICAL PROPERTIES

- **Pot Life: 120 mins @ 70°F**
- **Tack Free: 7 hr @ 70°F**
- **Elongation (ASTM D638-14): >300%**
- **ASTM D624 - Tear Strength (lb/in): 90**
- **Adhesion (ASTM D4541): Concrete - Substrate Failure**
- **Adhesion (ASTM D4541): Steel - 850 psi**
- **Tensile Strength (ASTM D638-14): 1,241 psi**
- **Shelf Life: 1 year from date of purchase**
- **Yield:**
  5 qts. (1.25 gallons) / kit
  (2 part pre-measured kit)
- **Tensile Strength (ASTM D638-14): 1241 psi**

Each kit coats 2′ (VF) of 24″ chimney @ 100 mils.

Flexible Liner for Extreme Freeze/Thaw Conditions

DESCRIPTION

Chimney Guard™ is a 100% solids Epoxy/Urethane hybrid designed to provide a highly flexible and securely bonded seal prepared to address heavy traffic loading, extreme freeze/thaw and infiltration.

ADVANTAGES

- **High build monolithic coating / 100 mils per coat**
- **One step, durable chimney seal**
- **Superior adhesion to steel, concrete and brick**
- **Permanent flexibility at low temperature**
- **Advanced elongation properties**
- **Extended work time**

PACKAGING AND STORAGE

Premeasured kit, approximately 5 quarts. Store Chimney Guard at room temperature (70°F) in original container. Do not allow to freeze.

SURFACE PREPARATION

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: Must be profiled to achieve a minimum CSP4.

VORTEX

WARRANTY

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

PRECAUTIONS

Avoid eye contact or prolonged contact with skin. Wash thoroughly after use. Persons using Chimney Guard should **wear necessary eye protection, dust mask and rubber gloves**. Read all product labels and technical literature.

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.

All surfaces must be clean and free from oil, grease and other contaminants!

APPLICATION CONDITIONS

Concrete Substrate or Cementitious underlayment must be at an 80% relative humidity or below before installation of the Chimney Guard™.

Relative Humidity in the environment of application must be at an 85% relative humidity or below before installation of the Chimney Guard.

We recommend to NOT apply Chimney Guard if the surface temperature is within 5°F/2.78°C of the air dew point. Ideally, the surface temperature should be at least 5°F/2.78°C above the dew point temperature during all stages of the coating process.

APPLICATION

Fill all voids and cracks greater that 1/8 inch with Quadex® Hyperform®. Wait one hour before applying Chimney Guard. Quadex AluminaLiner® will need a full 24-hour cure prior to the application of Chimney Guard. Quadex GeoKrete® and QM-1s Restore® will need a full 5-day cure prior to the application of Chimney Guard. When Quadex Structure Guard® has been used to line the manhole, Chimney Guard can be applied directly to Structure Guard within 8 hours, or as soon as Structure Guard has become tack free. After 8 hours, Structure Guard must be abraded with 80 grit sand paper before applying Chimney Guard.

All surfaces must be dry before applying Chimney Guard.

CLEAN UP

Use Acetone to clean tools.

Chimney Guard™

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name	• Chimney Guard™ Part A
Trade Name	• RE2130 A
Company	• Quadex LLC, 564 W. 9320 S., Sandy, UT 84070
Company Contact	• Matthew Peterson
Company Phone	• 844-782-4832
Emergency	• Domestic Shipments and to Canada: 1-800-633-8253 • International Shipments: 1-801-629-0667

2. HAZARDS IDENTIFICATION

GHS Ratings			
	Oral Toxicity	• Acute Tox. 4	• Oral>300+<=2000mg/kg
	Dermal Toxicity	• Acute Tox. 4	• Dermal>1000+<=2000mg/kg
	Skin Corrosive	• 1C	• Destruction of dermal tissue: Exposure < 4 hours Observation < 14 days, visible necrosis in at least one animal
	Eye Corrosive	• 1	• Serious eye damage: Irreversible damage 21 days after exposure, Draize score: Corneal opacity >= 3, Iritis > 1.5
Hazard Statement(s)			
	H302	• Harmful if swallowed	
	H312	• Harmful in contact with skin	
	H314	• Causes severe skin burns and eye damage	
	H318	• Causes serious eye damage	
Precautionary Statement(s)			
	P260	• Do not breathe dust/fume/gas/mist/vapours/ spray	
	P264	• Wash ... thoroughly after handling	
	P270	• Do not eat, drink or smoke when using this product	

