CHEM CONCRETE

Manufacturer & Supplier of ChemConcrete Hybrid Admixtures

NATA-Accredited Concrete Laboratory ABN: 79 652 759 772

Operating in Australia, New Zealand, USA, Canada, South America, Caribbean, India, Europe, … with Distributors Worldwide.

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PRODUCT TECHNICAL DATA

R4: 15/01/2026

ChemConcrete Hybrid Admixture

Waterproofing, Durability-Enhancing, Corrosion Inhibiting & Strengthening Admixture

• Introduction

ChemConcrete Hybrid Admixture (Waterproofing, Durability-Enhancing, Corrosion-Inhibiting and Strengthening Admixture– Patent AU2023902368) is a next-generation, multifunctional concrete admixture engineered to enhance the overall performance and service life of concrete. This advanced technology is among the most comprehensively independently tested admixtures available, validated by more than 200 accredited laboratories and universities worldwide. It enhances fresh properties, mechanical strength, and long-term durability while reducing carbon footprint and producing permanently waterproof concrete. ChemConcrete Hybrid Admixture functions as a “Complete Concrete Enhancement System”. It is classified as non-toxic, environmentally friendly, and non-hazardous. The product significantly improves the durability of concrete structures exposed to aggressive environments, including seawater, chlorides, acids, sulphates, rainwater, salts, ASR, freeze–thaw cycles, efflorescence, and both static and hydrostatic water pressures. Conventional waterproofing admixtures typically rely on a single mechanism—such as hydrophobic agents, crystalline growth systems, or pore-blocking technologies. In contrast, ChemConcrete integrates multiple synergistic mechanisms, including hydrophobic compounds, pore-blocking agents, self-healing components, and nano-densifying technologies. These modified and optimised chemistries work simultaneously to severely disrupt the capillary network and refine the pore structure, resulting in ultra-low permeability and ultra-high durability. Concrete treated with ChemConcrete meets the requirements of all existing standards for waterproof and durable concrete. Extensive independent testing and research conducted by accredited organisations confirm its superior performance compared with conventional technologies. The admixture is compatible with various cement types, including blended cements, as well as supplementary cementitious materials (SCMs) such as fly ash, GGBS, and silica fume. It is also compatible with commonly used chemical admixtures and performs effectively in both cold and hot climates. Independent testing by accredited laboratories compliant with AASHTO and NATA standards has confirmed full compliance with ASTM C494, AASHTO M194, and AS 1478 (Type S) standards.

• Properties

Appearance	Off-white liquid
Unit weight	~ 1.3 gr/cm^3
Chloride ion content	< 0.001%
Solid content	~ 30%
pH	6 - 8

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• Applications

ChemConcrete Hybrid Admixture is primarily used to:

1. **Enhance durability and extend service life of concrete structures and pavements.**
2. **Reduce cement consumption, lowering CO_2 emissions and overall material costs.**
3. **Prevent water ingress in water- and liquid-retaining structures, basements, and other below-grade applications.**
4. **Replace silica fume and other SCMs as a more cost-effective and performance-reliable alternative.**

This advanced multifunctional admixture has been independently validated to reduce cement content by up to 32% (depending on dosage used) while improving fresh properties, compressive strength, and long-term durability. This makes it particularly suitable for sustainability-driven projects targeting low-GWP concrete mixes. Even at a fixed water-to-cement (w/c) ratio, the admixture enables cement reduction of up to 25%, primarily due to its significant strength-enhancement effect. This results in substantial reductions in both production costs and carbon footprint without compromising performance. Typical Applications of ChemConcrete Hybrid Admixture include:

- ✓ **Basements and foundations**
- ✓ **All sustainability-driven projects targeting low-GWP concrete mixes**
- ✓ **Bridge decks and marine structures (wharves, jetties, boat ramps)**
- ✓ **Tunnels and shotcrete applications**
- ✓ **Concrete pavements and pavers**
- ✓ **Parking structures and podium decks**
- ✓ **Water tanks, OSD tanks, dams, and sewer pipes**
- ✓ **Concrete waterways and pipelines**
- ✓ **Swimming pools**
- ✓ **Piles and marine foundations**
- ✓ **Concrete blocks, bricks, and tiles**
- ✓ **Roofs, balconies, kerbs, and road barriers**
- ✓ **Reclaimed land and aggressive service environments**

The product is particularly suited for marine and chemically aggressive environments, where exposure to salts, chlorides, sulphates, organic acids, and other corrosive agents is expected. It is also ideal for damp or permanently wet conditions where moisture transfer, water absorption, and chemical ingress must be strictly controlled. ChemConcrete permanently waterproofs concrete under both static and hydrostatic water pressure. Independent comparative testing has demonstrated that it is over 60-80% more effective than any conventional waterproofing admixtures in reducing water absorption and permeability, while significantly improving long-term durability and structural lifespan.

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- ## Product Performance

Water Absorption, Permeability, Strength, Workability, Shrinkage, and Creep

ChemConcrete Hybrid Admixture significantly reduces the water absorption rate and permeability of concrete compared with untreated mixes under both static and hydrostatic water pressure (see Table 1). The hydrophobic effect is carefully controlled, ensuring the concrete remains compatible with coatings and membranes and maintains excellent surface adhesion.

At equivalent cement content and constant workability (slump), ChemConcrete Hybrid Admixture enhances 28-day compressive, flexural, and tensile strengths by up to 50%, depending on dosage (Table 1). Early-age performance is also substantially improved, with 1-day compressive strength increases of up to 70%. The modulus of elasticity is approximately 15% higher than that of comparable untreated concrete.

