



Kryton International Inc.  
 1645 East Kent Avenue  
 Vancouver, BC V5P 2S8  
 Phone: (800) 267- 8280  
 Phone: (604) 324-8280  
 Fax: (604) 324-8899  
 E-mail: [info@kryton.com](mailto:info@kryton.com)  
 Website: [www.kryton.com](http://www.kryton.com)

This 3-PART SPECIFICATION utilizes the Construction Specifications Canada (CSC) *Manual of Practice* (MOP), including *MasterFormat*<sup>™</sup>, *SectionFormat*<sup>™</sup> and *PageFormat*<sup>™</sup>. A 3-PART SPECIFICATION is a manufacturer-specific proprietary product specification using the proprietary method of specifying applicable to project specifications and master guide specifications. Optional text is indicated by brackets [ ]; delete optional text in final copy of specification. Specifier Notes precede specification text; delete notes in final copy of specification. Trade/brand names with appropriate product model numbers, styles and types are used in Specifier Notes and in the specification text Article titled "Acceptable Material." Metric conversion, where used, is soft metric conversion.

This 3-PART SPECIFICATION specifies crystalline waterproofing products for concrete, as manufactured by Kryton International Inc. Revise 3-PART SPECIFICATION section number and title below to suit project requirements, specification practices and section content. Refer to CSC/CSI *MasterFormat* for other section numbers and titles.

**SECTION 07 16 16**  
**CRYSTALLINE WATERPROOFING**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section Includes: This Section specifies crystalline waterproofing products for use with concrete.

Specifier Note: Revise Paragraph below to suit project requirements. Add section numbers and titles per CSC/CSI *MasterFormat* and specifier's practice.

- B. Related Requirements:

Specifier Note: Include in this Paragraph only those sections and documents that directly affect the work of this section. If a reader of this section could reasonably expect to find a product or component specified in this section, but it is actually specified elsewhere, then the related section number(s) should be listed in the Subparagraph below. Do not include Division 00 documents or Division 01 sections since it is assumed that all technical sections are related to all project Division 00 documents and Division 01 sections to some degree. Refer to other documents with caution since referencing them may cause them to be considered part of the Contract.

1. Section [03 01 30 - Maintenance of Cast-in-Place Concrete: Concrete repair].
2. Section [03 01 30.71 - Rehabilitation of Cast-in-Place Concrete: Concrete repair].
3. Section [03 30 00 - Cast-in-Place Concrete: Concrete slabs and walls].
4. Section [03 35 00 - Concrete Finishing].
5. Section [03 39 00 - Concrete Curing].

**1.02 REFERENCES**

Specifier Note: Paragraph below may be omitted when specifying manufacturer's proprietary products and recommended installation. Retain References Paragraph when specifying products and installation by an industry reference standard. List retained standard(s) referenced in this section alphabetically. Indicate issuing authority name, acronym, standard designation and title. Establish policy for indicating edition date of standard referenced. Contract Conditions Section 01 42 00 - References may establish the edition date of standards. This Paragraph does not require compliance with standard(s). It is a listing of all references used in this section. Do not include references to building codes at any level.

- A. Reference Standards:

1. ASTM International (ASTM):

- a. ASTM C494/C494M Standard Specification for Chemical Admixtures for Concrete.
- 2. Canadian Standards Association (CSA):
  - a. CAN/CSA A23.1-04/A23.2 Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate work of this Section with work of other trades for proper time and sequence to avoid construction delays. Comply with Section [01 31 00 - Project Management and Coordination].
- B. Preinstallation Meetings: Conduct preinstallation meeting [1 week] prior to commencing [work of this Section] [and] [on-site installations] to verify project requirements, substrate conditions and coordination with other building subtrades, and to review manufacturer's installation instructions and manufacturer's warranty requirements. Comply with Section [01 31 19 - Project Meetings].
- C. Sequencing: Sequence work of this section in accordance with Section [01 12 16 - Work Sequence] [and manufacturer's written recommendations for sequencing construction operations].
- D. Scheduling: Schedule work of this Section in accordance with Section [01 32 13 - Scheduling of Work].

Specifier Note: Article below includes submittal of relevant data to be furnished by Contractor before, during or after construction. Coordinate this article with Architect's and Contractor's duties and responsibilities in Contract Conditions and Section 01 33 00 - Submittal Procedures.

1.04 ACTION SUBMITTALS

- A. General: Submit listed submittals in accordance with Contract Conditions and Section [01 33 00 - Submittal Procedures].
- B. Product Data: Submit specified products as follows:
  - 1. Manufacturer's product data, including manufacturer's technical data sheet.
  - 2. Manufacturer's installation instructions.
  - 3. Material Safety Data Sheets (MSDS).

1.05 INFORMATION SUBMITTALS

Specifier Note: Specify submittal of test reports or evaluation service reports intended to document required tests without repeating the test requirements specified in Division 01.

