

Product Properties

Reference US 08/06

1 Product Description

SewperCoat[®] is a ready-to-use mortar for the municipal wastewater industry. It is designed specifically to provide an abrasion and corrosion-resistant, protective lining that can withstand the most severe biogenic corrosion related to hydrogen sulfide (H₂S) found in wastewater environments.

The unique properties of SewperCoat[®] result from the chemical and mineral phases formed during the hydration process. What sets SewperCoat apart from other materials such as ordinary portland cement (OPC) concrete, epoxies, poly-vinyl chloride (PVC) or polyethylene, is its capacity to inhibit bacterial activity by effectively neutralizing sulfuric acid production. See charts 2, 3 and 4.

SewperCoat[®] is a cohesive mortar that possesses thin section toughness as well as high compressive and flexural strengths. Additional features include high early strength, freeze-thaw resistance as well as high temperature resistance (1,800°F/1,000°C). SewperCoat[®] is also resistant to many other types of corrosion including sulfates, seawater, oils, gases, and dilute acids (pH range 3.5 – 11).

SewperCoat[®] is used to coat both new and existing structures, such as manholes, wet wells, lift/pump stations, treatment plant structures, junction boxes, and piping networks. SewperCoat[®] enhances the structural integrity of existing systems and reduces infiltration due to its high-density and low-porosity characteristics.

2 Technical Properties

Biogenic Corrosion Resistance: SewperCoat[®] withstands the most severe H₂S corrosive environments, which results from Thiobacillus activity. Due to its high neutralization capacity, SewperCoat[®] has the ability to raise the surface pH normally found on the surface of other construction materials.

In extremely low pH ranges, SewperCoat[®] provides maximum corrosion resistance. See chart 1 for depth of attack and charts 2 and 3 for percent weight loss data.

Accelerated Test Method: Intensive H₂S related bacterial corrosion research was conducted by the Microbiology Department of the University of Hamburg in Germany on pre-scored concrete samples (8" x 24" x 4 1/4"). One part of the sample was immersed in actual municipal effluent; the other part was exposed to the artificial chamber's atmosphere. The system was maintained at a specific humidity, constant temperature, and bacterial levels to simulate a severely corrosive environment.

The samples and chamber were inoculated with several strains of bacteria cultured from natural sewer environments as well as reproduced bacteria.

This test is believed to be the most accurate method of duplicating and simulating (at an accelerated rate) the specific corrosion mechanism found in sanitary sewers and the long-term performance of construction materials used in this environment.

After 1 year, the corrosion observed in the test chamber was equal to that of 24 years of OPC based concrete corrosion in Hamburg's most deteriorated sewers.

TYPICAL MATERIAL PROPERTIES (PERFORMED BY AN INDEPENDENT TESTING LABORATORY)				
SEWPERCOAT [®]		24 HRS	7 DAYS	28 DAYS
ASTM C 109	Compressive Strength, psi	>6,000	>7,000	>8,000
ASTM C 293	Flexural Strength, psi	>1,300	>1,400	>1,600
ASTM C 596	Shrinkage at 90% Humidity, %	< 0.04	< 0.06	< 0.08
ASTM C 666	Freeze-Thaw After 300 Cycles	No Damage		
ASTM C 496	Splitting Tensile Strength	> 900 psi		
ASTM C 882	Bond Strength by Slant Shear	> 2,300 psi at 28 days		
ASTM C 457	Air Void Content (7 Days)	2-4%		
ASTM C 642	Specific Gravity/Absorption Test (7 Days)	3-5%		

Static Modulus of Elasticity: 7.10 x 10⁶ psi after 24 hours moist curing at 68°F. The test results above were obtained under standard laboratory conditions and are presented as typical material properties only. Those properties presented above are not warranted or guaranteed by Kerneos. Properties obtained from field cast specimens may result in values lower than those listed above. The warranted material properties are presented in the applicable Product Data Sheet.

