شركة المرصد العالمي المتخصص لتشييد المباني

GSO – Global Specialized Observatory

حلول متكاملة لجودة البناء وحماية المنشآت

Krystol Repair Grout™

معالجة كريستالية لتسربات المياه وإصلاح الخرسانة

Crystalline Leak and Waterproofing Repair



Permanent Waterproofing | Penetrates Deep | Self-Sealing Cracks | Non-Toxic & Eco-Friendly

تكنولوجيا كريستول المتطورة
لحماية الخرسانة من الداخل إلى الخارج

Trusted Worldwide Since 1973

Proven Performance in Demanding Environments

Quality You Can Build On

TECHNICAL DATA SHEET

Concrete Repair

Krystol® Repair Grout



DESCRIPTION

Krystol Repair Grout is a high performance grout used to make durable and waterproof repairs for concrete and masonry. It contains advanced Krystol crystalline waterproofing technology for superior performance.

WHERE TO USE

- Concrete and masonry repairs – cracks, spalls, and honeycombs.
- Repairing and restoring concrete cover
- Block wall repairs
- Grouting around pipes and other penetrations
- Use as part of the Krystol Leak Repair system to repair leaking cracks, joints, and holes.

BENEFITS

- Contains advanced Krystol® crystalline waterproofing technology
- Very low permeability
- Non-shrink and crack resistant
- Self-seals against leaks
- Fiber reinforced
- Non-corrosive – does not contain chlorides
- High bond strength
- Sulfate resistant
- Resists H_2S and sewer environments
- Uses inert, non-reactive aggregates - not affected by Alkali-Silica Reaction (ASR)
- Resists freeze-thaw cycles
- Good cold weather application performance
- Pre-blended and easy to use
- Certified to NSF/ANSI/CAN No. 61 – safe for contact with potable water

TECHNICAL DATA

Packaging and yield	25kg (55 lb.) pail – yields approx. 13 L (0.46 cubic feet). 5 kg (11 lb.) pail – yields approx. 2.6 L (0.09 cubic feet)
Color	Concrete grey
Shelf-Life	At least 3 years for unopened pails when stored in a dry enclosed area.
Mix Ratio	Concrete Repair/Leak Repair – 4.5 parts powder to 1-part water by volume Parge Coat – 4 parts powder to 1 part water by volume Bonding slurry – 3 parts powder to part water by volume
Working time (20°C / 68°F, 50% RH)	30 minutes
Hardening time (20°C / 68°F, 50% RH)	1-1.5 hours

TECHNICAL DATA SHEET

Concrete Repair

TECHNICAL DATA

Hydrostatic head resistance (USACE CRD-C48)	140 m (460 feet)
Compressive Strength (ASTM C109)	16 MPa (2300 psi) @ 1 day 38 MPa (5500psi) @ 3 days 45 MPa (6500 psi) @ 7 days 49 MPa (7100psi) @ 28 days 52 MPa (7500psi) @ 56 days
Pull-off Strength (ASTM C1583)	2.8 MPa (400 psi)

Properties are typical obtained under laboratory conditions. Reasonable variation can be expected on-site due to specific project factors.

APPLICATION

General Procedure - Mix Krystol Repair Grout to a non-sag putty consistency (approximately 4.5 parts of powder to 1 part clean water by volume) and install to damp and properly prepared concrete. The grout may be mixed by hand or using a drill with grout paddle. Additional powder may be used to produce a thicker grout for vertical repairs. Protect application from damage by rain, rapid drying or freezing for at least 24 hours and wet cure for 72 hours (7 days for potable water tanks). For deep repairs or overlays thicker than 25 mm (1 inch), Repair Grout may be extended with clean, graded pea gravel. The gravel's nominal maximum size must not be larger than 1/3rd of the repair depth. Use approximately 4 parts powder to 2 parts gravel plus up to 1-part clean water. Because sources of gravel vary, trial batches may be needed.

For full instruction, see:

- Application Instruction 5.12 - Waterproofing Cracks, Holes, and Joints
- Application Instruction 5.22 – Patching and Parging Defective Concrete and Masonry
- Application Instruction 5.32 – Waterproofing Pipe Penetrations

Drawings, CAD details and specification language: See www.kryton.com/technical-info/ or contact your authorized Kryton representative.

LIMITATIONS

Krystol Repair Grout is effective for rigid structures only and may not reliably seal crack or joints that experience repeated movement. Consult a Kryton representative for project specific recommendations.

SAFETY

Read the Safety Data Sheet (SDS) for this product. For professional use only. This product becomes caustic when mixed with water or perspiration. Avoid contact with skin or eyes. Avoid breathing dust. Wear long sleeves, safety goggles and impervious gloves.

WARRANTY

Kryton International Inc. (Kryton) warrants that Kryton products are free from manufacturing defects and comply with the specifications given in their respective technical data sheet. Because conditions of use, such as site conditions, surface preparations, workmanship, concrete ingredients, weather, structural issues and other factors are beyond the control of Kryton, no warranty can be given as to the results of use. Purchaser agrees to seek the advice of qualified professionals and to determine for themselves the suitability of the products for their intended purpose and assumes all risks. Purchaser's sole remedy is limited to replacement of any product proven defective or at Kryton's option refund of the purchase price paid. THIS LIMITED WARRANTY CONTAINS THE ENTIRE OBLIGATION OF KRYTON. NO OTHER WARRANTIES, EXPRESS OR IMPLIED, SHALL APPLY INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. KRYTON SHALL NOT BE LIABLE UNDER ANY LEGAL THEORY FOR SPECIAL OR CONSEQUENTIAL DAMAGES. No representative of Kryton has the authority to make any representations or provision except as stated herein. Kryton reserves the right to change the properties of its products without notice.

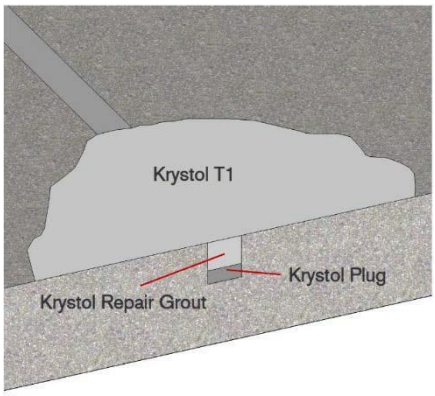
Krystol® Leak Repair System

Waterproofing Cracks, Holes & Joints

DESCRIPTION

The Krystol Leak Repair System is used to permanently waterproof leaking cracks, joints, and holes in concrete. It is installed in place of other less reliable crack repair systems and allows the concrete to be protected from any direction, even under high hydrostatic pressure.

The Krystol Leak Repair 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 in concrete to reduce permeability and stop water. The following application instructions are used for the repair of leaking cracks, holes & joints from either the positive or negative side.



Drawings and Specifications:

For section drawings, CAD details and specification language related to this product, visit www.kryton.com/technical-info/ or contact your authorized Kryton representative.

LIMITATIONS

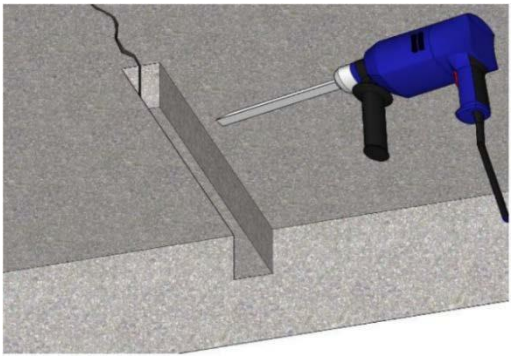
Krystol leak repair is effective for rigid structures only and may not reliably repair cracks or joints that are subject to movement. Moving cracks can only be repaired using a flexible system such as urethane injection. Consult a Kryton representative for project specific recommendations. Use typical 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: PREPARE THE LEAKING CRACK OR JOINT

1. Using a sharp 25 mm (1 in.) square chisel, chip a 25 mm (1 in.) wide chase along the entire length of the crack to a minimum depth of 40 mm (1.5 in.). The shape of the chase is critical to your success. The chase must be rectangular 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.
   When chiseling, do not place the chisel inside the chase. Instead, place the chisel on the concrete surface over the leaking crack or joint 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.

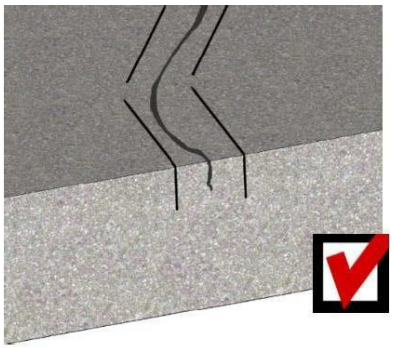


2. Wash the chase with water until it is clean and water runs clear. If necessary, use a vacuum to remove dust, debris or water.
3. Grind or wire brush the concrete 6 inches on either side of the repair to expose clean, sound concrete. This will provide better adhesion for the Krystol T1® coating (Step 4).

IMPORTANT: Be sure to repair the full length of the crack or joint. If you repair only the area that is currently leaking, the water will likely migrate to the un-repaired section and you will be back to repair a new leak.

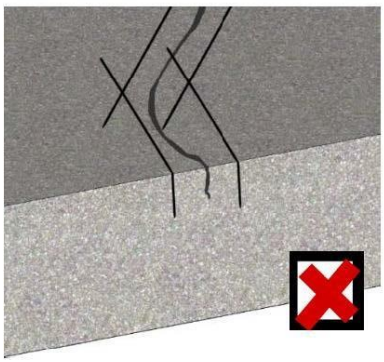
ALTERNATIVE METHOD FOR HORIZONTAL CRACK PREPARATION

To speed efficiency, saw cutting can be done before chiseling. This has been effective at doubling the speed in preparing the chase and increasing productivity. Saw cut the leaking crack using a Hilti DCH 230 Diamond cutter. Set the two blades apart using a slitting hood and set the cutting depth to 40 mm (1.5 in.). Align the crack between the two blades and saw cut the entire length of the crack. If the crack is not straight, reposition the saw and cut accordingly. Leave a space between saw cuts, do not overlap. See diagram. Chisel in between the saw cuts to create a chase and connect the unaligned saw cuts by chiseling. Expect to go over the entire chase with a chisel 3 times to get it at full depth. Try to roughen the sides of the chase without spalling the top.



NOTES:

- Know where the breakers are. Breakers may blow
- Use saw and vacuum or separate circuits
- Use heavy duty extension cord for the saw, vacuum can use a standard cord
- Move along slowly and evenly with the saw; don't cut from one stationary point



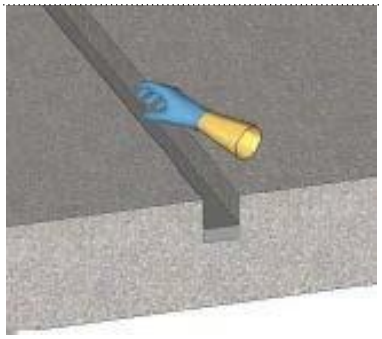
TOOLS NEEDED FOR ALTERNATIVE METHOD:

- Hilti DCH 230 Diamond cutter
- Hilti DCH-EX 180-SL slitting hood
- Two 177mm x 22mm (7 in. x 7/8 in.) diameter blades
- Vacuum

STEP 2: STOP FLOWING OR SEEPING WATER

If there is no active leaking at this time, you may skip to step 3.

1. Quickly mix four (4) parts Krystol Plug™ to one (1) part clean water by volume to a putty consistency. Mix only enough material as can be placed in 1 minute.
2. Using a gloved hand, immediately press the Krystol Plug firmly into the leaking chase while it is in a pliable form and hold still until it has set. Compact the Krystol Plug so there are no voids.
3. Repeat, working from one end of the crack to the other until the entire chase has been plugged and all water has been completely stopped.

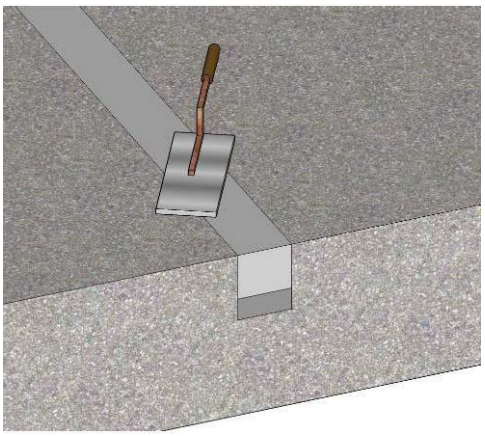


IMPORTANT:

- To avoid early water exposure, use separate measuring cups when portioning Krystol Plug Powder and water
- In hot weather, use cold water to slightly extend setting time
- In cold weather, use hot water to accelerate setting time
- Do not move or work the plug after it has started to set or it will break apart
- The Krystol Plug must not fill more than one-third of the chase. The maximum thickness of Krystol Plug is 13 mm (0.5 in.). Use a trowel or chisel to scrape out any excess Krystol Plug so that at least 25 mm (1 in.) of space remains in the chase
- Do not allow Krystol Plug to build up on the walls of the chase. Wire brush the chase to remove excess Krystol Plug from the walls so the remaining materials can bond directly to clean concrete
- All leaking water must be stopped before proceeding. Touch up work may be needed to stop all the water

TIP: In areas of very high water flow, insert a rubber hose at the highest flow area to direct water and install Krystol Plug around it.. Removing the hose will leave a deep narrow hole that is much easier to plug with a single ball of material. Fill the chase leaving the highest flow area to the end.

STEP 3: INSTALL KRYSTOL REPAIR GROUT



1. Wash the chase with water until it is clean and water runs clear. Ensure that the chase is in Saturated, Surface Dry (SSD) condition; saturate with water, then remove any standing water before proceeding.

2. Mix Krystol Repair Grout as follows: Slowly add powder to water while mixing (approximately 4.5 parts powder to 1 part water by volume). Mix thoroughly once all powder is added to obtain a non-sag putty consistency. The mixture will appear dry at first, but with mixing will become smooth and workable. If the grout sags during installation, mix in extra powder until the grout holds in place. **NOTE:** The mix ratio is only approximate and intended only as a guide since job site conditions may vary affecting the actual powder to water required.

   Large Repairs: For repairs with minimum width and depth of 50 mm (2 in.) or larger, Krystol Repair Grout may be extended with 10 mm (3/8 in.) pea gravel. Use clean, non-reactive, well-graded gravel complying with ASTM C33. Mix 4 parts grout powder: 2 parts gravel, and up to 1 part water to make a low-slump, cohesive mix. Perform trial batches to confirm workability, as aggregate properties can vary.

3. Tightly pack the Krystol Repair Grout into the keyway so that it is flush with the surface. Do not leave any voids.
4. Protect the Krystol Repair Grout application from damage by rain, rapid drying or freezing for at least 24 hours.

