

# CONCRETE WATERPROOFING AND DURABILITY SOLUTIONS GUIDE



Runways, highway pavements, and intersections

Hydro dams, irrigation, 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)

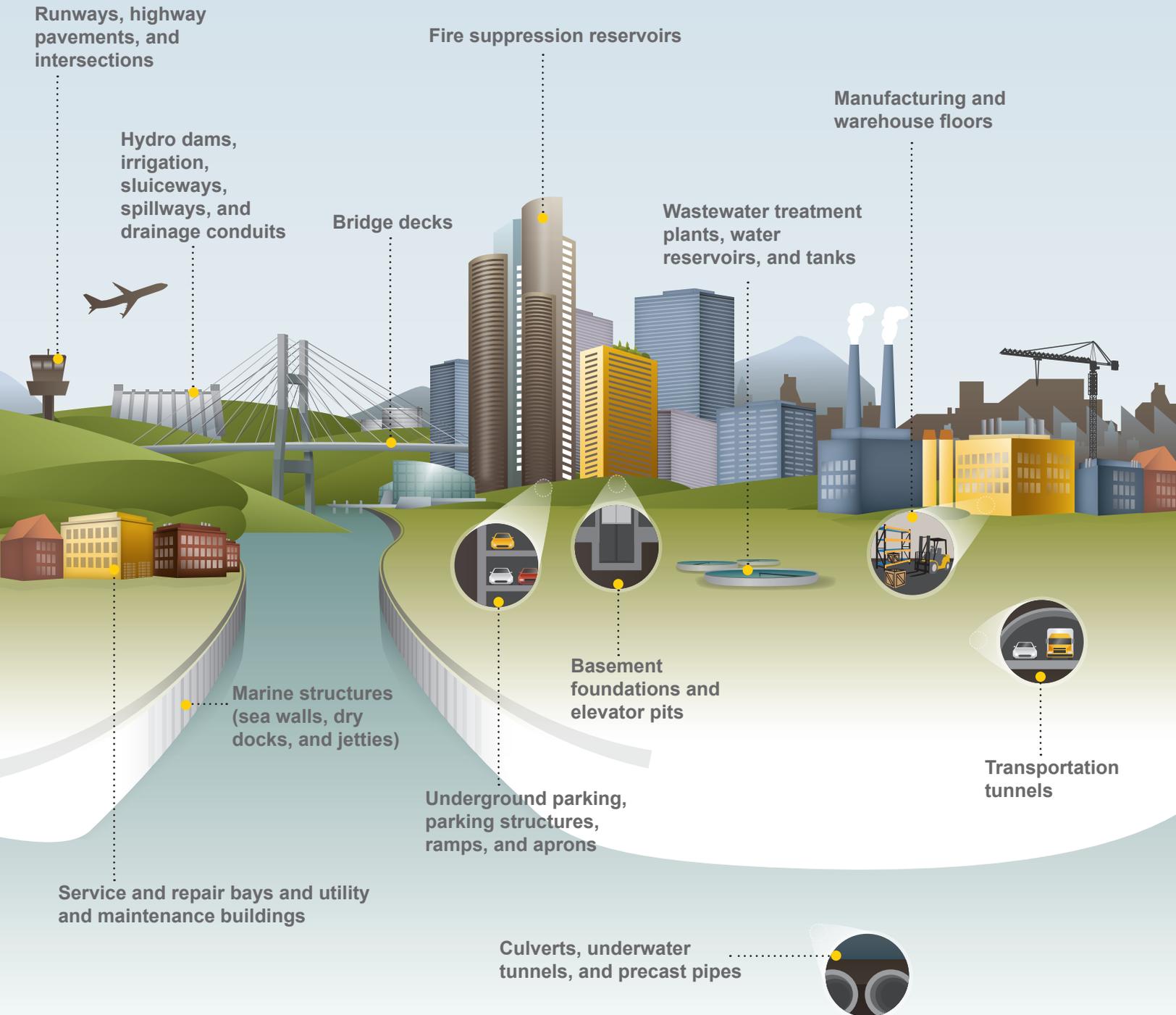
Basement foundations and elevator pits

Underground parking, parking structures, ramps, and aprons

Transportation tunnels

Service and repair bays and utility and maintenance buildings

Culverts, underwater tunnels, and precast pipes





KRYTON INTERNATIONAL INC.

