



Use of KIM® admixture: Instructions for mix design & batch plant

PRODUCT DESCRIPTION

Krystol Internal Membrane™ (KIM®) is a chemical admixture in dry powder form that is effective in creating waterproof concrete. KIM is used in place of externally applied surface membranes to protect against moisture transmission, chemical attack, and corrosion of reinforcing steel.

EFFECTS ON PLASTIC CONCRETE

- KIM reduces the water demand for a given slump. For most mixes, you can expect a slump increase of approximately 25 mm (one inch).
- KIM retards the initial and final setting times.
- KIM improves the pumpability of concrete.
- KIM entrains air *

Be aware of the differences in air entrainment between KIM and KIM-HS.

* KIM® - HS

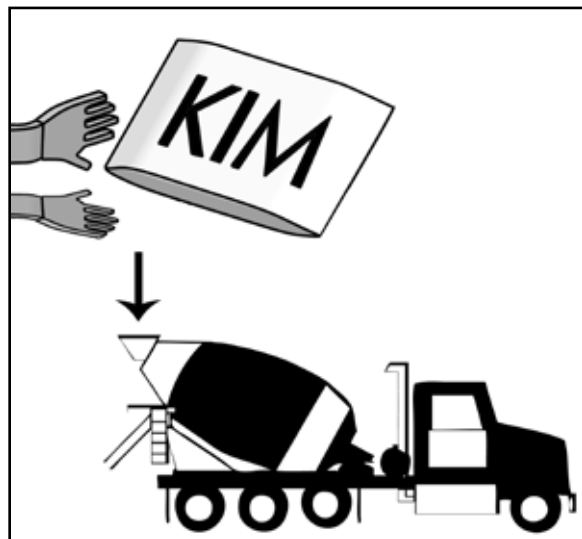
This specialized version of KIM® is available with reduced air-entrainment properties. KIM-HS is designed for applications where freeze/thaw resistance is not required. Typically, concrete with lower air content will produce higher compressive strength results. KIM will add about 3-5% air entrainment while KIM-HS will increase air content by approximately 1%.

COMPATIBILITY WITH OTHER CONCRETE MATERIALS

- KIM is compatible with other concrete admixtures, such as accelerators, air-entrainers, and plasticizers. However, care must be taken when using water reducers or plasticizers that may delay the setting time.
- KIM admixtures, Type B admixtures (set retarding), Type D admixtures (water reducing and set retarding) and fly ash may all retard the setting time of concrete. Avoid using all of these materials in the same mix design without first testing for compatibility.

MIX DESIGN CONSIDERATIONS

- Dose KIM at 2% by weight of cementitious materials (incl. SCMs such as fly ash and slag) to a **maximum dosage of 8kg** per cubic meter (13.5 lbs per cubic yard).
- Minimum **Portland cement** content shall in no case be less than **250kg** per cubic meter (420 lbs per cubic yard).
- Aggregates, cements and supplementary cementing materials can vary in properties from region to region – **Test batches are required** to assess the local plastic and hardened properties to determine appropriate mix designs.
- It is recommended that cast-in-place concrete be batched at water to cementitious ratio (WCR) of approximately 0.40 (0.37 for shotcrete). The maximum total WCR is either 0.45 (0.40 for shotcrete) or the specified maximum WCR. This includes all water present in the concrete and any added on route and on site.
- Ideal slump before the addition of KIM is 2" - 2.5" (50mm - 65mm). This provides sufficient shear for pumpable bags to disperse and to allow for complete mixing of KIM.
- Adjust or remove air-entraining admixtures (AEA) according to the results of your trial batches. Air content can be adjusted using air entrainers or air detrainers.



SAFETY

- Before using or handling, read the Material Safety Data Sheet for this product.
- Safety precautions for KIM concrete are no different than for normal concrete.
- KIM powder becomes caustic when mixed with water or perspiration. Take appropriate safety precautions to prevent contact with skin or eyes and to prevent breathing dust.



BATCHING CONSIDERATIONS

- Maintain the targeted WCR - Ensure that truck mounted mixers are empty prior to batching.
- Do not use recycled water.
- Eliminate variables - The use of recycled aggregates is not recommended.
- When using multiple admixtures in the same batch of concrete, they should be dispensed separately into the concrete to avoid intermixing and possible interference of the admixtures.
- KIM in pails – before opening, loosen compacted material by turning the pail over once or twice. Dispense directly into concrete mixer.
- KIM in bags can be thrown un-opened into the concrete mixer. The bags are designed to disintegrate in the mixer.
- Store any unused portions in an airtight container to prevent moisture contamination.
- Mix concrete for at least 10 minutes on medium/high speed after KIM dosage.
- If the slump is below specification, add a mid or high range water reducer to achieve the required slump. Only add additional water with the approval of the quality control technician. Record all water additions on the batch ticket and do not exceed the specified water-cement ratio.
- Under some circumstances, you may observe slump loss at 25-40 minutes. This is false set and slump may recover with continued mixing. False set may be avoided by dosing KIM on the project site. Avoid placing KIM during the false set period.

SHELF LIFE

KIM and KIM-HS admixtures have a minimum shelf life of 24 months for sealed pails, 12 months for wrapped skid bags, and 4 months for open skid or open pails.