IMPORTANT: Mix only as much material as can be placed in 30 minutes. Warm temperatures will reduce working time. Note that material left standing will stiffen, but mixing will restore plasticity. Do not add water to the material once it has started to set. Over-watering will result in cracking.

STEP 4: APPLY KRYSTOL T1 COATING

- Once active leaks have been stopped, and cracks / defects have been repaired, apply Krystol T1 to the entire wall, floor and/or ceiling to ensure permanent waterproofing. See **Application Instruction 2.11 – Krystol T1 Surface Applied Waterproofing** for detailed instructions on this product.

COVERAGE

Material	Coverage
Krystol Plug	Approximately 30-42 m per 25 kg pail (100-138 ft per 55 lb pail)
Krystol Repair Grout	Yields approx. 13 L (0.46 cubic feet) per pail, as installed: Approximately 14 m per 25 kg pail (46 ft per 55 lb pail) when used without Krystol Plug Approximately 21 m per 25 kg pail (68 ft per 55 lb pail) when used with Krystol Plug
Krystol T1	Approximately 20 m² per 25 kg pail (225 ft² per 55 lb pail)

TOOLS & MATERIALS

- Krystol Plug
- Krystol Repair Grout
- Krystol T1
- Clean water supply
- Mixing bucket, drill and mortar paddle
- Natural bristle concrete brush
- Margin trowel
- Chipping Hammer or scrabbler

Krystol Repair Grout

Grout Repairs and Parge Coat for Concrete and Masonry

DESCRIPTION

Krystol Repair Grout is used to provide a strong waterproof barrier for patching and parging defective concrete & masonry. Krystol Repair Grout features high strength and excellent bonding with low shrinkage, fiber reinforcement and high durability. Krystol Repair Grout contains Kryton's proven Krystol® technology which reacts with water and un-hydrated cement particles to grow insoluble needle-shaped crystals to waterproof the grout and seal hairline cracks. Krystol Repair Grout is NSF certified for potable water contact.

WHERE TO USE

Use Krystol Repair Grout as a strong, waterproof parge coat for porous materials such as concrete block walls. Repair Grout may also be used to repair general concrete defects such as honeycombs, or to resurface rough, uneven or damaged concrete. Krystol Repair Grout is also the preferred product for applications subject to heavy abrasion or erosion. After repairs with Krystol Repair Grout, you may apply Krystol T1 for additional crystalline waterproofing protection if desired. These instruction for Krystol Repair Grout may be used to substitute for any instruction or detail calling for Krystol Bari-Cote.

NOTE - For cracks or leaks, follow the Leak Repair procedure in Application Instruction 5.12 (cracks, holes, joints) or 5.32 (pipes).
NOTE - For coating higher density surfaces such as concrete, use Krystol T1 (Application Instruction 2.11).

LIMITATIONS

Do not install if air and surface temperatures are below 4°C (40°F). This product is effective for rigid structures only and may not reliably repair areas that are subject to movement. Consult a Kryton representative for project specific recommendations.

SAFETY PRECAUTIONS

Read and follow the Safety Data Sheets (SDS) for these products (available at www.Kryton.com). For professional use only. Powder is 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. Chip out any defects using a chipping hammer with a sharp, flat 25 mm (1 in.) chisel. Remove all weak or unsound concrete. Ensure edges are square and stable. Do not leave feathered edges.

2. Alternate – Saw cut the perimeter of the defect using a segmented diamond bade. Cut out the defect as square as possible and avoid sharp angles. Do not let the saw cuts overlap.

3. Thoroughly clean surfaces using high-pressure water blasting or mechanical roughening to remove any form release or curing compounds, and any weak concrete or masonry. Do not use an acid cleaner. Remove all dust, debris and standing water.

NOTE – For concrete resurfacing, a rough surface texture will enhance bonding. ICRI CSP #3-5 is recommended. The underlying concrete must be strong enough to bond to the new grout. Follow ICRI practices to assess surface strength for resurfacing.

STEP 2A: CONCRETE REPAIRS AND RESURFACING

1. Surfaces to receive Krystol Repair Grout must be brought to a saturated, surface-dry (SSD) condition. This means that the pores of the concrete or masonry are completely saturated with water, but no free water remains at the surface. Thoroughly pre-soak the surface with water, then remove excess water immediately before application. **TIP:** High pressure water blasting is effective at cleaning and saturating the surface in one step.
2. Mix Krystol Repair Grout to a putty consistency, approximately (4.5) parts powder to one (1) part clean water by volume. Do not mix more than can be applied within 15 minutes.
3. Pack the grout tightly into the repair so there are no voids and trowel flush.

NOTE: For repairs with minimum width and depth of 50 mm (2 in.) or larger, Krystol Repair Grout may be extended with 10 mm (3/8 in.) pea gravel. Use clean, non-reactive, well-graded gravel complying with ASTM C33. Mix 4 parts grout powder: 2 parts gravel, and up to 1 part water to make a low-slump, cohesive mix. Perform trial batches to confirm workability, as aggregate properties can vary.

NOTE: For resurfacing, apply a bonding slurry as described Step 2B, or apply a suitable polymer bonding agent.

STEP 2B: CONCRETE BLOCK WALLS – REPAIRS AND PARGE COAT

Concrete block walls are challenging to waterproof because the blocks are highly porous and contain many joints. Be thorough when examining the wall for defects that need to be repaired. A finish coat of Krystol T1 is recommended.

1. Repair any cracked or faulty mortar joints using the methods described in Steps 1 and 2A.

NOTE - Only remove faulty mortar from the joints. Do not damage the blocks. If the joints are leaking, follow the leak repair instruction in Application Instruction 5.12, but confine the repair to the joint only.

NOTE - It is recommended to protect the joint where the block wall meets the concrete floor as follows: Ensure both the block wall and the concrete along the floor joint are clean and rough. Mix grout to a putty consistency, approximately (4.5) parts powder to one (1) part clean water by volume, and firmly trowel a 25x25 mm (1x1 in.) triangle of grout across the wall-floor joint.

2. Clean and bring the surface to SSD condition as described in Steps 1 and 2A. **CMU blocks may absorb a lot of water before they reach SSD.**

3. A bonding layer will increase adhesion and make spreading the parge coat easier. Apply a bonding layer as follows: Mix Krystol Repair Grout to a slurry consistency, approximately three (3) parts powder to one (1) part clean water. Do not mix more than can be applied within 15 minutes. Firmly scrub a thin layer of this material over the surface to fill all surface voids. **Do not allow to dry. Immediately proceed with the parge coat.**

4. For the parge coat: Mix approximately four (4) parts powder to one (1) part clean water by volume. Trowel this mixture over the bonding layer to a thickness of 3-6 mm (1/8 to 1/4 in.). Work in sections if needed to maintain a wet edge.
   Greater thickness will increase strength, durability and waterproofing.

STEP 3: CURING AND PROTECTION

1. Protect fresh Krystol Repair Grout from rapid drying or freezing for at least 24 hours. Cover with tarps or poly if necessary. Protect the fresh grout from rain until it has fully hardened, and do not apply curing water if the grout has not hardened.

2. Begin wet curing once Krystol Repair Grout has hardened (1-2 hours under most conditions). Wet cure by ensuring the grout remains saturated with water by using hoses and sprinklers, saturated coverings or impermeable coverings. Maintain these curing conditions for at least 72 hours (7 days for drinking water tanks).

APPLYING OTHER PRODUCTS OVER KRYSTOL REPAIR GROUT

Leave a rough or textured surface if other products are to be applied. Additional parge coats of Krystol Repair Grout may be applied following the instructions in Step 2B any time after the first layer has hardened. Krystol T1 may be applied over Krystol Repair Grout any time after it has hardened. Other paints or finishes must be suitable for use on new concrete. Follow the manufacturer's instructions, including all steps for surface preparation and any recommended primers.

COVERAGE AND YIELD

Yield per pail: Approximately 13 liters (0.46 cubic feet) per 25 kg (55 lb pail).

Parge Coat - Approximate Coverage per 25 kg (55 lb) Pail	
Thickness	Coverage
3 mm (1/8 inch)	4.8 m^2 (52 sq.ft.)
6 mm (1/4 inch)	2.4 m^2 (26 sq.ft.)

TOOLS & MATERIALS

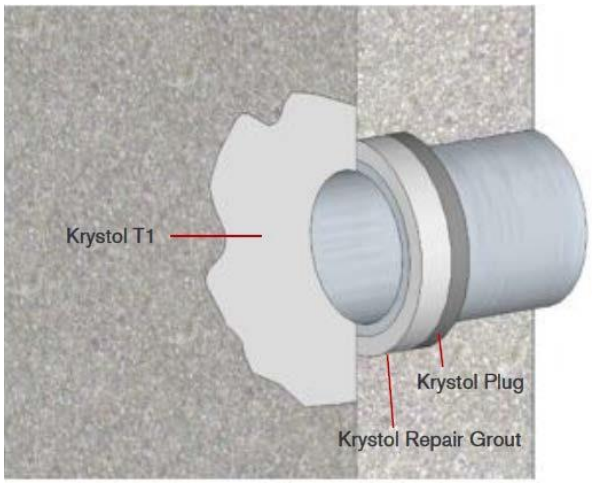
- Clear water supply
- Mixing bucket, drill and mortar paddle
- Margin trowel
- Concrete trowel
- Chipping hammer
- Diamond grinder
- Masonry brush
- Poly or curing sheets

Krystol® Leak Repair System

Waterproofing Pipe Penetrations

DESCRIPTION

The Krystol Leak Repair System is used to permanently waterproof leaking cracks, joints, and holes in concrete. It is installed in place of other less reliable crack repair systems and allows the concrete to be protected from any direction, even under high hydrostatic pressure. The Krystol Leak Repair 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 in concrete to reduce permeability and stop water. The following application instructions are used to repair leaking cracks or holes from pipe penetrations.



Drawings and Specifications:

For section drawings, CAD details and specification language related to this product, visit www.kryton.com/technical-info/ or contact your authorized Kryton representative.

LIMITATIONS

Krystol leak repair is effective for rigid structures only and may not reliably repair cracks or joints that are subject to movement. Moving cracks can only be repaired using a flexible system such as urethane injection. 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: PREPARE THE LEAKING CRACK OR JOINT



1. Using a sharp 25 mm (1 in.) square chisel, chip a 25 mm (1 in.) wide chase along the entire length of the crack to a minimum depth of 40 mm (1.5 in.). The shape of the chase is critical to your success. The chase must be rectangular 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.

   When chiseling, do not place the chisel inside the chase. Instead, place the chisel on the concrete surface over the leaking crack or joint 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.
2. Wash the chase with water until it is clean and water runs clear. If necessary, use a vacuum to remove dust, debris or water.
3. Grind or wire brush the concrete 6 inches on either side of the repair to expose clean, sound concrete. This will provide better adhesion for the Krystol T1® coating (step 4).

IMPORTANT Be sure to repair the full length of the crack or joint. If you repair only the area that is currently leaking, the water will likely migrate to the un-repaired section and you will be back to repair a new leak.

STEP 2: STOP FLOWING OR SEEPING WATER

If there is no active leaking at this time, you may skip to step 3.



1. Quickly mix four (4) parts Krystol Plug™ to one (1) part clean water by volume to a putty consistency. Mix only enough material as can be placed in 1 minute.
2. Using a gloved hand, immediately press the Krystol Plug firmly into the leaking chase while it is in a pliable form and hold still until it has set. Compact the Krystol Plug so there are no voids.
3. Repeat, working from one end of the crack to the other until the entire chase has been plugged and all water has been completely stopped.

IMPORTANT:

- To avoid early water exposure, use separate measuring cups when portioning Krystol Plug Powder and water
- In hot weather, use cold water to slightly extend setting time
- In cold weather, use hot water to accelerate setting time
- Do not move or work the plug after it has started to set or it will break apart
- The Krystol Plug must not fill more than one-third of the chase. The maximum thickness of Krystol Plug is 13 mm (0.5 in.). Use a trowel or chisel to scrape out any excess Krystol Plug so that at least 25 mm (1 in.) of space remains in the chase
- Do not allow Krystol Plug to build up on the walls of the chase. Wire brush the chase to remove excess Krystol Plug from the walls so the remaining materials can bond directly to clean concrete
- All leaking water must be stopped before proceeding. Touch up work may be needed to stop all the water

  TIP: In areas of very high water flow, insert a rubber hose at the highest flow area to direct water and install Krystol Plug around it. Removing the hose will leave a deep narrow hole that is much easier to plug with a single ball of material. Fill the chase leaving the highest flow area to the end.

STEP 3: PIPE PREPARATION



1. Before installing Krystol Repair Grout, it is necessary to prepare the pipe surface so that the repair products will adequately adhere to the pipe.
   a. 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® repair materials. Remove all greases, oil, corrosion, and scale. Abrade by coarse sanding or sandblasting to achieve a coarse surface profile.
2. 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 repair materials. The sand is adhered to the pipe using the joint cement (glue) that is normally used to assemble the pipe sections.

   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 the Krystol repair materials. Immediately apply dry silica sand to the joint cement to completely cover it.

   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 the Krystol repair materials.

STEP 4: INSTALL KRYSTOL REPAIR GROUT



1. Wash the chase with water until it is clean and water runs clear. Ensure that the chase is in Saturated, Surface Dry (SSD) condition; saturate with water, then remove any standing water before proceeding.

2. Mix Krystol Repair Grout as follows: Slowly add powder to water while mixing (approximately 4.5 parts powder to 1 part water by volume). Mix thoroughly once all powder is added to obtain a non-sag putty consistency. The mixture will appear dry at first, but with mixing will become smooth and workable. If the grout sags during installation, mix in extra powder until the grout holds in place. **NOTE:** The mix ratio is only approximate and intended only as a guide since jobsite conditions may vary affecting the actual powder to water required.

   Large Repairs: For repairs with minimum width and depth of 50 mm (2 in.) or larger, Krystol Repair Grout may be extended with 10 mm (3/8 in.) pea gravel. Use clean, non-reactive, well-graded gravel complying with ASTM C33. Mix 4 parts grout powder: 2 parts gravel, and up to 1 part water to make a low-slump, cohesive mix. Perform trial batches to confirm workability, as aggregate properties can vary.

3. Tightly pack the Krystol Repair Grout into the keyway so that it is flush with the surface. Do not leave any voids.

4. Protect the Krystol Repair Grout application from damage by rain, rapid drying or freezing for at least 24 hours.

IMPORTANT: Mix only as much material as can be placed in 30 minutes. Warm temperatures will reduce working time. Note that material left standing will stiffen, but mixing will restore plasticity. Do not add water to the material once it has started to set. Over-watering will result in cracking.

