

CCS™ BONDER LIQUID LWL

Long Work Life Epoxy Liquid Adhesive For Bonding

CCS Bonder Liquid LWL (Long Work Life) is a two component, long working life, structural adhesive. The physical properties of the product allow its use in applications requiring resistance to creep and stress relaxation, maintenance of mechanical properties at high ambient temperatures and high load bearing strength. Applications include the structural bonding of plastic (fresh) concrete to hardened (existing) concrete; bonding of concrete, masonry, stone, wood, steel and FRP; and anchoring bolts, dowels and rebar into downward oriented holes or horizontal slots in concrete, masonry or stone and as a binder in polymer concretes with aggregates. The working/cure time and viscosity of Bonder Liquid, Long Work Life can be adjusted by blending with the appropriate companion products. The product bonds to dry, damp and wet substrates and meets the ASTM C881 Types I, II, IV and V (and AASHTO M 235) as well as the ACI 548.13-14 requirements for bonding agents in non-load and load bearing applications from new to old concrete.

Features:

- Convenient 2 : 1, by vol. mix ratio
- Long work life for high temperatures, limited access
- Bonds to dry, damp and wet substrates
- Low exotherm aids mass applications
- Adjustable work life/viscosity using related product blends
- Exceptional substrate wetting/water displacement
- Environmentally safe - No VOC solvents

Limitations: The recommended minimum substrate temperature during installation and cure is 45° F. (For installation and cure temperatures down to 40° F or when a faster cure is needed, use CCS Bonder Liquid SWL.) The maximum in-service temperature should not exceed 20° F below the HDT in bonding applications subjected to substantial and sustained shear stresses that may cause creep. When bonding plastic concrete containing resinous admixtures, establish the suitability of the concrete mix before actual use. Do not add solvents or otherwise thin this material.

Packaging & Colors: Standard package sizes of Part A & Part B are 3 and 15 gallons. Standard color is concrete gray.

Chemical Resistance: CCS Bonder Liquid LWL has excellent resistance to a wide range of commonly encountered chemicals including acids and bases, aircraft and automotive fluids, cutting oils, etc. Performance is a 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 or wet but must be sound and free of all bond-inhibiting substances. Prepare surfaces in accordance with *ASTM D 4259* or *ACI 503R* and ChemCo Systems' specific recommendations. Cleaned 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.

Mixing: CCS Bonder Liquid LWL is a two-component system. The resin to hardener (Part A : Part B) mix ratio is 2 :1, by volume. Read material safety data (MSDS) information before handling the product. Wear safety glasses and rubber gloves when handling the materials. Premix the individual components before drawing from bulk packaging. Transfer the appropriate quantities of Part A and Part B into a mixing container. Use quantities that can be applied before the pot life of the material expires. Blend thoroughly using a Jiffy mixer blade attached to a low speed (350 - 750 rpm) electric or pneumatic drill. Proper mixing will take 2 - 3 minutes.

Installing: Pour mixed material onto the prepared substrate and spread to the specified coverage with a V-notch trowel, squeegee or paint roller surfaces. Allow all coated substrate surfaces to rest for 5 - 10 minutes before pouring fresh concrete or mating with another surface. In plastic to hardened concrete bonding applications, the bond line should be at least 15 mils. Lightweight concrete may require a second coat of adhesive. In other bonding applications, bond line thickness is less critical but should be at least 4 mils above the peaks in the surface profile. For large surface area coverage, CCS Bonder Liquid LWL can be sprayed using a low pressure pole gun with a 1/4" or 3/8" tip.

For installation of reinforcement, the slot width or hole diameter is typically 1/4" greater than the width of the insert--this represents an annular space of 1/8". For large diameter anchor applications, holes can be prefilled with dried pea gravel and then Bonder Liquid LWL parts A and B are premixed and poured to match the top of the gravel fill to complete the polymer concrete mix. CCS Bonder LWL can also be used in premixed grouting applications with selected aggregates, please consult ChemCo Systems for recommendations.

Blending With Compatible Products: The working life/cure time of Bonder Liquid, LWL may be decreased, if required, by pre-blending the Part B with the Part B of the short work life product, Bonder Liquid, SWL. The viscosity of Bonder Liquid, LWL may be increased by blending the mixed product with mixed companion paste product, Bonder Paste, LWL. The long and short work life and liquid and paste forms of the product employ a 2 :1 (by vol.) mixing ratio that must be maintained at all times.

TYPICAL PROPERTIES ⁽¹⁾

PROPERTY ⁽²⁾		TEST METHOD	VALUE		
MIX RATIO, A : B,	BY VOL		2 : 1		
	BY WT		100 : 35		
WEIGHT PER GALLON, LB:	PART A	ASTM D 1475	12.1		
	PART B		7.9		
	MIXED		10.7		
VISCOSITY, P:	PART A PART B MIXED	ASTM D 2393	@ 50° F	@ 73° F	@ 105° F
			300	110	35
			10	4	1
			70	30	10
GEL TIME, 1 QUART,	HOURS	ASTM D 2471	4.4	1.4	0.5
THIN FILM PROPERTIES:					
OPEN TIME, HOURS		AASHTO T-237	5	4	0.7
HARD DRY TIME, HOURS		ASTM D 1640	36	10	3
CURE TIME, DAYS		AASHTO T-237	14	7	3
TENSILE STRENGTH, PSI		ASTM D 638	6000		
ELONGATION AT BREAK, %		ASTM D 638	2		
COMPRESSIVE YIELD STRENGTH, PSI		ASTM D 695	10,000		
COMPRESSIVE MODULUS, PSI		ASTM D 695	350,000		
FLEXURAL STRENGTH, PSI		ASTM D 790	10,000		
FLEXURAL MODULUS, PSI		ASTM D 790	450,000		
HEAT DEFLECTION TEMP., °F		ASTM D 648	120		
BOND STRENGTH, PSI:	2 DAY CURE @ 60° F	ASTM C 882	1000 (3)		
	14 DAY CURE @ 60° F		1500 (3)		

- (1) THE PROPERTIES LISTED ARE TYPICAL AND DESCRIPTIVE OF THE PRODUCT AND SHOULD NOT BE USED FOR SPECIFICATION PURPOSES. FOR SPECIFICATION PREPARATION, REFERENCE 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.

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

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

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 - 2 (Moderate Hazard). Contains alkaline amines. Danger! Causes severe eye and skin burns. May cause allergic skin and respiratory reaction. 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.

DISCLAIMER: NO EXPRESS WARRANTY IS MADE WITH RESPECT TO THE RESULTS OF ANY USE OF THIS PRODUCT. NO IMPLIED WARRANTIES, INCLUDING AND NOT LIMITED TO AN IMPLIED WARRANTY OF MERCHANTABILITY OR AN IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE ARE MADE WITH RESPECT TO THIS PRODUCT. NO LIABILITIES FOR PERSONAL INJURY, LOSS OR DAMAGE RESULTING FROM THE USE OF THIS PRODUCT IS ASSUMED. CHEMCO SYSTEMS, INC., RESERVES THE RIGHT TO ALTER OR DISCONTINUE THE PRODUCT DESCRIBED HEREIN AT ANY TIME AND WITHOUT PRIOR NOTICE.

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