2. HAZARDS IDENTIFICATION (CONTINUED)

Precautionary Statement(s)		
	P280	• Wear protective gloves/protective clothing/eye protection/face protection
	P310	• Immediately call a POISON CENTER or doctor/physician
	P312	• Call a POISON CENTER or doctor/physician if you feel unwell
	P321	• Specific treatment (see … on this label)
	P322	• Specific measures (see … on this label)
	P330	• Rinse mouth
	P363	• Wash contaminated clothing before reuse
	P301+P312	• IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell
	P301+P330+P331	• IF SWALLOWED: Rinse mouth. Do NOT induce vomiting
	P302+P352	• IF ON SKIN: Wash with soap and water
	P303+P361+P353	• IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
	P304+P340	• IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
	P305+P351+P338	• IF IN EYES: Rinse continuously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing
	P405	• Store locked up
	P501	• Dispose of contents/container to …
Signal Word	• Danger	
Pictogram		

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Cas #	Weight Concentration %
Tris-2,4,6-(dimethylaminomethyl)phenol	• 90-72-2	• 90.00% - 100.00%

4. FIRST AID MEASURE

If inhaled remove to fresh air. If breathing is difficult, give oxygen. Obtain medical advice if there are persistent symptoms. 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	• 140°C (284°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 spill with non spark tools. No information available.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Chemical Name / CAS No.	• Tris-2,4,6-(dimethylaminomethyl)phenol 90-72-2
OSHA Exposure Limits	• Not Established.
ACGIH Exposure Limits	• Not Established.
Other Exposure Limits	• Not Established.
Use appropriate engineering control such as process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended 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.
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.

9. PHYSICAL & CHEMICAL PROPERTIES

Boiling Point	• 212°C
Specific Gravity (SG)	• 1.020
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	• 1,200mg/kg
Dermal Toxicity LD50	• 1,280mg/kg
Component Toxicity	
90-72-2	• Tris-2,4,6-(dimethylaminomethyl)phenol Oral LD50: 1,200 mg/kg (Rat) Dermal LD50: 1,280 mg/kg (Rat)
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.
Effects of Overexposure	
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

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 Hazard • Sec313 Chemicals above de minimus level: None
CA PROP. 65 NOTICE WARNING: CANADIAN REGULATORY INFORMATION	• 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).
Country	• EU
Safety Phrase	• None
Regulation	• All Components Listed
REACH (EU) SUBSTANCES OF VERY HIGH CONCERN	• No
Toxic Substance Control Act (TSCA)	• Yes

16. OTHER INFORMATION

Further Information	• HMIS® is a registered trade and service mark of the NPCA.	
HMIS® Ratings		
	Health	• 2
	Flammability	• 2
	Physical hazard	• 0
NFPA Ratings		
	Health	• 2
	Flammability	• 2
	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	• Product and Company Identification: Synonyms changes from the previous Physical & Chemical Properties: Multiple Properties version in section(s): Transport Information: Material Transportation Information Regulatory Information: United States.	

Chimney Guard™

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name	• Chimney Guard™ Part B
Trade Name	• RE2135 B
Company	• Quadex LLC, 564 W. 9320 S., Sandy, UT 84070
Company Contact	• Matthew Peterson
Company Phone	• 844-782-4832
Emergency	• Domestic Shipments and to Canada: 1-800-633-8253 • International Shipments: 1-801-629-0667

2. HAZARDS IDENTIFICATION

GHS Ratings			
	Carcinogen	• 2	• Limited evidence of human or animal carcinogenicity
Hazard Statement(s)			
	H351	• Suspected of causing cancer	
Precautionary Statement(s)			
	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		
Pictogram			

CHIMNEY GUARD™ SAFETY DATA SHEET

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Cas #	Weight Concentration %
Epoxy Resin	• 25085-99-8	• 61.00%
Barium Sulfate	• 7727-43-7	• 20.00% - 30.00%
Silica	• 67762-90-7	• 5.00% - 10.00%
Titanium Dioxide	• 13463-67-7	• 1.00% - 5.00%

4. FIRST AID MEASURE

If inhaled remove to fresh air. If breathing is difficult, give oxygen. Obtain medical advice if there are persistent symptoms. 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. 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 spill with non spark tools. No information available.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Chemical Name / CAS No.	• Epoxy Resin 25085-99-8
OSHA Exposure Limits	• Not Established.
ACGIH Exposure Limits	• Not Established.
Other Exposure Limits	• Not Established.