STEP 5: APPLY KRYSTOL T1 COATING

- Once active leaks have been stopped, and cracks/ defects have been repaired, apply Krystol T1 to the entire wall, floor and/or ceiling to ensure permanent waterproofing. See **Application Instruction 2.11 – Krystol T1 Surface Applied Waterproofing** for detailed instructions on this product.

COVERAGE

Material	Coverage
Krystol Plug	Approximately 30-42 m per 25 kg pail (100-138 ft per 55 lb pail)
Krystol Repair Grout	Yields approx. 13 L (0.46 cubic feet) per pail, as installed: Approximately 14 m per 25 kg pail (46 ft per 55 lb pail) when used without Krystol Plug Approximately 21 m per 25 kg pail (68 ft per 55 lb pail) when used with Krystol Plug
Krystol T1	Approximately 20 m² per 25 kg pail (225 ft^2 per 55 lb pail)

TOOLS & MATERIALS

- Krystol Plug
- Krystol Repair Grout
- Krystol T1
- Clean water supply
- Mixing bucket, drill and mortar paddle
- Natural bristle concrete brush
- Margin trowel
- Chipping Hammer or scrabbler

NEW CONSTRUCTION OVERVIEW

Waterproofing Wastewater Treatment Tanks

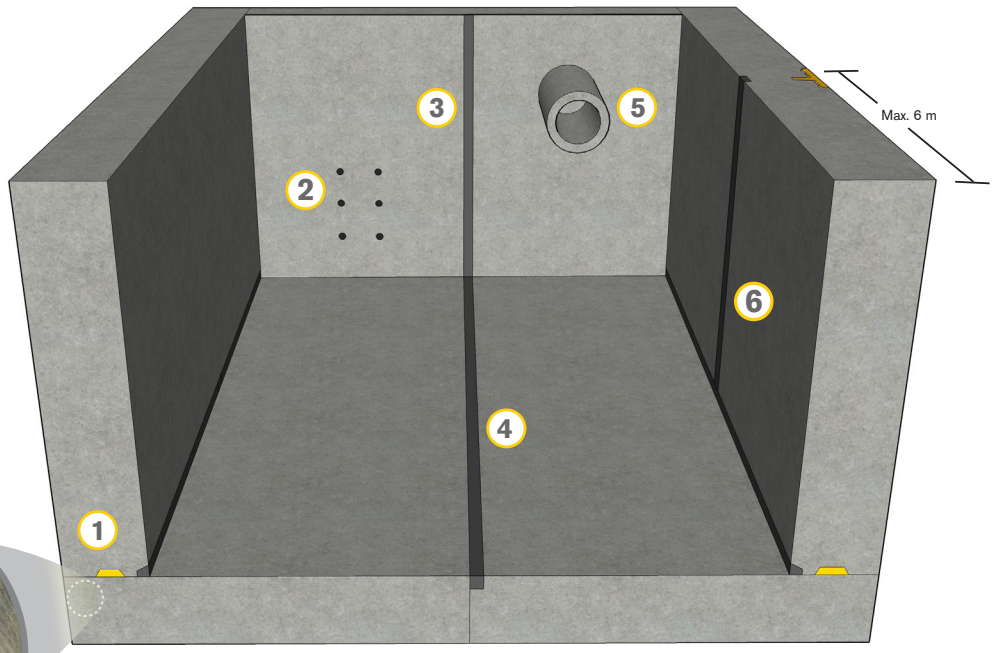
KRYTON® SMART CONCRETE®

Kryton's **Krystol Internal Membrane™ (KIM®)** Waterproofing System covers every construction detail to create watertight concrete structures that replace the need for traditional surface applied membranes. It is more reliable, lasts longer and saves time over other waterproofing systems. This not only saves money during initial construction but also reduces long term repair and maintenance costs.

Krystol Internal Membrane (KIM)

Add to the concrete mix to turn the concrete itself into a permanent waterproofing membrane.

KIM stops water by lowering the permeability of the concrete. Through its unmatched ability to self-seal micro cracks and stop water under the most severe hydrostatic pressure, KIM is the most effective concrete waterproofing solution available.





Krystol® chemically reacts with water and un-hydrated cement particles to form insoluble needle-shaped crystals that fill capillary pores and micro-cracks in the concrete and block the pathways for water and waterborne conteminants. Any moisture introduced over the lifespan of the concrete will initiate crystallization, ensuring permanent waterproofing protection.

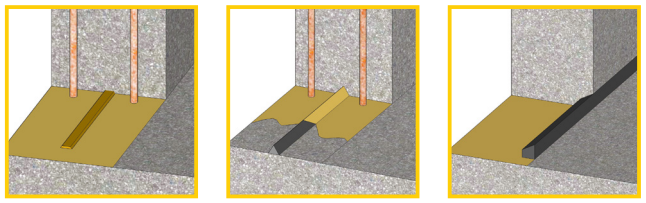
Krystol Waterstop System (KWS)

Use to permanently waterproof every concrete detail including Construction Joints, Penetrations, Tie Holes and Control Joints.

1. **Wall to slab Construction Joints**
2. Tie Holes
3. Wall on wall Construction Joints
4. Slab to slab Construction Joints
5. **Penetrations**
6. **Control Joints**

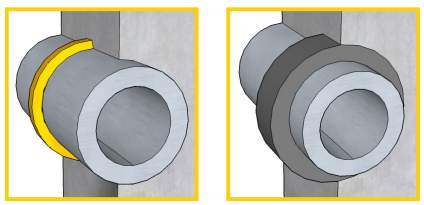
1 WALL TO SLAB CONSTRUCTION JOINTS

DOUBLE PROTECTION | **TRIPLE PROTECTION**



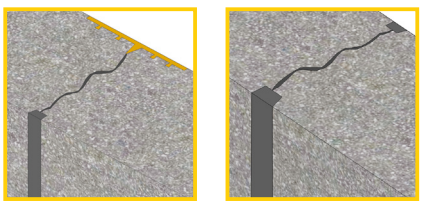
Internal Swelling Method | Internal Grout Method | External Grout Method

5 PENETRATIONS



Internal Swelling Method | External Grout Method

6 CONTROL JOINTS



Crack Inducing Waterstop Method | External Grout Method

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V 2017-07

EXISTING CONSTRUCTION OVERVIEW

Waterproofing Existing Parking Garages

SMART CONCRETE®

Kryton's concrete repair products are specially designed to resurface, waterproof and repair leaking cracks, joints, penetrations, tie-holes and defective concrete from the positive or negative side of water pressure. They can be used in concrete that was built yesterday, or structures needing waterproofing repair after decades of service. Kryton's concrete repair products reliably stop high water flow, even under high-hydrostatic pressure, and outperform epoxy or polyurethane injection repair systems.

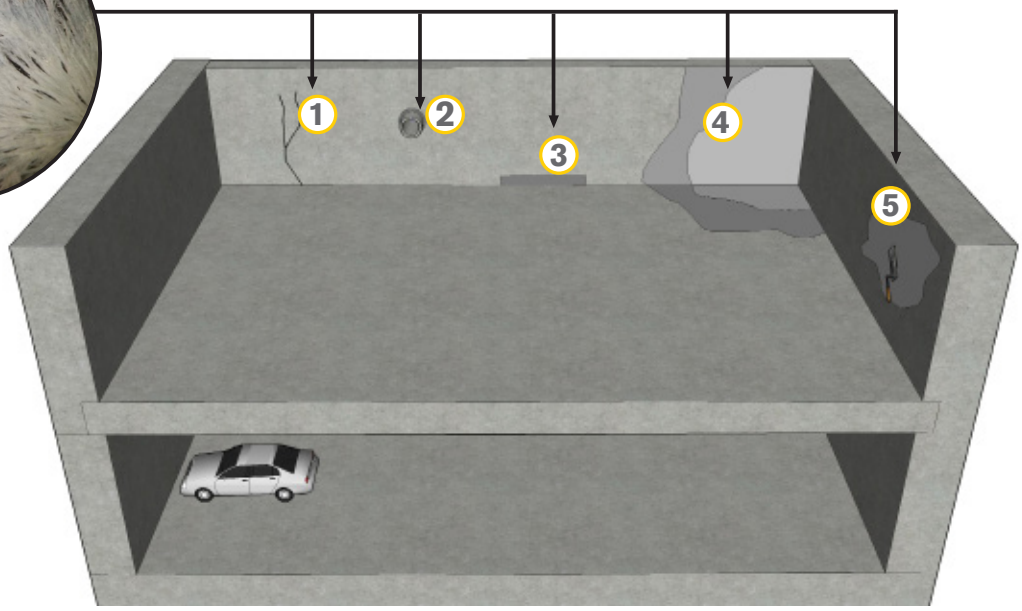
Krystol® Technology

Kryton waterproof repair products contain Krystol technology.

When applied to concrete, Krystol chemically reacts with water and un-hydrated cement particles to form insoluble needle-shaped crystals that fill capillary pores and micro-cracks in the concrete and block the pathways for water and waterborne contaminants.

Any moisture introduced over the lifespan of the concrete will initiate crystallization, ensuring permanent waterproofing protection.





Krystol Leak Repair System

Comprised of Krystol Plug™, Krystol Repair Grout™, and Krystol T1® (recommended), it is primarily used to repair leaking cracks in concrete.

1. Waterproofing cracks, holes and joints.
2. Leaking pipe penetrations.
3. Leaking joints.

Krystol T1 Concrete Waterproofing

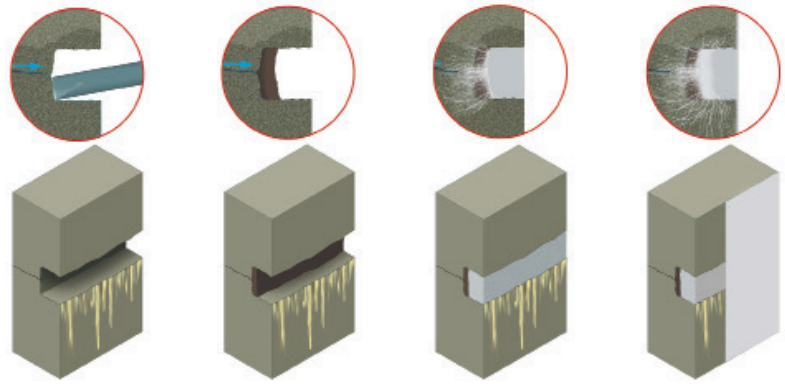
An "in-depth" concrete treatment that is applied as a slurry or spray to the surface of existing concrete structures.

4. Slab and walls to prevent further water ingress.

Krystol Repair Grout or Krystol Bari-Cote

5. Patching and parging defective concrete and masonry.

1 KRYSTOL LEAK REPAIR SYSTEM



Step 1: *Prepare the crack or joint.*

Step 2: *Stop flowing water with Krystol Plug.*

Step 3: *Install Krystol Repair Grout.*

Step 4: *Apply Krystol T1 to the surface.*

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V 2018-02

Frequently Asked Questions (FAQ)

Only a portion of the crack / joint is leaking, should I repair the entire crack anyway?

Yes, always repair the entire length of a crack / joint even if only a portion of it is leaking. If only the actively leaking portions are repaired, the leak will shift and start leaking in previously dry areas

How do I install Krystol Plug against high hydrostatic pressure (i.e. water is streaming from a portion of the crack)?

Repairing a crack that is leaking under high hydrostatic pressure can be challenging, particularly if there is a high pressure stream of water coming from the crack. The following procedure will help to address this situation:

Plug the high pressure stream of water last. Most of the pressure against the crack is being relived at this point, so let it continue to leak until Krystol Plug has been installed in the rest of the chase.

A small section of hose or pipe can be grouted over the water stream to direct water away from the wall while the repair is filled with Krystol Plug.

As the last step, remove the section of hose/pipe and fill this spot with Krystol Plug to stop the flowing water.

Why is my Krystol Plug setting too slowly/too quickly?

When properly mixed under most conditions, Krystol Plug will harden in 1-2 minutes allowing it to stop actively leaking cracks. There are two situations that may cause the set time to be slower:

1. Too much mixing water will slow down strength development. Try preparing a drier mix to improve performance.
2. The effects of low temperature will be particularly noticeable for a rapid setting material like Krystol Plug. Store the material in a warmer location prior to use, and use warm mixing water to achieve normal set times in cold weather.

In hot weather, Plug will set very quickly. Use cooler water to provide the working time needed.

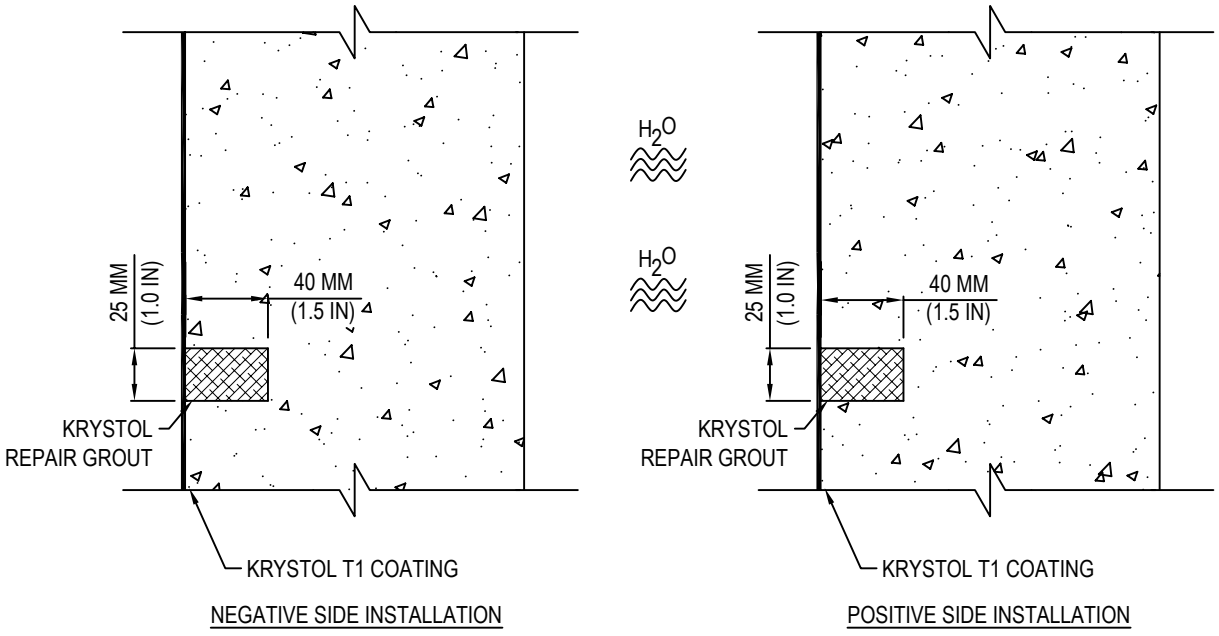
It is faster and easier to chip out a “V” shaped chase rather than a sharp “U” shape. Can I use a “V” shape instead?