This 1-to-24 yearly ratio may differ from one sewer system to another. In areas with more aggressive environments, the same level of attack of OPC based materials can be observed in far fewer years.

Abrasion Resistance: U.S. Army Corps of Engineers test CRD-C-63-80, Test Method for Abrasion-Erosion Resistance of Concrete, resulted in 0.5% weight loss after 12 hours of testing and 2.0% weight loss after 72 hours of testing. Typical 5,000-psi high-performance OPC concrete experienced a 3.6% weight loss after only 12 hours of testing. SewperCoat® is approximately seven times more resistant to this type of abrasion than high-performance OPC concrete.

Aggregate Size:

- #8 mesh X down (SewperCoat® 2000HS Regular)
- #14 mesh X down (SewperCoat® PG)

Working Time at 68°F:

- 1 hour (SewperCoat® 2000HS Regular)
- 2 hours (SewperCoat® PG)

Wet Density at 68°F: 148-155 lb./ft³

Coefficient of Thermal Expansion: 5 x 10⁻⁶ in/in/°F (68°F to 1832°F)

3 Chemical Composition

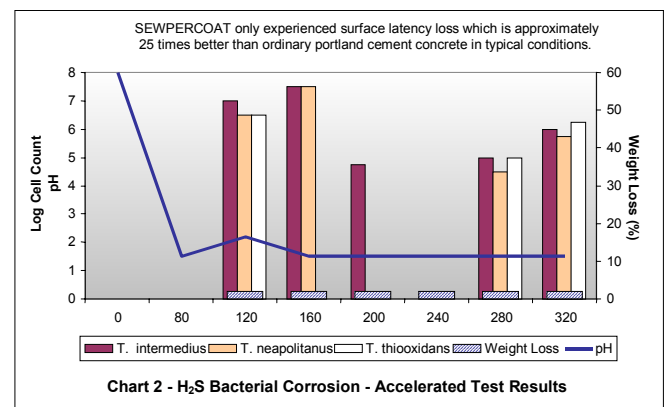
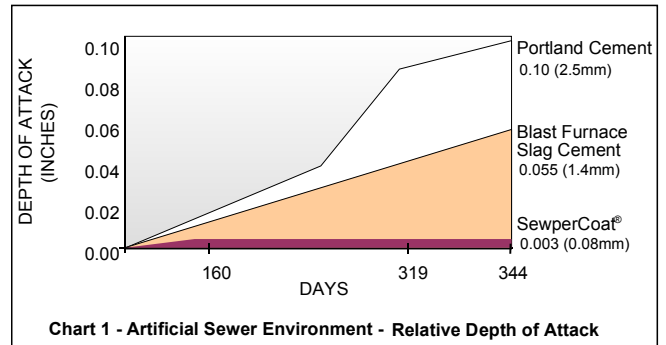
SewperCoat® contains no calcium sulfate, calcium chloride, tricalcium aluminate, lime hydrates or aggressive agents that attack reinforcing steel. The high-performance properties of SewperCoat® are achieved through a blend of mineral elements.

Chemical analysis main constituents			
Al ₂ O ₃	CaO	FeO+Fe ₂ O ₃	SiO ₂
39% - 44%	35% - 40%	9% - 15%	4% - 9%

4 Installation

Clean, potable water should be used for mixing. Water content is provided on each individual bag. Water quantity is critical to obtain ultimate performance properties. Always stay within the recommended specifications for mixing water.

SewperCoat® products are not designed to be hand-applied. SewperCoat® 2000HS is designed to be applied with dry-gunite equipment. SewperCoat® PG is

