

# CONCRETE WATERPROOFING AND DURABILITY SOLUTIONS GUIDE



Runways, highway pavements and intersections

Hydro dams, irrigation, sluiceways, spillways and drainage conduits

Bridge decks

Fire suppression reservoirs

Wastewater treatment plants, water reservoirs and tanks

Manufacturing and warehouse floors

Marine structures: sea walls, dry docks and jetties

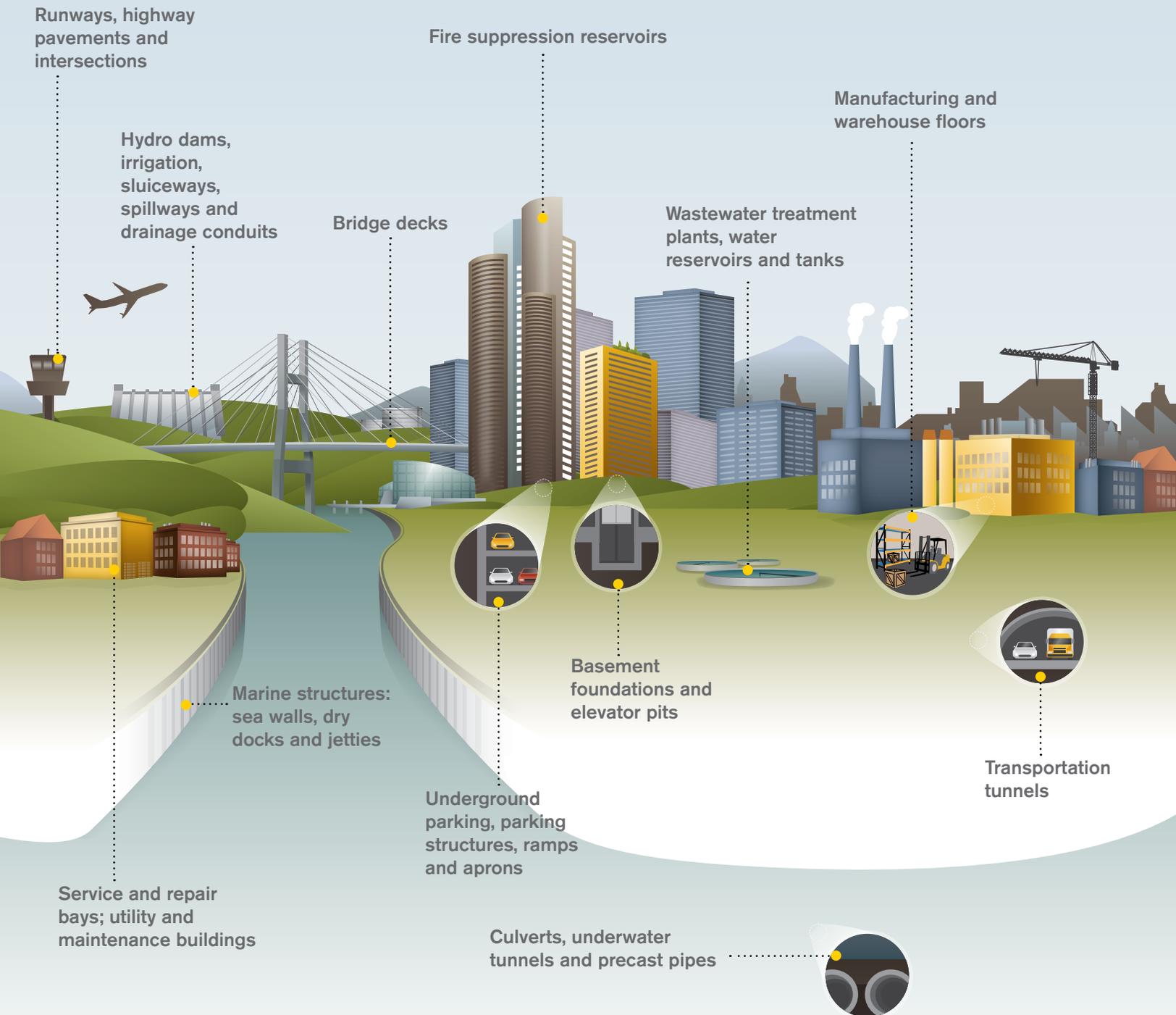
Basement foundations and elevator pits

Transportation tunnels

Service and repair bays; utility and maintenance buildings

Underground parking, parking structures, ramps and aprons

Culverts, underwater tunnels and precast pipes





# KRYTON INTERNATIONAL

## SMART CONCRETE® TECHNOLOGICALLY ADVANCED CONCRETE THAT AUTOMATICALLY RESPONDS TO ITS ENVIRONMENT



**Using Kryton technologies, Smart Concrete will respond to its environment to protect itself against corrosion, erosion, abrasion and water penetration. SMART CONCRETE will last many times longer than regular concrete – even in the harshest conditions.**

For 45 years, Kryton has been developing technologies for improving the durability of concrete structures. In the 1970's, Kryton pioneered its "Krytol" technology, which turns normally porous concrete into watertight concrete. Concrete is able to protect itself against water intrusion by filling its capillary pores with millions of microscopic, needle-shaped crystals. In 1980, Kryton invented the world's first crystalline waterproofing admixture. Employing the same Krytol technology, surface-applied coatings and membranes are eliminated as Krytol turns the concrete itself into a waterproof membrane. Just as importantly, Krytol treated concrete has the unique ability to respond to moisture entering through newly formed cracks by growing more crystals to shut off the water. This "self-sealing" ability was a critical advancement in concrete performance. Over the past four decades, this technology has revolutionized the way concrete structures are built all around the globe.