# 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 1970s, Kryton pioneered Krystol® 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 Krystol technology, the admixture eliminates surface-applied coatings and membranes as Krystol turns the concrete itself into a waterproof membrane. Just as importantly, Krystol-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 doubles concrete resistance to abrasion and 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

## TABLE OF CONTENTS

Smart Concrete® .....	2
-----------------------	---

### ADMIXTURES & ADDITIVES

Krystol Internal Membrane™ (KIM®) .....	4
How Is Kryton KIM Different? .....	5
KIM vs Traditional Surface-Applied Waterproofing .....	6
Krystol Mortar Admixture™ .....	7
Hard-Cem® .....	8
Hard-Cem vs Surface-Applied Hardeners .....	9
Con-Fume® .....	10

### SURFACE-APPLIED WATERPROOFING

Krystol T1® Concrete Waterproofing .....	11
Krystol Broadcast™ .....	12
Hydrostop™ Sealer .....	13

### CONSTRUCTION JOINTS & DETAILS

Krystol® Waterstop System .....	14
Krystol Waterstop Grout™ .....	15
Krystol Waterstop Treatment™ .....	15
Krytonite™ Swelling Waterstop .....	16
Kryton's Crack Inducing Waterstop .....	16
How It Works .....	17

### CONCRETE REPAIR

Krystol Bari-Cote™ .....	19
Krystol® Leak Repair System .....	20

### KRYTON HAS YOUR SOLUTION

Application Chart .....	22
Warranty .....	23
Industry Expertise .....	23

# KRYSTOL INTERNAL MEMBRANE™ (KIM®)

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 unhydrated cement particles to form insoluble needle-shaped crystals. These crystals fill capillary pores and micro-cracks in the concrete, which blocks the pathways for water and waterborne contaminants. Any moisture introduced over the life span of the concrete will initiate crystallization, ensuring permanent waterproofing protection.



## Product Benefits

- Offers a 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
- Is NSF 61-certified for potable water applications

## Packaging

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



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

- |   |   |   |
|---|---|---|
| <ul style="list-style-type: none"> <li>• Below grade parking</li> <li>• Basements</li> <li>• Sewage plants</li> <li>• Swimming pools</li> </ul> | <ul style="list-style-type: none"> <li>• Dams</li> <li>• Foundation walls</li> <li>• Footings</li> <li>• Slabs</li> </ul> | <ul style="list-style-type: none"> <li>• Pits</li> <li>• Water containment tanks</li> <li>• Canals</li> </ul> |
|---|---|---|



Marina Bay Sands, Singapore



Whitney Museum, New York City, USA



Line 3 Metro, Monterrey, Mexico

# HOW IS KRYTON KIM DIFFERENT?

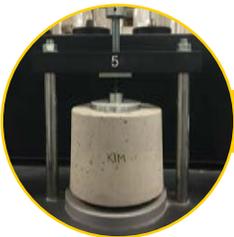
## NOT ALL CRYSTALLINE ADMIXTURES ARE THE SAME

All 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 unhydrated 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 different from competitors



### KIM Has **SUPERIOR PERFORMANCE**

- It has the highest level of permeability reduction and most dependable self-sealing performance
- KIM also comes with the best dry shrinkage and restrained shrinkage crack reduction
- It's the only crystalline admixture proven to protect against corrosion of reinforced steel (proven by the 10-year corrosion study conducted by the University of Hawaii)



### It's the **COMPLETE WATERPROOFING SYSTEM**

- Every construction detail is covered to create a watertight structure
- The 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**

- Kryton invented the world's first crystalline admixture 15 years before competitors
- We offer the best warranty in category with many projects outlasting their original warranties
- In return, we have successfully waterproofed many 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 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.



## OFFERS 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



## SHORTENS CONSTRUCTION SCHEDULES

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

- Is added directly to concrete during the batching process for easy and efficient installation
- Prevents delays due to weather, scheduling a sub-trade, or applying an externally applied product
- Allows workers 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
- Is 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)

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 unhydrated cement particles to form insoluble needle-shaped crystals. These crystals fill capillary pores and micro-cracks in the concrete, which blocks the pathways for water and waterborne contaminants. Any moisture introduced over the life span 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
- Is NSF 61-certified for potable water applications

## Packaging

- 15-kilogram (33-pound) 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 and extend its wear life. Hard-Cem is added during batching to provide durable, environmentally sustainable concrete. Since it is integral, Hard-Cem provides full-depth hardening and can be used in any horizontal, vertical, or inclined structure. Hard-Cem provides superior performance and replaces dry shake hardeners and liquid hardeners or densifiers used for abrasion resistance.