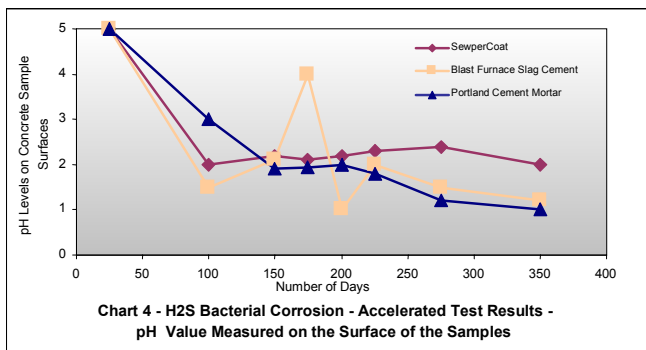
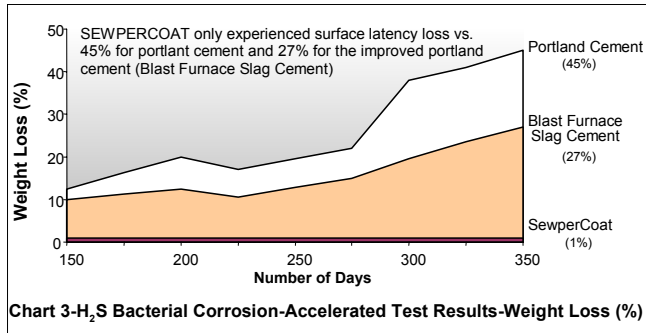


designed to be applied with low-pressure, wet spray equipment (rotor-stator or swing tube type pumps).

Preparation of the surface to be coated should be performed in accordance with applicable industry standards and specific project specification requirements. Sandblasting and/or hydro-demolition with high-pressure water may be used to remove existing deterioration and debris. The immediate bonding surface should be rough, damp and free of any existing coatings, sewer residue and running water. The structure itself should be fully saturated prior to a SewperCoat® installation. Please see our suggested SewperCoat® specification language for detailed surface preparation recommendations.

SewperCoat® products are to be used as packaged. Under no circumstances should any substance other than water be added to SewperCoat® products.

SewperCoat® should not be used as a “build-out” mix or underlayment for any other product. SewperCoat® should not be used in conjunction with or adjacent to any inert or organic coatings, including but not limited



For more information about SewperCoat[®], including a listing of competent and qualified installers, please contact Kerneos, Inc. at 1-800-524-8463.



A typical rehabilitation installation...

to epoxy, polyurethane, polyurea, and fiberglass. Curing should be implemented as soon as the surface begins to harden and dry (as early as one hour after application). Several layers of ASTM C309 liquid membrane curing compound or a 100%-humid moisture cure may be used.

Equipment used must always be clean and free of portland cement build-up to avoid accelerated set.

General concreting practices (water ratio per bag, compaction, curing, etc.) should be employed to obtain the best quality installation in terms of mechanical strength and corrosion resistance.

5 Availability and Installation

SewperCoat[®] is available in North America directly through Kerneos, Inc. main office and warehouses.

SewperCoat[®] is packaged in various bag sizes depending upon application and installation methods. SewperCoat[®] 2000HS Regular is typically supplied in 50-lb bags. SewperCoat[®] PG is typically supplied in 65-lb bags.

SEWPERCOAT[®]

1-800-524-8463

www.SewperCoat.com

6 Technical Assistance

A licensed Professional Engineer must be responsible for the suitability, overall design and specifications and follow up for each project.

Kerneos, Inc. has a Technical Assistance Department and on-site laboratory facilities available to provide customer support.

Kerneos assistance in technical planning and installation of a project does not warrant the success of any application, and is not a substitute for professional engineering judgment.

7 Limited Warranty

Kerneos, Inc. ("Kerneos") warrants to each purchaser to whom it sells its SewperCoat® 2000HS Regular and SewperCoat® PG products ("SewperCoat® products") that the SewperCoat® products will conform to the physical and mechanical properties set forth in the Data Sheet issued by Kerneos for the applicable product at the time of sale and will be free of defects and workmanship when installed in accordance with the manufacturer's recommendations and additional constraints outlined herein. **THIS IS A MATERIALS WARRANTY ONLY, AND IN ADDITION TO THE OTHER LIMITATIONS CONTAINED HEREIN, THE FOREGOING WARRANTIES SHALL BE VOID IF THE APPLICABLE SEWPERCOAT® PRODUCT IS NOT USED PROMPTLY AND HANDLED, STORED, MIXED AND SPRAY-APPLIED BY A QUALIFIED CONTRACTOR TO A CONCRETE, BRICK OR BLOCK SUBSTRATE AND CURED IN ACCORDANCE WITH STANDARD INDUSTRY PRACTICE AND ALL APPLICABLE INSTRUCTIONS (INCLUDING, WITHOUT LIMITATION, THIS DOCUMENT, KERNEOS "SUGGESTED TECHNICAL SPECIFICATIONS - REFERENCE US 08/06" AND APPLICABLE "PRODUCT DATA SHEETS").**