More recently, Kryton has introduced a highly specialized admixture that gives concrete up to six times greater resistance to abrasion or erosion. Kryton's "Hard-Cem" technology is ideal for industrial floors, roadways, hydro spillways and many other applications in transportation, agriculture, power generation and marine structures. Hard-Cem overcomes the performance issues, practical constraints and safety concerns of existing hardening strategies while actually costing much less.

Concrete has always been a durable material to build with. Concrete structures have proven this through the test of time but today we look at our aging infrastructure and ask if we can build things even better. The answer is yes – using Kryton's Smart Concrete technologies.

# THE MOST EFFECTIVE INTEGRAL CONCRETE WATERPROOFING AND DURABILITY SOLUTIONS

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# KRYSTOL INTERNAL MEMBRANE™ (KIM®)

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

KIM lowers the permeability of concrete and is used in place of externally applied waterproofing membranes. By stopping the transmission of water through concrete, KIM adds durability and longevity to concrete by protecting it against chemical attack and corrosion of reinforcing steel.

## How It Works

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



## Product Benefits

- Permanent and reliable hydrostatic waterproofing solution
- Shortens construction schedules
- Reduces initial and long-term waterproofing costs
- Self-seals micro-cracks for the life of the concrete
- Increases longevity of reinforced concrete
- NSF 61-certified for potable water applications

## Packaging

Mixer-ready bags in custom sizes to match your mix design  
25 kg (55 lbs) resealable pails



KIM is used to integrally waterproof and increase the durability of concrete subject to water exposure and hydrostatic pressure:

- Below grade parking
- Basements
- Sewage plants
- Swimming pools
- Dams
- Foundation walls
- Footings
- Slabs
- Pits
- Water containment tanks
- Canals



Marina Bay Sands, Singapore



Whitney Museum, New York City, USA



Line 3 Metro, Monterrey, Mexico

# HOW IS KRYTON KIM DIFFERENT?

## NOT ALL CRYSTALLINE ADMIXTURES ARE THE SAME

Crystalline admixtures classified as Permeability Reducing Admixtures for Hydrostatic conditions (PRAH) are not the same. KIM consistently produces far better results. Understanding the differences ensures you can make an informed decision resulting in watertight structures for life.



### Krytol Technology is **CHEMICALLY UNIQUE**

- KIM reacts with un-hydrated cement in concrete and continues to enable the growth of more crystals, ensuring long-term protection
- Long needle-shaped crystals grow deeper, fill smaller spaces, and resist more water pressure
- KIM is the original crystalline admixture and is chemically differently from competitors



### KIM has **SUPERIOR PERFORMANCE**

- Highest level of permeability reduction and most dependable self-sealing performance
- Best dry shrinkage and restrained shrinkage crack reduction
- Only crystalline admixture proven to protect against corrosion of reinforced steel (proven by the 10-year Corrosion Study conducted by the University of Hawaii)



### The **COMPLETE WATERPROOFING SYSTEM**

- Every construction detail is covered to create a watertight structure
- Entire waterproofing system comes from one manufacturer, ensuring ease of use and expertise
- Kryton is a one stop shop for all concrete waterproofing and durability needs



### Kryton has the **MOST EXPERIENCE**

- Invented the world's first crystalline admixture 15 years before competitors
- Offers the best warranty in category with many projects outlasting their original warranties
- Successful waterproofing of high-risk projects around the world

Make an informed choice. Only **KIM** can reliably waterproof concrete structures for life.

# KIM VS TRADITIONAL SURFACE-APPLIED WATERPROOFING

Kryton's Krystol Internal Membrane (KIM) crystalline admixture has been outperforming externally applied membranes since 1983. From the simple process of adding KIM to the concrete at the time of batching to improving the concrete's ability to self-seal, KIM projects require less maintenance and last longer than those using externally applied membranes for waterproofing.



## PROVEN WATERPROOFING PERFORMANCE

KIM has been used successfully in high-risk projects around the world.

- Withstands 460 ft. (200 PSI) of hydrostatic pressure
- Cannot be punctured like externally applied membranes because it is added to the concrete mix
- Permanently self-seals micro-cracks



## SHORTENED CONSTRUCTION SCHEDULES

KIM is an internal crystalline admixture that turns concrete into a waterproof barrier.

- Added directly to concrete during the batching process for easy and efficient installation
- Avoid delays due to weather, scheduling a sub-trade, or applying an externally applied product
- Able to backfill sooner



## IMPROVES DESIGN CREATIVITY

KIM eliminates the need for an externally applied membrane.

- Can contribute to over 20 LEED points
- Maximizes building footprint and freedom of design
- The only way to effectively waterproof blind-wall applications



## SAVES MONEY

KIM reduces waterproofing costs for concrete projects.

- Reduces maintenance and repair costs for concrete over its service life
- Increases revenue with a larger building footprint and reduces costs with a shorter construction schedule
- Extends the service life of a structure by creating durable and long-lasting concrete

Building sustainably means building for the long-term. KIM treated concrete will last many times longer than regular concrete.

# KRYSTOL MORTAR ADMIXTURE™ (KMA)

Krystol Mortar Admixture (KMA) is a hydrophilic crystalline admixture used to provide long-term protection of masonry mortars and concrete masonry units against water and waterborne contaminants by reducing permeability and absorption.

KMA simplifies installation by removing the need for surface-applied sealers. It is incorporated easily into existing masonry and stucco products and application processes. KMA provides superior waterproofing performance that lowers building maintenance and repair costs.

## How It Works

KMA contains Krystol technology. When added to cementitious mortars or concrete masonry units, Krystol chemically reacts with water and un-hydrated cement particles to form insoluble needle-shaped crystals. These crystals fill capillary pores and micro-cracks in the concrete which block the pathways for water and waterborne contaminants. Any moisture introduced over the lifespan of the concrete will initiate crystallization, ensuring permanent waterproofing protection.