The size and shape of the chase is vital to a successful leak repair. Experience has found a sharp “U” shape provides the strongest repair. A “U” shape provides more support for the repair materials during application and provides a stronger final repair. A “U” also allows each repair component to be installed at the correct width and thickness.

The chiseling method or new saw cut method described in Application Instruction 5.12 has been found to be the fastest and most effective method to prepare a chase for repair.

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NEGATIVE SIDE INSTALLATION

POSITIVE SIDE INSTALLATION

MANUFACTURER'S NOTES:

1. SAW CUT AND OR CHISEL ANY CRACKS OVER 0.5 MM TO THE REQUIRED DEPTH OF 40 MM X 25 MM (1.5" X 1")
2. PACK WITH KRYSTOL REPAIR GROUT AT A RATE OF APPROPRIATELY 2.5 KG PER LINEAL METER (1.6 LB PER LINEAL FOOT)
3. APPLY KRYSTOL T1 AT A RATE OF 1.2 KG PER M² (2.2 LBS PER YD²).

NOTES:

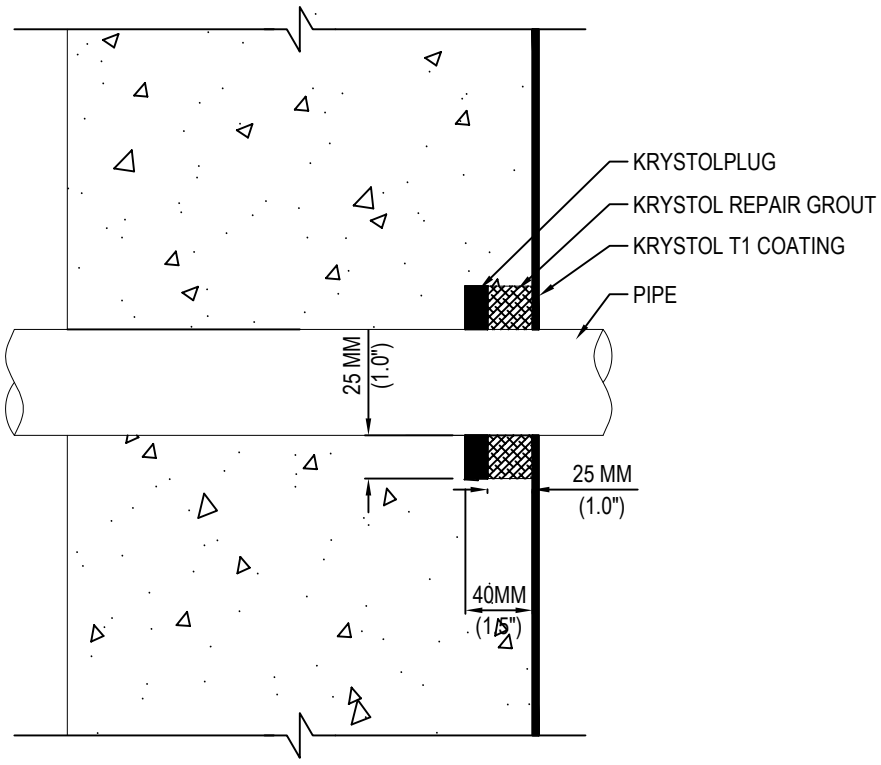
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4. ALL INFORMATION CONTAINED HEREIN WAS CURRENT AT THE TIME OF DEVELOPMENT BUT MUST BE REVIEWED AND APPROVED BY THE PRODUCT MANUFACTURER TO BE CONSIDERED ACCURATE.
5. CONTRACTOR'S NOTE: FOR PRODUCT AND COMPANY INFORMATION VISIT www.CADdetails.com/info AND ENTER REFERENCE NUMBER 5104-061

KRYSTOL T1 SURFACE APPLIED CRYSTALLINE WATERPROOFING

VERTICAL SURFACES

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MANUFACTURER'S NOTES:
- CHISEL TO CREATE A CHASE AROUND THE PIPE TO THE REQUIRED 25 MM X 40 MM (1 X 1.5)
1. APPLY KRYSTOL PLUG TO PREPARED CHASE TO STOP FLOWING WATER.
2. TIGHTLY PACK REMAINING CHASE WITH KRYSTOL REPAIR GROUT AT A RATE OF APPROXIMATELY 1.6 KG PER LINEAL METER (1 LB. PER LINEAL FOOT).
3. WATERPROOF ENTIRE WALL OR SLAB WITH KRYSTOL T1 AT A RATE OF 1.2 KG/M2.

NOTES:
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KRYSTOL LEAK REPAIR SYSTEM

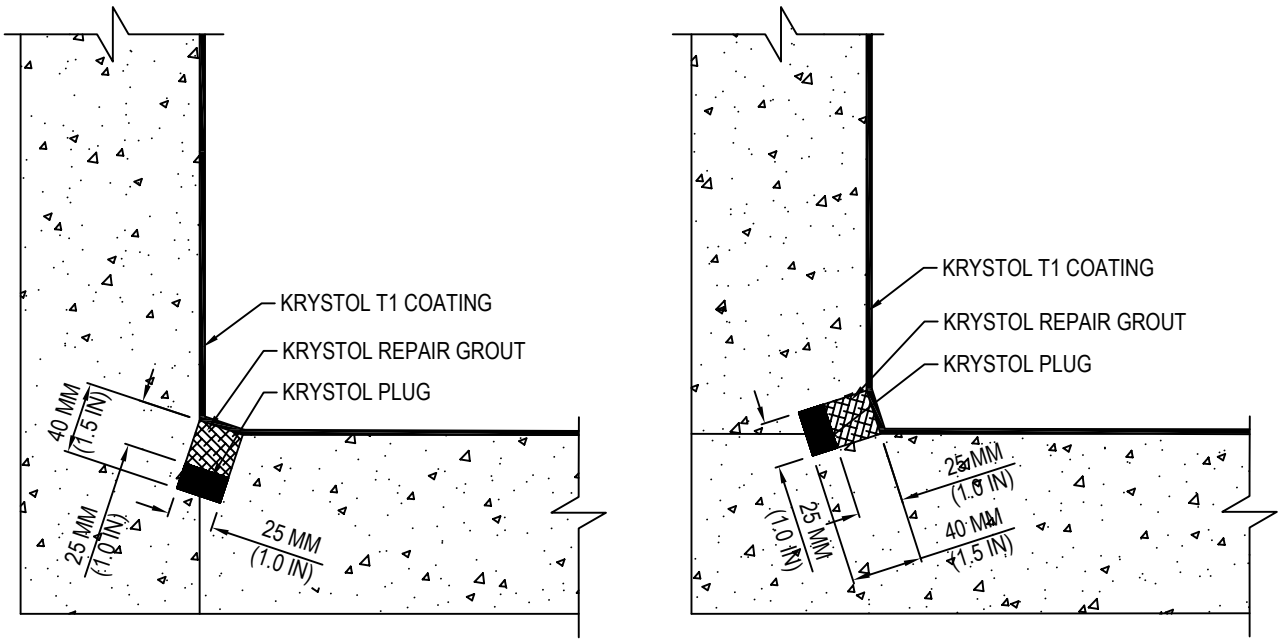
PIPE PENETRATION - LEAK REPAIR

5104-052

REVISION DATE 20/11/2018

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WALL TO SLAB JOINT REPAIR

MANUFACTURER'S NOTES:

CHISEL TO CREATE A CHASE ALONG THE ENTIRE LENGTH OF THE LEAKING CRACK OR JOINT TO THE REQUIRED 25 MM X 40 MM (1" X 1.5")

1. APPLY KRYSTOL PLUG TO PREPARED CHASE TO STOP FLOWING WATER.
2. TIGHTLY PACK REMAINING CHASE WITH KRYSTOL REPAIR GROUT AT A RATE OF APPROXIMATELY 1.6 KG PER LINEAL METER (1 LB. PER LINEAL FOOT).
3. WATERPROOF ENTIRE WALL OR SLAB WITH KRYSTOL T1 AT A RATE OF 1.2 KG/M2

NOTES:

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KRYSTOL LEAK REPAIR SYSTEM

WALL TO SLAB – LEAK REPAIR

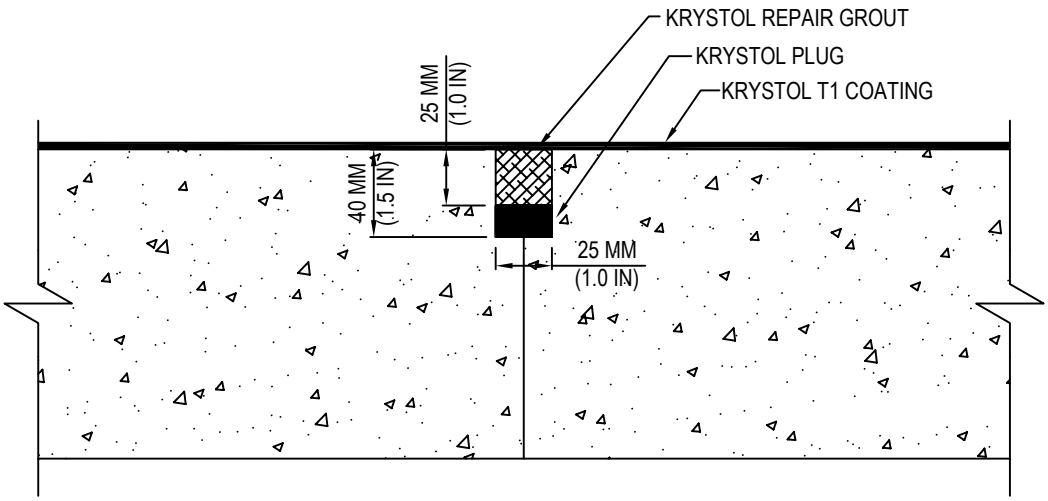
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SLAB TO SLAB/WALL TO WALL JOINT REPAIR

MANUFACTURER'S NOTES:

CHISEL TO CREATE A CHASE ALONG THE ENTIRE LENGTH OF THE LEAKING CRACK OR JOINT TO THE REQUIRED 25 MM X 40 MM (1" X 1.5")

1. APPLY KRYSTOL PLUG TO PREPARED CHASE TO STOP FLOWING WATER.
2. TIGHTLY PACK REMAINING CHASE WITH KRYSTOL REPAIR GROUT AT A RATE OF APPROXIMATELY 1.6 KG PER LINEAL METER (1 LB. PER LINEAL FOOT).
3. WATERPROOF ENTIRE WALL OR SLAB WITH KRYSTOL T1 AT A RATE OF 1.2 KG/M2

NOTES:

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KRYSTOL LEAK REPAIR SYSTEM

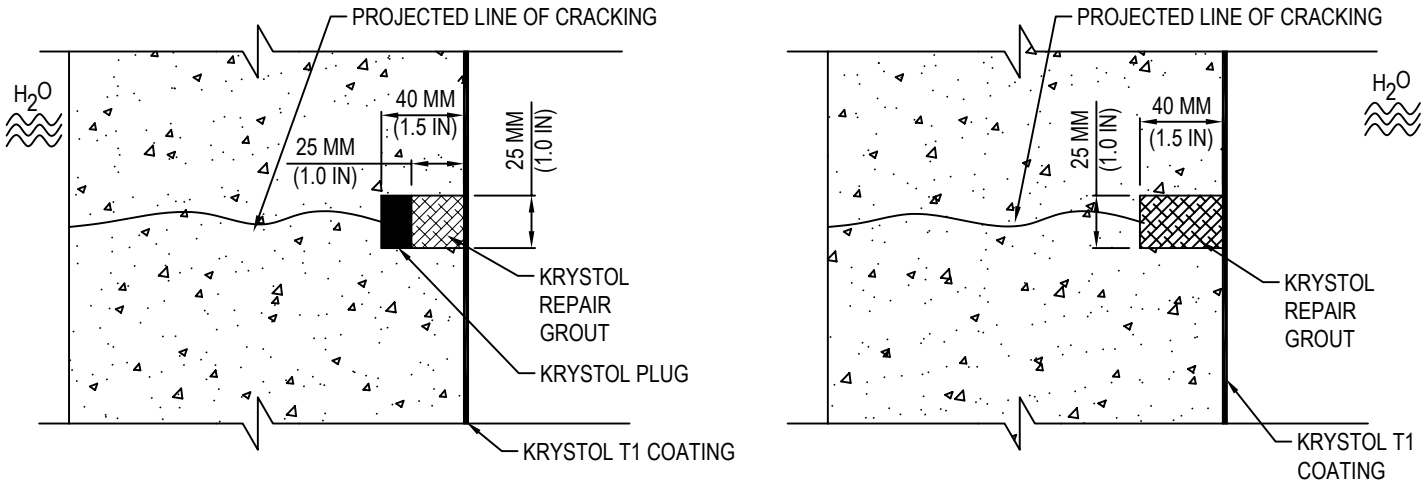
SLAB TO SLAB – LEAK REPAIR

5104-034

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NEGATIVE SIDE LEAK REPAIR

POSITIVE SIDE LEAK REPAIR

LEAKING CRACK REPAIR

MANUFACTURER'S NOTES:
CHISEL TO CREATE A CHASE ALONG THE ENTIRE LENGTH OF THE LEAKING CRACK OR JOINT TO THE REQUIRED 25 MM X 40 MM (1" X 1.5")

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3. WATERPROOF ENTIRE WALL OR SLAB WITH KRYSTOL T1 AT A RATE OF 1.2 KG/M2

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KRYSTOL LEAK REPAIR SYSTEM

POSITIVE NEGATIVE – LEAK REPAIR

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THREE OF MANY SUCCESSFUL PROJECTS



VanDusen Botanical Gardens Visitor Centre, Vancouver, B.C, Canada

The visitor center was built to exceed LEED (Leadership in Energy and Environmental Design) Platinum status and pursue the Living Building Challenge, which defines the highest measure of sustainability for built environments. Kryton's Krystol Internal Membrane (KIM) concrete waterproofing admixture was used to waterproof the site's water cistern as well as the wall behind the rammed earth wall. Kryton's Krystol Waterstop System for joints was also used to fully tank the site's water cistern.

Winner of the 2012 Outstanding Shotcrete Project
Project of the Year for Infrastructure from the American Shotcrete Association

AMERICAN SHOTCRETE ASSOCIATION



Knight Theater Pedestrian Tunnel, Charlotte, NC, USA

Several waterproofing systems were considered for the new pedestrian tunnel, including HDPE membrane, PVC membrane, double-bonded spray-applied cementitious membrane and cementitious concrete admixtures. After evaluating the cost and constructability issues of these methods, a combination of two systems were selected to achieve the specified and desired results. It was decided to use Kryton's Krystol Internal Membrane (KIM) in the structural shotcrete walls and invert concrete slab of the tunnels and then apply a double-bonded spray-applied membrane to the walls.



