



Approved Quality
Management System
AS/NZS ISO 9001:2008
Lloyds Register-Certificate
No. MEL 0927759

Technical Data Sheet
SEASHIELD 510
UNDERWATER GROUT

Description:	Denso Seashield 510 Underwater (UW) Grout is an underwater pumpable cementitious based non shrink grout. It is specially formulated for minimal washout and is salt water resistant.
Composition:	A specific blend of Portland cement, specially graded aggregates and admixtures designed for controlled expansion, cohesiveness and maximum fluidity and strength. A cementitious based non shrink grout for use in underwater repairs such as pile restoration.
Characteristics:	<ul style="list-style-type: none"> • free flowing, easily pumped for underwater placement • thixotropic, wash out resistant, technology • high early and ultimate strength for fast repairs and turn around without chlorides • non shrink for maximum durability and adhesion • seawater resistant • complies with US Corps of Engineers CRD C-621 (plastic and flowable conditions) • 100% solids, VOC free • designed for underwater and other wet applications
Uses:	Denso Seashield Underwater Grout is designed for underwater use in tidal zones in applications requiring a non shrink, non metallic, washout resistant grout from 12mm up to about 75 mm coating thicknesses. Underwater grouting of bridge columns, concrete pilings, concrete tanks, dam repairs, seawalls, piers and other marine structures.
Surface Preparation & Application:	<p>The concrete must be clean and sound, free of all marine growth, foreign material, including, laitance or other surface contaminants. All loose material must be removed.</p> <p>Permanently immersed substrates should be sand blasted or cleaned with a high pressure water jet.</p> <p>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.</p> <p>Mix 4.0 - 4.5 litres (depending on desired consistency) of fresh clean water per 22.6 kg (50 lb) bag of material. Water quantity is critical to obtaining uniform consistency. Mix with a heavy duty low speed drill. Add recommended amount of clean water into the container, followed by the Denso UW Grout. Mix 3 to 4 minutes to desired consistency. 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.</p> <p>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 tube, 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 tube should be maintained at a minimum of 150 mm below the surface level of the grout in the form work.</p> <p>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.</p>



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Surface Preparation & Application: (continued)	<p>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 13 mm aggregate up to 50% by weight of the grout. For such mixes a concrete agitator must be used.</p> <p>In cold weather tidal applications exposed to the air protect the Denso UW Grout from freezing until it reaches 6.9 MPa (1000 psi). Also 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.</p> <p>In hot weather for applications above the water level that will be exposed to the air keep the grout wet until final set time by covering with and maintaining wet cloths over the grout.</p> <p>Unrestrained exposed surface areas should be kept to a minimum.</p>
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Recommended Temperatures:	<p>Application: ≥ +7.5 °C, preferably + 18 to + 30 °C</p> <p>Service: - 20 to 65 °C</p> <p>Peak: + 65 °C</p>
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Storage:	Large temperature differentials or high humidity can shorten the shelf life. Store in a cool, dry area away from heat and direct sunlight.
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Available Sizes:	By Weight: 22.6kg (50 lb) bag, 1350kg (3000 lb) bulk bag.
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Physical Properties:	Test	Test Method	Units	Value	
	Density	ASTM D1475	kg/L	1.80	
	Set Time @ 21°C	ASTM C266	hours	Initial Set	
	Final Set			4.5	
	@ 4°C			Initial Set	10
	Final Set			12	
	Compressive Strength	ASTM C109	MPa	1 day	
				3 days	37.9
				7 days	43.4
				28 days	52.4
	Flexural Strength	ASTM C190	MPa	9.7	
	Tensile Strength	ASTM C190	MPa	4.1	
	Coefficient of Thermal Expansion	ASTM C531	per °C	8.45 x 10 ⁻⁶	
	Bond Strength	ASTM C882	MPa	12.7	

Limitations:	Do not exceed recommended mix water amount. Use only clean mixing water. Denso UW Grout is a fast setting product, so mixing equipment should be cleaned with water as soon as possible.
Precautions:	<p>Contains Portland Cement and sand. Cement will cause irritation. Dust respirator, safety goggles and rubber gloves are recommended. Avoid prolonged contact with skin.</p> <p>In case of contact with eyes, immediately flush with water for at least 15 minutes and seek prompt medical attention.</p> <p>Do not wear contact lenses when working with this product. Do not take internally. Keep out of reach of children. Follow all precautions found in any available Safety Data Sheets, product labels and technical literature.</p>