## Product Benefits

- Reduces water permeability and absorption
- Resists weathering
- Improves workability
- Reduces shrinkage and cracking
- Self-seals hairline cracks
- NSF 61-certified for potable water applications

## Packaging

15 kg (33 lbs) resealable pails



KMA provides permanent protection for:

- Rendering and plastering mortar (including stucco and other thin topping overlays) over concrete masonry walls or other prepared substrates
- Masonry mortar (mortar that goes between the masonry units)
- Concrete masonry units (bricks and blocks when they are manufactured)



American Dream, Changsha, China



Crowne Plaza Today Hotel, Gurgaon, India



Royal Mills Apartments, Rhode Island, USA

# HARD-CEM®

Hard-Cem is an Integral Hardening Admixture used to increase the abrasion and erosion resistance of concrete.

Hard-Cem is added to concrete at the time of batching to increase hardness and expand wear life. It outperforms and overcomes deficiencies of labor-intensive surface-applied hardeners. It also enhances the durability of both air-entrained and non-air-entrained concrete. Since it is integral, Hard-Cem can be used to harden horizontal, vertical or inclined concrete and shotcrete surfaces.

## How It Works

When added to concrete, Hard-Cem's proprietary technology increases the hardness of the concrete paste and reduces fine and coarse aggregate exposure that causes degradation to concrete surfaces. Since it is integral, it continues to offer surface wear resistance throughout its life. By increasing the abrasive-erosive service life of concrete, maintenance costs are reduced and replacement of the concrete is substantially deferred.

## Product Benefits

- Extends concrete wear life up to 6 times under harsh conditions
- Improves worksite safety and conditions (dust-free)\*
- Only hardener that can be used on air-entrained concrete
- Expedites construction schedules\*
- Lowers installed cost\*
- Reduces maintenance costs and improves concrete sustainability
- No side effects on concrete water demand, workability, set time, strength development or shrinkage
- Full-depth concrete hardening\*
- Can be used in horizontal, vertical or inclined concrete
- Improved quality control\*

*\*compared to surface-applied (dry-shake) hardeners*

## Packaging

Available in 20 kg (44 lb.) mixer ready bags, 1,600 kg (3,527 lb.) super bags and bulk pneumatic tankers.



Hard-Cem can be used in any ready-mix, shotcrete, or precast concrete to improve abrasion and erosion resistance and extend the wear life of concrete. It is typically used to construct:

- Warehouse floors
- Service and repair bays
- Bridge decks
- Runways
- Hydro dams
- Parking structures, ramps and aprons
- Tunnels and shafts
- Utility and maintenance buildings
- Highway pavements and intersections
- Livestock housing



White River Hydro, White River, Canada



Vancouver Convention Centre, Vancouver, Canada



City Bus Barn, Calgary, Canada

# HARD-CEM VS SURFACE-APPLIED HARDENERS

Hard-Cem provides superior value and performance that surpasses traditional surface-applied hardeners.

It offers best-in-class abrasion and erosion resistance, while removing risks associated with installation. Installation limitations such as the numerous steps, waiting for weather, working with mix designs containing Supplementary Cementitious Materials or air-entrained concrete and getting consistent coverage/dosage is a thing of the past. Hard-Cem avoids job-site wide exposure to harmful dust because it is added directly to the concrete mix. It goes where traditional dry-shake hardeners cannot: shotcrete, vertical cast-in-place, precast concrete and vertical concrete.

Since 2004, Hard-Cem has increased the durability on more than 5.6 million m<sup>2</sup> (60 million ft<sup>2</sup>) of concrete.



## IMPROVES HARDENING PERFORMANCE

Hard-Cem offers consistent and reliable performance increasing surface wear life, exceeding that offered by traditional surface-applied methods.

- Consistent dosage guarantees expected performance and removes quality control concerns
- Saves concrete finishers a number of steps, and results in improved finishing and flatter floors
- Provides full-depth concrete hardening as opposed to just a surface layer
- Removes health hazards related to installation dust exposure



## SHORTENS CONSTRUCTION SCHEDULES

Hard-Cem is added to concrete and unlike surface-applied products, requires no additional installation other than typical concrete finishing.

- Speeds up installation and does not require special labor or extra steps to install
- Removes weather-related constraints that affect scheduling
- Can install more concrete



## MORE APPLICATIONS

Unlike surface-applied hardeners, Hard-Cem is not limited to horizontal surfaces, non-air entrained concrete or concrete containing fly ash. It can be used in any concrete mix design including shotcrete and precast. It can be applied anywhere abrasion and erosion is a concern.

- Only hardener that can be used with air-entrained concrete
- Can be used in horizontal, vertical or inclined concrete
- Fully compatible with Supplementary Cementitious Materials (SCMs) such as fly ash
- No negative side effects on plastic or hardened concrete



## SAVES MONEY

Hard-Cem extends the life of concrete and reduces repair and maintenance costs more than surface-applied hardeners.

- Better cost to performance value than surface-applied hardening products
- Saves time allowing for a faster construction schedule

# CON-FUME®

Con-Fume® silica fume is a pozzolanic material used to produce high-performance concrete or mortar possessing increased strength, impermeability and durability.

As a supplementary cementing material, Con-Fume meets or exceeds all current ASTM, CSA, and AASHTO specifications for silica fume.

## How It Works

Con-Fume silica fume reacts with the hydration products of Portland cement, forming calcium silicate hydrate gel which enhances strength and durability by consuming the weaker calcium hydroxide.

## Product Benefits

- Meets all CSA A3001-13 specifications for a Type SF silica fume supplementary cementing material
- Meets all ASTM C1240-14 specifications for silica fume supplementary cementing material (SCMs)
- Specially developed to provide enhanced bulk material flow and handling characteristics, providing efficient bulk transportation and pneumatic unloading

## Packaging

Available in 11.4 kg (25 lb.) mixer ready bags, 1,000 kg (2,204 lb.) bulk bags and bulk pneumatic tankers.



