



ASTM C494, Type S
Certified
Admixture

**ChemConcrete
Hybrid Admixture
Durability & Waterproofing
Admixture**

ENGINEERING DATA
SHEET (June, 2024)

Description

Chem Concrete is a complex liquid mixture of inorganic elements introduced into Portland-based cement concrete during the batching process. It reacts quickly and permanently to disrupt and dwarf the normal capillary structure found in concrete to an Ultra Low Level. A combination of several technologies:

01 "Crystalline Growth" for self-healing micro cracks.

02 Pore-blocking technology to prevent water infiltration.

03 Hydrophobic Compounds for enhanced "water fearing" resistance.

04 Nano-Densifiers to "particle pack" at the molecular level.

Key Benefits

Chem Concrete is dosed off of cement content of your mix design; normal circumstances call for 2%. Usually about 2 gallons of Chem Concrete admix per cubic yard of concrete will unlock the formula to providing Ultra Low Permeability Concrete to un-matched levels, allowing for:

- ▶ Reduced Cement specified in your mix, lowering expense and providing significant carbon credit/savings.
- ▶ Eliminating or greatly reducing traditional water/damp proofing membranes and coatings normally specified.
- ▶ Providing key Corrosion Inhibiting characteristics in all your concrete applications, for ALL types of corrosion.
- ▶ Provided (Priced, Mixed, Delivered) as part of your Ready-mix or Precast Concrete requirements.
*Ultimate pricing is provided by your local ready-mix or precast producer.

TECHNICAL DATA

The following Technical Data is presented to support proper specification of Chem Concrete as the leading Durability Enhancing and Waterproofing Concrete Admixture system, and should be included in the mix design submittal process when appropriate.

CONCRETE PERMEABILITY

ASTM C31 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens

~ 170% @ 3 Days
~ 142% @ 7 Days
~ 130% @ 28 Days

~ 124% @ 3 Days
~ 115% @ 7 Days
~ 120% @ 28 Days

ASTM C78 - Standard Test Method for Flexural Strength of Concrete

ASTM C143 - Standard Test Method for Slump of Hydraulic-Cement Concrete

Slump increased 0.5 inches;
with 16% LESS mix water

The above results are summarized from our ASTM C494 - testing. Performed by a third-party testing lab, with mixes Standard Specification for Chemical Admixtures for Concrete designed around slump. Full reports available upon request.

MIX DESIGN – 5,000 PSI (at 28-days)

Type II/V Cement – 705 lbs.
 Water – 292 lbs. (35 gallons); 0.41 water:cement ratio
 1" x #4 Rock – 1374 lbs.
 3/8" x #8 Rock – 306 lbs.
 Wash Con. Sand – 1373

Type A WR, Zyla 625 – 35 oz./cu. Yard

*All aggregate weights are SSD condition,

**All sample sizes are all 1 cu. foot, mixed in a 3 cu. foot mixer,

***We have aggregate gradations & 3-point strength curves for this mix upon request.

The above mix design is from a local ready-mix producer in Southern California; Simi Valley, Grimes Canyon for the aggregate, and Cal Portland's Oro Grande cement. We have similar testing for other strategic regions throughout the United States and Canada – please feel free to inquire. If we don't have it already, we'd be glad to perform it for you.

Chem Concrete mix was designed at 2% of cement by volume = 2 gallons per cu. Yard.
 All measurements were taken at 28 days. Molds were stripped at 3 days.

TEST PROTOCOLS



ASTM C31 – Compressive Strength
 (Average of 2 specimens, in psi)



ASTM C78 – Flexural Strength
 (Average of 2 specimens, in psi)



ASTM C642 – Water Absorption
 (Average of 4 specimens, in %)



ASTM D5084 – Coefficient of Permeability
 (Average of 4 specimens, in cm/sec. & US Perms)

CONTROL MIX

CHEM CONCRETE MIX

5,893

7,429

*Chem Concrete mix showed a 126% increase over control. We found similar results at 3 & 7 day breaks too.

491

561

*Chem Concrete mix showed a 122% increase over control. We found similar results at 3 & 7 day breaks too.

5.25%

0.76%

*Chem Concrete mix showed a 86% decrease over control.

8.49x10⁻⁸
0.148

3.21x10⁻¹⁰
0.0056

*Chem Concrete mix showed a 96% decrease over control.

COMMENTARY & VALUE PROPOSITION

As both researchers and practical tradesmen, we take the initial assumption that if you could design, order and install concrete designed at a 0.38 w/cm ratio- concrete structures would be close to perfect. Low shrinkage. Low water permeance. High corrosion inhibition. Durable, long-lasting and high performance....would be the norm. Reality is different. Budgets, realworld costs, and project circumstances rarely allow for such a 'tight' mix design placement. So then we look to real-world solutions & answers. Pozzolans were a good answer. High quality fly ash and slags. Super Plasticizers are a good answer. High range water reducers that give us excellent rheologies. Chem Concrete, is the next good answer. Plasticizer effect. Ultra Low permeability. Exceptional corrosion inhibition. Affordable. Relevant. Available.

Chem Concrete Hybrid admixture's Sustainability Proposition is significant. The test data supports redesigning mixes with up to 30% less cement, and still achieve desired results & characteristics of your concrete (at certain dosages). Testing also reveals we have not seen true "protection" with a disrupted capillary system anywhere before with a 'price point' so within reach, lowering concrete permeance to such dramatic levels. It would be conservative to practically triple the Life Span design of all your concrete structures. Triple.



Chem Concrete's Value Proposition is clear ~ We will quickly and permanently disrupt the capillary system in portlandbased concrete to an ultra-low level, each and every time as to not be below 98% solid - or "WaterProofed". Any mix you want to use, at an attractive price point. The applications are immense; with almost any concrete application worth considering. We sell expressly through established commercial ready-mix and precast producers throughout the USA and Canada. And we know full well, as we sit on just about every relevant ACI National and ASTM committee dealing with this type of product and appropriate testing, there is no 'silver bullet' test nor procedure. If you have a particular test or protocol you'd like to see data on, reach out today. We'd be glad to test it....as we can never get enough testing. In reality, Chem Concrete may be the most widely and thoroughly tested material ever brought to market.

Contact US

For more information, discuss you next project or to schedule your firms Product Roundtable & get your entire project delivery team up to speed:

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