## 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

- Doubles the concrete wear life under harsh conditions
  - Lowers installed cost, and expedites construction schedules\*
  - Reduces maintenance costs, and improves concrete durability and sustainability
  - Simplifies application by being added directly to the concrete with no specialized spreading equipment needed
  - Allows dust-free use with mixer-ready bags and bulk silo dispensing, helping worksites comply with OSHA silica exposure requirements\*
  - Improves concrete placement, finishing operations, and quality control\*
  - Eliminates installation errors due to wind or from over- or under-applying surface hardeners
  - Works with all concrete finishing types and methods
  - Prevents the surface delamination after troweling that can occur with surface-applied hardeners\*
  - Is compatible with all cement types and supplementary cementitious materials (SCMs)\*\*
  - Remains the only hardener that can be used with air-entrained concrete\*
  - Does not have negative side effects on water demand, workability, set time, strength development, or shrinkage
  - Contributes to LEED points with zero VOCs, reduced jobsite waste, and a lower carbon footprint
- \*compared to surface-applied (dry shake) hardeners, \*\*compared to liquid hardeners or densifiers**



## Packaging

- 13.4-kilogram (33-pound) pulpable mixer-ready bags
- 1,600-kilogram (3,527-pound) super sacks and bulk pneumatic truckloads

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 SCMs, or using air-entrained concrete and getting consistent coverage or dosage is a thing of the past. Hard-Cem avoids exposure to harmful silica dust because it is added directly to the concrete mix. It can be applied where traditional dry shake hardeners cannot: shotcrete, vertical cast-in-place concrete, precast concrete, and vertical concrete.

Since 2004, Hard-Cem has increased the durability on more than 7.4 million m<sup>2</sup> (80 million ft<sup>2</sup>).



## IMPROVES PERFORMANCE

- Guarantees consistent dosage and expected performance, and removes quality control concerns
- Eliminates installation challenges, which reduces failures, improves finishing, and delivers flatter floors
- Provides full-depth concrete hardening



## SPEEDS UP CONSTRUCTION

- Speeds up installation as it does not require special labor or equipment or additional installation steps
- Removes weather-related constraints that affect scheduling
- Produces faster finishing, which enables workers to place more concrete



## ELIMINATES SILICA DUST EXPOSURE

- Eliminates concerns around respirable silica exposure
- Keeps workers on the jobsite safe, and simplifies safety plans
- Removes liability and fines issued by organizations like OSHA



## HAS MULTIPLE APPLICATIONS

- Is the only hardener that can be used with air-entrained concrete
- Can be used in cast-in-place concrete, shotcrete, or precast concrete in horizontal or vertical applications
- Works with SCMs and common admixtures



## SAVES MONEY

- Extends life for longer, reducing repair and maintenance costs
- Offers better cost to performance value
- Reduces labor costs

# 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 an SCM, 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 SCM
- Meets all *ASTM C1240-14* specifications for silica fume SCMs
- Is specially developed to provide enhanced bulk material flow and handling characteristics, providing efficient bulk transportation and pneumatic unloading

## Packaging

- 11.4-kilogram (25-pound) mixer-ready bags
- 1,000-kilogram (2,204-pound) 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

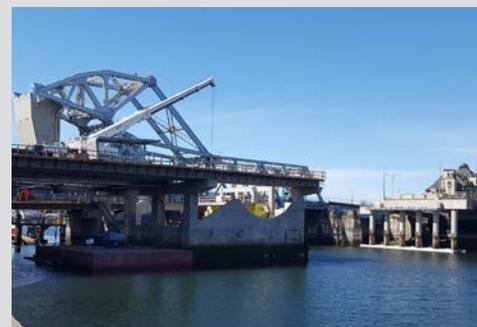


By sashafatcat

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 unhydrated cement particles to form insoluble needle-shaped crystals that fill capillary pores and micro-cracks in the concrete, which blocks the pathways for water and waterborne contaminants. Any moisture introduced over the life span of the concrete will initiate crystallization, ensuring permanent waterproofing protection.

## Product Benefits

- Works effectively against high hydrostatic pressure; tested up to 140 m (460 ft) of head pressure
- Self-seals hairline cracks reliably up to 0.5 mm (0.02 in)
- Repairs from the positive or negative side of water pressure
- Fixes membrane failures without excavation
- Remains safe for contact with potable water with certification by NSF to NSF/ANSI Standard 61
- Offers solutions available in Grey or White

## Packaging

- 25-kilogram (55-pound) 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, and 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 unhydrated cement particles to form needle-shaped crystals. These crystals fill capillary pores and micro-cracks in the concrete, which blocks the pathways for water and waterborne contaminants. Any moisture introduced over the life span of the concrete will initiate crystallization, ensuring permanent waterproofing protection.

