

# Krystol® Waterstop System

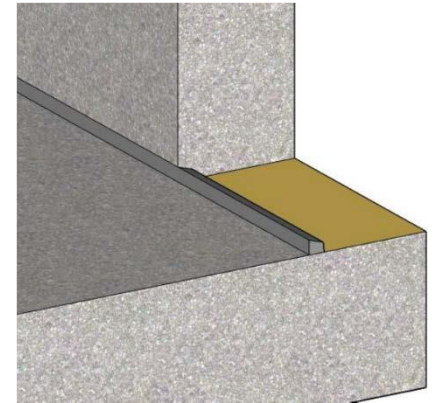
## Waterproofing Horizontal & Vertical Construction Joints – External Grout Method

### DESCRIPTION

Follow these instructions to waterproof horizontal and vertical construction joints with the External Grout Method, using Krystol Waterstop Grout and Krystol Waterstop Treatment.

### Drawings and Specifications:

For section drawings, CAD details and specification language related to this product, visit [www.kryston.com/technical-info/](http://www.kryston.com/technical-info/) or contact your authorized Kryton representative.



### LIMITATIONS

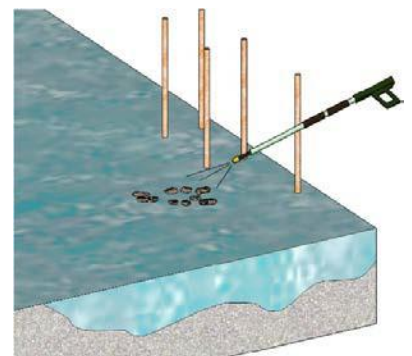
Not for use at expansion joints. The Krystol Waterstop System is effective for rigid structures only and may not reliably seal joints that experience variable loading or repeated movement. Not compatible with stay-in-place metal mesh formwork. Air and surface temperatures at the time of application must be at least 4°C (40°F).

### SAFETY PRECAUTIONS

Read and follow the Safety Data Sheets (SDS) for these products (available at [www.Kryton.com](http://www.Kryton.com)). For professional use only. These products become highly caustic when mixed with water or perspiration. Avoid contact with skin or eyes. Avoid breathing dust. Wear long sleeves, safety goggles and impervious gloves.

### STEP 1: SURFACE PREPARATION

1. Joints must be level and sound. Use a chipping hammer to level areas that are very rough or uneven. Chip out voids or rock pockets using a sharp, flat chisel (ensure edges are square and not feathered). **TIP:** Forming joints so they are sound and level while the concrete is fresh will eliminate the need to do this after it has hardened.
2. Clean joints by high-pressure water blasting, or use a wire brush and rinse until very clean. Remove laitance, oils, curing compounds or anything that may interfere with bonding. Use a de-greaser if needed to remove form release agents. A final ICRI Concrete Surface Profile (CSP) of 1-3 is adequate.
3. If voids or rock pockets were chiseled out, fill them with Krystol Waterstop Grout as follows: Mix grout to a sag free but workable putty (approximately 4.5 parts powder to 1 part clean water by volume), install to damp concrete and allow to harden (approx. 1 hour at 20°C).



# APPLICATION INSTRUCTION

## Construction Joints & Details

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### STEP 2: APPLY KRYSTOL WATERSTOP TREATMENT

1. Bring the concrete to a saturated surface-dry (SSD) condition. This means the concrete is saturated with water, but no free water remains at the surface. Thoroughly soak the surface with water; then remove excess water with a sponge just before applying Krystol Waterstop Treatment.

**TIP:** Water blasting is effective at cleaning and saturating the joint in one-step.

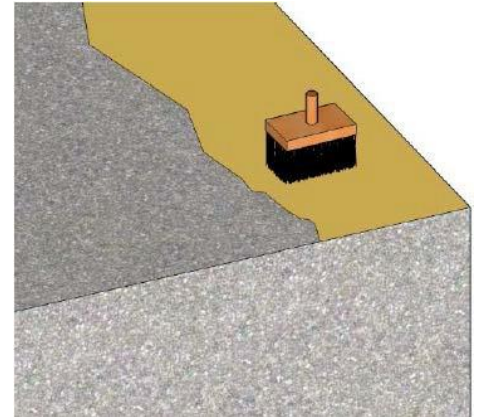
**SHOTCRETE TIP:** You can apply Treatment to end-of-day shotcrete joints before the shotcrete fully hardens. Cut back and shape the shotcrete joint, then lightly dampen the surface and apply Treatment.

