



PERMACAST® PL-8,000



High strength, factory blended, fine aggregate concrete designed for creating a new pipe within old storm culverts and sanitary sewer pipe by centrifugally compacting a structural liner at the thickness engineered for the size, shape, ground water, and dynamic loading of each specific pipe.

The extremely dense, concrete liner contains crystalline waterproofing additives that continuously heal cracks and seal out infiltration. For sanitary sewer conditions, ConShield®, a proven additive is added to prevent biogenic corrosion.

PHYSICAL PROPERTIES

Color	Gray
Special Handling	None-keep dry
Shelf Life	One year
Water Demand	118 - 128 fl. oz./bag
Coverage	50# bag yields .42 cu. ft.
Working Time:	60-120 minutes

NOMINAL VALUES

Set Time at 70°F ASTM C-266	
Initial Set	Approx. 170 minutes
Final Set	Approx. 300 minutes
Compressive Strength ASTM C-109	
24 hours	4,000 psi
28 days	8,000 psi
Flexural Strength ASTM C-1609/C78	
24 hours	940 psi
28 days	1,135 psi
Slant Shear Bond ASTM C-882	
28 days	2,900 psi
Tensile Strength ASTM C-496	
28 days	695 psi
Freeze Thaw ASTM C-666	300 Cycle Pass
Modulus of Elasticity ASTM C-469	
28 days	3.90 X 10 ⁶ psi
Rapid Chloride Permeability ASTM C-1202 (AASHTO T-277)	< 50 Coulombs

The Physical properties contained herein were obtained under laboratory conditions at 72° F. Physical properties obtained under field conditions may be different due to environmental variables. Data is subject to reasonable deviation.

GENERAL

This information establishes the minimum standard for material and method of application for restoring and sealing leaking and deteriorated sewer pipe, culvert pipe and manholes by centrifugally casting PERMACAST® PL-8,000, onto its interior in one or more passes at a specified thickness.

MATERIAL

The material, PERMACAST® PL-8,000, is a high strength, high build, abrasion resistant and corrosion resistant fine aggregate concrete, based on advanced cements and polymer additives. When mixed with the appropriate amount of water, a paste-like material will develop which may be sprayed, centrifugally cast or pumped into any prepared surface including metal, wood, plastics, brick, block, stone and other construction materials.

The hardened liner is dense and highly impermeable due to a complex formulation of mineral, organic and densifying agents and sophisticated chemical additives including rust inhibitors. Graded quartz sands are used to enhance particle packing and further improve the hardened density and abrasion resistance. The composition also possesses excellent thin-section toughness, high modulus of elasticity, extremely low permeability, and superior bonding. Unique fibers are added for crack control, increased cohesion, and structural reinforcement and to enhance flexural strength. All components are covered by long standing ASTM standards.

Crystalline waterproofing membrane technology is a vital component of the material because in the presence of moisture, it continuously combines with hydration by-products in the micro-capillaries and permanently reseals cracks against infiltration and damage from the resulting soil settlement.

EQUIPMENT

Mortar mixers, compressors and pumps are standard commercial models. Please contact AP/M for equipment specifications. The high speed, rotating applicator and specialty equipment is licensed to certified applicators.

MIXING

Combine 50 pounds of the packaged dry mix with 118-128 fl. oz. of clean (50°-70°F) water while mixing with a high-speed shear mixer until proper consistency is obtained. Continue to agitate the concrete to prevent thickening beyond the desired fluidity. The working time is approximately 60-120 minutes depending upon field conditions such as wind and humidity.

PREPARATION

Pressure wash the interior surface with a high-pressure water-blast sufficient to remove all laitance and loose material and flush debris from the pipe. Plug active leaks and fill voids; use PL-12,000 for fast setting, high-strength invert/base replacement.

APPLICATION

Position the rotating applicator within the center of the sewer pipe and commence pumping the material. As the fine aggregate concrete begins to be centrifugally cast evenly around the interior, the applicator head is retrieved at the best speed for applying the thickness that has been selected. If flows are interrupted for any reason, stop its retrieval until flows are restored. The retrieval speed can be adjusted to create different thickness as engineered for the best structural thickness. Because of the even application throughout the interior, the thickness may be verified at any point. If additional thickness is desired, the rotating applicator is placed at that level and pumping, and retrieval is recommenced until that area is thickened. Built-in bonding agents allow additional layers to be applied at any time without cold joints exceeding split tensile values.

The pressure application from the centrifugal casting of the concrete produces a finely textured surface that requires no

additional troweling or finishing. The interior dimension is uniform, and all corrugations are filled.

Work is performed in compliance with ASTM A979 STANDARD SPECIFICATION FOR CONCRETE PAVEMENTS AND LININGS INSTALLED IN CORRUGATED STEEL PIPE IN THE FIELD.

CURING

Use an ASTM C309 conforming curing compound or 1315 Sealer as required in the standard.

QUALITY ASSURANCE & ACCEPTANCE

All work shall be performed by factory certified applicators only. Mortar cube test samples for material strengths may be taken randomly as directed by the inspector for testing at the owner's expense. Thickness can be verified with a wet gage at any random point of the new interior surface. Any areas found to be thinner than minimum tolerances shall immediately receive additional material. Visual inspection should verify a leak-free, uniform appearance.

SAFETY

Observe OSHA standards for confined space entry.

WARRANTY and DISCLAIMER

The technical data herein provided is compiled from laboratory specimens in accordance with ASTM Standards. Test results from specimens made in the field may vary. Although this data is believed to be reliable, APM, LLC makes no warranty express or implied, and further disclaims any liability as to the suitability of this information to a particular end use. This product is intended for use solely by our certified applicators.

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