

# 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

Designed for underwater use or in tidal zones in applications requiring a non-shrink, non-metallic, washout resistant grout from 20 mm up to about 175 mm coating thickness. Used in underwater grouting of bridge columns, concrete pilings, concrete tanks, dam repairs, seawalls, piers and other marine structures, re-instatement of dam walls/wharf columns, anchor bolt filing, grouting underneath precast panels and concrete sections.

### Benefits

- Shrinkage compensated
- Does not wash out in water - displaces water
- Gaseous expansion while in plastic state eliminates shrinkage and settlement
- Grouting from 20 mm to 175 mm in a single application
- Non-metallic - eliminates staining
- Pumpable for larger applications
- Non-shrink for maximum durability and adhesion
- Dimensionally stable
- Expansion characteristics (plastic state): 15 minutes (start), finish (3 hours)
- Compliant to AS/NZS 4020:2005 when exposed to area to volume ratios up to 15,000 mm<sup>2</sup>/L at 20°C ± 2°C

### Yield data for SeaShield™ 510 UW Grout

Consistency	Trowellable	Flowable/ Pourable
Water per 20 kg bag (L)	3.0 - 3.4	3.6 - 4.0
Yield per bag (L)	10.6	11.0
Fresh water density (kg/m <sup>3</sup> )	2220	2190
Bags required per m <sup>3</sup>	94	91

### Test Data

Compressive Strength (Flowable) (AS 1012.18)	Flowable (mixed with 3.6 L water)
1 Day	> 20 MPa
3 Days	> 30 MPa
7 Days	> 40 MPa
28 Days	> 55 MPa

Flexural Strength (Flowable) (ASTM C348-86)	Flowable
1 Day	> 1.5 MPa
3 Days	> 3.5 MPa
7 Days	> 8.5 MPa
28 Days	> 9.5 MPa

Set Time @ 20°C, 50% Relative Humidity (AS 1012.18)	Initial	Final
Trowellable	3.0 hours	4.5 hours
Flowable	4.5 hours	6.5 hours

Bond Strength (ASTM C-882-1987)	7 Days	10 - 13.8 MPa
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### Application

The substrate must be clean and sound, free of all marine growth, foreign material, including laitance or other surface contaminants. All loose material must be removed. Permanently immersed substrates should be sand blasted or cleaned with a high pressure water jet. Substrates in the splash zone or above can also be prepared by sand blasting or high pressure water jet. Scabblers or brush hammering may also be used.

**Mixing:** Mix 3.6 - 4.0 L of fresh clean water per 20 kg bag of material to achieve flowable consistency of grout. Always add the grout powder to pre-measured water. Cold water is

recommended. Water quantity is critical to obtaining uniform consistency. Excess water will cause grout to segregate and bleed. Mix for 3-5 mins until a consistent mix is obtained using a forced action mixer. For small quantities, an electric drill with a spiral mixing paddle is suitable. The speed drill should be approx. 500-600 rpm.

DO NOT MIX BY HAND.

Mix only what can be applied within the pot life period of approximately 20 minutes. Pass the mixed grout through a #4 sieve to remove any lumps immediately prior to placement.

Placement: Place the Denso 510 UW Grout into the prepared area, ensuring intimate contact with the bonding surface. Continuous grout flow is required. The UW Grout should be poured or pumped into place through a flexible hose, which is a minimum diameter of 12 mm, into the lowest point of the form work. When commencing restrict the flow to prevent any air entrapment. The hose should be maintained at a minimum of 150 mm below the surface level of the grout in the formwork to optimise performance.

The grout can be placed in thicknesses of up to 100 mm in one pour for above water applications. When under water up to 175 mm can be placed in one pour.

Large volume applications: For thicker applications, up to 250 mm above water and 500 mm below water Denso 510 UW Grout can be extended using clean rounded and well graded 9.5 to 12 mm aggregate up to 50% by weight of the grout. For such mixes a concrete agitator must be used. A positive displacement pump is recommended for large placement application. For large grout pours ensure that the grout is pumped from bottom upwards as this will minimise air entrapment and ensure complete void filling.

Weather extremes: In cold weather tidal applications exposed to air, protect the Denso UW Grout from freezing until it reaches 6.9 MPa. Do not allow repairs to freeze until the material has reached a minimum of 6.9 MPa compressive strength. This should occur within 24 hours.

In hot weather applications above water level and exposed to air, keep the grout wet until final set time by covering with and maintaining wet cloths over the grout.

Unrestrained exposed surface areas should be kept to a minimum.

Contact Denso for special grout applications and placements.

## Recommended Temperatures

Application: 10°C to 30°C      Service: -20°C to 65°C

In instances where the temperature is greater than 30°C, grouting should be conducted early in the day or late in the evening and kept sheltered from sunlight/heat.

## Limitations/Precautions

Do not exceed the recommended mix water amount. Use only clean mixing water. Mixing equipment should be cleaned as soon as possible.

Contains Portland Cement and sand. Cement will cause irritation. Dust respirator, safety goggles and rubber gloves are recommended, Avoid prolonged contact with skin. Avoid hazards by following all precautions found in the Safety Data Sheet (SDS), product labels and technical literature prior to use of the product.

## Receiving

It is recommended that all bagged products are checked for dryness prior to signing shipping papers.

## Packaging

20 kg bags.

## Shelf Life/Storage

Shelf life of  $\geq 9$  months when stored in unopened bags. Large temperature differentials or high humidity can shorten shelf life. Store in a cool, dry area and away from heat and direct sunlight.



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