

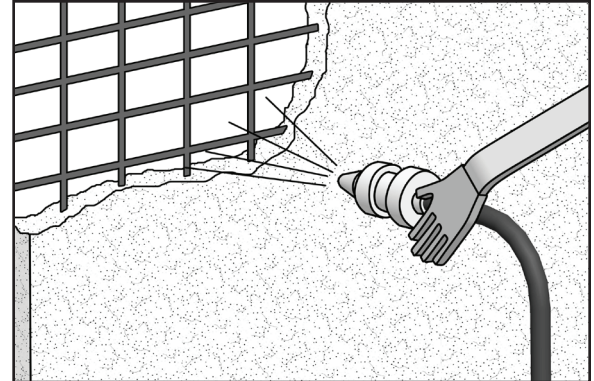


Use of KIM® Admixture: Instructions for Shotcrete Nozzleman and Crew

IMPORTANT

You are making a waterproof membrane out of shotcrete. This is different from traditional construction, where the shotcrete just forms the structure. The KIM shotcrete you are placing will be the only barrier to water penetration. This means that common defects found in typical shotcrete cannot be tolerated. Poor consolidation, unplanned cold joints, cracks, penetrations, contaminations, etc. will all result in a leaking structure. To avoid leakage and to achieve success, you must follow the critical instructions outlined in this document.

All nozzlemen and crew must be familiar with and follow the guidelines of ACI 506R Guide to Shotcrete.



PREPARATION FOR SHOTCRETING

- Ensure all formwork, reinforcing steel and embedded items are braced to avoid vibration and are designed to allow for the escape of compressed air and rebound.
- Ensure sufficient clearance around reinforcement to allow for complete encapsulation.
- Ensure that the Krystol® Waterstop System has been applied to all existing concrete/shotcrete surfaces (refer to Cold Joints and Construction Joints section below).
- Ensure that all pipes and other penetrations are prepared according to Application Instruction 303 - Waterproofing Pipe Penetrations.
- Ensure there are no unintended penetrations through the shotcrete element such as excess rebar, tie wires, etc. that could provide a migration path for water.
- Ensure that all surfaces to be shot are dampened to a saturated-surface-dry (SSD) condition immediately prior to shotcrete application. Drain free standing water away from shotcrete operations.

SAFETY

The safety precautions for shotcrete containing KIM admixture are the same as for regular shotcrete.

SHOTCRETE SUPPLY

Inspect the ready mix shotcrete batch ticket to verify that the correct shotcrete mixture has been supplied with KIM added at the specified addition rate.

SHOTCRETE APPLICATION

- Place shotcrete with sufficient velocity and plasticity so material flows around and behind the reinforcement. Follow proper shooting technique as detailed in ACI 506R Guide to Shotcrete.
- Cut out defects while the shotcrete is still plastic and reshoot the affected areas. Defects include:
 - Sloughs, delaminations, plastic shrinkage cracks, etc.
 - Entrapped rebound and overspray
 - Voids of incomplete consolidation, including shadows behind rebar
- Inform the shotcrete inspector or quality control supervisor of any conditions that prevent the placement of fully consolidated, waterproof shotcrete.



COLD JOINTS AND CONSTRUCTION JOINTS

- Cold joints represent a break in the shotcrete membrane and are vulnerable to water penetration. Whenever possible, build shotcrete elements to their full thickness in one layer to avoid cold joints.
- Apply the Krystol Waterstop System (consisting of Krystol Waterstop Grout and Krystol Waterstop Treatment) to all preplanned construction joints at the end of a shift using one of the following procedures:
 - Application Instruction 201 for wall-to-slab construction joints.
 - Application Instruction 203 for shotcrete-to-shotcrete construction joints.
 - Prepare pipes and other penetrations to receive the Krystol Waterstop System as described in Application Instruction 303.
- All surfaces to receive the Krystol Waterstop System must be free of contaminants and dampened to a saturated-surface-dry (SSD) condition to ensure adequate bonding.

REFERENCE

Application Instruction 201	Krystol® waterstop system (Internal Method) - wall to slab
Application Instruction 202	Krystol® waterstop system (External Method) - wall to slab
Application Instruction 203	Krystol® waterstop system (Shotcrete) - Horizontal and Vertical Construction Joints
Application Instruction 204	Krystol® waterstop system (Shotcrete) - Treatment of Unintended Cold Joints
Application Instruction 303	Waterproofing Pipe Penetrations

CRITICAL

Unintended cold joints may develop along lift breaks during bench gunning if the previous layer of shotcrete hardens before the next layer is placed. This is common during hot weather or when using highly accelerated mixes.

Inspect all lift breaks as described in Application Instruction 204, and apply a slurry coat of Krystol Waterstop Treatment before shooting the next layer if the previous layer has already hardened.