Con-Fume is recommended for high performance ready-mix, shotcrete and precast concrete applications.

- Concrete
- Shotcrete
- Refractory and ceramics
- Oil and gas well cementing
- Repair products



By sashafatcat

Golden Ears Bridge, Langley, Canada



Coast Meridian Overpass, Port Coquitlam, Canada



Johnson Street Bridge, Victoria, Canada

# KRYSTOL T1® CONCRETE WATERPROOFING

Krystol T1 is a surface applied crystalline slurry treatment that transforms new or existing concrete into a permanent waterproof barrier.

Krystol T1 lowers the permeability of concrete to protect against the ingress of water and waterborne chemicals. Since it becomes integral to the concrete, it can be applied to either the positive (wet) or negative (dry) side of water pressure which allows reliable hydrostatic waterproofing protection and remediation for even the most difficult applications.

## How It Works

Krystol T1 contains 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.

## Product Benefits

- Effective against high hydrostatic pressure; tested up to 140 m (460 ft) of head pressure
- Reliably self-seals hairline cracks up to 0.5 mm (0.02 in)
- Repair from the positive or negative side of water pressure
- Fixes membrane failures without excavation
- Safe for contact with potable water, certified by NSF to NSF/ANSI Standard 61
- Available in Grey or White

## Packaging

25 kg (55 lbs) resealable pails



Krystol T1 Concrete waterproofing is used to integrally waterproof and add durability to newly placed as well as existing concrete of any age:

- Concrete basements, walls, slabs, footings
- Marine structures
- Elevator pits and equipment pits
- Parking structures
- Swimming pools and water features
- Water towers, reservoirs and storage tanks
- Tunnels, pipes and underground vaults
- Water treatment reservoirs
- Bridge decks, elevated slabs and ramps
- Rooftops and roof decks



Bharat Oman Refinery, Bina, India



Atlantis Hotel, Dubai, UAE



Futang Tunnel/Ying Wen Highway, Sichuan, China

# KRYSTOL BROADCAST™

Krystol Broadcast is a dry-shake crystalline waterproofing treatment that transforms horizontal concrete applications into a permanently waterproof barrier.

Krystol Broadcast is troweled in during the final finishing to become an integral part of the concrete that replaces the need for conventional membrane waterproofing systems. Krystol Broadcast features a unique fugitive dye to ensure uniform distribution and produces a smooth finish suitable for non-air entrained slabs.

## How It Works

Krystol Broadcast contains Krystol technology. When applied to concrete, Krystol chemically reacts with water and un-hydrated cement particles to form needle-shaped crystals. These crystals fill capillary pores and micro-cracks in the concrete which block the pathways for water and waterborne contaminants. Any moisture introduced over the lifespan of the concrete will initiate crystallization, ensuring permanent waterproofing protection.

## Product Benefits

- Permanent and reliable hydrostatic waterproofing solution
- Integral to the concrete; Krystol Broadcast does not wear away or deteriorate
- Fugitive dye ensures uniform distribution
- Self-seals micro-cracks for the life of the concrete
- Increases longevity of reinforced concrete
- NSF 61-certified for potable water applications

## Packaging

25 kg (55 lbs) resealable pails



Krystol Broadcast produces a smooth finish and is used to integrally waterproof and add durability to concrete slabs that will be power-troweled during finishing:

- Slabs on-grade, below-grade or elevated
- Parking structures
- Marine structures
- Reservoirs (NSF 61-Certified)
- Water treatment plants
- Pits
- Warehouse and commercial floors
- Basements



*Tung Ho Steel Plant, Taiwan*

### Tung Ho Steel Plant, Taiwan

Tung Ho Steel Enterprise is a major steel manufacturing company and they know that steel and water do not mix. When they were constructing their new plant, they chose various Kryton products to target specific problem areas. To prevent water ingress, they used Krystol T1 and Krystol Internal Membrane. As well, Krystol Broadcast was applied on the positive side of the driveway which covered over 500 square meters (597 square yards). With Kryton's help, the plant was able to quickly and successfully open its doors. With a complete waterproofing system in place, the Tung Ho Steel plant will be permanently protected from water ingress.

# HYDROSTOP™ SEALER

Hydrostop Sealer is a high performance penetrating sealer used to protect concrete, brick, mortar and masonry from the damaging effects of water intrusion. It is a clear, water-based liquid that is sprayed or rolled onto horizontal or vertical surfaces. It does not affect appearance or breathability, and will not wear, fade, yellow, crack or peel.

## How It Works

Hydrostop Sealer contains a unique blend of silane and siloxane compounds that chemically react with the silicates below the surface of the substrate to form an insoluble, water-repellent barrier.

## Product Benefits

- Chemically reacts with silicates below the surface
- Forms an insoluble, water-repellent barrier
- Works better and lasts longer than conventional sealers
- Water-based
- Does not affect appearance or breathability
- Will not wear, fade, yellow, crack or peel

## Packaging

18.9 L (5 US gallons) pails



\*Hydrostop is Hydropol™ in USA

Hydrostop Sealer is used to protect above grade structures from the damaging effects of water:

- Bridge decks and supports
- Parking structures
- Concrete, block or brick walls and chimneys
- Driveways, including exposed aggregate
- Sidewalks, patios, balconies, steps
- Concrete pavers and retaining walls
- Marine floats and docks
- Stucco walls
- Concrete roof tiles and unglazed floor tiles
- Asbestos cement
- Use to treat any masonry surface made from concrete, brick, mortar, grout, tile, terra-cotta, plaster, stone and limestone



Channel M Building, Vancouver, Canada



Vancouver Public Library, Vancouver, Canada

# KRYSTOL® WATERSTOP SYSTEM

The Krystol Waterstop System is the most versatile waterstop system on the market and is used to permanently waterproof concrete construction joints, pipe-penetrations, tie-holes and control joints. Using this system in conjunction with Krystol Internal Membrane (KIM) provides a complete, fully integrated concrete waterproofing system for the life of the concrete structure.