The Carlyle Residences, Los Angeles, CA, USA

Home to Bruce Willis and Larry King among others, the 24-story Carlyle Residences features price points from $2.9 million to $15 million. The four level parking structure is equipped with a modern elevator system that leads owners to their respective suites without so much as a single hallway. The building's placement above an active aquifer challenged the architects and their design concept. The project stakeholders chose to waterproof every portion of the below grade areas with Kryton's waterproofing systems. The parking structure was constructed by KIM-treated shotcrete eliminating the need for conventional membranes. Control cracks were intentionally implemented, and those were addressed using Kryton's Crack Repair System and all joints were treated with Kryton's Krystol Waterstop System. When addressing all tie-holes and beam pockets, Kryton's detailed application instructions were helpful in safeguarding those areas.



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and try our cost comparison tool!

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WATERPROOFING STRUCTURAL SHOTCRETE WITH AN INTERNAL MEMBRANE

KRYTON®
SMART CONCRETE®

AUTHORIZED DISTRIBUTOR

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THE PROBLEM:
Why is waterproofing structural shotcrete so difficult?

1. Shotcrete is commonly applied to a blind-wall form and there is no access to apply a membrane
2. Membranes that are hung on the form and shot against risk damage and/or torn seams
3. Membrane installation adds time and money
4. It is difficult to reliably waterproof around pipes and other penetrations
5. Shotcrete is known to shrink and crack more than cast-in-place

THE SOLUTION:
Using Krystol Internal Membrane (KIM) to waterproof structural shotcrete instead of a membrane

1. **Reduce Risk**: KIM is mixed into and becomes a permanent part of the shotcrete and so there is no risk of damage to waterproofing system
2. **Build Faster**: KIM allows for faster construction as there is no need to schedule installation or wait during delays
3. **More Practical**: KIM is an integral waterproofer and so there is no need to access the blind side of the shotcrete
4. **Reduces Cracking**: KIM treated shotcrete is proven to reduce cracking due to shrinkage
5. **Reliably Waterproofs Around Pipes and Penetrations**: The KIM waterproofing system can reliably waterproof around pipes and other penetrations
6. **Protects Against Corrosion**: KIM is proven to protect steel reinforcement from corrosion
7. **Enhances Durability**: KIM will enhance the durability of the shotcrete by protecting it from deleterious chemicals
8. **Kryton Offers the Industry-Leading 25-year Manufacturer's Warranty**



DID YOU KNOW?

Structural shotcrete is becoming a preferred concreting method in foundation construction, building tanks, parking garages and many other structures because it's up to 50% faster than conventional cast in place.

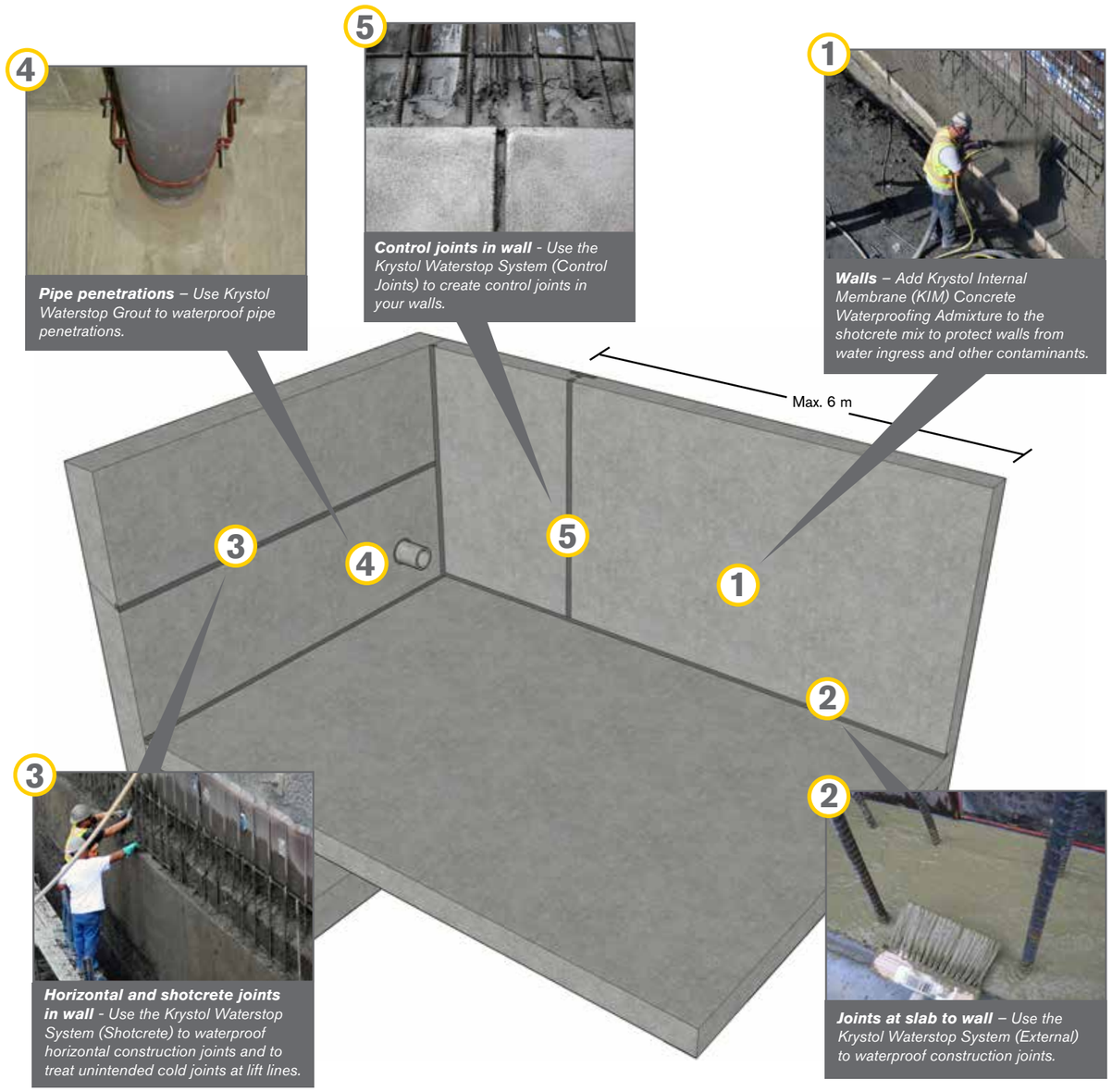
ADDITIONAL BENEFITS OF USING KRYTON'S SHOTCRETE CONCRETE WATERPROOFING SYSTEM

- **Increases your Profitability**: No need to go back and repair leaks that are common with shotcrete structures waterproofed by membranes.
- **Peace of mind**: Kryton's Dedicated One-Stop-Shop Expertise mitigates risk. Kryton's knowledge and expertise of specific shotcrete details including waterproofing construction joints, penetrations and other tricky details ensure the delivery of a completely tanked and waterproofed concrete structure from a single partner. Kryton Takes the Risk Out of Concrete Waterproofing.

> *"…compared to membranes or other admixtures, Kryton's KIM offers superior performance due to its unique crystal self-sealing technology being able to both reduce shrinkage during the curing process combined with reduced cracking. This has enabled us to build watertight structures with greater confidence and time savings."*
>
> - Gary Hawkins, Torrent Shotcrete Structures Ltd.

BUILD BETTER WITH KRYTON WATERPROOFING

Although, shotcrete structures can be challenging to waterproof, Kryton's experience and systemic approach has all the details covered. There are many considerations to take into account that are different from waterproofing structures that are built using cast in place concrete. Rebar stabilization, shadowing, experienced and attentive nozzlemen, proper concrete mix designs, climate, construction joint details, penetrations, and cracking, are just a few items that need to be addressed differently when dealing with shotcrete compared to cast in place. Most membrane waterproofing systems do not address the differences in concrete placement and the result or doing it wrong can lead to costly repairs.



Pipe penetrations *– Use Krystol Waterstop Grout to waterproof pipe penetrations.*

Control joints in wall *- Use the Krystol Waterstop System (Control Joints) to create control joints in your walls.*

Walls *– Add Krystol Internal Membrane (KIM) Concrete Waterproofing Admixture to the shotcrete mix to protect walls from water ingress and other contaminants.*

Horizontal and shotcrete joints in wall *- Use the Krystol Waterstop System (Shotcrete) to waterproof horizontal construction joints and to treat unintended cold joints at lift lines.*

Joints at slab to wall *– Use the Krystol Waterstop System (External) to waterproof construction joints.*

Kryton has all these details covered. Kryton International Inc. provides the most effective concrete waterproofing systems in the world. With over 40 years of experience, and more than 10,000 successful waterproofing projects, Kryton is recognized and acknowledged as the leader in taking the risk out of concrete waterproofing.

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PROTECT
MARINE STRUCTURES
WITH CRYSTALLINE WATERPROOFING

KRYTON®
SMART CONCRETE®

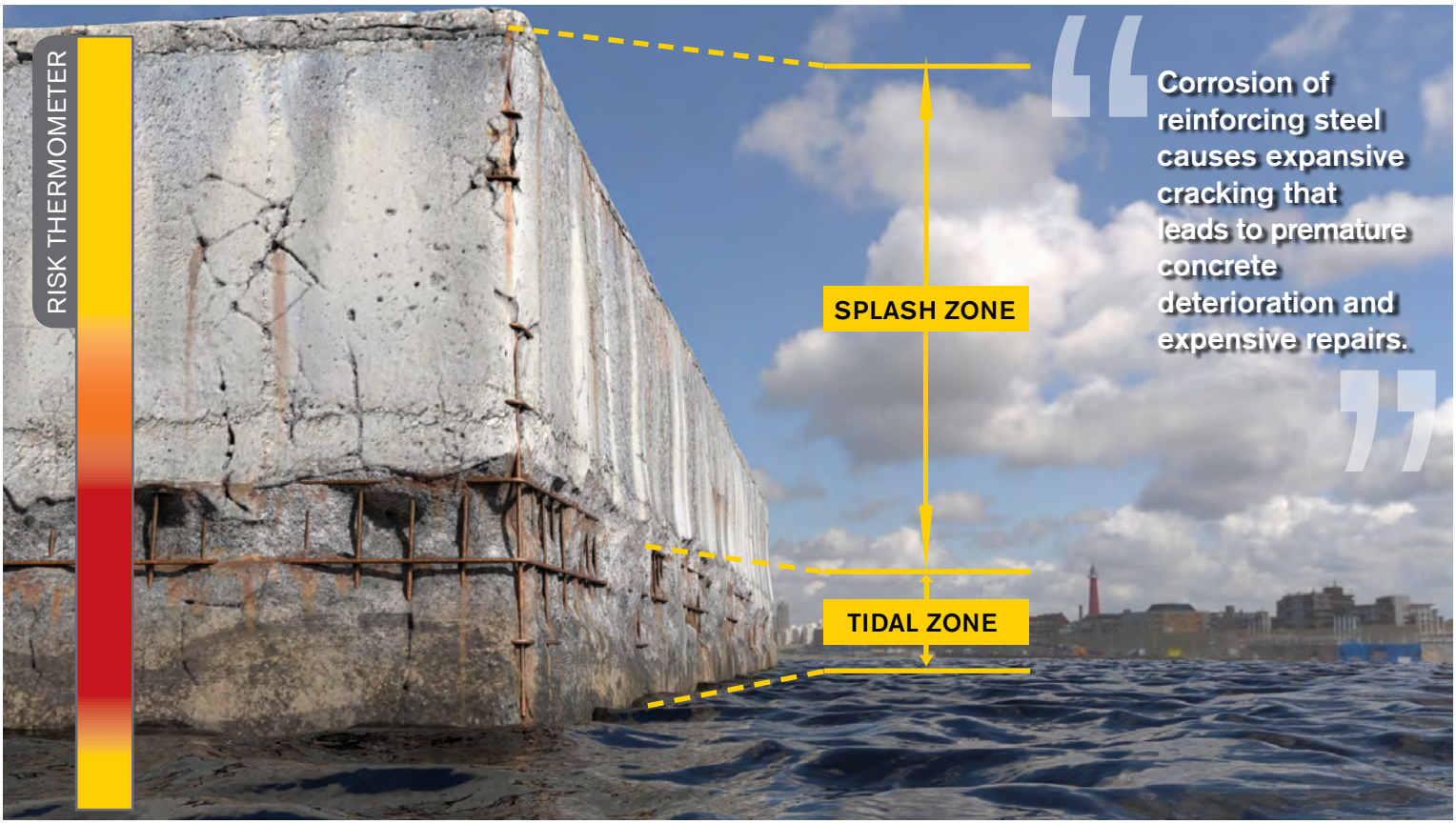


INCREASE THE LIFESPAN OF MARINE CONCRETE:

- Sea Walls
- Piers
- Waterside Buildings / Infrastructure
- Breakwaters
- Docks
- Concrete Pilings
- Dams
- Bridges
- Jetties
- Groynes
- Bulkheads
- Ports

USE THE RIGHT PRODUCTS TO PROTECT AND INCREASE

THE LIFESPAN OF INFRASTRUCTURE IN HARSH MARINE ENVIRONMENTS



THE PROBLEM:

Concrete located in or near marine environments have a higher risk of chloride attack and corrosion due to constant wet-dry cycles that force water through the capillary tracts and micro-pores found in concrete.

Water movement through the concrete allows waterborne chlorides to penetrate to the reinforcing steel and causes corrosion resulting in expansive pressure and cracking. These factors lead to rapid deterioration of concrete and a drastically shortened lifespan.

THE SOLUTION:

Krystol Internal Membrane™ (KIM®) is a hydrophilic crystalline admixture used to create permanently waterproof concrete.

KIM effectively and reliably lowers the permeability of concrete and self-seals micro-cracks for the life of the structure. By preventing the transmission of water through concrete, KIM eliminates the factors that cause early concrete destruction such as chemical attack and corrosion of reinforcing steel. Instead, KIM is a permanent waterproofing solution that ensures durability and longevity for a concrete structure.



