



## 1 General Characteristics

Composed entirely of calcium aluminates, SEWPERCOAT® PG is a pre-packaged ready to use, fiber reinforced, high strength wet shotcrete material.

SEWPERCOAT® PG is a mortar that is designed to coat both new and existing municipal wastewater structures including manholes, lift stations, wet wells, etc. It is designed specifically to provide an abrasion and corrosion-resistant, protective lining that can withstand severe biogenic corrosion caused by the hydrogen sulfide (H<sub>2</sub>S) found in wastewater environments.

The unique properties of SEWPERCOAT® result from the chemical and mineral phases formed during the hydration process. SewperCoat is unique when compared to other materials such as ordinary Portland cement (OPC) concrete, epoxies, poly-vinyl chloride (PVC) or polyethylene because of its ability to inhibit bacterial activity which drastically reduces

the production of sulfuric acid.

SEWPERCOAT® is an adhesive 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® enhances the structural integrity of existing systems and reduces infiltration due to its high-density and low-porosity characteristics.

SEWPERCOAT® PG does not release calcium hydroxide as a hydration product. This imparts good chemical resistance and eliminates the major cause of efflorescence.

SEWPERCOAT® PG is a very dark gray color. SEWPERCOAT® PG does not contain crystalline silica.

### TYPICAL MATERIAL PROPERTIES\* (PERFORMED BY AN INDEPENDENT TESTING LABORATORY @ 14-16% water)

SEWPERCOAT® PG		24 HRS	7 DAYS	28 DAYS
ASTM C 109	Compressive Strength, psi	>5,500	>6,000	>7,000
ASTM C 348	Flexural Strength, psi	>900	>1,100	>1,300
ASTM C 157	Shrinkage after 28d immersion, %	< 0.04	< 0.05	< 0.07
ASTM C 496	Splitting Tensile Strength, psi	>550	>600	>700
ASTM C 882	Bond Strength by Slant Shear, psi		>2500	>2500
ASTM C 666	Freeze-Thaw – 300 cyc, Rel. Dyn. Modulus		102	
ASTM C 642	Volume of Permeable Voids (40 days), %		15	
ASTM C 642	Apparent Density (40 days)		2.74	
ASTM C 469	Modulus of Elasticity (28 days), ksi		>5,000	

\*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 different than those listed above. The warranted material properties are presented in section two of this Product Data Sheet.

## 2 Specifications

SEWPERCOAT® PG sold and distributed by Kerneos Inc. adheres to the following specifications:

### Sieve Analysis

	Min (% retained)	Max (% retained)
# 8 (2.36 mm)	0	0
# 16 (1.18 mm)	1.5	9.5
# 30 (600 µm)	22	32
# 50 (300 µm)	38	52
# 100 (150 µm)	48	62
# 200 (75 µm)	52	68
Pan (passing #200)	32	48

### Mortar Properties (using 14.5% water)

- Vibration flow
  - 0 min. 120 - 160 %
  - 30 min. 110 - 160 %
- Penetrometer Final Set
  - 4 – 10 hours
- Compressive Strength @ 24 hours
  - >5,500 psi

For detailed test procedures, please contact a Kerneos Technical or Quality Manager.

## 3 Technical properties

**Biogenic Corrosion Resistance:** SEWPERCOAT® withstands corrosive environments containing H<sub>2</sub>S gas, which show strong Thiobacillus bacterial activity. Due to its high neutralization capacity, SEWPERCOAT® has been shown to locally raise the surface pH found on the surface of wastewater structures and prevents the

successful colonization of the most aggressive strains of bacteria.

**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:** #14 mesh and finer (0 – 1.4 mm)

**Working Time at 68°F:** 2 hours

**Wet Density at 68°F:** 148-155 lb./ft<sup>3</sup> (2.4 – 2.5 g/cc)

**Coefficient of Thermal Expansion:** 5 x 10<sup>-6</sup> in/in/°F (68°F to 1832°F)

## 4 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 <sub>2</sub> O <sub>3</sub>	CaO	FeO+Fe <sub>2</sub> O <sub>3</sub>	SiO <sub>2</sub>
39% - 44%	34% - 38%	9% - 15%	6% - 8%

## 5 Installation

Clean, potable water should be used for mixing. The water requirement is provided on each individual bag and is critical to obtain the specified performance properties. Always stay within the recommended specifications for mixing water.