Chemical Name / CAS No.	• Barium Sulfate 7727-43-7
OSHA Exposure Limits	• 15 mg/m^3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)
ACGIH Exposure Limits	• 5 mg/m^3 TWA (inhalable fraction, particulate matter containing no asbestos and <1% crystalline silica)
Other Exposure Limits	• NIOSH: 10 mg/m^3 TWA (total dust); 5 mg/m^3 TWA (respirable dust)

Chemical Name / CAS No.	• Silica 67762-90-7
OSHA Exposure Limits	• Not Established.
ACGIH Exposure Limits	• Not Established.
Other Exposure Limits	• Not Established.

Chemical Name / CAS No.	• Titanium Dioxide 13463-67-7
OSHA Exposure Limits	• 15 mg/m^3 TWA (total dust)
ACGIH Exposure Limits	• 10 mg/m^3 TWA
Other Exposure Limits	• 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 sufficient to control airborne levels. Where such systems are not effective wear suitable personal protective equipment, which preforms satisfactory and meets OSHA or other recognized 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 910.133, 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 NIOSH air purifying respirator with an organic vapor cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposurelimits. 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 Point	• 2500 to 3000°C
Specific Gravity (SG)	• 1.594
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	
CAS Number	• 13463-67-7
Description	• Titanium Dioxide
% Weight	• 1 to 5%
Carcinogen Rating	• Titanium Dioxide: NIOSH: potential occupational carcinogen • IARC: Possible human carcinogen • OSHA: listed
Effects of Overexposure	
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

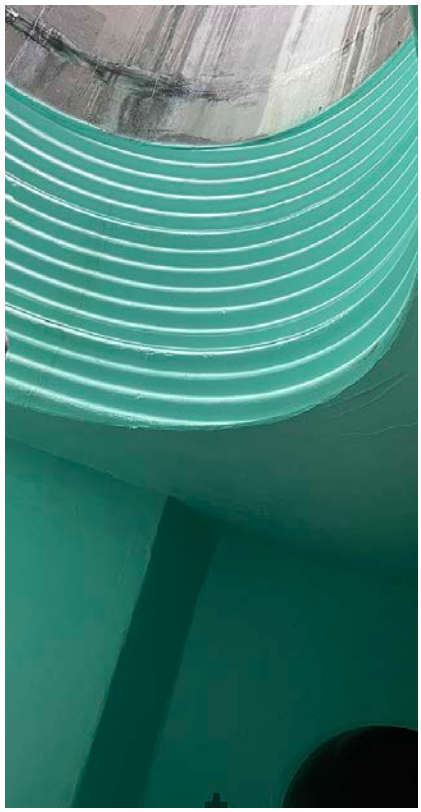
OSHA:29 CFR 1910.1200 Haxardous Chemical “Irritant”, Sensitizer State of California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): WARNING!
This product contains the following chemicals which are listed by the State of California as carcinogenic or a reproductive toxin:
13463-67-7 Titanium Dioxide 1 to 5 % Carcinogen

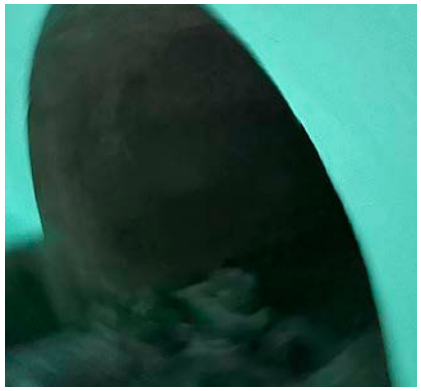
The following chemicals are classified under SARA 313 Toxic Release Invetnory (TRI):	• None
Country	• EU
Safety Phrase	• None
Regulation	• All Components Listed
REACH (EU) SUBSTANCES OF VERY HIGH CONCERN	• No
Toxic Substance Control Act (TSCA)	• Yes