The Krystol Waterstop System creates completely watertight concrete down to the last detail, performing as promised in areas other waterstop systems fail.

## How It Works

The Krystol Waterstop System is comprised of Krystol Waterstop Grout, Krystol Waterstop Treatment, Krytonite Swelling Waterstop and Kryton's Crack Inducing Waterstop. These products are used in various ways to waterproof all construction joints and details found in concrete construction.

## System Benefits

- Supports the complete crystalline waterproofing system
- Covers and waterproofs every construction detail
- Improved performance and reliability over competitors
- Design options based on project requirements
- Easy installation of products within the system
- NSF 61-Certified for potable water applications



The Krystol Waterstop System is used to waterproof and protect construction joints and details where there is a risk of water penetration. Applications include:

- Static concrete-to-concrete joints
- Pre-planned and unintended cold joints
- Crack control joints



*Olympic Cauldron, Vancouver, Canada*



*CityCenter, Las Vegas, USA*



*Women and Children Hospital, Brunei Darussalam*

# KRYSTOL WATERSTOP GROUT™

Krytol Waterstop Grout is a crystalline grout used to create an internal or external waterstop at construction joints, pipe penetrations, tie-holes and control joints.

Krytol Waterstop Grout contains fiber reinforcements that reduce shrinkage and limit cracking. It is typically used in conjunction with Krytol Waterstop Treatment as part of the Krytol Waterstop System.

## How It Works

Krytol Waterstop Grout contains Krytol technology. When applied to concrete, Krytol chemically reacts with water and un-hydrated cement particles to form insoluble needle-shaped crystals. These crystals fill capillary pores and micro-cracks in the concrete which block the pathways for water and waterborne contaminants. Any moisture introduced over the lifespan of the concrete will initiate crystallization, ensuring permanent waterproofing protection.

## Product Benefits

- Multi-use: internal or external waterstop
- Permanent crystalline waterproofing and protection
- Crack resistant
- NSF 61-Certified; safe for contact with potable water
- Durable; resistant to rain, foot traffic and shifting

## Packaging

25 kg (55 lbs) resealable pails



# KRYSTOL WATERSTOP TREATMENT™

Krytol Waterstop Treatment is a cementitious crystalline slurry that is applied to horizontal and vertical construction joints to provide additional waterproofing protection, and protect rebar from corrosion.

Krytol Waterstop Treatment is used in conjunction with Krytol Waterstop Grout and/or Krytonite Swelling Waterstop, as part of the Krytol Waterstop System. The system is used wherever water penetration through static concrete-to-concrete joints is a concern. Krytol Waterstop Treatment can also be used by itself as a damp proofing treatment.

## How It Works

Krytol Waterstop Treatment contains Krytol technology. When applied to concrete, Krytol chemically reacts with water and un-hydrated cement particles to form insoluble needle-shaped crystals. These crystals fill capillary pores and micro-cracks in the concrete which block the pathways for water and waterborne contaminants. Any moisture introduced over the lifespan of the concrete will initiate crystallization, ensuring permanent waterproofing protection.

## Product Benefits

- Easy to install
- Provides a permanent waterstop treatment as part of the Krytol Waterstop System
- Durable; resistant to rain and foot traffic once hardened
- Safe for contact with potable water; certified to NSF/ANSI Standard 61
- Easy to inspect; distinctive yellow color increases reliability and quality control during installation

## Packaging

25 kg (55 lbs) resealable pails



# KRYTONITE™ SWELLING WATERSTOP

Krytonite Swelling Waterstop is a synthetic rubber waterstop that uses swelling pressure to seal concrete construction joints and stop water.

Krytonite has superior swelling pressure and performance that stops water better than bentonite and competing swelling waterstops. It is suitable for use with regular ground water, as well as salt and sulfate contaminated water. Krytonite is extremely durable and will not deteriorate over time. It can be used by itself as a single protection waterstop, or with other components of the Krystol Waterstop System as a double or triple protection option for construction joints.

## How It Works

Krytonite Swelling Waterstop is adhered to clean dry concrete using Krytonite Adhesive at or near the center of the construction joint. For added long-term protection of the outboard reinforcing steel, Kryton Waterstop Treatment is first applied to the concrete surface then Krytonite Swelling Waterstop is adhered to the treated area. Finally, the concrete is poured over the Krytonite Swelling Waterstop making it part of the concrete structure.

## Product Benefits

- Resistant to high-hydrostatic pressure
- Extremely durable – will not deteriorate even with repeated wetting and drying cycles
- Innovative trapezoid shape resists dislodgement and allows for better concrete consolidation
- Controlled swelling allows for concrete strength development in advance of swelling pressure
- High-performance swelling – even in contaminated or salt water

## Packaging

1 box 20x5 mm (approx. 0.8" x 0.2") – 50 meters, 5x10m rolls



# KRYTON'S CRACK INDUCING WATERSTOP

Kryton's Crack Inducing Waterstop is specially engineered to produce a waterproof crack control joint.

Used as part of the Krystol Waterstop System and in conjunction with Krystol Waterstop Grout, Kryton's Crack Inducing Waterstop is resistant to waterborne chemicals and is perfect for blindside applications where access is limited. It is placed in a predetermined location to isolate cracking to a controlled area in order to eliminate water entry through uncontrolled shrinkage cracking.

## How It Works

Kryton's Crack Inducing Waterstop is fastened to the concrete form or shoring wall. A keyway is measured and formed directly opposite the waterstop. After the concrete is placed, a controlled crack develops from the Crack Inducing Waterstop through to the keyway. Krystol Waterstop Grout is then tightly packed in the keyway for added protection.

