

## Powder Crystalline Waterproofing Additive for Concrete

- ☑ **Capillary/Crystalline**
- ☑ **Dosage rate 0.8% of cement weight**
- ☑ **Reduces water penetration**
- ☑ **Permanently active**
- ☑ **Not a vapor barrier**
- ☑ **Protects reinforcement**

### Product Description

AQUAFIN®-ADMIX-AQ100P powder admix is a state-of-the art formulation using Portland cement, well graded fine quartz sand and a high concentration of various proprietary inorganic waterproofing chemicals. These chemicals react with moisture and the free lime in the concrete, creating millions of insoluble crystalline fibers, which fill the pores, capillary tracts and minor shrinkage cracks within the concrete. Passage of water through the concrete, either from the positive or negative water pressure side is permanently blocked and the reinforcement protected from corrosion.

ADMIX-AQ100P is added to the concrete mix at the time of batching or at the job site.

### Working Principle

- During concrete hardening ADMIX-AQ100P forms millions of fine crystalline fibers inside the capillary pores.
- Crystalline fibers reduce the pore diameter, thus blocking the flow of water through the capillary voids.
- Treated concrete is permanently watertight.

Under dry conditions the ADMIX-AQ100P chemicals lie dormant, however they reactivate whenever re-exposed to moisture, even years later.

ADMIX-AQ100P can seal static cracks up to 1/64" (0.4 mm), which occur months or years after the concrete has cured and hardened.

ADMIX-AQ100P waterproofing chemicals start reacting immediately. However, it may require up to several weeks to reach its maximum waterproofing capability. Environmental factors such as ambient temperature, density of concrete, moisture present and weather conditions all can affect the timing of the sealing process.

Concrete treated with ADMIX-AQ100P protects against rebar corrosion, spalling, freeze/thaw cycles and weather related damage.

### Typical Applications

Any concrete mix requiring waterproofing (water impermeable) capabilities. (i.e. tunnels & subway systems, foundations, precast structures, parking structures, reservoirs, sewage & water treatment plants, swimming pools, underground vaults, etc.).

### Advantages

- Resists extreme hydrostatic pressure, positive (active) or negative (passive) water pressure side
- Can self-seal static hairline cracks up to 1/64" (0.4 mm)
- Becomes an integral part of the concrete
- Not a vapor barrier - allows concrete to breathe
- Negligible interference with water reducers & plasticizers
- Negligible effect on slump
- Negligible influence on air entrainment
- Impervious to physical damage and deterioration
- Non toxic ■ Inorganic, zero VOC (0%)
- Contains no chlorides ■ Permanent
- Less costly than most other methods.

### Dosage Rate

Standard dosage rate for concrete with maximum w/c ratio <0.45 (shotcrete <0.40), is:  
**0.8% of cement weight.**

Dosage rate may be increased for w/c ratio >0.45 to <0.55.  
Call our technical dept. for guidance if specific project requirements are to be met.

### Batching

#### A. Mixing

- ◆ Add ADMIX-AQ100P to the concrete mix at the time of batching or at the job site. The following mixing recommendations are guidelines only. Depending on the plant operation and equipment, the sequence of procedures may vary.
- ◆ The concrete mix should be minimum 40°F (4°C) when incorporating ADMIX-AQ100P.
- ◆ Do **NOT** add dry ADMIX-AQ100P powder to wet concrete mix. This may cause clumping and uniform dispersion can not be guaranteed. **Mix with water first, before adding to wet concrete.**
- ◆ ADMIX-AQ100P can retard the initial and final setting time of Portland cement Type I/ II concrete mixes. The amount of retardation depends on the mix design used and ambient temperature during placing and curing. Adjust or remove any set-retarding admixtures accordingly.
- ◆ In hot weather, the use of a retarding agent may be necessary to control the setting time. In cold weather an accelerator may be required.
- ◆ Use a retarder for mix designs containing Type II/V or Type III Portland Cement. Call

### Technical Data

Aggregate State:	Powder
Color:	Concrete Gray
Bulk Density:	~62 lbs/ft <sup>3</sup> (~1.0 kg/dm <sup>3</sup> )
pH - Value:	11 - 13.5
VOC:	0%

our office for acceptable products.

- ◆ Trial mixes under project conditions to determine setting time, slump, air content and compressive strength of concrete are highly recommended.
- ◆ Aggregates conforming to a well graded sieve curve are necessary to assure water tightness.
- ◆ Interference with accelerators or retarders: test before use.
- ◆ Contact our technical department if alkali sensitive aggregate is used.
- ◆ If the slump is below specification, add a mid or high range water reducer to achieve required slump. Alternatively, check with quality control technician if adding water is desired. Do not exceed the specified w/c ratio.

#### B. Ready Mix Plant - Central Mix Operation

1. Mix ADMIX-AQ100P with clean, potable water to a thin slurry consistency. I.e. 50 lb (22.7 kg) ADMIX-AQ100P powder with 4 gallons (15 L) water.
2. Pour the required amount of mixed ADMIX-AQ100P into the drum of the ready-mix truck.
3. Produce the cement, aggregate and additives as per concrete mix design in the batching plant. Take into account the amount of water already placed in the ready-mix truck (item B.1)
4. Drop the concrete mix into the ready-mix truck.
5. Mix at least 5 minutes to assure homogenous distribution of the ADMIX-AQ100P in the concrete.

#### C. Ready Mix Truck - Job Site Mixing

1. Mix ADMIX-AQ100P with clean, potable water to a thin slurry consistency. I.e. 50 lb (22.7 kg) ADMIX-AQ100P powder with 4 gallons (15 L) water.
2. Pour the required amount of mixed ADMIX-AQ100P into the drum of the ready-mix truck, containing the wet concrete mix.
3. Mix at least 5 minutes to assure homogenous distribution of the ADMIX-AQ100P in the concrete.

