

Krystol® Waterstop System

Waterproofing Horizontal and Vertical Construction Joints - Internal Swelling 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 and vertical construction joints using the Internal Swelling Method, which is composed of Krytonite Swelling Waterstop, Krytonite Adhesive 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.

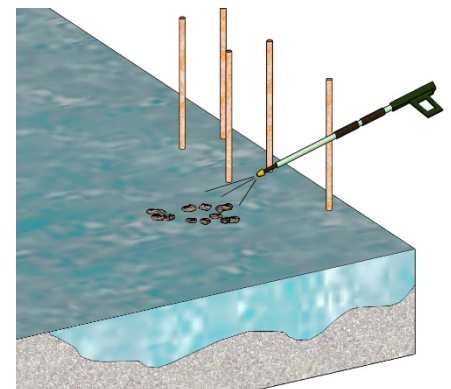
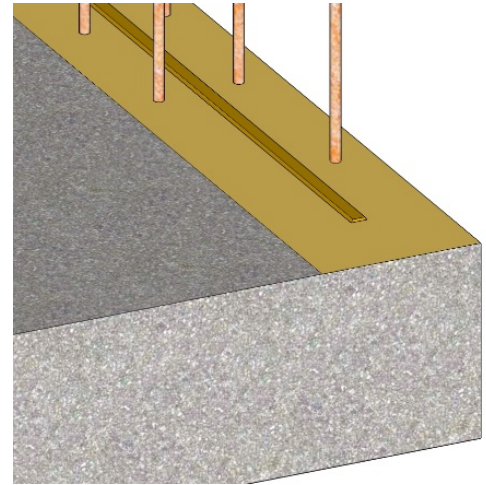
STEP 1: SURFACE PREPARATION

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 scabbler 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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STEP 2: APPLY KRYSTOL WATERSTOP TREATMENT

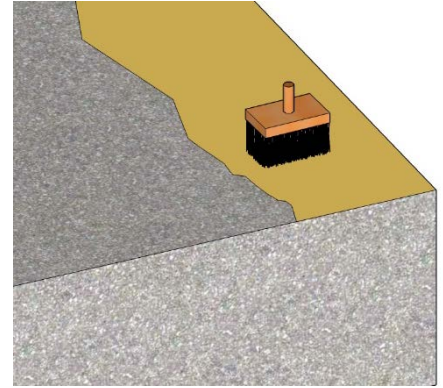
1. Bring concrete to a saturated surface-dry (SSD) condition. This means that the pores of the concrete are completely saturated with water but no free water remains at the surface. Thoroughly pre-soak the surface with water; then remove excess water with a sponge just before applying Krystol Waterstop Treatment.
2. 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 thinner 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.

3. Coat the entire surface area of the joint with Krystol Waterstop Treatment using a concrete brush at a spread rate of 1 kg/m² (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.
4. Protect the Krystol Waterstop Treatment application from damage by rain, rapid drying or freezing for 24 hours or until concrete / shotcrete is placed over it. Typical hardening time of Krystol Waterstop Treatment is 2.5 hours at 20°C.

NOTE: For shotcrete placed the same day, the subsequent layer of shotcrete must be placed while the Krystol Waterstop Treatment is still plastic (within 60 minutes under most conditions).

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.



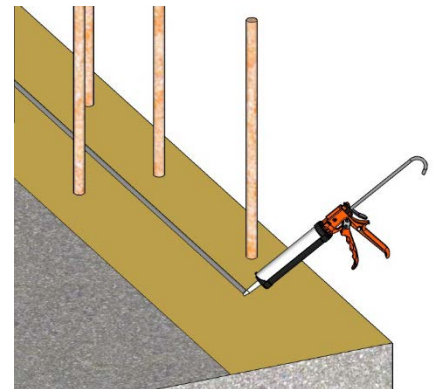
STEP 3: INSTALL KRYTONITE SWELLING WATERSTOP

Only install Krytonite Swelling Waterstop after Krystol Waterstop Treatment is in a hardened state. Installation of Krytonite before Krystol Waterstop Treatment has hardened can result in failure. Install in dry conditions only; contact with water can result in premature swelling of the strip, which must be avoided.

1. At a coverage rate of 8-10 meters (26-32 feet) per tube, apply a 6 mm (1/4 in.) thick bead of Krytonite Adhesive along the center of construction joint where Krytonite is to be installed. There must be enough adhesive that when Krytonite is pressed into the adhesive it squeezes out from the sides. Rough surfaces will require more adhesive.

IMPORTANT: Krytonite needs to be placed at, or near, the center of the construction joint.

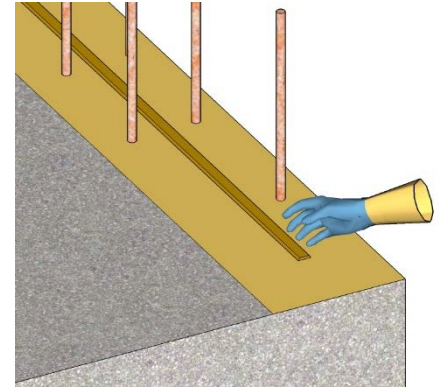
- Must have a minimum of 75 mm (3 in.) of concrete cover. Do not place within 75mm (3 inches) of the edge of the construction joint. Installation too close to the outside edge of the concrete may result in damage to the concrete. If immediate swelling should occur.
- Leave a space between Krytonite and rebar of at least 25 mm (1 in.) to prevent void spaces.
- Krytonite is NOT for use at expansion joints. Use Krytonite at construction joints, around penetrations, between precast elements and other places where concrete joints occur.



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2. Immediately press the Krytonite Swelling Waterstop into the adhesive, unrolling the coil as you progress. Do not allow time for the adhesive to form a skin. If adhesive is not available or if additional hold is needed, nails can be used to secure the waterstop and spaced a maximum of 3 nails per meter (approx. 1 nail per foot).
3. Cut Krytonite to length using scissors. Ends should be tightly and squarely butted and not overlapped. Mitre corners by cutting both strips at an angle.
4. Allow adhesive to cure before pouring concrete.



IMPORTANT: Contact with water will result in premature swelling of the strip. Protect the installed Krytonite from water until concrete is poured. If premature swelling occurs, dry the Krytonite sufficiently to restore its original dimensions and ensure material is properly affixed to the surface before pouring concrete..

STEP 4: PLACE AND CONSOLIDATE CONCRETE

Take care not to dislodge the Krytonite during concrete placement. Do not drop concrete from a great height. If placement is by shotcrete method, avoid shooting at the side of the Krytonite strip. Place concrete over the joint using normal concrete practices, ensuring:

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

MATERIALS AND COVERAGE

Material	Coverage
Krytonite Adhesive	Approximately 8- 10 m (26-32 ft.) per tube
Krytonite Swelling Waterstop	50 m (164 ft.) per/box; 5 rolls @ 10 m (33 ft.) per/roll
Krytol Waterstop Treatment	Approximately 80 m per 25 kg pail @ 30 cm wide (225 ft. per 55 lb. pail @ 12 in. wide)

TOOLS

- Clean water supply
- Mixing bucket, drill and mortar paddle
- Natural bristle concrete brush
- Water spray and towel/sponge
- High pressure water blaster
- Measuring cups
- Caulking gun