

## Krystol® Waterstop System

### Waterproofing Tie Holes and Pipe Penetrations

#### DESCRIPTION

The Krystol Waterstop System is used to permanently waterproof concrete construction joints and details. It is installed in place of other less reliable 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 tie holes and pipe penetrations using the Krystol Waterstop Grout.

#### 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](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: PREPARE TIE HOLES & PIPE PENETRATIONS

For Tie Holes, remove plastic cones, snap-ties and tapered rods from the concrete to expose tie holes.

For Pipe Penetrations, use a sharp 25 mm (1 in.) square chisel and chip a 25 mm (1 in.) wide chase around the pipe to the dimensions of 40 mm (1.5 in.) deep by 25 mm (1 in.) wide. The shape of the chase is critical to your success. The chase must be square shaped and deeper than it is wide. If the concrete breaks apart near the surface, you must chisel deeper to obtain the required 25 mm by 40 mm (1 in. by 1.5 in.) size and shape.

**TIP:** When chiseling, do not place the chisel inside the chase. Instead, place the chisel on the concrete surface over the concrete about one inch ahead of the chase and direct chisel pressure back towards the chase so that the piece being removed falls into the chase. Chisel to the full depth of 40 mm (1.5 in.) before moving on. This method is proven to be most productive, requires the least effort and will result in a chase that is the proper shape.

**NOTE:** Chiseling can be avoided in new construction by forming when the concrete is placed using a flexible form made from foam or other suitable material.

Prepare the pipe surface so that Krystol Waterstop Grout will adequately adhere to the pipe.

**Metal Pipes:** The surface of a metal pipe must be prepared by cleaning and roughening the area that will be in contact with the Krystol Waterstop Grout. Remove all grease, oil, corrosion, and scale. Abrade by coarse sanding or sandblasting to achieve a coarse surface profile.

**PVC or ABS Pipes:** The surface of a PVC or ABS pipe must be prepared by applying a silica sand layer to the area that will be in contact with the Krystol Waterstop Grout. The sand is adhered to the pipe using the joint cement (glue) that is normally used to assemble the pipe sections.

1. Using the appropriate joint cement for the material (either PVC or ABS joint cement), apply a heavy coating of joint cement to the pipe in the area that will be in contact with Krystol Waterstop Grout. Immediately apply dry silica sand to the joint cement to completely cover it.



Pipe Penetration

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2. Allow the joint cement to harden then remove excess loose sand using a blow pipe or vacuum. This will result in a continuous coating of dry silica sand firmly cemented around the pipe. This dry sand layer will provide for adhesion of Krystol Waterstop Grout.

### STEP 2: SURFACE PREPARATION

1. Prepare Tie Holes and Pipe Penetrations 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.
2. 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.

### STEP 3: INSTALL KRYSTOL WATERSTOP GROUT

Only proceed if the keyway is NOT leaking water. If water is leaking through the keyway, stop flowing water with Krystol Plug before installing Krystol Waterstop Grout.

1. Krystol Waterstop Grout may be installed at anytime, but for best results wait for concrete / shotcrete drying shrinkage to take place first.
2. Ensure that the concrete keyway is clean. Remove any form release agents, dirt or debris using mechanical abrasion and/or water blasting.
3. Bring concrete keyway 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 Grout.

Mix Krystol Waterstop Grout to a stiff putty consistency. 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.

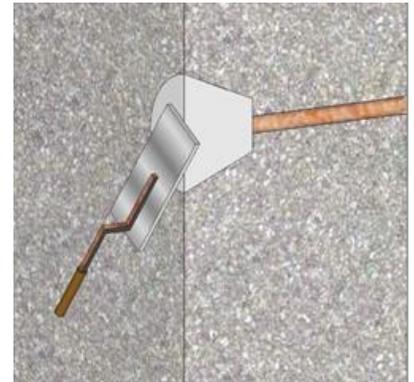
4. Mix only as much material as can be placed in 30 minutes.

**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.

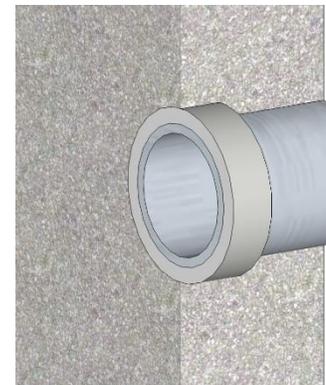
**IMPORTANT:** Above mix ratio is approximate and intended only as a guide. Conditions may vary affecting the actual powder to water required. Adjust the powder and water content accordingly in order to obtain a consistency that is plastic, sag free and stiff enough to be formed into a ball and hold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

5. Tightly pack the Krystol Waterstop Grout into the keyway so that it is flush with the surface.
6. Protect the Krystol Waterstop Grout application from damage by rain, rapid drying or freezing for at least 24 hours.

**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.



Tie Hole



Pipe Penetration

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## MATERIALS AND COVERAGE

<u>Material</u>	<u>Coverage</u>
Krystol Waterstop Grout	Approximately 7.5 meters per 25 kg pail (25 feet per 55 lb. pail)

## TOOLS

- Clean water supply
- Mixing bucket, drill and mortar paddle
- Margin trowel
- Chipping hammer
- 25 mm (1 in.) square chisel blade