## Product Benefits

- Accurate placement of control joints
- Extremely durable
- Control concrete cracks; decreasing maintenance costs

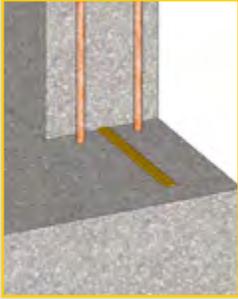


# KRYSTOL WATERSTOP SYSTEM

## HOW IT WORKS

### Construction Joints

SINGLE PROTECTION



**Single Protection: Improved waterproofing performance over common swelling waterstops**

Superior swelling pressure and performance that stops water better than bentonite and competing swelling waterstops.

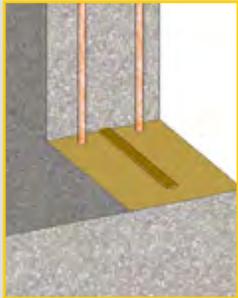
**Usage:** Horizontal and Vertical Construction Joints

**Products:** Krytonite Swelling Waterstop (secured w/ Krytonite Adhesive)

**Features:** Exceptional swelling performance (+1000%) ▪ Proven to stop at least 8 bar of hydrostatic pressure (265 ft. of head pressure) ▪ Fills gaps, voids and contours in concrete to stop water from passing ▪ Maintains cohesive state after repeated wet / dry cycles

*Note: like all single protection waterstops, outboard rebar is NOT protected.*

DOUBLE PROTECTION



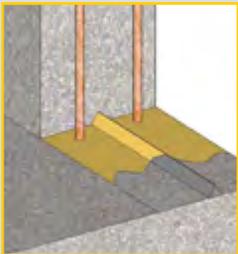
**Double Protection: When a permanent, long term, hydrostatic waterproofing solution is needed**

Superior swelling pressure and performance combined with Krystol technology delivered through a slurry treatment that ensures permanent waterproofing protection.

**Usage:** Horizontal and Vertical Construction Joints

**Products:** Krystol Waterstop Treatment & Krytonite Swelling Waterstop (secured w/ Krytonite Adhesive)

**Features:** Double protection against water ▪ Protects outboard facing rebar ▪ Preformed material, easy installation ▪ Exceptional swelling waterstop performance ▪ Immediate waterstop

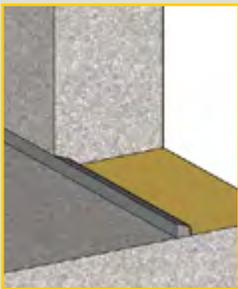


Krystol technology delivered through an internally placed, triangle shaped, waterstop and a slurry treatment that ensures permanent waterproofing protection.

**Usage:** Horizontal Construction Joints

**Products:** Krystol Waterstop Treatment & Krystol Waterstop Grout

**Features:** Double protection against water ▪ Protects outboard facing rebar ▪ Easily conforms to rough joint surfaces ▪ Easy/flexible installation ▪ Difficult to damage after hardened ▪ NSF 61 certified



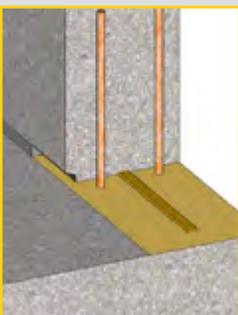
Krystol technology delivered through a slurry treatment and external waterstop that ensures permanent waterproofing protection.

**Usage:** Horizontal and Vertical Construction Joints

**Products:** Krystol Waterstop Treatment & Krystol Waterstop Grout

**Features:** Double protection against water ▪ Protects outboard facing rebar ▪ Keyway can be filled anytime after removing form ▪ Easy/flexible installation ▪ Eliminates difficulties around congested rebar ▪ NSF 61 certified

TRIPLE PROTECTION



**Triple Protection: Use on high risk, critical projects**

The ultimate construction joint. Superior swelling pressure and performance combined with Krystol technology that is delivered through a slurry treatment and an external waterstop that ensures permanent waterproofing protection.

**Usage:** Horizontal and Vertical Construction Joints

**Products:** Krystol Waterstop Treatment & Krystol Waterstop Grout & Krytonite Swelling Waterstop (secured w/ Krytonite Adhesive)

**Features:** Triple protection against water ▪ Protects outboard facing rebar ▪ High-risk waterproofing ▪ Immediate and permanent joint protection

## Pipe Penetrations



Krystol technology delivered through an externally placed waterstop that ensures permanent waterproofing protection.

**Products:** Krystol Waterstop Grout

**Features:** Keyway can be chiseled or formed ▪ Keyway can be filled anytime after removing form ▪ Allows for easy and flexible installation ▪ Eliminates difficulties around congested rebar ▪ NSF 61 certified



Superior swelling pressure and performance that stops water better than bentonite and competing swelling waterstops.

**Products:** Krytonite Swelling Waterstop

**Features:** Exceptional swelling performance (+1000%) ▪ Proven to stop at least 8 bar of hydrostatic pressure (265 ft. of head pressure) ▪ Fills gaps, voids and contours in concrete to stop water from passing ▪ Maintains cohesive state after repeated wet / dry cycles

## Tie Holes



Krystol technology delivered through an externally placed waterstop that ensures permanent waterproofing protection.

**Products:** Krystol Waterstop Grout

**Features:** Tie Holes can be filled anytime after removing form ▪ Allows for easy and flexible installation ▪ NSF 61 certified products

## Control Joints



Kryton's Crack Inducing Waterstop creates a controlled crack, then introduces Krystol technology through an externally placed waterstop that ensures permanent waterproofing protection.

