

SeaShield Marine Systems

SeaShield 510 UW Grout

A non-shrink cementitious grout designed to resist “wash-out” in underwater or tidal zone grouting applications. SeaShield 510 UW Grout is a specific blend of Portland Cement, specially graded aggregates and admixtures to impart controlled expansion and exceptional cohesiveness for maximum flowability and strength.

Uses

Recommended for underwater grouting for bridge columns, concrete pilings and dam repairs where a “wash-out” resistant free-flowing pumpable non-shrink, high strength grout is required.

Benefits

- “Wash-out” resistant thixotropic consistency for dependable underwater repairs (displaces water)
- Free-flowing and/or pumpable consistency for easy application
- High early and ultimate strength for fast repair and turnaround without chlorides
- Positive expansion for maximum durability and adhesion

Applicable Standards

Corps of Engineers CRD C-621 (in plastic and flowable conditions).

Architectural Specifications

Underwater Non-Shrink Grout: All underwater grouting shall be performed with a non-shrink “wash-out” resistant cementitious grout. Grout must be specifically designed

for placement underwater in a thixotropic consistency, displacing water and resisting cement wash-out. Approved Product: SeaShield 510 UW Grout or approved equivalent.

Application

Surface Preparation: Substrate must be clean and sound. All loose material must be removed. Substrates which are permanently immersed should be sand blasted or cleaned with a high pressure water jet. Non-immersed or intermittently immersed substrates can also be prepared using these techniques. Depending on the circumstances, scabbling or brush hammering may be appropriate. In view of the fluid nature of SeaShield 510 UW Grout, all form work must be grout-tight. This can be achieved using foam rubber sealing strips at the edges.

Mixing: The quantity of water required to achieve a fluid consistency must be accurately measured for each mix. Start with 7 pints (3.3 L) and add additional water to bring the consistency to a fluid yet cohesive mix. Do not exceed 8 pints (3.8 L) of water. A mechanically powered grout mixer must be used. Ensure that the machine capacity and the number of workers is adequate to enable grouting to be carried out as a continuous operation.

Place the specified amount of water in the mixer. Slowly add the contents of the SeaShield 510 UW Grout bag,

Test Data

Compressive Strength

(ASTM C-109)
1 Day
3 Days
7 Days
28 Days

Flowable

(mixed with 8 pints / 3.8 L water)
2500 psi (17 MPa)
5500 psi (37.9 MPa)
7500 psi (51.7 MPa)
9000 psi (62 MPa)

Set Time (ASTM C-266)

70°
40°

Initial

2 hours
10 hours

Final

4 hours
12 hours

Flexural Strength (ASTM C-190)

28 Days 1410 psi (9.7 MPa)

Tensile Strength (ASTM C-190)

28 Days 600 psi (4 MPa)

Coefficient of Thermal Expansion

(ASTM C-531)

4.65×10^{-6} in/in/°F
 $(8.37 \times 10^{-6}$ mm/mm/°C)

Bond Strength (ASTM C-882)

7 Days 1500 - 2000 psi
(10 - 13.8 MPa)

mixing continuously. When all the contents are added, mix continuously for a minimum of 3 minutes making sure that a smooth, uniform mix is obtained. Pass the mixed grout through a #4 sieve to remove any lumps prior to placing. Important - The need to observe the accurate gauging of water addition and the stated mixing time should be stressed to all operatives and, wherever possible, included in specifications.

Placing: Place the grout within 20 minutes of mixing to gain full benefit of the expansion process. Continuous grout flow is required and the grout should be poured or pumped through a flexible tube, minimum diameter 1/2" (12.7 mm) to the lowest point in the form. At the start of the operation the grout flow should be restricted in order to avoid any water entrapment. The bottom of the tube may be raised as necessary to reduce any back pressure but should not be raised above the level of the grout. A 6" (150 mm) minimum depth is suggested below the grout surface to optimize performance.

Application Thickness: Grout may be placed in thickness up to 4" (100 mm) in one pour when placed above water. When placed under water, the heat sink effect in this environment permits thickness up to 7" (175 mm) to be placed. For thicker sections up to 10" (250 mm) above water and 20" (500 mm) under water, it is necessary to fill out SeaShield 510 UW Grout using a clean, rounded and well graded aggregate in the size range 3/8" (9.5 mm) to 1/2" (12.7 mm). The quantity of aggregate added should not exceed 1 part aggregate to 1 part by weight. For such mixes a concrete mixer must be used. Unrestrained surface areas should be kept to a minimum. Excessively large volumes should require a thermal analysis to determine any limitations on pour size.

Curing: Curing will not be required in intermittent or totally submerged conditions. However, when cast above water, cover immediately with clean wet rags and keep moist until final set.

Yield: Yield per 50 lb. (22.7 kg) bag mixed with 1 gallon (8 pints) of water is .45 cubic feet (0.01 m³).

Packaging

50 lb. triple lined bag (60 ea. 50 lb. bags per pallet) and 3,000 lb. (1,361 kg) supersack.

Limitations/Precautions

DO NOT place at temperatures below 35°F (1.6°C) or if the temperature is expected to fall below 35°F (1.6°C) in the next twenty-four hour period.

DO NOT over water. This can cause bleeding or separation. DO NOT retemper. DO NOT add cement, sand, or mixtures. DO NOT mix more than can be use in twenty minutes.

Caution: Contains Portland Cement and sand. Cement will cause irritation. Avoid contact. Use of a dust respirator, safety goggles and rubber gloves are recommended. Avoid prolonged contact with eyes, immediately flush with water for at least 15 minutes. Get prompt medical attention. DO NOT wear contact lenses when working with this product. DO NOT take internally. Keep out of reach of children.

Avoid hazards by following all precautions found in the Material Safety Data Sheet (MSDS), product labels and technical literature. Please read this information prior to using the product.

Receiving

All bagged products should be checked for dryness prior to signing shipping papers.

Storage

SeaShield 510 UW Grout should be stored in a cool, dry interior area. At no time should material be exposed to high moisture, rain or snow conditions.

Technical Services

Complete technical and specification services are available from the manufacturer and their authorized representatives and distributors.

Filing System

Additional literature and the Material Safety Data Sheet can be obtained upon request.



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