XYPEX® ECOLOGICAL RESILIENCE SUPPORTS LONG-LASTING CONCRETE INFRASTRUCTURE

Waterproofing Admixtures Characteristics

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There are a number of concrete waterproofing admixtures on the market with varying claims, performance and reactions.

One of the key performance differences is whether it is hydrophilic or hydrophobic. Often, people are unaware of the significance of this difference when looking at appropriate concrete admixtures. Is this something you have considered?

When investigating hydrophilic versus hydrophobic, it is important to understand that while they are called waterproofing admixtures, their tendencies and implications on their effectiveness and appropriateness for certain structures are not the same.

So, what is hydrophobic?

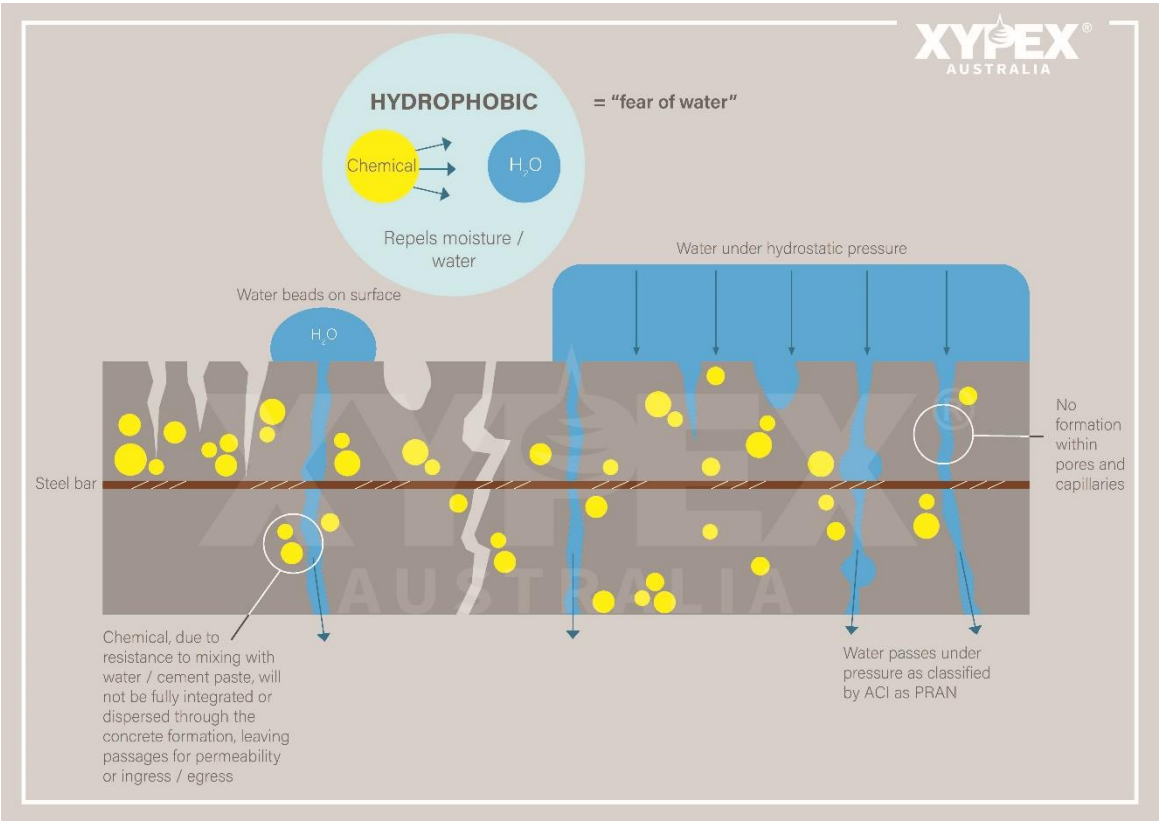
Hydrophobic means "fear of water". These admixtures repel water. This can appear effective as a sprinkling of water on the concrete surface may "bead".

The American Concrete Institute (ACI) defines these hydrophobic products under report 212.3 "Report on Chemical Admixtures for Concrete" as a PRAN classified treatment (Permeability Reducing Admixture for Non-Hydrostatic conditions).

Hydrostatic conditions will occur when any water ponds on the concrete surface.

Due to hydrophobic chemicals not fully integrating with water or the cement paste at a micro level and their repellent reaction to moisture/water, the product will not form a consistent presence across the concrete surface which leaves voids and capillaries free from the chemicals. Additionally, these chemicals do not react with moisture to form further crystalline structures. And so, they may reduce water penetration, but will not fully mitigate it.

When the hydrostatic pressure forces overcome the repellent forces, water can then pass through and/or ingress and egress can occur, which leads to water permeability and concrete deterioration



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And, hydrophilic?

Hydrophilic is when a substance is attracted to water resulting in chemicals to combine with water and the hydrated cement to become integral and spread throughout the concrete structure. In the case of hydrophilic Crystalline Technology, the moisture is used to build a Crystalline structure within the pores and capillaries through the reaction of the products chemicals, moisture, and by-products of the cement hydration.

When moisture presents in the concrete, the Crystalline structure develops and will continue to densify the structure. The ACI defines the nature of these products as a PRAH (Permeability Reducing Admixture for Hydrostatic Conditions), as these products will ensure any ponding or hydrostatic pressure is resisted and permeability does not occur.

If you have further questions around these differences or crystalline admixtures, contact the Xypex Australia Technical Department.