## Product Benefits

- Provides a permanent and reliable hydrostatic waterproofing solution
- Acts integral to the concrete; Krystol Broadcast does not wear away or deteriorate
- Ensures uniform distribution with fugitive dye
- Self-seals micro-cracks for the life of the concrete
- Increases longevity of reinforced concrete
- Is NSF 61-certified for potable water applications

## Packaging

- 25-kilogram (55-pound) 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 KIM. As well, Krystol Broadcast was applied on the positive side of the driveway, which covered over 500 m<sup>2</sup> (597 y<sup>2</sup>) of space. 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

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

## Packaging

- 18.9-liter (five-US gallon) pails



\*Hydrostop is Hydropel™ 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, and steps
- Concrete pavers and retaining walls
- Marine floats and docks
- Stucco walls
- Concrete roof tiles and unglazed floor tiles
- Asbestos cement
- Any masonry surface made from concrete, brick, mortar, grout, tile, terra-cotta, plaster, stone, or 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 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
- Offers improved performance and reliability over competitors
- Provides design options based on project requirements
- Allows for easy installation of products within the system
- Is 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
- Preplanned and unintended cold joints
- Crack control joints



Olympic Cauldron, Vancouver, Canada



CityCenter, Las Vegas, USA



Women and Children Hospital, Brunei Darussalam

# KRYSTOL WATERSTOP GROUT™

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

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

## How It Works

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

## Product Benefits

- Provides multi-use as it can be used with an internal or external waterstop
- Creates permanent crystalline waterproofing and protection
- Is crack-resistant
- Is NSF 61-certified and safe for contact with potable water
- Offers a durable solution that's resistant to rain, foot traffic, and shifting

## Packaging

- 25-kilogram (55-pound) resealable pails



# KRYSTOL WATERSTOP TREATMENT™

Krystol 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.

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

## How It Works

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

## Product Benefits

- Is easy to install
- Provides a permanent waterstop treatment as part of the Krystol Waterstop System
- Offers a durable solution that's resistant to rain and foot traffic once hardened
- Remains safe for contact with potable water; certified to NSF/ANSI Standard 61
- Eases inspections with a distinctive yellow color that increases reliability and quality control during installation

## Packaging

- 25-kilogram (55-pound) resealable pails



# KRYTONITE™ SWELLING WATERSTOP

Krytonite Swelling Waterstop is a hydrophilic synthetic elastomeric rubber waterstop that uses swelling pressure to seal concrete construction joints and penetrations to stop water in the most extreme conditions.

Krytonite has superior performance that swells up to 10x its original size and up to 4x more than competing bentonite and rubber swelling waterstops. For use with regular ground water, 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 double or triple protection for construction joints and penetrations.

## 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, Krystol 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

- Produces high-performance swelling up to 10x the original volume
- Is flexible and easy to install
- Resists high hydrostatic pressure
- Offers an extremely durable product that will not deteriorate even with repeated wetting and drying cycles
- Resists dislodgement, and allows for better concrete consolidation with an innovative trapezoid shape
- Allows for concrete strength development in advance of swelling pressure with controlled swelling

## Packaging

- 1 box (20 mm x 5 mm, which is approximately 0.8" x 0.2") – 50 m, 5 m x 10 m 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

- Allows for accurate placement of control joints
- Is extremely durable
- Controls concrete cracks, and decreases maintenance costs

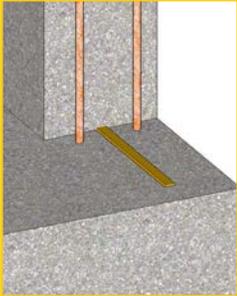


# KRYSTOL WATERSTOP SYSTEM

## HOW IT WORKS

### Construction Joints

SINGLE PROTECTION



**Single Protection: Improve Waterproofing Performance Over Common Swelling Waterstops**  
Superior swelling pressure and performance that stops water better than bentonite and competing swelling waterstops.