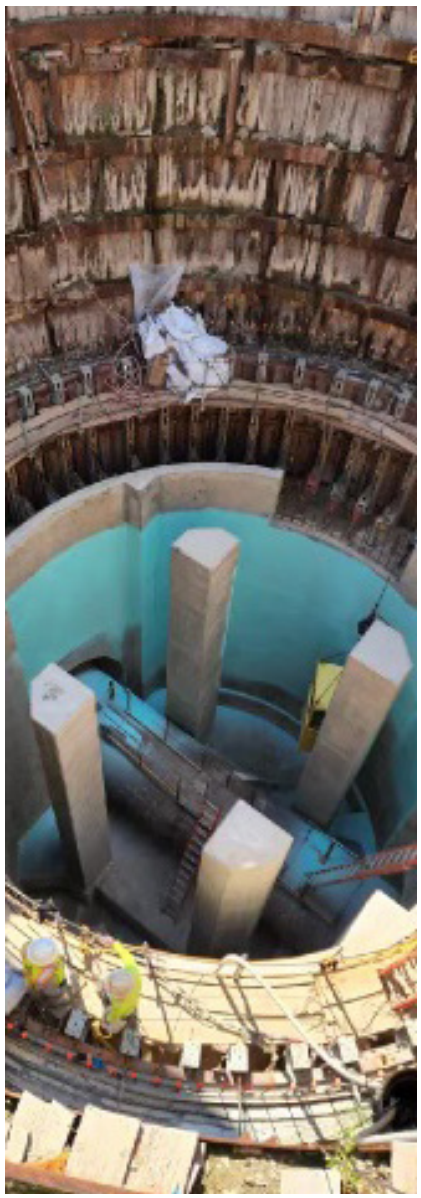
16. OTHER INFORMATION

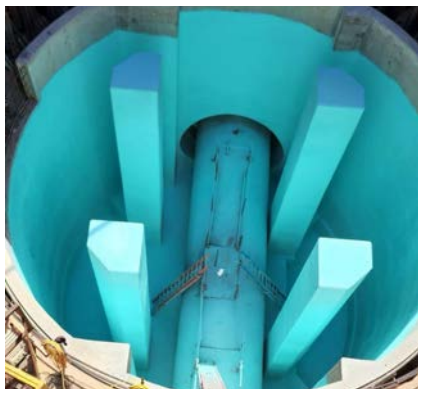
Further Information	• HMIS® is a registered trade and service mark of the NPCA.	
HMIS® Ratings		
	Health	• 1
	Flammability	• 1
	Physical hazard	• 2
NFPA Ratings		
	Health	• 1
	Flammability	• 1
	Instability	• 2
Disclaimer	• The information provided in this Safety Data Sheet is correct to the best of our 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	• Product and Company Identification: Synonyms changes from the previous Physical & Chemical Properties: Multiple Properties version in section(s): Transport Information: Material Transportation Information Regulatory Information: United States.	