Kerneos maintains a listing of competent contractors who have demonstrated requisite skill and training to be qualified applicators of SewperCoat® products but does not warrant their work.

Kerneos reserves the rights to inspect and determine whether any failure of a SewperCoat® product is the result of a breach of a warranty set forth herein or is related to another cause (any and all of which such other causes are expressly excluded from coverage by the warranties contained herein).

Any claim under this limited warranty requiring an investigation by Kerneos may require extensive laboratory testing. It is the responsibility of any party making a claim hereunder to make accessible and available to Kerneos within a reasonable period of time after a claim arises any product or structure requiring testing. Inspection may require the removal of a portion of the SewperCoat® lining in question or, if a structure requiring investigation cannot be made readily accessible, the removal of any frames, covers, or obstructions for thickness verification and the gathering of sample testing specimens. At Kerneos's option, technical investigations and testing may be performed by either Kerneos internal facilities or by an independent agency.

The sole remedy of a purchaser, and the sole obligation of Kerneos, for breach of the warranties contained herein shall be replacement of nonconforming SewperCoat® products or, at Kerneos's option, refund the purchase price therefore. **THE WARRANTIES PROVIDED HEREIN ARE THE ONLY WARRANTIES APPLICABLE TO THE SEWPERCOAT® PRODUCTS AND ARE MADE IN LIEU OF ANY OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ALL OF WHICH ARE HEREBY EXPRESSLY DISCLAIMED. IN NO EVENT SHALL KERNEOS BE LIABLE FOR ANY SPECIAL, INCIDENTAL, PUNITIVE, INDIRECT OR CONSEQUENTIAL DAMAGES, INCLUDING, WITHOUT LIMITATION, DAMAGES RESULTING FROM DELAY, WORK STOPPAGE, LOSS OF PROFITS OR SALES, LOSS OF USE OF EQUIPMENT, OR LOSS OR DAMAGE TO THE WORK INTO WHICH THE APPLICABLE SEWPERCOAT® PRODUCT IS INCORPORATED, REGARDLESS OF THE FORM OF ACTION, WHETHER IN CONTRACT, TORT, BREACH OF WARRANTY OR OTHERWISE (COLLECTIVELY, "LOSSES").**

ANY LABOR ASSOCIATED WITH ANY SEWPERCOAT® INSTALLATION IS ENTIRELY THE RESPONSIBILITY OF THE INSTALLER, AND KERNEOS HEREBY EXPRESSLY DISCLAIMS ANY AND ALL LIABILITY FOR ANY LOSSES RESULTING FROM, ARISING OUT OF OR OTHERWISE RELATED TO THE INSTALLATION OF ANY SEWPERCOAT® PRODUCT.

This limited warranty extends only to direct, original "qualified installer" customers of Kerneos. If a SewperCoat® product is re-sold by any party or installed by any party other than the direct, original customer of Kerneos, the warranties set forth herein shall be void and unenforceable.

It is the responsibility of the customer to maintain and document product installation reports in accordance with all applicable instructions including, without limitation, the location and date, the quantities installed, the mixing methods, installation personnel, existing conditions of the structure including H₂S concentrations and initial surface pH. Kerneos will provide installation report forms upon request.

Typical deteriorated brick manhole



Manhole receiving a SewperCoat® PG installation Rehabilitated brick manhole