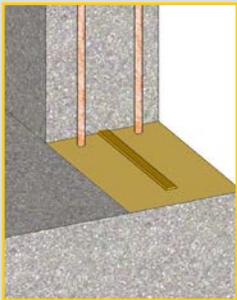
**Usage:** Horizontal and vertical construction joints

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

**Features:** Produces exceptional swelling performance (+1,000%) • Withstands hydrostatic pressure up to 265 ft (0.8 MPa) of head • 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



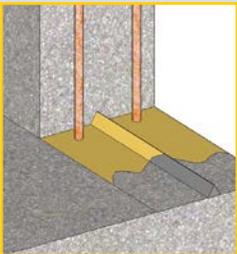
**Double Protection: Apply for a Permanent, Long-Term Hydrostatic Waterproofing Solution**

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 and Krytonite Swelling Waterstop (secured w/ Krytonite Adhesive)

**Features:** Provides double protection against water • Protects outboard-facing rebar • Comes with preformed material and easy installation • Produces exceptional swelling waterstop performance • Acts as an immediate waterstop

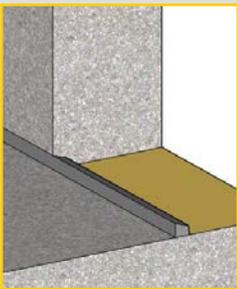


Krystol technology delivered through an internally placed, triangle-shaped waterstop and a slurry treatment that ensures permanent waterproofing protection.

**Usage:** Horizontal construction joints

**Products:** Krystol Waterstop Treatment and Krystol Waterstop Grout

**Features:** Provides double protection against water • Protects outboard-facing rebar • Conforms easily to rough joint surfaces • Offers an easy and flexible installation • Hardens to make it difficult to damage • Is NSF 61-certified



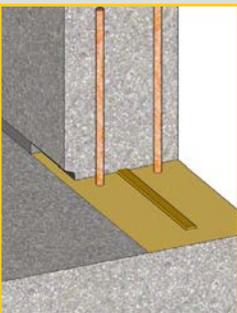
Krystol technology delivered through a slurry treatment and external waterstop that ensures permanent waterproofing protection.

**Usage:** Horizontal and vertical construction joints

**Products:** Krystol Waterstop Treatment and Krystol Waterstop Grout

**Features:** Provides double protection against water • Protects outboard-facing rebar • Allows keyway to be filled anytime after removing form • Offers an easy and flexible installation • Eliminates difficulties around congested rebar • Is 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, and Krytonite Swelling Waterstop (secured w/ Krytonite Adhesive)

**Features:** Provides triple protection against water • Protects outboard-facing rebar • Works for high-risk waterproofing • Creates immediate and permanent joint protection

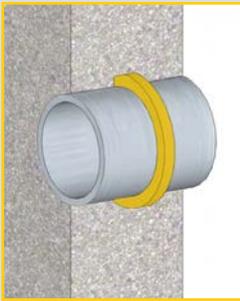
## Pipe Penetrations



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

**Products:** Krystol Waterstop Grout

**Features:** Can work with a chiseled or formed keyway • Allows for keyway to be filled anytime after removing form • Offers an easy and flexible installation • Eliminates difficulties around congested rebar • Is NSF 61-certified

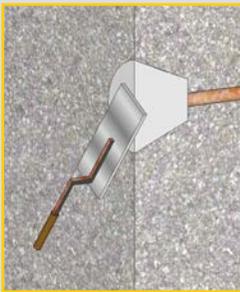


Superior swelling pressure and performance that stops water better than bentonite and competing swelling waterstops.

**Products:** Krytonite Swelling Waterstop

**Features:** Produces exceptional swelling performance (+1,000%) • Withstands hydrostatic pressure up to 265 ft (0.8 MPa) of head • Fills gaps, voids, and contours in concrete to stop water from passing • Maintains cohesive state after repeated wet-dry cycles

## Tie Holes

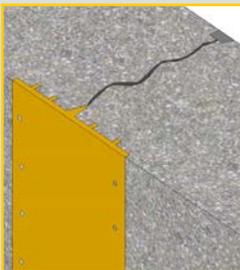


Krystol technology delivered through an externally placed waterstop that ensures permanent waterproofing protection.

**Products:** Krystol Waterstop Grout

**Features:** Allows for tie holes to be filled anytime after removing form • Allows for easy and flexible installation • Is NSF 61-certified

## Control Joints

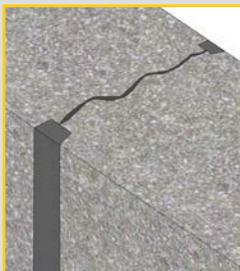


Kryton's Crack Inducing Waterstop creates a controlled crack and then introduces Krystol technology through an externally placed waterstop that ensures permanent waterproofing protection.

