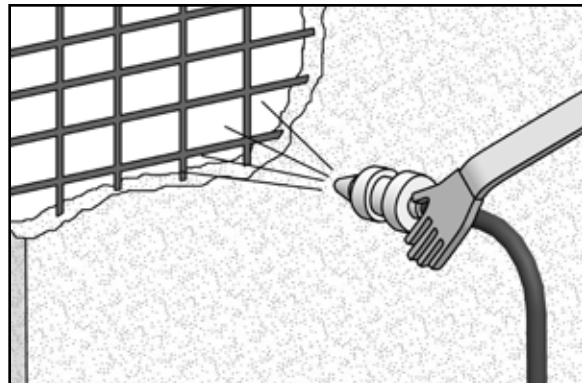




Use of KIM admixture: Instructions for shotcrete nozzleman and crew

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 achieve success you must follow the critical instructions outlined in this document.



All nozzleman 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 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.

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 area. Defects include:

- Entrapped rebound and overspray
- Voids of incomplete consolidation, including shadows behind rebar
- Sloughs, delaminations, plastic shrinkage cracks etc.

Inform the shotcrete inspector or quality control supervisor of any conditions that prevent the placement of fully consolidated, waterproof shotcrete.

SAFETY

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

Construction 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 203 for shotcrete-to-shotcrete construction joints.

Application Instruction 201 for wall-to-slab 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 | Treatment of Unintended Cold Joints When Bench Gunning |
| Application Instruction 303 | Waterproofing Pipe Penetrations |
| Technical Data Sheet 501 | Krystol Internal Membrane™ - KIM® (K-300, K-301) |
| Technical Data Sheet 601 | Krystol Waterstop Grout™ - Internal (K-322i) |
| Technical Data Sheet 602 | Krystol Waterstop Grout™ - External (K-322x) |
| Technical Data Sheet 603 | Krystol Waterstop Treatment™ (K-321) |

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.