#### D. Precast Batch Plant

1. Fill the batch mixer with the designed amount of sand and aggregate.
2. Add the calculated amount of ADMIX-AQ100P and mix thoroughly for 3 - 5 minutes.
3. Add the cement and water and blend as per standard batching plant practices.

# ADMIX-AQ100P

## PLACING

Concrete containing ADMIX-AQ100P should be placed the same way as normal concrete.

## JOINTS & PIPE PENETRATIONS

Pouring ("cold"), control, crack control and expansion joints must be designed as if there was no ADMIX-AQ100P, using appropriate waterstop's or other technical measures. ADMIX-AQ100P does not prevent defects in concrete (i.e. honeycombs, cracks beyond specified limits, etc.). Consult Aquafin on particular applications.

Pipe entries or penetrations, formwork ties, etc. must be securely sealed to maintain watertightness.

## CURING:

Cure as per ACI Manual of Concrete Practice. (Latest Edition.) Wet cure the concrete with a fog mist spray, sprinkler or wet burlap for five days. Protect from rain, excessive wind, and sun. If a curing compound is used, it must conform to ASTM-C 309.

## DURABILITY

Concrete treated with ADMIX-AQ100P is more durable than equivalent plain concrete due to its reduced permeability.

## NON-CHLORIDE, NON-CORROSIVE

ADMIX-AQ100P will not initiate or promote corrosion of reinforcing steel embedded in concrete. Neither sodium chloride, calcium chloride nor any chloride-based ingredients are used in the manufacture of AQUAFIN ADMIX-AQ100P.

## FINISHES

If finishes are to be used on the negative side of ADMIX-AQ100P concrete, use cementitious coatings such as AQUAFIN-1K WHITE or equal. Thorough surface preparation is required to remove waterproofing crystals from the surface (i.e. minimum 4000 psi high pressure water blasting) prior to applying any top coats.

A bonding agent may be required when top coating hardened concrete containing ADMIX-AQ100P with water based products.

## PACKAGING

50 lb (22.7 kg) bags or 55 lb (25 kg) pails, or customized sizes, depending on size of truck mixers or customer requirements.

## Test Data based on a 4000 psi (27.8 MPa) concrete mix

I. Concrete Mix designs	Treated Mix		Control Mix	
	Lbs/ly <sup>3</sup>	Kg/m <sup>3</sup>	Lbs/ly <sup>3</sup>	Kg/m <sup>3</sup>
As per ACI-211-1				
<b>Materials:</b>				
Portland Cement, Type I/II	564	256	564	256
Sand, ASTM C-33	1350	614	1320	600
Aggregate, ASTM C-33	1750	795	1750	795
ADMIX-AQ100P, 0.8%	4.51	2.05	0.0	0.0
Water	264	120	301	137
Air Entraining Agent, oz	4.3	127 ml	4.3	127 ml
Superplasticizer, oz	56.4	1668 ml	56.4	1668 ml
Slump, inches (*)	3.0/7.0	76/178 mm	3.0/7.0	76/178 mm
Air content, %	6.0	6.0	6.0	6.0
Water/Cement Ratio	0.48	0.48	0.53	0.53
Plastic Unit Weight, lb/ft <sup>3</sup>	145.4	2.35	145.7	2.35
Initial Set time:	1 hr 50'	1 hr 50'	2 hrs 25'	2 hrs 25'
Final Set Time:	3 hrs 15'	3 hrs 15'	3 hrs 50'	3 hrs 50'

(\*) Slumps are before and after the addition of Superplasticizer.

II. TEST RESULTS	Treated Mix		Control Mix	
	Psi	MPa	Psi	MPa
1. Compressive Strength				
	3 days (ASTM C-39)	2830	19.5	2210
	7 days	3980	27.5	3280
	28 days	5540	38.2	4750
2. Tensile Strength				
	3 days (ASTM C-496)	407	2.8	330
	7 days	710	4.9	560
	28 days	940	6.5	740
3. Water Permeability				
	3 days (ASTM D-5084)	7.8 x 10 <sup>-9</sup>		4.95 x 10 <sup>-7</sup>
	7 days	1.4 x 10 <sup>-9</sup>		1.05 x 10 <sup>-7</sup>
	28 days	5.6 x 10 <sup>-10</sup>		2.5 x 10 <sup>-8</sup>
<b>Note:</b> All tests carried out by Independent Laboratory.				

## SHELF LIFE

Shelf life in unopened, undamaged bags is 12 months, pails 24 months.

## SAFETY

Refer to MSDS (Material safety Data Sheet). This product contains Portland cement and sand (crystalline silica) and is highly alkaline (corrosive) which may cause significant skin and eye irritation. Dust may cause respiratory tract irritation. Avoid breathing dust. Avoid contact with skin and eyes. Wear rubber gloves and safety goggles during mixing and

application. After contact with skin, wash with plenty of water. In case of eye contact, rinse immediately with plenty of water for 15 minutes and seek medical advice.

**KEEP OUT OF REACH OF CHILDREN.**

LIMITED WARRANTY: AQUAFIN, INC. warrants its products to be manufactured free of defects and to be consistent with its standard high quality. We will replace, or, at our election, refund the purchase price of, any product which is proven to be defective, provided that the product was properly applied. Our product recommendations are based on Industry Standards and testing procedures. We assume no warranties either written, expressed or implied as to any specific methods of application or use of the product. AQUAFIN, INC. MAKES NO WARRANTY AS TO MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED. AQUAFIN, INC. shall not be liable for damages of any sort including remote or consequential damages, down time, or delay. User shall determine the suitability of the product for his intended use and assume all risks and liability in connection therewith.



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