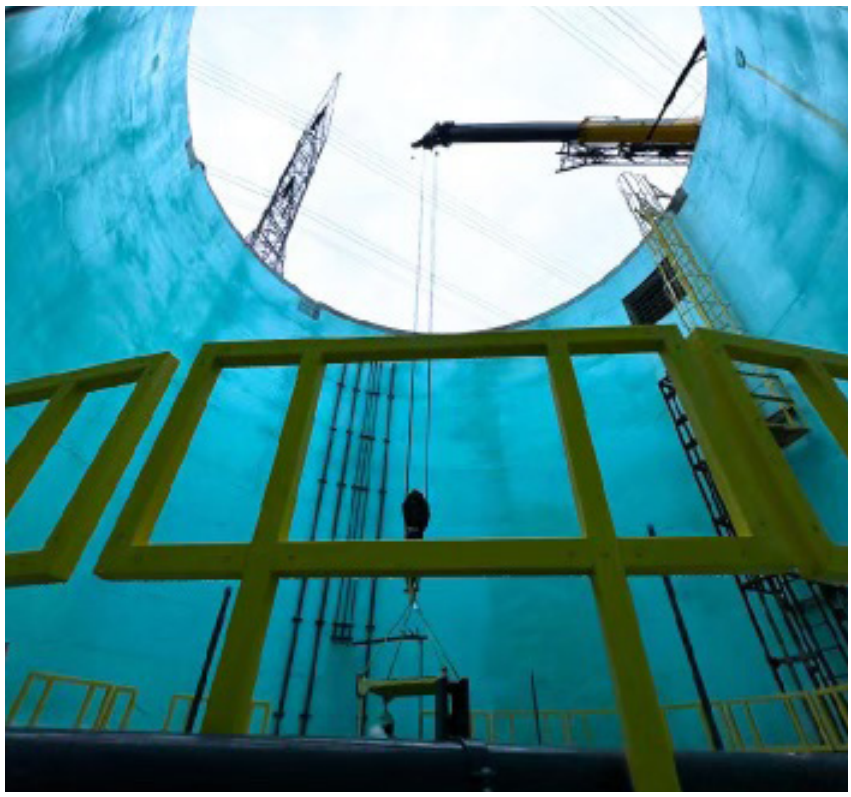
Project Installation Photos











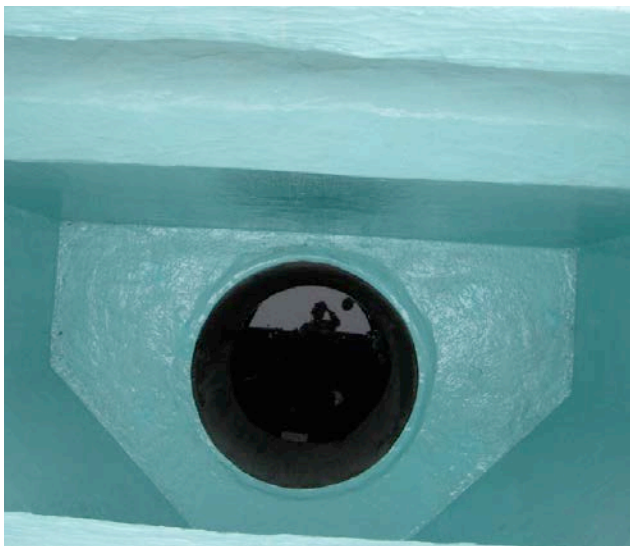


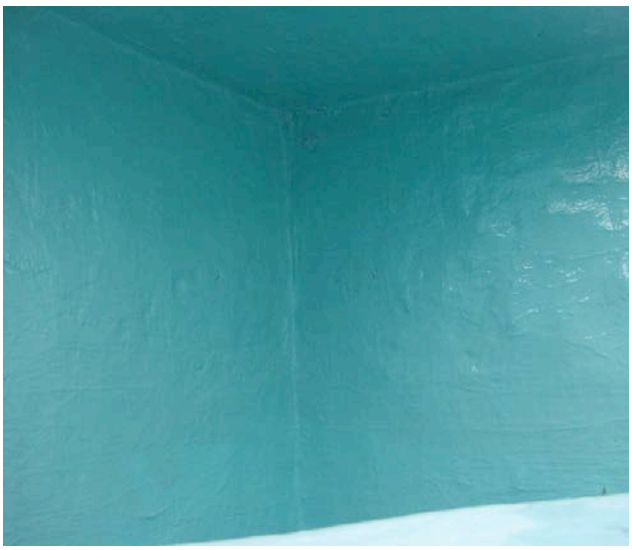


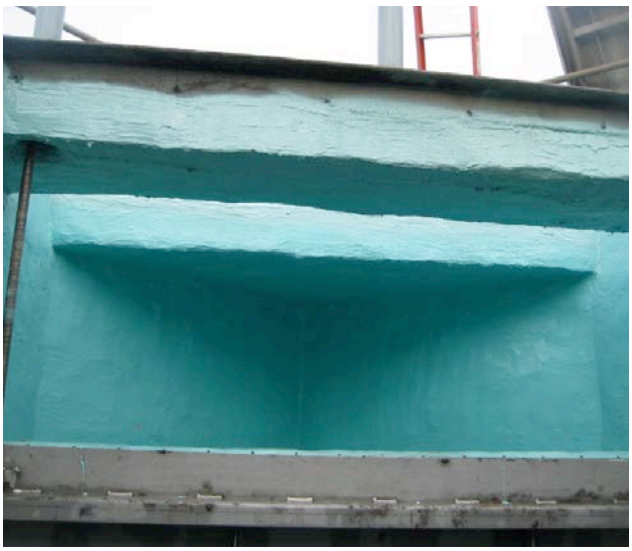