2. Mix Krystol Waterstop Treatment to a thick but flowing paste (approximately 3 parts powder to 1 part clean water by volume). The paste will seem very stiff at first, but will become thinner when fully mixed. Mix only as much as you can apply within 30 minutes.

**NOTE:** After mixing, the material may thicken in the pail. Do not add more water. Remixing will make the material easy to spread again.

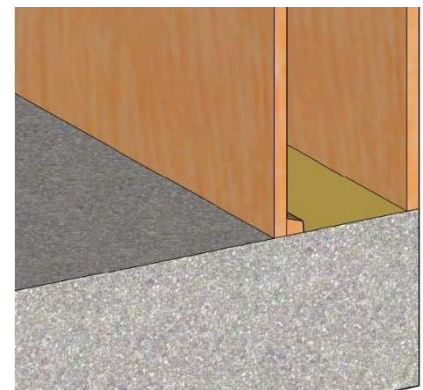
3. Use a concrete brush to coat the entire joint. Ensure Treatment fills all surface voids and is at about 1 mm (40 mil) thick. Work around reinforcement; Treatment touching the rebar is not harmful and helps protect against corrosion, but avoid heavy build-up on the bar.

**IMPORTANT:** Protect the joint from rain and rapid drying. Use plastic sheeting to protect from rain, sun and wind until the Treatment has hardened (approx. 2.5 hours at 20°C). Once hardened, protect from freezing for 24 hours, and keep damp for 24 hours or until covered in concrete. Do not use curing compounds.



### STEP 3: CREATE A KEYWAY

1. Create a keyway at the intersection where the two concrete sections will meet. A suitable keyway can be formed from a dressed 2x2 by trimming one edge off at an angle to leave a narrow edge of about 1.25 in. (40 mm x 40 mm tapering to 30 mm).
2. Attach the keyway form to the edge of the concrete form with the narrow end facing inwards. The keyway can be pressed into the fresh concrete for slab-to-slab joints. For Shotcrete, press or carve the keyway into the plastic shotcrete, or tack on a form before shotcrete placement and remove it to form the keyway.



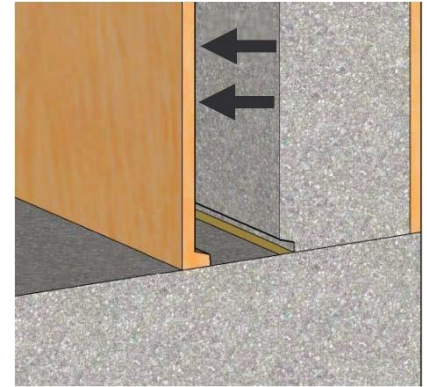
### STEP 4: PLACE AND CONSOLIDATE CONCRETE

Place concrete over the joint as normal. To achieve a waterproof joint:

1. Remove debris and water from the joint before placing concrete.
2. Do not let form release oil contaminate the joint.
3. Remove form spreaders (if present) as the concrete is placed.
4. Place and vibrate concrete following ACI 309R - Guide for Consolidation of Concrete.
5. Place shotcrete using an ACI certified nozzle crew following ACI 506R – Guide to Shotcrete.
6. Cure following ACI 308.1 (Specification for Curing Concrete) taking measures to prevent rapid drying.

### STEP 5: PREPARE THE KEYWAY

1. Remove keyway forms from the hardened concrete. Ensure no wood remains in the keyway.
2. Inspect for rock pockets, or any part of the keyway that is filled with concrete but should not be. Chip these areas out using a sharp, flat chisel. Ensure edges are square and not feathered.
3. Clean the keyway by high-pressure water blasting, or use a wire brush and rinse until very clean. Use a de-greaser if needed to remove form release agents.