KRYSTOL® TECHNOLOGY TURNS THE CONCRETE INTO A PERMANENT
WATERPROOF BARRIER BY LOWERING PERMEABILITY AND INCREASING DURABILITY

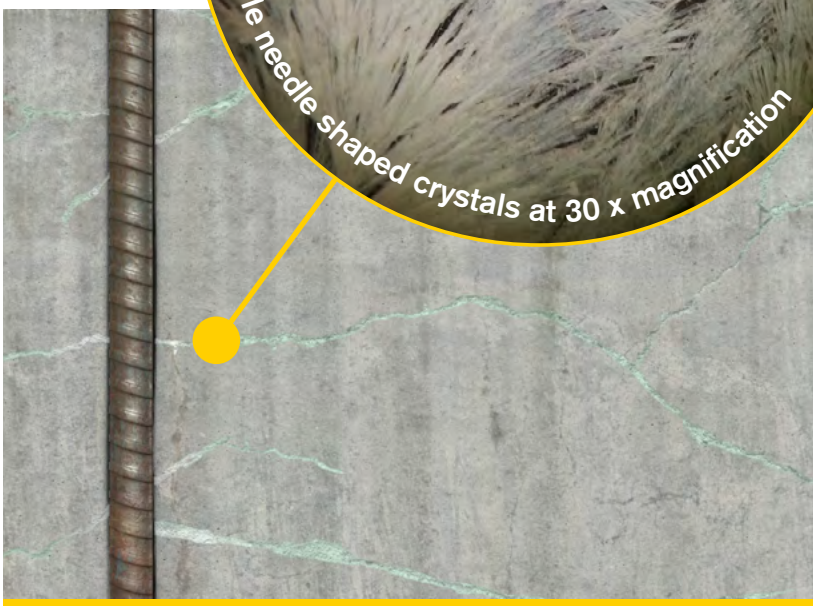
HOW IT WORKS:

KIM is a crystalline waterproofing admixture that uses Krystol® technology to waterproof concrete. When added to concrete, Krystol chemical reacts with water and un-hydrated cement particles to form insoluble needle-shaped crystals that fill capillary pores and micro-cracks in the concrete and block the pathways for water and waterborne contaminants.

Any moisture introduced over the lifespan of the concrete will initiate crystallization, ensuring permanent waterproofing protection.



A cross section of unprotected concrete



A cross section of KIM protected concrete

Krystol Internal Membrane™ (KIM®):

Permanently waterproofs concrete to protect against:
- Corrosion of steel reinforcement
- Chloride attack
- Sulfate attack
- Carbonation
- Alkali Aggregate reaction (AAR)
- Freeze/thaw damage

Reduces plastic and drying shrinkage of concrete, preventing:
- Cracks in concrete
- Direct exposure of reinforcement to water and chlorides
- Early onset of corrosion

Provides life-long 'self-sealing' of static cracks
- Certified up to 0.5 mm – tested to 0.77 mm
- Permanent solution, no need to reapply



KIM is added to the concrete before placement

10-year Corrosion Study by University of Hawaii Recommends KIM

A long-term corrosion study was conducted to evaluate the durability of 22 reinforced concrete specimens, all containing various pozzolans and chemical admixtures. Test panels were exposed to a marine environment, in the tidal zone in Honolulu Harbor from 2002-2012. Panels were monitored for half-cell potential, chloride concentrations, cracking and visible signs of corrosion.



After 10 years marine exposure; Control concrete / KIM treated concrete.

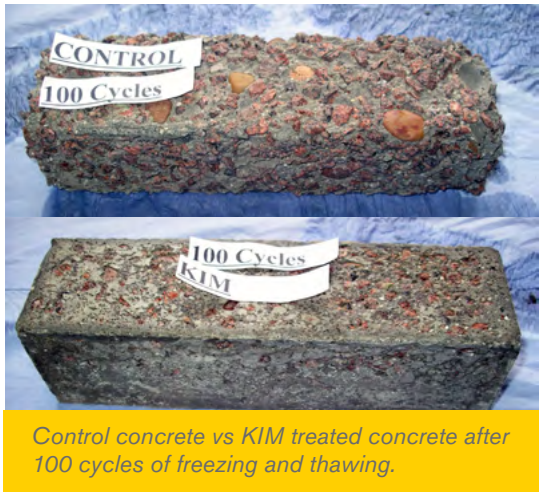
KEY FINDINGS

- The panel using Krystol Internal Membrane (KIM) at a dosage of 2% had low half-cell readings and no visible signs of corrosion
- KIM significantly outperformed other permeability reducing admixtures & corrosion inhibitors

BBA BRITISH BOARD OF AGRÉMENT
CERTIFICATE No 05/4217

Independent testing by the British Board of Agrément (BBA) confirms that Krystol Internal Membrane (KIM) has superior waterproofing properties. KIM's ability to stop water increases concrete durability as freeze thaw expansion and corrosion expansion cracking are virtually eliminated.

Water Permeability	Reduced 70%
Drying Shrinkage	Reduced 25%
Wetting Expansion	Reduced 33%
Freeze Thaw Expansion	**Reduced 86%**
Compressive Strength (28 Day)	Improved 11%
Flexural Strength	Improved 7%
Water Vapor Permeability	Reduced 17%



Control concrete vs KIM treated concrete after 100 cycles of freezing and thawing.

No other company has more experience at keeping water out of concrete than Kryton International Inc.

Kryton has been an innovator of crystalline waterproofing technology throughout the world for more than 40 years and is the inventor of the crystalline waterproofing admixture. Kryton offers a full line of waterproofing products for new and existing construction, including admixtures, surface-applied coatings, construction joints and details, as well as repair systems.

Kryton's Krystol Technology has been used to successfully waterproof high-risk projects throughout the world and has been proven to extend the life of a structure by creating durable, long-lasting concrete.

Kryton's global network includes staff in Canada, USA, UK, UAE, India, China, Singapore, as well as Distributors in over 50 countries. To find a Kryton office near you please visit: www.kryton.com

BBA BRITISH BOARD OF AGRÉMENT CERTIFICATE No 05/4217 · CE · ES · NSF Certified to NSF/ANSI 61

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KRYTON®
SMART CONCRETE®



CONSTRUCTION & REPAIR OF CONCRETE PARKING STRUCTURES

KRYTON®

SMART CONCRETE®

CONSTRUCT WATERTIGHT

PARKING STRUCTURES THAT LAST

Kryton takes the risk out creating durable waterproof concrete parking structures.

Parking structures are different from other concrete buildings due to:

- Reduced roofing, cladding, and climate control that result in a more severe direct or indirect exposure to rain, snow, sunlight, temperature variations and airborne chlorides;
- Water and waterborne contaminates can cause corrosion of reinforcing steel and compromise the structural integrity of the structure;
- Vehicular occupancy that imposes heavy moving loads and deposits deicing salts;
- Large plan size that magnifies the potential for damage caused by restraint of movements and forces associated with volumetric changes.

All of these factors influence the durability of parking structures and require consideration in their design. Kryton's Concrete Waterproofing System reduces risk by transforming concrete into a powerful water resistant barrier which extends the durability of your new parking structure.

1



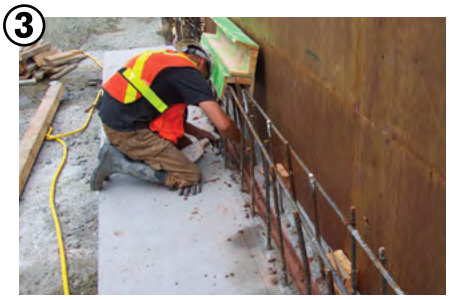
Create a watertight structure by using Krystol Internal Membrane™ (KIM®) in precast, cast-in-place or shotcrete walls and slabs. KIM builds the waterproofing right in to the concrete, eliminating the need for unreliable membranes.

2



Waterproof pipe penetrations and tie-holes with Krystol Waterstop Grout™.

3

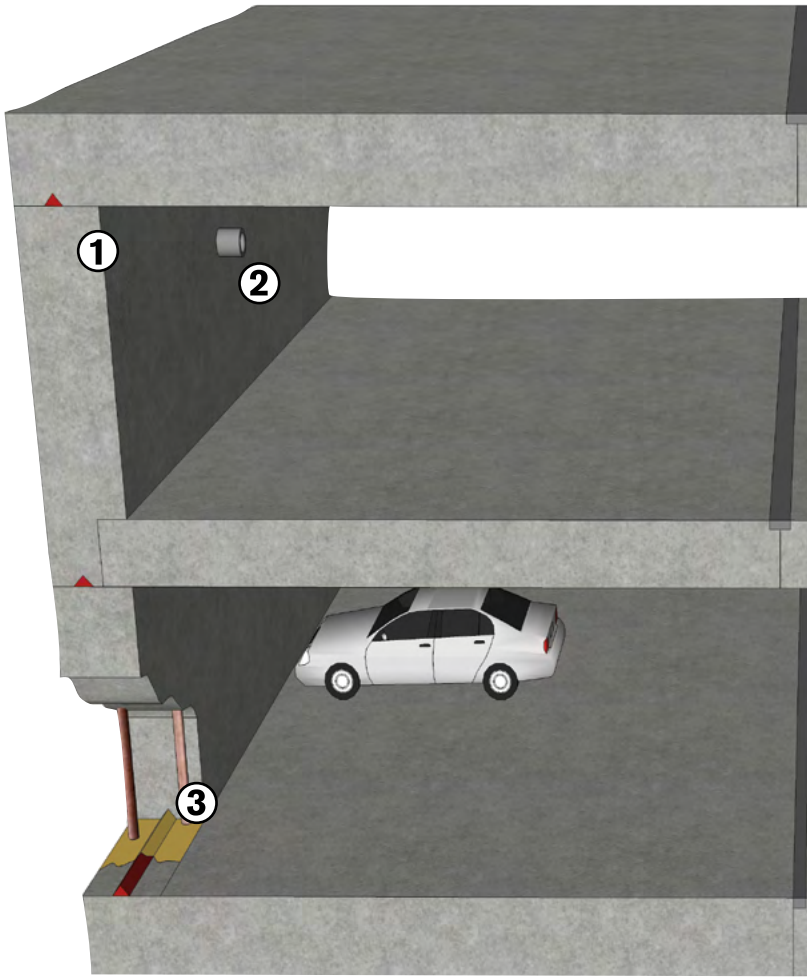


Create two levels of construction joint protection with both a physical and crystalline chemical barrier by using the Krystol® Waterstop System.

4



Construct a water resistant seal at suspended slab control joints.



Kryton's complete waterproofing system makes concrete more durable:

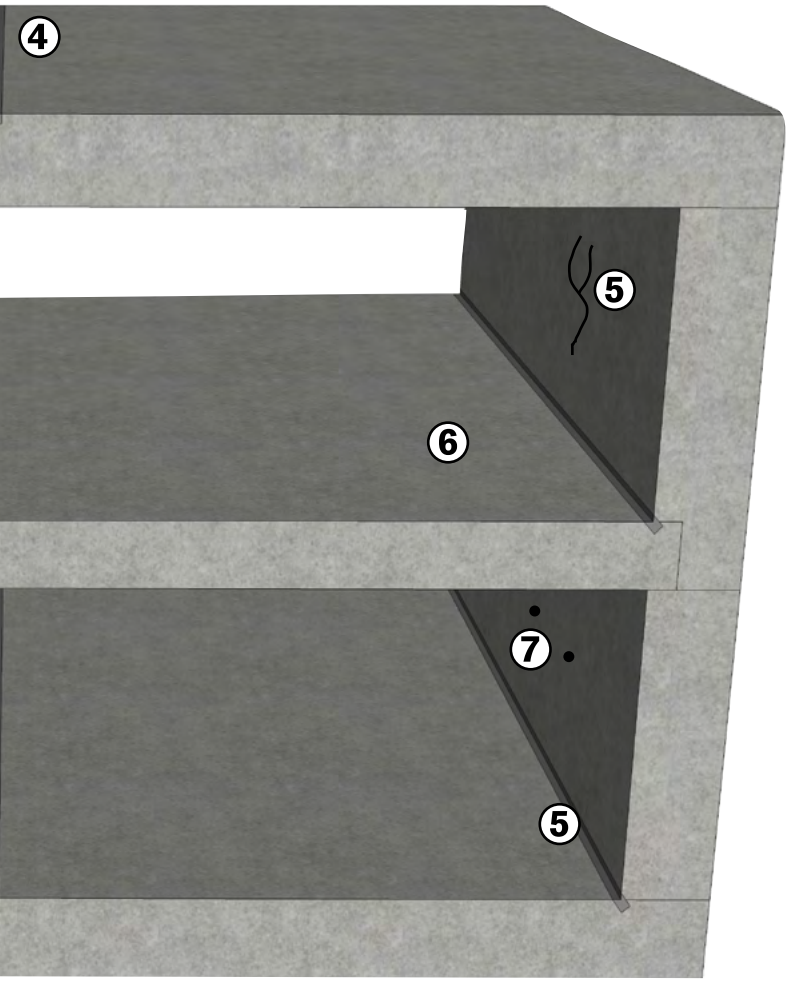
- Kryton's Waterproofing System self-seals leaks and protects rebar from corrosion
- Promotes more efficient use of time and money
- Replaces leak prone membranes

REPAIR AND EXTEND THE LIFE

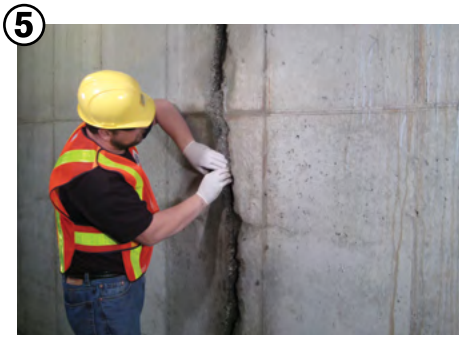
OF EXISTING PARKING STRUCTURES

Extend the life of your parking structure with the use of Kryton's complete Waterproofing System.

- Repair of parking structures damaged by ground water penetration and leaks
- Stops water and waterborne contaminates entering the structure
- Avoids premature deterioration of structural components
- Extends the durability of your parking structure

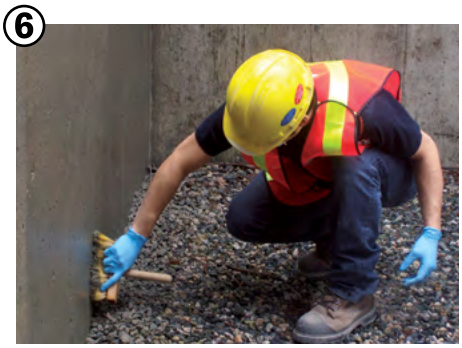


5



Waterproof leaking cracks and joints using the Krystol Leak Repair System.

6



Waterproof where existing membranes have failed or where there was no initial waterproofing with Krystol T1 & T2®; a cementitious slurry system that becomes an integral part of the concrete to prevent water ingress.

7



Repair leaking pipe penetrations and tie holes with Krystol Leak Repair System.

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The Erickson Underground Parking
Vancouver, B.C, Canada

The Erickson is a luxury, 20-story concrete and steel-trussed building with glass on all sides and an undulating shape that rises from the edge of False Creek in downtown Vancouver, surrounded by water on three sides.

