



Use of KIM® Admixture: Instructions for Mix Design & Batch Plant

PRODUCT DESCRIPTION

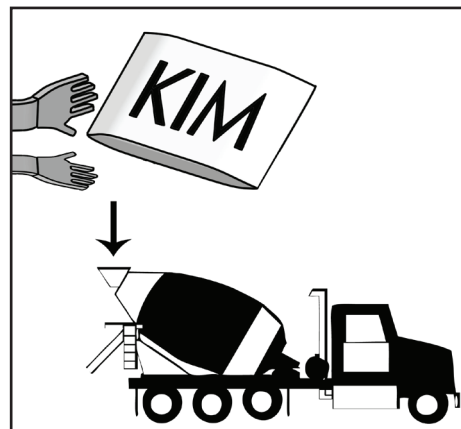
Kryton Internal Membrane™ (KIM®) is a chemical admixture in dry powder form that is effective in creating waterproof concrete. KIM is used in place of externally applied surface membranes to protect against moisture transmission, chemical attack, and corrosion of reinforcing steel.

EFFECT ON PLASTIC CONCRETE

The KIM® admixture has been specially formulated to meet the requirements of projects in different climate conditions as follows:

- **KIM-HS:** This version of KIM® is used for most common applications. KIM-HS is compatible with common admixtures, such as plasticizers, accelerators, retarders and air-entrainers.
- **KIM-AE:** This version of KIM® is specially designed for concrete requiring air-entrainment to resist freezing and thawing cycles. KIM-AE will increase air content by 3-5 %. Adjust or remove any air-entraining admixtures accordingly.
- **KIM-ES:** This version of KIM® is specially designed for use in hot climates and mass concrete. KIM-ES will prolong the slump retention of the concrete and delay the initial setting time. Adjust or remove set retarding admixtures accordingly.

All versions will typically delay the setting times of the concrete. Consult with a Kryton Technical Services Representative for the most appropriate KIM® admixture for your project.



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.

Be aware of the differences in air entrainment and retardation between KIM-HS, KIM-AE & KIM-ES.

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

- KIM-AE reduces the water demand for a given slump. For most mixes, you can expect a slump increase of approximately 25 mm (one inch).
- Dose KIM at 2% by weight of cementitious materials (incl. supplementary cementing materials such as fly ash and slag) to a **maximum dosage of 8 kg** per cubic meter (13.5 lbs per cubic yard).
- Minimum **Portland cement** content shall in no case be less than **250 kg** 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 50 mm - 65 mm (2" - 2.5"). This provides sufficient shear for pulpable 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.



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 WCR.
- 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 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.