



8800 Tavenor Lane
Houston, TX 77075
720.454.4866
quadexonline.com

March 25, 2016

Quadex Repair Materials
4801 Crystal Hill Rd.
North Little Rock, AR 72118
www.quadexonline.com

Attn: Paul Niehoff
Maser Consulting
pniehoff@maserconsulting.com
(201) 602-5385

RE: Contract SR-01-15B Alternate Submittal – GeoKrete Geopolymer

Dear Mr. Niehoff:

This letter serves to request your consideration for our GeoKrete Geopolymer mortar as a substitution for the currently specified composite manhole rehab specification on the above mentioned contract. While Quadex manufactures hybrid cements and epoxies suitable for the current composite specification, we would like to note the advantages of our GeoKrete Geopolymer as opposed to a hybrid system below. Please also see the attached references: a technical product report, a technical data sheet, and a thorough GeoKrete manhole submittal package.

- One step monolithic system versus a two-step multi-material system
- Structural renewal and Corrosion resistance addressed in single application
- Superior corrosion resistance in a single component
 - While epoxies have a strong corrosion resistance ultimately their effectiveness relies on the bond to the cement underlayment.
- Improved manhole crew production
- Increased feasibility in traffic control and bypass coordination
- Superior material bond strength allows for a singular surface preparation method
- Superior QAQC installation protocol
- Green Technology with a 50-year service life

Should you have any questions during your review of GeoKrete, please do not hesitate to contact me at 501-993-6450.

Regards,

Neil Wisener
President
Quadex, LLC
P 501-993-6450



REPAIR
MATERIALS

TECHNICAL DATA SHEET

TYPICAL PERFORMANCE CHARACTERISTICS

Set Time At 70°F (ASTM C807)

Initial Set — approx. 60 - 75 minutes

Final Set — approx. 90 - 110 minutes

Compressive Strength (ASTM C109)

24-hours >2,500 psi

28-days >8,000 psi

Flexural Strength PSI (ASTM C78)

28-days >1300 psi

Bond Strength PSI (ASTM C882 Modified)

28-days >5000 psi

Modulus of Elasticity (ASTM C469)

28 days = 5.49×10^6 psi

Chemical Resistance (ASTM C267)

<0% mass loss in 8 week immersion

Chloride Ion Penetration Resistance (ASTM C1202)

28-Day < 250 Coulombs (very low)

Split Tensile Strength PSI (ASTM C496)

28-days >900 psi

Shrinkage (ASTM C596)

±.02%

Freeze Thaw (ASTM C666)

Mass change .04%

Antimicrobial Activity (ISO22196)

24 hours 99.9%

GEOKRETE GEOPOLYMER STRUCTURAL REHABILITATION MORTAR

DESCRIPTION

Quadex GeoKrete geopolymer is designed to provide corrosion resistant protection in a high hydrogen sulfide environment, increase structural integrity and stop the infiltration of groundwater in deteriorated structures. GeoKrete is a factory blended, one component fiber reinforced geopolymer synthesized from pozzolanic materials of industrial byproducts, enhanced with monocrySTALLINE quartz aggregate. The GeoKrete geopolymer reaction mechanism is polymerization which yields superior strength 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 pipe, both storm and sewer, consisting of metal, concrete, stone, masonry and others. Other structures such as manholes, wet-wells, and treatment plants also benefit from the superior strength and corrosion resistance properties of this advanced geopolymer.

FEATURES AND BENEFITS

- Quality controlled one-component blend for uniform results.
- High early and ultimate compressive, flexural and bond strengths.
- Resistant to acid attack in wastewater streams with pH as low as 1.0 and temperature as high as 170°F for industrial effluent.
- Low permeability.



PACKAGING

GeoKrete geopolymer is supplied in 60 lb. (27 kg.) or 1,000 lb (454 kg) poly-lined bags.