**Usage:** Blindside applications and shotcrete shoring walls

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

**Features:** Provides crack control for blindside applications • Offers ridged PVC waterstop • Produces double protection against water • Allows for keyways to 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:** Provides double protection against water • Allows for keyways to be filled anytime after removing form • Is NSF 61-certified

# KRYSTOL BARI-COTE™

Krystol Bari-Cote is a high-strength crystalline concrete waterproofing topcoat 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 unhydrated cement particles to form needle-shaped crystals. These crystals fill capillary pores and micro-cracks in the concrete, which blocks the pathways for water and waterborne contaminants. Any moisture introduced over the life span of the concrete will initiate crystallization, ensuring permanent waterproofing protection.

## Product Benefits

- Provides superior bonding
- Offers high compressive strength
- Creates permanent waterproofing repair
- Remains safe for contact with potable water
- Is easy and reliable to use

## Packaging

- 25-kilogram (55-pound) 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 unhydrated cement particles to form insoluble needle-shaped crystals. These crystals fill capillary pores and micro-cracks in the concrete, which blocks the pathways for water and waterborne contaminants. Any moisture introduced over the life span of the concrete will initiate crystallization, ensuring permanent waterproofing protection.



## Product Benefits

- Reduces call-backs
- Repairs from the positive or negative side effectively
- Is more reliable than injection systems
- Offers a permanent leak repair solution
- Provides a simple and easy installation

## Packaging

- 25-kilogram (55-pound) resealable pails for both Krystol Plug and Krystol Repair Grout

Use the Krystol Leak Repair System to stop water and repair leaking concrete from structures, 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

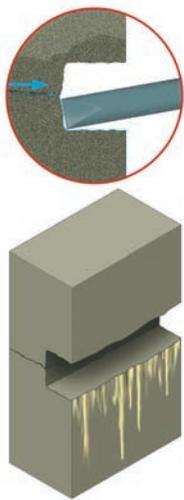


Madushan Dam, Yunnan Province, China

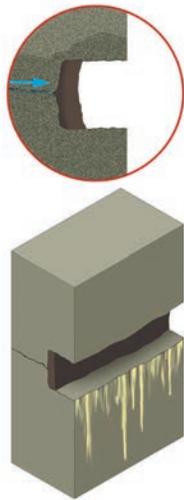
# CONCRETE REPAIR WITH THE KRYSTOL LEAK REPAIR SYSTEM

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.

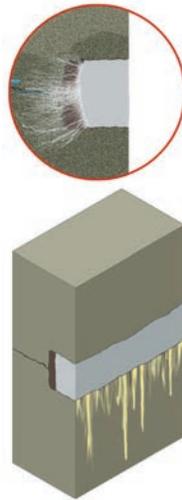
Kryton's Krystol concrete waterproofing system is the best way to repair leaking cracks and create durable, waterproof structures.



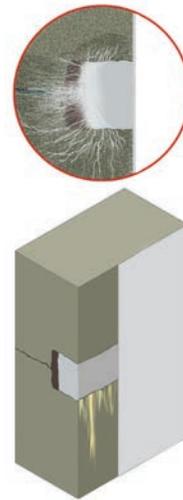
**Step 1:**  
Prepare the crack or joint.



**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 six 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	
	KIM	Hard-Cem	Con-Fume	KMA	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 the 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 we also continue to raise them. We work with industry, academic, and governmental bodies around the world to develop certification standards and testing methodologies.

	<p><b>British Board of Agrément (BBA)</b> – No 05/4217 for KIM, a reactive crystalline admixture used to provide watertight concrete.</p>
	<p><b>European CE Mark (CE)</b> – KIM meets all applicable European Union directives, safety guidelines, and quality standards.</p>
	<p><b>NSF International</b> – Krystol products are certified by NSF International 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, the environment, and water.</p>
	<p><b>GB Standard</b> – Chinese national standards issued by the Standardization Administration of China, 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> – KIM was the first chemical concrete admixture certified by ICC-ES, a non-profit US 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> – KIM (HS &amp; ES) has been approved by Singapore Green Label.</p>

Kryton headquarters are in Vancouver, Canada.  
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)



**Kryton International Inc.**

1645 East Kent Avenue  
Vancouver, BC, Canada V5P 2S8  
Tel: +1.604.324.8280  
Toll-free (in Canada/USA): 1.800.267.8280  
Email: [info@kryton.com](mailto:info@kryton.com)  
[www.kryton.com](http://www.kryton.com)



**SMART CONCRETE®**