**Usage:** Blindside Applications and Shotcrete Shoring walls

**Products:** Kryton Crack Inducing Waterstop & Krystol Waterstop Grout

**Features:** Crack control for blindside applications ▪ Ridged PVC waterstop ▪ Double protection against water ▪ Keyway can be filled anytime after removing form



Aligned keyways create a controlled crack to introduce Krystol technology through two external waterstops that ensure permanent waterproofing protection.

**Usage:** Backfilled walls, where access is available.

**Products:** Krystol Waterstop Grout

**Features:** Double protection against water ▪ Keyway can be filled anytime after removing form ▪ NSF 61 certified products

# KRYSTOL BARI-COTE™

Krystol Bari-Cote is a high-strength crystalline concrete waterproofing top coat used to resurface and repair concrete or masonry. Krystol Bari-Cote is commonly used as a waterproofing parge coat for spalled or honeycombed concrete, or as a waterproof plaster on masonry walls, where a higher compressive strength surface is required.

## How It Works

Krystol Bari-Cote contains Krystol technology. When applied to concrete, Krystol chemically reacts with water and un-hydrated cement particles to form needle-shaped crystals. These crystals fill capillary pores and micro-cracks in the concrete which block the pathways for water and waterborne contaminants. Any moisture introduced over the lifespan of the concrete will initiate crystallization, ensuring permanent waterproofing protection.

## Product Benefits

- Superior bonding
- High compressive strength
- Permanent waterproofing repair
- Safe for contact with potable water
- Easy and reliable to use

## Packaging

25 kg (55 lb.) resealable pails



Krystol Bari-Cote is used to resurface and repair concrete or masonry, making it waterproof for the life of the structure.



*Oakland Zoo Tiger Pool, Oakland, USA*



*Whampoa MTR Station, Hong Kong SAR, China*



*Vancouver Pavilion, Shanghai, China*

# KRYSTOL® LEAK REPAIR SYSTEM

The Krystol Leak Repair System is a permanent crystalline waterproofing solution used for repairing leaking cracks, holes and joints found in concrete. It reliably stops high water flow, even under high-hydrostatic pressure, and outperforms injection systems. Repairing leaks is a simple process that involves preparing a chase by chiseling into the concrete, stopping flowing water with Krystol Plug, and then filling the chase flush to the surface with Krystol Repair Grout.



After completing the leak repair, the Krystol T1 Waterproofing System will protect the entire structure against the continued ingress of water and further concrete deterioration, as well as reduce the likelihood of further leaks developing in the structure.

## How It Works

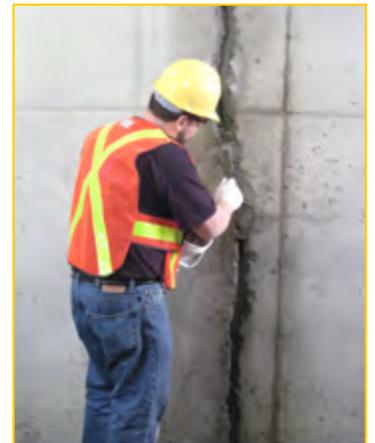
The Krystol Leak Repair System and Krystol T1 Waterproofing System contain Krystol technology. When applied to concrete, Krystol chemically reacts with water and un-hydrated cement particles to form insoluble needle-shaped crystals. These crystals fill capillary pores and micro-cracks in the concrete which block the pathways for water and waterborne contaminants. Any moisture introduced over the lifespan of the concrete will initiate crystallization, ensuring permanent waterproofing protection.

## Product Benefits

- Reduces call-backs
- Effective repair from the positive or negative side
- More reliable than injection systems
- Permanent leak repair solution
- Simple and easy installation

## Packaging

Krystol Plug, Krystol Repair Grout are available in 25 kg (55 lbs) resealable pails



Use the Krystol Leak Repair System to stop water and repair leaking concrete, including:

- Construction joints
- Pipes and metal fixtures in concrete
- Spalled or honeycombed concrete
- Leaking cracks in concrete



Governors Island Seawall, New York City, USA



The Pearl-Qatar, Doha, Qatar

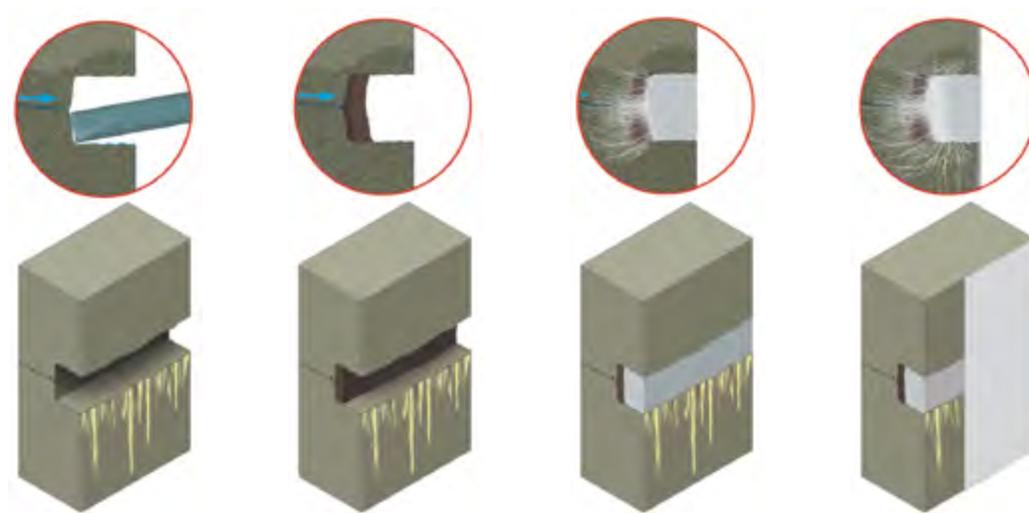


Madushan Dam, Yunnan Province, China

# CONCRETE REPAIR WITH THE KRYSTOL LEAK REPAIR SYSTEM

At best, concrete cracks are just an unattractive nuisance. At worst, they cause leaks that can damage the interior of the building, corrode steel reinforcements and ultimately shorten the life of the concrete structure.