They chose Kryton's Krystol Internal Membrane (KIM) admixture in all below grade concrete. KIM was used for all below grade perimeter walls. In addition to the waterproof concrete, the builder also applied thousands of lineal feet of Kryton's Krystol Waterstop System to seal the below grade construction joints, giving the joints the same level of crystalline protection that is in the concrete.

The Krystol Waterproofing System eliminated any need for exterior waterproof membranes, saved time and labour costs, and ensured a guaranteed leak-free building that can proudly bear the Arthur Erickson name.



Al Mashfa Private Hospital
Underground Parking, Jeddah, Saudi Arabia

Kryton's Krystol Internal Membrane (KIM) admixture was used to waterproof the base slab and perimeter walls and the Krystol Waterstop System was used for all the cold joints in the slabs and walls. The Krystol Waterproofing System saved the team thousands of dollars and shaved 48 days off their construction schedule.

"The implementation of all typical waterproofing methods would have been near impossible for our project. Particularly given the challenges we incurred during excavation: the 12-meter (39.4 feet) cutoff wall and extreme head pressure. We required an advanced waterproofing system that could withstand all of these obstacles especially during the casting of the matt slab."
– Mr. A. Hamis Elmas, Project Manager & Architectural Consultant, Al Mashfa Group



KK Times Square Underground Parking
Kota Kinabalu, Malaysia

For KK Times Square the developers used Kryton's Krystol Internal Membrane (KIM) admixture, surface-applied Krystol T1 & T2, Krystol Waterstop Joint System and Krystol Leak Repair system. The Krystol line of products met the developer's requirements for:

- affordability and ease of application
- a system that would be long lasting, minimizing future repair costs and inconveniences
- a waterproofing system that could withstand significant hydrostatic pressure and protect against the corrosion of steel reinforcements

Kryton is headquartered in Canada and has 7 regional offices in China, India, Mexico, SIngapore UAE, UK and the USA.

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CONSTRUCTION & REPAIR OF CONCRETE TUNNELS

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CONSTRUCT WATERTIGHT

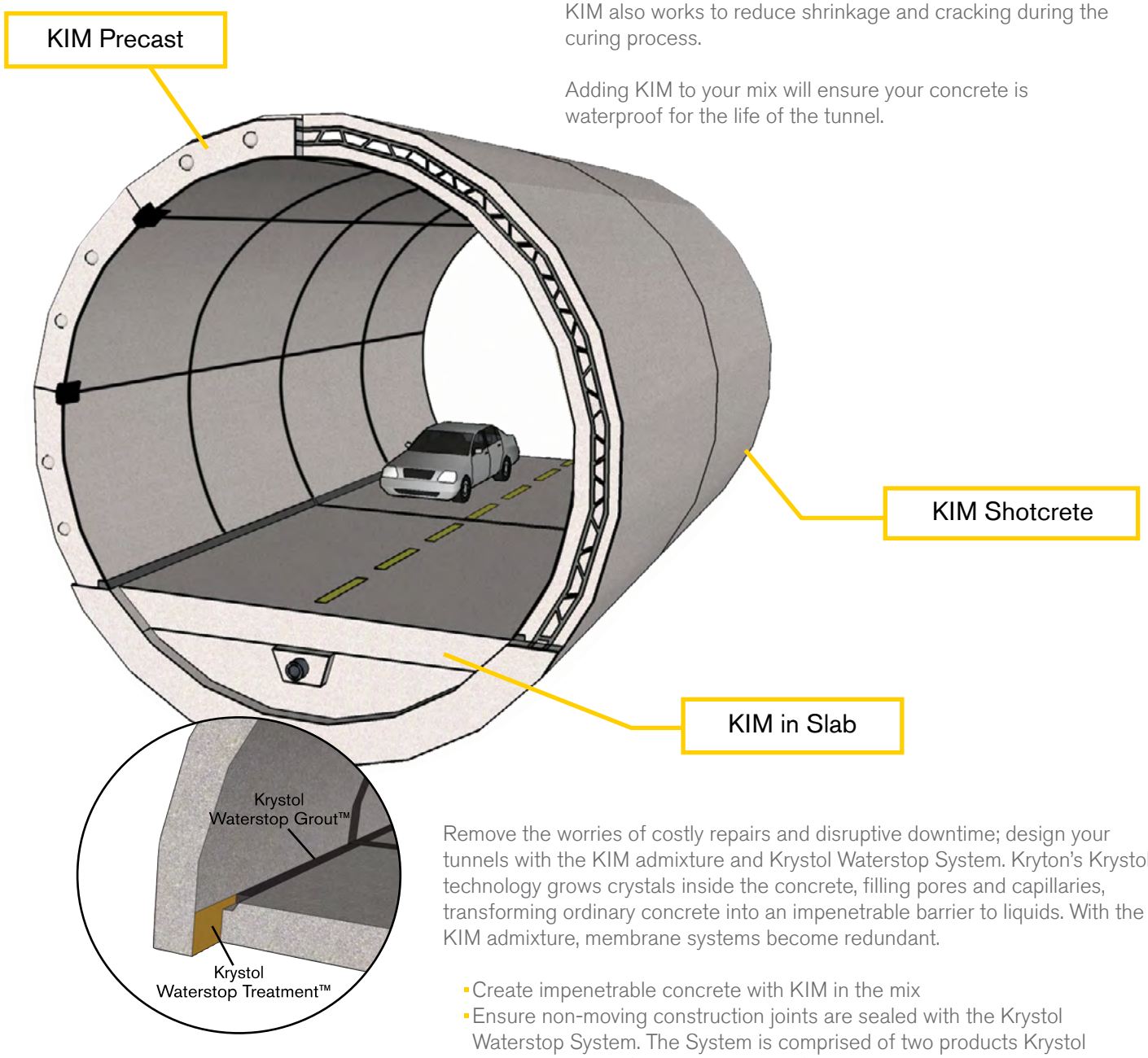
TUNNELS THAT LAST

Tunnels can be subjected to heavy traffic and vibration, temperature changes, corrosion damage and freeze thaw cycles which affect the tunnel's durability.

Proper waterproofing prevents the penetration of moisture and chemicals into the concrete and steel components of the tunnel. Ultimately protecting the durability and structural integrity of the concrete; overall, prolonging the life of the tunnel. Kryton's Krystol® Waterproofing System protects the structural rebar from corrosion and provides a durable, leak-free solution that will last for the life of the tunnel.

Whether using cast-in-place, shotcrete and/or precast to construct your tunnel, Krystol Internal Membrane™ or KIM® can be added to the concrete at the plant, or on-site to the mixer truck to make your concrete watertight. KIM turns the concrete itself into the waterproofing membrane – eliminating the need for any surface-applied membrane to be applied. KIM and the Krystol Waterproofing System reduce labor, construction schedules and costs for concrete waterproofing. KIM also works to reduce shrinkage and cracking during the curing process.

Adding KIM to your mix will ensure your concrete is waterproof for the life of the tunnel.



Remove the worries of costly repairs and disruptive downtime; design your tunnels with the KIM admixture and Krystol Waterstop System. Kryton's Krystol technology grows crystals inside the concrete, filling pores and capillaries, transforming ordinary concrete into an impenetrable barrier to liquids. With the KIM admixture, membrane systems become redundant.

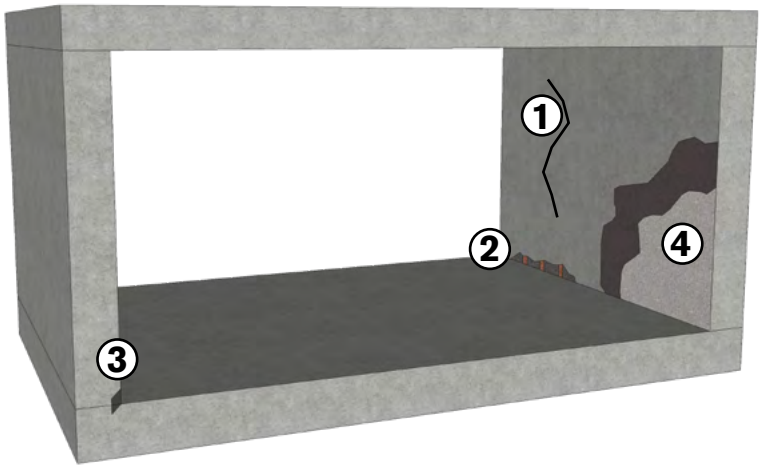
- Create impenetrable concrete with KIM in the mix
- Ensure non-moving construction joints are sealed with the Krystol Waterstop System. The System is comprised of two products Krystol Waterstop Grout (Internal or External) and Krystol Waterstop Treatment.

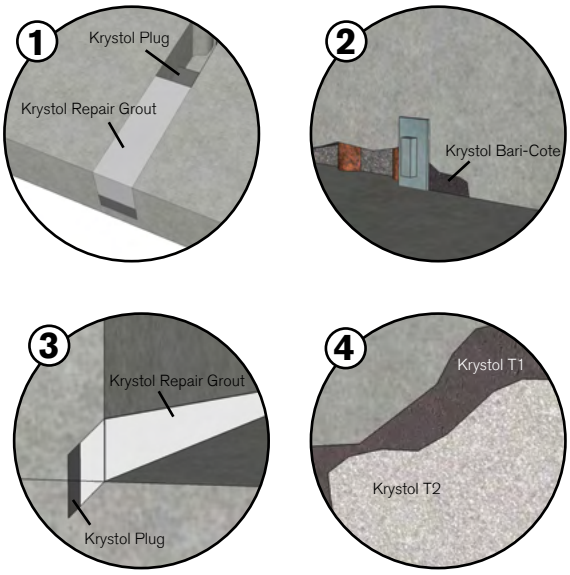
REPAIR AND WATERPROOF

EXISTING TUNNELS

Wherever previous waterproofing systems have failed, Kryton has a solution; the only solution that is as strong as concrete and works 100% of the time.

- Seal cracks and stop leaks with the Krystol Leak Repair System
- Resurface honeycombing and spalling, and waterproof with Krystol Bari-Cote™
- Repair leaking cold joints using the Krystol Leak Repair System
- Prevent water ingress by applying Krystol T1® and Krystol T2® to the concrete on the inside of the tunnel





REPAIRING THE **YUNNAN SHUIMA TUNNELS**



Repair work on the Yunnan Shuima Tunnels

BACKGROUND

In 2007, construction was completed on a 180 km (112 mi.) superhighway that included five pairs of tunnels through the mountains of the Sichuan Province of China.

Shortly after completion the tunnels needed to be repaired; the soil and rock conditions paired with heavy seasonal rainfall quickly contributed to cracking and water leakage within the newly completed tunnels. With approximately 125,000 sq m (150,000 sq. y.) of surface area throughout the tunnels, the waterproofing repair work was a significant undertaking.

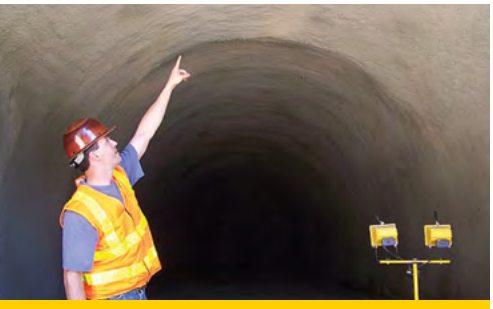
SOLUTION

Because the leaking tunnels had already been built using cast-in-place concrete, Kryton's team recommended using Krystol T1 & T2 surface-applied crystalline slurry coat system. Krystol T1 & T2 is a two-step, brush-applied system that prevents water intrusion, repairs cracking and maintains existing concrete structures. T1 seals the concrete against permeating water and T2 protects the surface of the structure from moisture. Once applied, the chemicals are absorbed into the concrete creating a strong barrier to water.

25,000 kg (55,000 lb.) of T1 & T2 were used to waterproof the 125,000 sq m (150,000 sq. y.) of tunnel walls and about 2,000 kg (4,400 lb.) of Kryton's Krystol Leak Repair System material were also used to mend the 1,200 m (3,937 ft.) of cracked and leaking concrete.

Less than a year later, a massive earthquake struck Sichuan killing more than 68,000 people. It destroyed communities and cost the government 1 trillion Yuan ($146.5 billion USD) to rebuild. Despite the quake's wholesale destruction the waterproofed tunnels of the Sichuan Mountains remained unaffected.

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Knight Theater Pedestrian Tunnel, Charlotte, North Carolina, USA

Shotcrete Construction

Several waterproofing systems were considered for the new pedestrian tunnel, including HDPE membrane, PVC membrane, double-bonded spray-applied cementitious membrane and cementitious concrete admixtures. After evaluating the cost and constructability issues of these methods, a combination of two systems were selected to achieve the specified and desired results. It was decided to use Kryton's Krystol Internal Membrane (KIM) in the structural shotcrete walls and invert concrete slab of the tunnels and then apply a double-bonded spray-applied membrane to the walls.



Ensenada International Terminal Grain Tunnel, Ensenada, Baja California, Mexico

Cast-in-Place Construction

A below grade concrete tunnel to house a belt transportation system and grain silo were constructed using Kryton's Krystol Internal Membrane (KIM) admixture, Krystol Waterstop System for joints and Krystol Leak Repair System. The port location meant that the tunnel would be in constant contact with sea water and it was essential the tunnel remained water free. Water in the transport tunnel could ruin entire containers worth of valuable grain. Further, salt water and its ability to corrode the steel and structure was also a key factor in the waterproofing design.



Manukau Police Hub Tunnel, Manukau City, New Zealand

Precast Construction

The new Manukau Police Hub built an underground tunnel between the police hub and the adjacent courthouse. The tunnel was constructed out of fifty precast box culverts with the most sound structural integrity in mind. The contractor selected Kryton's Krystol Internal Membrane (KIM) as the waterproofing choice based on performance and pricing. All fifty of the precast box culvert segments contained KIM, ensuring that they would be permanently protected from water ingress from the inside out.

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Replace Unreliable Waterproofing Membranes. Build The Waterproofing In With Krystol® Technology!

KRYTON | NOVEMBER 2008

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Replace Unreliable Waterproofing Membranes. Build The Waterproofing In With Krystol Technology!

BE SURE. BE KRYTON.

Build The Waterproofing In With Krystol Technology

It's the intelligent, self-sealing water-protection system that transforms concrete into a powerful water-resistant barrier. Krystol relies on a revolutionary crystalline technology that turns porous concrete into an impermeable barrier. The result is a structure with reduced cracking, self-sealing and waterproofing abilities that provide a powerful defense against water damage and corrosion of reinforcing steel.

So whether it's new construction, upgrading an existing structure or repairing cracks, Krystol will help you build the quality, reliability and cost-effectiveness into the concrete.