SEWPERCOAT® products are not designed to be hand-applied. SEWPERCOAT® PG is designed to be applied with low-pressure, wet-spray equipment.

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 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.

Generally accepted concreting practices (water ratio per bag, compaction, curing, etc.) should be employed to obtain the best quality installation with respect to mechanical strength and corrosion resistance.

## 6 Availability

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® PG is typically supplied palletized in 65-lb bags.

For more information about SEWPERCOAT®, including a list of installers, please contact Kerneos Inc. at 1-800-524-8463.

## 7 Technical Assistance

A licensed Professional Engineer is responsible for the determination of suitability, overall design, specifications and follow up for each project.

Kerneos Inc. has a technical assistance department with 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.

## 8 Packaging & Shelf Life

SEWPERCOAT® PG is available palletized in 65-lb bags. SEWPERCOAT® PG packaging is designed to protect it from humidity. However, as with all prepackaged concretes, SEWPERCOAT® PG should not be placed outdoors or in direct contact with the ground. When correctly stored in dry conditions, the properties of SEWPERCOAT® PG should remain within specification limit for at least 6 months. In most cases, its properties will be retained for over a year.

### **SEWPERCOAT<sup>®</sup> 10 YEAR LIMITED WARRANTY (OWNER)**

This warranty extends to the OWNER of the structure to which SewperCoat<sup>®</sup> is applied, effective as of the OWNER's acceptance of the work: Kerneos warrants to the OWNER that SewperCoat<sup>®</sup> PG, when installed in compliance with the recommended installation guidelines published by Kerneos, will protect sanitary wastewater structures from biogenic corrosion caused by exposure to sanitary sewerage environment. To be honored, claims must be filed by the OWNER within 10 years of acceptance of the work by OWNER. Kerneos' obligations hereunder extend only to providing labor and material to replace the defective material.

This warranty excludes consequential and incidental damages (including, without limitation, damage to equipment and peripheral facilities, service interruption, and loss of use). This warranty applies to sanitary sewage exposure only. Exposure to effluent, chemicals, or contaminants from industrial discharge will void this limited warranty.

### **SEWPERCOAT<sup>®</sup> LIMITED WARRANTY (BUYER)**

Kerneos warrants to the BUYER of this product that, at the time of shipment, the product conforms to the Specifications set forth in Section 2 of the applicable Product Data Sheet. To be honored, claims under this warranty must be filed by the BUYER within 30 days of use of the product or 6 months of delivery to its BUYER, whichever comes first. Kerneos' sole obligation and the sole and exclusive remedy of BUYER under this warranty shall be the replacement of any nonconforming product or, at Kerneos' option, the refund of the purchase price paid by its BUYER.

### **DISCLAIMER OF OTHER WARRANTIES**

THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, TO OWNER OR BUYER EXCEPT AS PROVIDED IN THIS LIMITED WARRANTY. ALL OTHER WARRANTIES, INCLUDING WITHOUT LIMITATION THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE EXCLUDED. NO WARRANTY IS GIVEN FOR, OR MAY BE IMPLIED FROM, ANY TECHNICAL ADVICE OR RECOMMENDATIONS PROVIDED BY KERNEOS.

### **WARRANTY CLAIM PROCEDURE**

Kerneos reserves the right to inspect and determine whether any claim is the result of a breach of a warranty set forth herein or is related to another cause (all 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 to make any product or structure requiring testing accessible and available to Kerneos within a reasonable period of time after a claim arises. Inspection, including thickness verification and the gathering of specimens for testing may require the removal of a portion of the SewperCoat<sup>®</sup> lining in question or, if a structure requiring investigation cannot be made readily accessible, the removal of any frames, covers, or obstructions. At Kerneos' option, technical investigations and testing may be performed by either Kerneos internal facilities or by an independent agency.

It is the responsibility of the buyer (applicator) to maintain and document product installation and job acceptance reports in accordance with all applicable instructions including, without limitation, the location and date, the quantities installed, the mixing methods, surface preparation procedures used, installation personnel, and existing conditions of the structure including H<sub>2</sub>S concentrations and initial surface pH. Kerneos will provide installation report forms upon request.