YIELD

One 60-lb. bag of GeoKrete geopolymer will yield approximately .54 cu. ft. and will cover 12.5 sq. ft. at a 1/2 inch thickness.

PROCEDURE

Prepare surface to be patched by removing unsound concrete, dirt, dust, oil and other debris using high pressure (3000 PSI) water blasting. This will provide a clean, damp surface to allow for a good bond.

Use approximately 0.6 to 0.7 gallons of potable water per 60 lb. bag of GeoKrete geopolymer. First add water to mixer, start mixer to mixing and add GeoKrete geopolymer until mortar is completely mixed.

Apply GeoKrete geopolymer by low pressure spraying or the spin cast application process on horizontal or vertical surfaces to a monolithic thickness of 1/2 or more inches.

CURING

Cure in accordance with manufacturer's recommendations.

WARRANTY

Quadex warrants its products to be free of defects in material and workmanship. Quadex will replace any product proved to be defective when applied in accordance with manufacturer's instructions. Quadex's obligation shall be limited solely to such replacement. There are no other warranties by Quadex expressed or implied.

PRECAUTIONS

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



**REPAIR
MATERIALS**



REPAIR
MATERIALS

TECHNICAL PRODUCT REPORT

A CASE FOR SWITCHING TO GEOPOLYMERS

*It's simply a matter
of lining technology
evolution...*

*First, there were
Standard Cements.*

*Then, the industry
evolved to Calcium
Aluminate Cements.*

*Today, through
years of R & D and
testing, we NOW
have Geopolymers
– simply a superior
lining product.*



Technological Advances Of The GeoKrete Geopolymer Benefit Sewer Systems Rehabilitation

There are many products currently being used today for the rehabilitation and restoration of sewer pipes, manholes, wet-wells junction boxes and others.



Every product, without a doubt, excels in one performance area or another. It could be strength, corrosion resistance, even performance life. For example, cementitious products possess excellent strength properties and epoxies are well known for corrosion resistance. Calcium aluminate products have proven to provide excellent strength and increased resistance to acid corrosion attack.

However, the recently developed GeoKrete Geopolymer delivers the best of both worlds, and possesses a broader range of high performing characteristics.

In addition it's exceptional strength, GeoKrete Geopolymer greatly increases Acid Resistance... and is environmentally friendly.

The development of geopolymers to line sewer pipes, manholes and wet-wells produces a material that is much more corrosion resistant than calcium aluminates and also provides a very real advantage in the chemical composition of the product.

Geopolymer Chemical Composition Provides Multiple Benefits to the User:

- A large percentage of the materials used to make up a geopolymer are recycled from coal burning power plants. These products are used in the place of standard cementitious products. Conversely, Cements are produced with extremely high-energy requirements generating huge amounts of CO₂.
- By using recycled products, the main component of acid corrosion in standard cements, Calcium Hydroxide Ca (OH)₂, is basically eliminated in the manufacture of this geopolymer.
- Geopolymerization is a geosynthesis — a reaction that chemically integrates minerals. These materials represent a new order of cementitious products able to provide ceramic and zeolitic properties not normally found in traditional cement materials.

GeoKrete Geopolymer Field Application Advantages:

- Tenaciously Bonds to all surfaces — slant shear bond strength has been tested at over 5,000 psi.
- Multiple layers can be applied without the possibility of cold joints being created.
- Flows through hoses easily and can be pumped further.
- Virtually no rebound of the GeoKrete geopolymer.
- Thicker layers may be applied in a single pass, speeding up production rates.
- The texture is easier to work with, shape, and trowel.
- Much wider temperature than calcium aluminates, and can be applied in conditions ranging from just above freezing to over 90°F.

The unique chemical composition, the chemical reaction it undergoes, and the physical application advantages of the GeoKrete geopolymer result in projects being completed much quicker, with a single component system, satisfying both high strength and superior corrosion resistant goals.



**REPAIR
MATERIALS**