In addition, the admixture reduces drying shrinkage by 20–30%, improves creep resistance, enhances abrasion resistance, and refines surface finish. Independent testing confirms a marked reduction in early-age cracking and surface defects.

ChemConcrete Hybrid Admixture promotes superior matrix cohesion, effectively eliminating excessive bleeding and segregation. It improves workability (slump) and finishability, while exerting minimal influence on setting time and heat of hydration.

Table 1. Effect of ChemConcrete Admixture on concrete properties (laboratory tests results).

Property	Control concrete	ChemConcrete*	Reference
Water absorption	7.31 %	1.88 %	ASTM C 642
Water Penetration	13 mm	2 mm	DIN 1048
Initial surface absorption test (ISAT) ($ml \cdot m^{-2} \cdot s^{-1}$)			BS 1881: 2008
10 min	0.55	0.01	
30 min	0.30	0.005	
Compressive strength	43 MPa	60 MPa	ASTM C39
Flexural strength	5.70 MPa	7.70 MPa	ASTM C78
Slump	130 mm	130 mm	ASTM C143

* For particular concrete mixes and site conditions, it is suggested to evaluate the specific effect of ChemConcrete Admix on the properties of concrete through site trials prior to the application.

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Durability

Ingress of water and waterborne contaminants is the main reason responsible for all the major physical and chemical degradations of concrete structures and pavements. Research shows that there is a relatively direct relationship between the durability of concrete and its porosity, water absorption rate, and permeability. The reduced porosity, water absorption, and permeability of concrete containing ChemConcrete Admixture drastically slows down the diffusion of aggressive chemicals into concrete and significantly improves protection against reinforcement corrosion and alkali-silica reaction (ASR). Moreover, ChemConcrete Admixture significantly improves the durability and service life of concrete exposed to seawater, chloride, acid, sulphate, rainwater, salt, freezing-thawing, and efflorescence. The chloride ion content of the product is below 0.001%. Test results show that this product complies with the corrosion behaviour requirements given in BS EN 934-1-2008, Clause 5.1, by testing to BS EN 480-14-2006. This product is effective under both static and hydrostatic water pressure. Cracks in concrete are a common phenomenon due to its relatively low tensile strength. However, the reduced shrinkage and self-healing ability of concrete treated with ChemConcrete Admixture assists in eliminating/repairing its micro-cracks autogenously. Besides, after 300 freeze-thaw cycles, the concrete samples treated with ChemConcrete Admixture (containing an air-entraining admixture) indicated ~ 102% relative durability. A relative durability factor of 115% was achieved when no air-entraining admixture was used in the concrete containing ChemConcrete Admixture. Its low alkali content significantly reduces the ASR and improves the freeze-thaw resistance of concrete. Tests results show that this admixture significantly mitigates the ASR of all types of concrete including waste glass-based concrete. This product complies with the requirements of **ASTM C494** and **AS1478**, as tested by well-known AASHTO and NATA accredited laboratories.

- ## Mix and Dosage

ChemConcrete Admixture should be used at a dosage of **10 - 20 litres per cubic meter** of concrete (2 to 4 gallons per cubic yard). A wider dosage range of **5 - 25 litres** may also be used, depending on the design requirements and successful trial tests conducted before field application. It is recommended to add the admixture to the concrete mix after about 50% of the mixing water has been added (do not add the admixture to dry materials). The remaining mixing water should then be gradually added until the target slump is achieved. This admixture is composed of several proprietary chemicals, two of which act similarly to workability aids (e.g., plasticizers); therefore, a small amount of water can sometimes increase workability (slump) significantly. It is recommended to add this admixture at batching plants; however, it can also be added to concrete trucks on-site and mixed at a relatively high speed for 3 to 4 minutes or until thoroughly dispersed. Consult with a technical staff member from CHEM CONCRETE to determine the appropriate dosage. When incorporating in concrete, the temperature of the mix must be above 6 °C.

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- ## Packaging and Storage

ChemConcrete Admixture has a shelf life of 12 months when stored under proper conditions. After this period, trial tests must be conducted to ensure that the admixture can still deliver the desired performance. It must be stored at room temperature. This admixture is available in 2-liter and 15-litre pails and 1000-liter IBC tanks.

- ## Environmental Friendliness

The ingredients used in the manufacture of ChemConcrete Admixture are classified as non-toxic, environmentally-friendly, and non-hazardous chemicals with “no or very low risk to human and environment” based on AICIS, Australia. The manufacturing process of this product is environmentally-friendly with nil greenhouse gas emissions. For further information and advice regarding transportation, handling, storage and disposal of chemical products, user should refer to the actual Safety Data Sheets containing physical, environmental, toxicological and other safety related data. User must read the current actual Safety Data Sheets before using any product.

- ## Legal Disclaimer

The information, and, in particular, the recommendations related to the application and end-use of ChemConcrete Hybrid Admixture, are given in good faith based on CHEM CONCRETE team’s current knowledge and experience on the product when properly stored, handled, and used in normal conditions in conventional concrete in accordance with recommendations provided by CHEM CONCRETE team. In practice, the user of the product must investigate the product's suitability for the intended application and purpose, and CHEM CONCRETE reserves the right to change or enhance the properties of its products and update the related technical information. All orders are accepted subject to our current terms of sale and delivery.

***Under some specific terms and conditions, CHEM CONCRETE may provide performance-based warranties, sometimes up to the design life of the projects, when ChemConcrete Hybrid Admixture is used. Please consult this with a technical team member of CHEM CONCRETE in Sydney office, Australia.**