Key Benefits of The Krystol Concrete Waterproofing System

- Lower the cost of waterproofing by up to 40%
- Shave weeks off the construction schedule
- Reduce the cost of maintenance and repairs
- Increase revenues with a larger building footprint

The Krystol Advantage

Replaces unreliable exterior membrane systems

- Penetrates deep into concrete—many inches over time
- Self-seals hairline cracks—minimum .02 in. (.5mm)
- Reactivates in the presence of moisture—even years later
- Effective against hydrostatic pressure—up to 460 ft (140m) of head pressure
- Waterproof from any direction (i.e. positive or negative side)
- Impervious to physical damage and deterioration
- Certified non-toxic and safe for potable water—NSF approved
- Easy to apply and reduces potential for human error
- Works where other systems fail to eliminate leaks and water damage

How Does Integral Crystalline Waterproofing Work?

When added or applied to concrete, crystalline chemicals create a reaction that causes long, narrow crystals to form, filling the pores, capillaries and hairline cracks of the concrete mass. As long as moisture remains present, crystals continue to grow throughout the concrete, reaching lengths of many inches over time. Once the concrete has cured, the crystalline chemicals sit dormant until another dose of water (such as through a new crack) causes the chemical reaction to begin again.

The ability to reactivate in the presence of water gives crystalline-treated concrete the ability to "self-seal". When cracks form due to curing shrinkage, settling, seismic activity, etc., water entering through them causes new crystals to form and grow, blocking and filling the cracks. Its ability to self-seal cracks is one of crystalline technology's most unique and useful features, and can help to dramatically reduce the long-term maintenance and repair costs of a concrete structure.



Other Benefits of Integral Crystalline Technology

Along with superior waterproofing and self-sealing properties, integral crystalline waterproofing technology offers a number of key benefits:

- **Permanent Solution** – becomes a part of the concrete matrix so it will not crack, peel, tear or wear-away. Even against high hydrostatic pressure. Unlike externally applied membranes, which are best on the day they are applied, crystalline applications become more effective with time.
- **Perfect for Blind-Wall Applications** – can be added to the concrete mix or applied to the negative side of the structure (against the water pressure). There's no need to save room outside the structure for membrane application. Project teams can design a larger structural footprint and build right to the property line.
- **Protect Reinforcing Steel** – adds to the longevity of concrete structures by preventing the penetration of waterborne contaminants and chloride-laden liquids that cause the corrosion of reinforcing steel.
- **Save Weeks on Construction Schedules** – can be applied to green concrete, or even added to the ready-mix truck. There is no need to wait for membrane application and backfilling can begin right-away.

In hot or tropical climates, integral crystalline waterproofing offers several key advantages. Hot weather can dramatically shorten concrete's setting time, resulting in weaker concrete and enhancing the likelihood of shrinkage and cracking. Adding crystalline chemicals to the concrete mix reduces premature moisture loss, creating a more durable structure and reducing shrinkage and cracking. Unlike membrane systems that become brittle and deteriorate when exposed to prolonged heat,

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crystalline waterproofing is unaffected by climate and remains effective for the life of the structure.

The soil in many hot or tropical climates can contain high levels of sulphates, chlorides and other chemicals that decrease concrete's integrity and corrode steel reinforcement. By blocking the penetration of water that can carry these contaminants and safeguarding concrete and reinforcements against corrosion, crystalline technology helps to prolong a structure's useful life.

How is Integral Crystalline Waterproofing Applied?



In the case of new concrete construction, crystalline chemicals are supplied as a dry powder comprised of Portland cement, silica sand and special chemicals. This powder can simply be added to the concrete mixture at the plant to create a powerful moisture barrier in slabs, walls and construction joints. There is no need for any sort of surface application at the construction site.

Can Integral Crystalline Waterproofing Be Used in Existing Concrete Structures?



Absolutely. A number of manufacturers produce surface-applied formulas that can be brushed onto existing concrete structures to repair existing cracks, fortify and waterproof concrete and protect against contamination and steel reinforcement corrosion. The best systems may be applied on the negative side of the concrete against the water pressure where access to outside walls may be difficult or impossible. This allows concrete to be repaired without digging up the perimeter, destroying landscaping and incurring extra cost.

When applied to existing concrete, crystalline chemicals are absorbed into the concrete by capillary action (the natural wicking movement of liquids through a porous structure) and diffusion (the natural movement of chemical molecules.) Once inside the concrete, crystalline chemicals begin growing crystals and filling the spaces between concrete particles. The majority of active crystalline chemicals migrate into the concrete within the first 28 days, meaning the surface-applied system can be completely removed from the surface after this time without impacting its waterproofing properties.

What About Concrete Joints?

In building a concrete structure, extra care must be taken when waterproofing construction joints, since these areas are most vulnerable to cracks and leakage. Historically, the best option for waterproofing joints was to place a PVC barrier or bentonite strip into the joint before an adjoining wall was poured. However, this method is unpredictable at best because physical barriers easily become dislodged or damaged during subsequent concrete pours, rendering them ineffective and leaving joints susceptible to leakage.

Some manufacturers offer special crystalline waterstop systems that replace conventional waterstops, cost less and are easier to install. When used with the appropriate crystalline waterproofing system for new or existing concrete, crystalline waterstop systems help ensure that a structure is truly watertight. And crystalline waterstops are one of the few systems that can be retrofitted into existing joints should the original waterstop method fail or deteriorate.

Selecting a Quality Integral Crystalline Waterproofing System

A number of companies, including Kryton International, offer integral crystalline waterproofing systems, featuring products for new and existing concrete structures and joints. When selecting an Integral Crystalline Waterproofing system, it's important not to confuse true crystalline products with those that are simply concrete densifiers or pore blockers. Be wary also of products that claim to grow crystals but really only crystallize as they dry – these products will not permeate the concrete, nor will they reactivate in the presence of water to fill cracks. Ask whether the product you are considering contains silicates, stearates, or talc – these offer temporary waterproofing at best. And be sure your manufacturer offers a long-term warranty on all crystalline products.

Though originally received with skepticism, integral crystalline waterproofing has been repeatedly and successfully tested and used in virtually every country around the world. Over the past few decades, crystalline technology has been embraced by the construction industry as a superior replacement for conventional membranes, offering time and cost savings and flexibility that are simply unmatched by traditional waterproofing methods.

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SMART CONCRETE®

The Science of Krystol® Technology

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The Science of Krystol Technology

SMART CONCRETE®

Krystol technology is based on principles that are very similar to the processes that occur during the hydration and hardening of concrete. Cement is mainly made up of several calcium silicates. When cement particles are mixed with water, a chemical reaction occurs whereby these calcium silicates combine with the water to form new compounds. The new compounds are calcium silicate hydrate (CSH) and calcium hydroxide.



Microscopic, needle-like crystals fill the naturally occurring pores and capillary tracts of concrete for guaranteed waterproof structures.

The CSH forms as an amorphous microcrystalline structure, extending outward from the individual cement particles and eventually filling the space between them. The CSH crystal formation is the mechanism by which the concrete stiffens and gains strength. It is most dramatic in the first hours after the concrete is placed, but actually continues for weeks, months and even years into the life of the concrete.

The reason that hydration can continue, seemingly indefinitely, is because only a portion of the cement has reacted during the initial hydration and hardening of the concrete. A significant portion of each cement particle remains un-reacted long after the concrete has reached its design strength. It is the un-reacted particles that allow the Krystol chemicals to perform their function. Krystol acts as a catalyst to a larger reaction within the concrete mass.

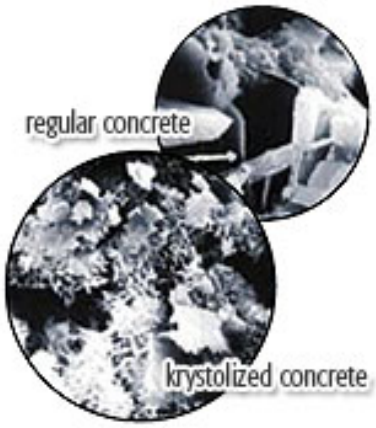
This is significantly different from silicate-based products that react with compounds in the concrete such as calcium hydroxide or free lime. The reaction binds such a treatment into an insoluble solid and hopefully blocks the pores. These products quickly become completely bound in place and therefore do not penetrate more than a few millimeters into the concrete. For the same reason, these products will not reactivate to self-seal new cracks that may form. In fact, they are insoluble and the presence of water in the future has no effect on them.

Krystol, on the other hand, works quite differently. The crystals that are formed are hydration crystals, but they are not amorphous like cement hydration crystals. Instead, they form into a crystalline structure of long hexagonal prisms that extend through and fill the capillary voids and micro-cracks of the concrete. The crystals themselves are not made up solely of the Krystol material, but grow from the partially reacted cement particles. This is why the crystals can travel many inches through the concrete.

Krystol treatments that have been applied to one side of a concrete wall have been observed to cause crystal growth to occur on the other side of several inches of “solid” concrete. The Krystol chemical is never used-up during the crystallization process. As a catalyst, only a very small amount of Krystol is required to grow a very large quantity of crystals. Within the tight confines of the concrete, crystals can easily grow to fill and block the microscopic capillary pores and micro-cracks without using more than a small fraction of the available Krystol chemical. The remaining chemical lies dormant within the concrete waiting for a crack to develop that will provide the necessary space and water source to allow the crystallization process to continue.

When added or applied to concrete, crystalline chemicals create a reaction that causes long, narrow crystals to form, filling the pores, capillaries and hairline cracks of the concrete mass. As long as moisture remains present, crystals continue to grow throughout the concrete, reaching lengths of many inches over time. Once the concrete has cured, the crystalline chemicals sit dormant until another dose of water (such as through a new crack) causes the chemical reaction to begin again.

The ability to reactivate in the presence of water gives crystalline-treated concrete the ability to “self-seal”. When cracks form due to curing shrinkage, settling, seismic activity, etc., water entering through them causes new crystals to form and grow, blocking and filling the cracks. Its ability to self-seal cracks is one of crystalline technology’s most unique and useful features, and can help to dramatically reduce the long-term maintenance and repair costs of a concrete structure.



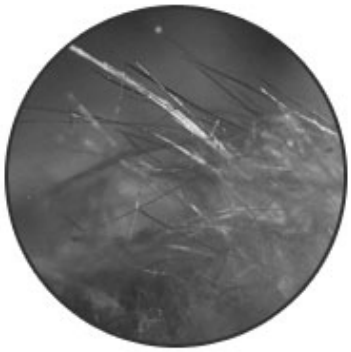
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Krystol® VS Silicate-based Technology

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Krystol VS Silicate-Based Technology



Krystol is a mixture of cement and waterproofing ingredients that work as a catalyst to further react un-hydrated cement particles and promote the hydration process - growing more and longer crystals that penetrate deeply into the pores and capillaries of the concrete, rendering it waterproof - permanently.

By contrast, silicates react with free lime in concrete to produce an insoluble Calcium Silicate Hydrate gel within the pores near surface. As the surface wears or is otherwise removed/damaged, the concrete will be unable to withstand even low hydrostatic pressure.

Self-Sealing

In the absence of water, Krystol chemicals remain dormant within the concrete matrix. Subsequent water intrusion, typically from cracks, will trigger the chemical reaction to cause additional crystals to grow and seal the crack and surrounding capillaries.

Silicate-based materials will not reactivate to produce additional gel and protect against future water intrusion.

	Silicate	Krystol
Self-sealing	No	Yes
Set time of green concrete	Accelerates	Retards
Hydrophilic vs. Hydrophobic	Hydrophobic	Hydrophilic
Strength	Decreases	Increases
Cracking	Increase	Decrease
Penetration	1/8—1/4”	inches
Reacts with free-lime	Yes	No
Improves with age	No	Yes
Helps reduce corrosion	No	Yes

Set Time of Green Concrete (Newly Poured Concrete)

Krystol retards the set time of the concrete to allow more time for un-hydrated cement particles to react with water and produce a stronger bond. This leads to higher compressive strength. Also, since the hydration process is extended, the hydration heat and peak heat are both decreased, which reduces the potential for shrinkage cracking.

Silicate-based material accelerates the set time. This leads to weaker strength and more potential for cracking during curing.

Hydrophilic vs. Hydrophobic

Krystol chemicals absorb water to create the unique crystals that serve to block the pores and capillaries of concrete - more water equals more crystals, until no additional water can penetrate. The hydrophilic nature of the Krystol system gives it the ability to resist unmatched levels of hydrostatic pressure, to grow deep into (and even throughout) the concrete matrix and to reactivate in the presence of moisture.

Silicate-based materials form a type of viscous, colloidal gel that repels water. They are unable to penetrate past the surface and are prone to wear and eventual deterioration. Negative-side water pressure will cause the surface treatment to “delaminate” while positive side pressure will wear the coating away.

Penetration

Krystol reacts with moisture and travels as far as water will carry it into the concrete matrix. Depending on porosity of concrete, humidity and water pressure, Krystol will penetrate many inches into concrete over time.

Silicate-based materials only produce a kind of viscous colloidal gel near the concrete surface during the initial hydration process. After that, it will not react to create additional gel and therefore won’t penetrate any further.

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Waterproof

By penetrating deeply into the concrete and becoming a permanent part of the concrete matrix, Krystol is effective against hydrostatic pressure from both the positive and negative side. In fact, once the Krystol chemicals are drawn into the concrete the initial surface treatment can be removed without affecting permeability of the concrete.

Because silicate-based materials form a high viscosity colloidal gel near the concrete surface, such systems rely on the surface layer to maintain effectiveness. Once the surface is compromised, the concrete will be unable to withstand hydrostatic pressure. In addition, since it doesn't penetrate deeply into the concrete, it cannot waterproof on the negative side.

Reacts with Free-Lime

Silicate-based materials require free-lime to form the surface gel that blocks water intrusion. Because Krystol does not require free-lime to grow millions of needle-like crystals throughout the concrete it is unaffected by the availability of this material.

Additives such as silica fume and fly-ash reduce the amount of free-lime that is available in the concrete. In addition, aged concrete that has undergone weathering and carbonation may not have enough free-lime left at the surface for silicate-based materials to be effective.

Improves with Age

In moist environments, when it matters most, Krystol will continue to grow into the concrete, even and especially under high water presence. The concrete will increase in compressive strength and reduce potential cracking. This is a permanent solution.

Reduces Corrosion

Krystol blocks the water from entering the concrete, reducing the potential for corrosion of steel reinforcements. As Krystol is a permanent treatment it offers protection against corrosion over the long-term.

Silicate-based materials are not permanent. They are subject to wear and deterioration and are unable to withstand hydrostatic pressure. Over time, water will penetrate the concrete and cause the corrosion of the steel.

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