Kryton's Krystol Concrete Waterproofing System is the best way to repair leaking cracks and create durable, waterproof structures.



**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.*

“For a long time, the basement of these two buildings would flood with up to a foot of water, especially at high tide. About 6 months ago, the elevator pits, storage room, boiler room and compacting room were all waterproofed using the Kryton Krystol waterproofing system, ...”

“For the first time, we have a substantially dry basement area, and the results have been excellent. I would recommend these products.”

- George Dambakly, Manhattan Apartments, New York City, USA

# KRYTON HAS YOUR SOLUTION

Kryton products are proven in the harshest environments from buildings to dams to tunnels, our products work from the outside in and inside out, to seal cracks and improve the durability of concrete structures.

	ADMIXTURES & ADDITIVES				SURFACE-APPLIED WATERPROOFING			CONSTRUCTION JOINTS & DETAILS	CONCRETE REPAIR	
	Krytol Internal Membrane™	Hard-Cem®	Con-Fume®	Krytol Mortar Admixture™	Krytol T1® Waterproofing System	Krytol Broadcast™	Hydrostop™ Sealer	Krytol® Waterstop System	Krytol® Leak Repair System	Krytol Bari-Cote™
Aquariums	■		■		■	■		■	■	■
Brick & block manufacturing	■	■	■							
Brick, block & stone masonry exteriors				■	■		■			■
Bridge decks & support structures	■	■	■		■	■	■	■	■	■
Canals	■	■	■		■	■		■	■	■
Culverts	■	■	■		■				■	■
Dams	■	■	■		■	■		■	■	■
Downhole cement	■	■	■							
Elevator pits	■		■		■	■		■	■	■
Foundations & basements	■		■		■	■		■	■	■
Fountains & water features	■			■	■	■		■	■	■
Green roofs	■		■		■	■		■	■	■
Highway pavements & intersections		■	■				■			
Hydroelectric buildings							■			
Livestock housing		■	■				■			
Manufacturing & distribution warehouses		■	■							
Marine structures	■	■	■		■	■	■	■	■	■
Parking structures, ramps & aprons		■	■				■			
Precast pipe & segments	■	■	■		■			■	■	■
Processing facilities		■	■							
Runways	■	■	■				■			
Service & repair bays		■	■							
Shotcrete	■	■	■							
Skateboard parks		■					■			
Sluiceways, spillways & drainage conduits	■	■	■		■	■		■	■	■
Stilling basins	■	■	■		■	■		■	■	■
Storage sheds & tractor garages		■	■							
Stucco & mortar				■			■			
Swimming pools	■		■		■	■		■	■	■
Tunnels & shafts	■	■	■		■	■		■	■	■
Underground parking garages	■		■		■	■	■	■	■	■
Utility & maintenance buildings		■	■				■			
Wastewater treatment plants	■	■	■		■	■		■	■	■
Water reservoirs & tanks	■		■		■	■		■	■	■

# WE'VE GOT YOU COVERED.

## Build Confidently with Kryton.

Kryton is the inventor of the crystalline waterproofing admixture and has been waterproofing concrete structures with its proprietary Krystol® technology since 1973. We offer the best-in-category warranty that guarantees Krystol treated areas of your structure will remain watertight during the warranty period. Over the decades Kryton has won awards for innovation, manufacturing, best place to work and entrepreneurial awards. In 2017, Kryton acquired Cementec Industries and is now distributing Hard-Cem®, an integral (not surface-applied) concrete hardener for increased abrasive and erosive wear resistance of ready-mix concrete, precast concrete and shotcrete. Kryton is now the only manufacturer of Silica Fume products in Western Canada.

All Kryton products are covered by our standard warranty guaranteeing every product is free from manufacturing defects.



*KIM, Hard-Cem and Krystol Waterstop System have all been recognized with a Most Innovative Product Award at the World of Concrete.*

## Industry Expertise

Kryton not only meets industry standards such as ICC-ES and NSF International, but continues to raise them. We work with industry, academic and government bodies around the world to develop certification standards and testing methodologies.

	<p><b>British Board of Agrément (BBA)</b> – No 05/4217 Krystol Internal Membrane (KIM) a reactive crystalline admixture used to provide watertight concrete.</p>
	<p><b>European CE Mark (CE)</b> – Krystol Internal Membrane (KIM) meets all applicable European Union directives, safety guidelines and quality standards.</p>
	<p><b>NSF</b> – Krystol products are certified by NSF to NSF/ANSI standard 61 Drinking Water System Components – Health Effects. NSF is a widely respected worldwide certification provider that develops national standards for food, indoor air, environment and water.</p>
	<p><b>GB Standard</b> – Chinese national standards issued by the Standardization Administration of China (SAC), the Chinese National Committee of the ISO and IEC. Mandatory standards are prefixed “GB”.</p>
	<p><b>International Code Council - Evaluation Service (ICC-ES)</b> – Krystol Internal Membrane (KIM) was the first chemical concrete admixture certified by ICC-ES, a non-profit U.S. organization that reviews and evaluates building products, materials and methods to ensure they comply with applicable building codes.</p>
	<p><b>Singapore Green Label</b> - Krystol Internal Membrane (KIM) (HS &amp; ES) has been approved by Singapore Green Label.</p>

Kryton headquarters are in Canada with 7 regional offices in China, India, Mexico, Singapore, UAE, USA and UK. Our solutions are sold by over 50 distributors worldwide. To find the Kryton distributor nearest you, visit our website: [www.kryton.com](http://www.kryton.com)



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**SMART CONCRETE®**