APPLICATION INSTRUCTIONS
Construction Joints & Details

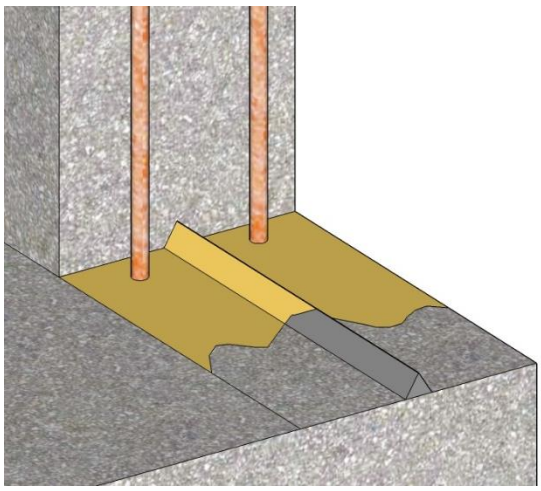
4.11

KRYTON SMART CONCRETE®

Krystol® Waterstop System

Waterproofing Horizontal Construction Joints - Internal Grout Method

DESCRIPTION



The Krystol Waterstop System is used to permanently waterproof concrete construction joints. It is installed in place of other less reliable joint systems and allows for flexible scheduling and easy inspection. The Krystol Waterstop System uses Krystol crystalline technology which reacts with water and un-hydrated cement particles to grow insoluble needle-shaped crystals that fill capillaries, micro cracks and pores of concrete to reduce permeability and stop water.

The following application instructions are used to waterproof horizontal concrete construction joints subject to hydrostatic pressure, such as wall-to-slab intersections (wall sits on slab) using the Internal Grout Method, which is composed of Krystol Waterstop Grout and Krystol Waterstop Treatment.

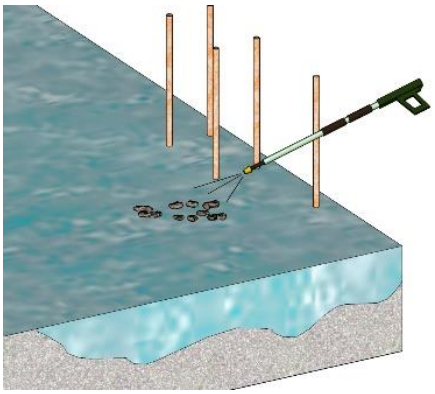
LIMITATIONS

Krystol Waterstop System is effective for rigid structures only and may not reliably seal joints that experience variable loading or repeated movement. Consult a Kryton representative for project specific recommendations. Use typical cold weather practices if applying in cold climatic conditions. Installation during heavy rain must be avoided.

SAFETY PRECAUTIONS

Read and follow the Safety Data Sheets (SDS) for these products (available at 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. Concrete / Shotcrete surfaces to receive the Krystol Waterstop System must be sound, clean and free of dirt, oil, and other elements which may interfere with bonding. Use a chipping hammer or scrabbler to remove loose aggregate and level rough or uneven joints.
   TIP: Removing loose or protruding concrete and aggregate, and cleaning debris or overspray while concrete / shotcrete is in a plastic state will minimize need to do after it is in a hardened state.
2. Prepare joints by high-pressure water blasting to remove any form oils, curing compounds, dust or other contaminants. The top most surface of cement paste should be removed; some exposed aggregate is ideal.
3. Surfaces to receive the Krystol Waterstop System must be brought to a saturated, surface-dry (SSD) condition. This means that the pores of the concrete are completely saturated with water but no free water remains at the surface. Thoroughly pre-soak the surface with water then remove excess water with a sponge immediately before application.
   TIP: High pressure water blasting is effective at cleaning and saturating the joint in one step.

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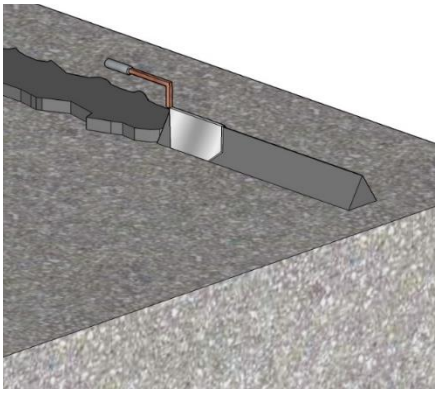
Waterproofing Horizontal Construction Joints - Internal Grout Method

STEP 2: INSTALL KRYSTOL WATERSTOP GROUT



1. Mix Krystol Waterstop Grout to a stiff putty consistency as follows: Start by mixing 3.5 parts powder with 1 part clean water by volume until smooth. Add an additional part of powder (for a total of approximately 4.5 to 1) and continue mixing to obtain a sag free paste. The mixture will appear dry at first, but with mixing will become smooth and workable. Mix only as much material as can be placed in 30 minutes.
   NOTE: Material left standing will quickly stiffen, but mixing will restore plasticity. Do not add water to the material once it has started to set. Over-watering will result in shrinkage cracking.