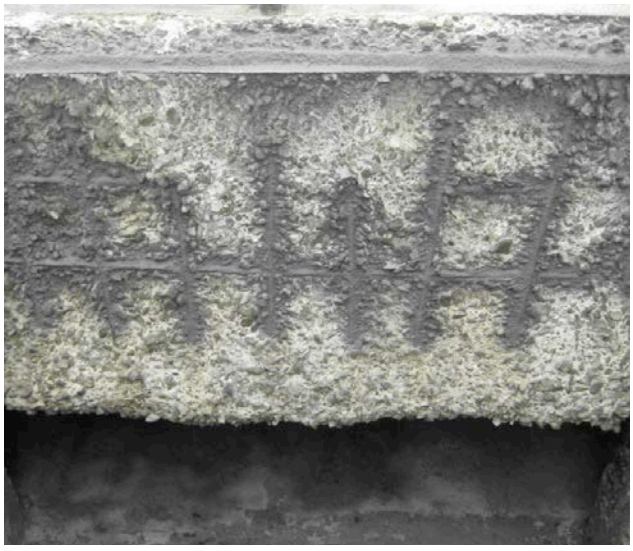


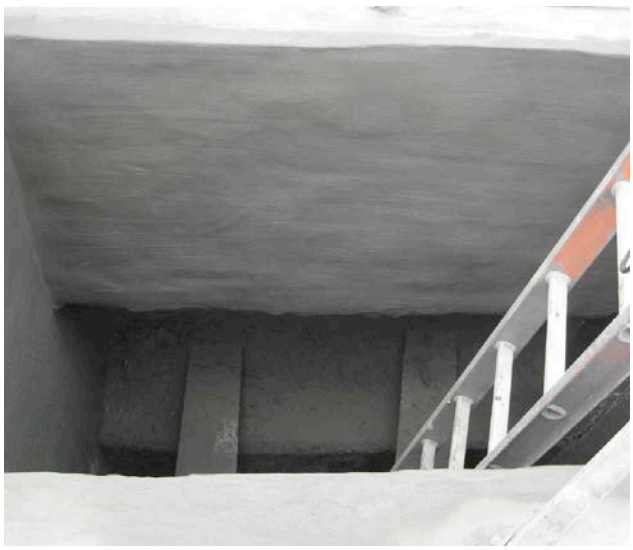



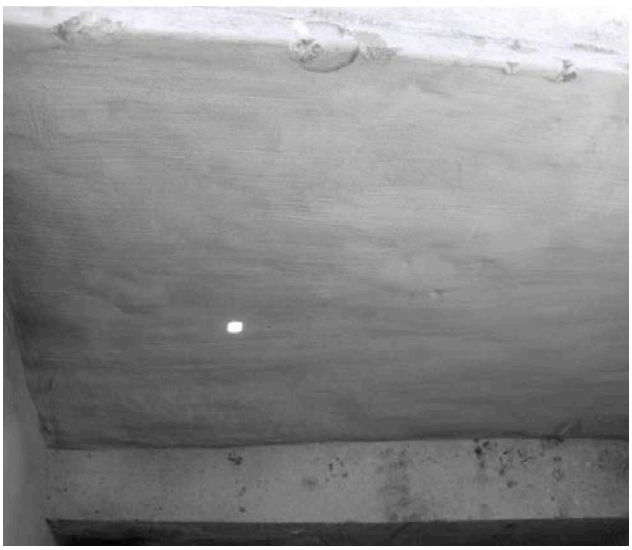










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