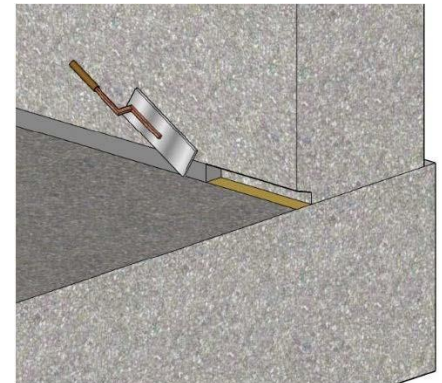


### STEP 6: INSTALL KRYSTOL WATERSTOP GROUT

**NOTE:** Install Krystol Waterstop Grout at any time, but for best results, wait for concrete drying shrinkage to take place first.

**NOTE:** Only proceed if the keyway is NOT leaking water. If it is leaking, stop the leak by installing 12 mm (0.5 inches) of Krystol Plug before finishing with Krystol Waterstop Grout.

1. Bring the concrete to a saturated surface-dry (SSD) condition. This means the concrete is saturated with water, but no free water remains at the surface. Thoroughly soak the keyway with water; then remove excess water with a sponge just before installing Krystol Waterstop Grout.
2. Mix Krystol Waterstop Grout as follows: Slowly add powder to water while mixing (approximately 4.5 parts powder to 1 part clean water by volume) and mix thoroughly. The mixture may appear dry at first, but will become workable when fully mixed. The grout should be sag free and stiff enough to hold its shape, but still easy to handle and trowel. Mix only as much as you can place in 30 minutes.



**NOTE:** After mixing, the grout may stiffen in the pail. Do not add more water. Remixing will make the grout easy to work with again.

3. Tightly pack Krystol Waterstop Grout into the keyway so it is flush with the surface.

**IMPORTANT:** Protect the joint from rain and rapid drying. Use plastic sheeting to protect from rain, sun and wind until the grout hardens (approx. 1 hour at 20°C). Once hardened, protect from freezing for 24 hours, and keep damp for 48 hours or until Treatment is applied.

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## COVERAGE

Material	Coverage										
Krytol Waterstop Treatment (Applied at 1 kg/m <sup>2</sup> (0.2 lb. /sq. ft.))	One 25 kg (55 lb. pail) will cover approximately 25 m <sup>2</sup> (270 square feet) Approximate lineal coverage:  <table border="1"><thead><tr><th>Joint Width:</th><th>Coverage per Pail</th></tr></thead><tbody><tr><td>150 mm (6 inches)</td><td>164 m (540 feet)</td></tr><tr><td>200 mm (8 inches)</td><td>125 m (405 feet)</td></tr><tr><td>250 mm (10 inches)</td><td>100 m (325 feet)</td></tr><tr><td>300 mm (12 inches)</td><td>82 m (270 feet)</td></tr></tbody></table>	Joint Width:	Coverage per Pail	150 mm (6 inches)	164 m (540 feet)	200 mm (8 inches)	125 m (405 feet)	250 mm (10 inches)	100 m (325 feet)	300 mm (12 inches)	82 m (270 feet)
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Krytol Waterstop Grout	One 25 kg (55 lb. pail) will yield approximately 13 liters (0.46 cubic feet) of grout. Approximate lineal coverage:  <table border="1"><thead><tr><th>Keyway Size:</th><th>Coverage per pail</th></tr></thead><tbody><tr><td>25x25 mm (1x1 inches)</td><td>21 m (68 feet)</td></tr><tr><td>25x40 mm (1x1.5 inches)</td><td>14 m (46 feet)</td></tr><tr><td>40x40x30 mm (1.5x1.5x1.25 inches)</td><td>10 m (33 feet)</td></tr></tbody></table> Consult a Kryton Representative to determine the best keyway size for your project.	Keyway Size:	Coverage per pail	25x25 mm (1x1 inches)	21 m (68 feet)	25x40 mm (1x1.5 inches)	14 m (46 feet)	40x40x30 mm (1.5x1.5x1.25 inches)	10 m (33 feet)		
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## TOOLS & MATERIALS

- Clean water supply
- Mixing bucket, drill and mortar paddle
- Natural bristle concrete brush
- Water spray and towel/sponge
- Margin trowel
- High pressure water blaster
- Measuring cups
- Keyway form
- Chipping hammer