   IMPORTANT: Above mix ratio is approximate and intended only as a guide. Conditions may vary affecting the actual powder to water required. Adjust the powder and water content accordingly in order to obtain a consistency that is plastic, sag free and stiff enough to be formed into a ball and hold its shape.

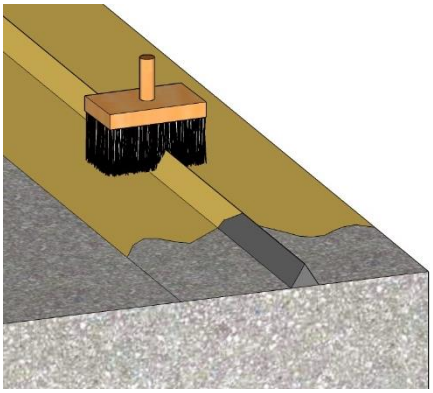
2. Place a line of Krystol Waterstop Grout down the center of the joint using a trowel. Mold it into a triangle using the Kryton Triangle Trowel (or similar tool) using a sawing motion as the material is being formed.

   IMPORTANT: The Krystol Waterstop Grout should form a continuous triangular strip that measures 50 mm (2 in.) wide by at least 30 mm (1.25 in.) high. If reinforcing bars are present, apply the grout as close to the center of the joint as possible, ensuring there is at least 25 mm (1 in.) clearance between the grout and the rebar, and a minimum of 50 mm (2 in.) from the edge of the concrete pour.

3. Protect the Krystol Waterstop Grout application from damage by rain, rapid drying or freezing for at least 24 hours, or until it is covered by Krystol Waterstop Treatment.

   IMPORTANT: Krystol products must be protected from rapid drying and kept damp to develop their full properties. Cover the Krystol Waterstop Grout with plastic sheeting or damp burlap to contain moisture. After the grout has hardened, mist the surface with water to maintain moisture levels for 48 hours.

STEP 3: INSTALL KRYSTOL WATERSTOP TREATMENT



1. Wait until the Krystol Waterstop Grout triangle has hardened enough not to be damaged during the application of Krystol Waterstop Treatment (a minimum of 2 hours under most conditions).
2. Bring concrete and Krystol Waterstop Grout to a saturated surface-dry (SSD) condition. This means that the pores of the concrete are completely saturated with water but no free water remains at the surface. Thoroughly pre-soak the surface with water; then remove excess water with a sponge just before applying Krystol Waterstop Treatment.
3. Mix Krystol Waterstop Treatment to a thick but free flowing paste (approximately 3 parts powder to 1 part clean water by volume). The paste will seem thick at first, but will become fluid with mixing. Mix only as much material as can be placed in 30 minutes.
   NOTE: Material left standing will quickly stiffen, but mixing will restore plasticity. Do not add water to the material once it has started to set. Over-watering will result in shrinkage cracking.

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4. Coat the entire surface area of the joint (including the hardened Krystol Waterstop Grout triangle) with Krystol Waterstop Treatment using a concrete brush at a spread rate of 1 kg/m^2 (0.2 lb. /sq. ft.), which will be at least 1 mm (40 mil). Employ a circular, scrubbing motion to achieve maximum penetration and adhesion. Do not allow Krystol Waterstop Treatment to build up on nearby reinforcement.
5. Protect the Krystol Waterstop Treatment application from damage by rain, rapid drying or freezing for 24 hours or until concrete is poured over it. Typical hardening time of Krystol Waterstop Treatment is 2.5 hours at 20°C.

   IMPORTANT: Krystol products must be protected from rapid drying and kept damp to develop their full properties. Cover the Krystol Waterstop Treatment with plastic sheeting or damp burlap to contain moisture. After the treatment has hardened, mist the surface with water to maintain moisture levels for 24 hours. Do not use curing compounds.

STEP 4: PLACE AND CONSOLIDATE CONCRETE

Place concrete over the joint using normal concrete practices, ensuring:

- Debris is removed from the joint prior to placing concrete.
- Form release oil does not contaminate the joint area.
- Form spreaders are removed as concrete is placed.
- Consolidation of concrete around the joint, which requires careful concrete placement and vibration, follow the procedures in ACI 309R (Guide for Consolidation of Concrete)
- Concrete forms are left on as long as possible.
- Shotcrete applications are placed by ACI certified nozzlemen following procedures in accordance with ACI 506R – Guide to Shotcrete.
- Curing is in accordance with ACI 308.1 and that proper measures are taken to prevent rapid drying.

MATERIALS AND COVERAGE

Material	Coverage
Krystol Waterstop Grout	Approximately 15 meters per 25 kg pail (50 feet per 55 lb. pail)
Krystol Waterstop Treatment	Approximately 80 meters per 25 kg pail for a 30 cm wide joint (225 feet per 55 lb. pail for a 12 in. wide joint)

TOOLS

- Clean water supply
- Mixing bucket, drill and mortar paddle
- Natural bristle concrete brush
- Margin trowel
- Water spray and towel/sponge
- High pressure water blaster
- Measuring cups
- Kryton Triangular Trowel or similar tool
- Chipping hammer or scrabbler

AU Patent No. 2005247966
UK Patent No. GB2429989
US Pat. Pend. No. 11/569,435
CA Pat. Pend. No. 2,565,467

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