

CCS™ GROUT, UNDERWATER

Structural Epoxy Adhesive For Pressure Injection Grouting

CCS Grout, Underwater is a two-component, low viscosity, structural epoxy crack injection adhesive designed for application with pressure injection equipment. CCS Grout Underwater is formulated for wet or underwater uses requiring resistance to creep and stress relaxation, maintenance of mechanical properties at high in-service temperatures and high load bearing strength. Excellent substrate wetting and water displacement properties provide adhesion and high bond strength under adverse application conditions, e.g., cold, submerged concrete, steel word or FRP. Primary uses include the structural repair of cracks and delaminations in concrete, masonry, stone and wood; filling of voids in porous and honeycombed concrete and grout; adhesive bonding of steel plates and FRP pier and piling forms (external reinforcement); and, anchoring bolts, dowels and rebar into concrete, masonry or rock when the substrate is immersed or submerged in water and structural crack repair. Underwater bonds to dry, damp and wet substrates and to substrates immersed or submerged in fresh or salt water. It has a convenient 2:1 (by volume) mixing ratio and complies with ASTM C881, Type IV for load bearing uses.

Features

Convenient 2: 1, by vol. mix ratio

Fast cure for short downtime

Bonds to dry, damp, wet, immersed and submerged substrates

Suitable for use in both fresh and salt water

Exceptional wetting for adhesion under adverse conditions

Does not embrittle; stays tough and resilient

Contrasting A and B component colors

Environmentally safe - 0 VOCs

Limitations: The recommended minimum substrate temperature during installation and for cure is 40°F. The maximum in-service temperature should not exceed 20 deg. F below the HDT in bonding applications subjected to substantial and sustained shear stresses that may cause creep. Installed thickness in excess of ¼" may require the use of pre-placed aggregate to dissipate heat generated during the cure process. Do not add solvents or thin this material.

Packaging & Colors: Standard package sizes of Part A & Part B are 3 and 15 gallons. Standard color is Dark purple. Clear-amber by special order.

Shelf Life: Three years minimum in unopened, original containers when stored between 60- 90°F in a dry place away from sunlight. Remixing of components may be required upon prolonged storage.

Chemical Resistance: CCS Grout, Underwater has excellent resistance to a wide range of commonly encountered chemicals including acids and bases, aircraft and automotive fluids, cutting oils, etc. Performance is function of the specific chemical and concentration, exposure times and housekeeping procedures. For information on specific chemicals and exposure conditions, contact a ChemCo Systems, Inc., technical representative.

Surface Preparation: Concrete surfaces may be dry, damp, wet, immersed or submerged but must be sound and free of all bond-inhibiting substances. Prepare cracks by blowing clean with oil-free compressed air or by flushing clean with an appropriate cleansing solution as required to remove foreign substances and contaminants. Prepare exposed surfaces for bonding in accordance with ASTM D 4259 or ACI 503R and ChemCo Systems' specific recommendations. Properly prepared concrete surfaces should have a minimum strength of 250 psi in direct tension. Steel surfaces should be cleaned to "white metal" according to SSPC SP 5. In underwater and tidal zone applications where cleaning of the substrate is possible, the product may have to be applied within a relatively short period of time (30 minutes to several hours) after substrate preparation to achieve a strong bond (to avoid regrowth of algae). Contamination of the concrete surface may negatively affect the bonding capability of the product.

Mixing: CCS Grout, Underwater is a two-component system designed specifically for use with automatic meter, mix and dispense application equipment. The resin to hardener (Part A: Part B) mix ratio is 2:1, by volume. Job specifications should include provisions for routine periodic testing of the grouting equipment to determine that it is metering the components accurately and delivering thoroughly mixed material. Read safety data sheets (SDS) before handling the product. Wear safety glasses and rubber gloves when handling the materials. Premix the individual components before drawing from bulk packaging.

Installing: Install material in accordance with established industry procedures and guidelines. Use only trained workmen with experience in pressure injection repair. For additional information on repair by pressure injection grouting, see ACI 503R, Chapter 7, "Applying Epoxy Compounds." Allow for adequate cure of the epoxy adhesive before the structure is returned to service. CCS Grout Underwater reaches approximately 5000 psi compressive within 5 hours at normal ambient temperatures (72°F).

TYPICAL PROPERTIES (1)

Property (2)		Test Method	Value
Mix Ratio, A:B,	by vol		2: 1
	by wt		100: 44
Color:	Part A	VISUAL	Clear amber
	Part B		Dark purple
	Mixed		Dark purple
Weight per Gallon, lb:	Part A	ASTM D 1475	9.5
	Part B		8.3
	Mixed		9.1
Viscosity, cp:	Part A	ASTM D 2393	300
	Part B		150
Viscosity @ 40° F, cp:	Part A	ASTM D 2393	1800
	Part B		850
Gel Time, 100 g, minutes:	@ 40° F	ASTM D 2471	50
	@ 73° F		15
Tensile Strength, psi		ASTM D 638	7800
Elongation at Break, %		ASTM D 638	2.0
Compressive Yield Strength, psi		ASTM D 695	14,600
Heat Deflection Temperature, deg. F		ASTM D 648	130
Wet Slant Shear Strength, psi (Cure schedule, 3 days @ 40° F)		AASHTO T-237	Cement mortar failure (3)

- (1) The properties listed are typical and descriptive of the product and should not be used for specification purposes. For specification preparation, reference the ChemCo Systems, Inc., product guideline specification.
- (2) Cure schedule, 7 days at 73° ± 4 F and test temperature, 73° ± 4 F unless otherwise indicated.
- (3) Compressive strength of cement mortar, 4500 psi.

Clean up: Excess mixed product is best removed from the work area and tools before it hardens. Use of rags and solvents such as acetone or heavy-duty detergents facilitate cleaning. Cured product may be removed from tools by soaking in an epoxy stripper.

Handling and Toxicity: This bulletin does not accompany the product when sold. For hazard warnings, safe handling and first aid instructions, READ CAREFULLY THE SAFETY DATA SHEETS AND CONTAINER WARNING LABELS. For industrial use only.

Part A: Liquid epoxy resin, HMIS Health Hazard Rating - 2 (Moderate Hazard). Warning! Causes eye and skin irritation. May cause allergic skin reaction. Harmful if swallowed. Avoid contact with eyes, skin and clothing. Wash thoroughly after handling. Avoid prolonged or repeated contact with skin.

Part B: Liquid epoxy hardener, HMIS Health Hazard Rating - 3 (Serious Hazard). Contains alkaline amines. Danger! Causes severe eye and skin burns. May cause allergic skin and respiratory reaction. Combustible, corrosive. Do not get in eyes or skin or on clothing. Avoid breathing vapor. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Keep away from heat and open flame.

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