- A. General: Submit listed submittals in accordance with Contract Conditions and Section [01 33 00 - Submittal Procedures].
- B. Test and Evaluation Reports:
  - 1. Certified test reports showing compliance with specified performance characteristics and physical properties.

Specifier Note: Specify submittals intended to document manufacturer's installation, storage and other instructions.

- 2. Manufacturer's Instructions: Submit manufacturer's [storage] [and] [\_\_\_\_\_] installation instructions.
- C. Source Quality Control: Submit documentation verifying that components and materials specified in this Section are from single manufacturer.

Specifier Note: Coordinate with Field Quality Control in PART 3. When manufacturer's services are specified during construction operations to verify installation, include following Paragraph for the submittal of instructions and reports. If no field inspections are required, delete the following Paragraph.

- D. Manufacturer's Reports: Manufacturer's field reports specified.
- E. Qualification Statements:
  - 1. Submit letter of verification for Manufacturer's Qualifications.
  - 2. Submit letter of verification for Installer's Qualifications.

1.06 CLOSEOUT SUBMITTALS

- A. General: Submit listed submittals in accordance with Contract Conditions and Section [01 33 00 - Submittal Procedures].

**B. Operation and Maintenance Data:**

1. Submit operation and maintenance data for installed products in accordance with Section [01 78 23 - Operation and Maintenance Data]. Include:

Specifier Note: Edit or expand list of operation and maintenance data submittal inclusions to suit project requirements.

- a. Manufacturer's instructions detailing maintenance requirements.
- b. Warranty Documentation: Submit warranty documents specified.

**1.07 QUALITY ASSURANCE****A. Qualifications:**

1. Manufacturer:
  - a. Having [5] years experience manufacturing components similar to or exceeding requirements of project.
  - b. Having sufficient capacity to produce and deliver required materials without causing delay in work.
  - c. Capable of providing field service representation during construction.
2. Installer:
  - a. Acceptable to manufacturer and experienced in work of this section and who has specialized in installation of work similar to that required for this project.

**1.08 DELIVERY, STORAGE & HANDLING****A. Delivery and Acceptance Requirements:**

1. Deliver material in accordance with Section [01 61 00 - Common Product Requirements] and in accordance with manufacturer's written instructions.
2. Deliver materials in manufacturer's original packaging with identification labels intact and in sizes to suit project.

**B. Storage and Handling Requirements:**

1. Store materials protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.

**C. Packaging Waste Management:**

Specifier Note: The disposal of packaging waste into landfill sites demonstrates an inefficient use of natural resources and consumes valuable landfill space. Specifying appropriate packaging and construction waste management and disposal procedures may contribute to points required for CaGBC LEED® construction project certification.

Specifier Note: Include the following Subparagraphs to specify information that will provide direction to the Contractor for the disposal of construction waste materials using environmentally responsible methodology other than landfill resources.

1. Separate waste materials for [reuse] [and] [recycling] in accordance with [Section 01 74 19 - Construction Waste Management and Disposal].

Specifier Note: CaGBC LEED® certification includes credits for the diversion of construction waste from landfill. Diversion can be tracked by either weight or volume but must be consistent for all materials. Manufacturer may reclaim packaging and delivery materials for recycling.

2. Remove packaging materials from site and dispose of at appropriate recycling facilities.
3. Collect and separate for disposal [paper] [plastic] [polystyrene] [corrugated cardboard] packaging material [in appropriate onsite bins] for recycling.
4. Fold metal and plastic banding, flatten and place in designated area for recycling.

Specifier Note: Add additional Subparagraphs to include pallets, crates, padding and other packing materials that are typically associated with the specified products.

5. Remove:

- a. Pallets from site [and return to supplier or manufacturer].

1.09 [FIELD] [SITE] CONDITIONS

Specifier Note: Specify the ambient conditions under which the work must be performed in order for the work results to provide the specified quality. Conditions can include factors such as temperature, humidity, lighting, or conditions of completion of related work or substrates.

A. Ambient Conditions:

- 1. Installation Location: Apply materials only when temperatures are above [4 degrees C (40 degrees F)].

Specifier Note: Coordinate Article below with Contract Conditions and with Section 01 78 36 - Warranties.

1.010 WARRANTY

- A. Warranty: Refer to Contract Conditions and Section [01 78 36 - Warranties] for project warranty provisions.
- B. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under other Contract Documents.

Specifier Note: KIM Admixture, KIM HS Admixture, Krystol Waterstop Grout and Waterstop Treatment each carry a 25 year material warranty. Krystol T1/T2 and Broadcast each carry a 10 year warranty. Coordinate paragraph below with manufacturer's warranty requirements.

- 1. Warranty Term: [Specify term.] years commencing on Date of Substantial Completion.

**PART 2 PRODUCTS**

Specifier Note: Retain Article below for proprietary method specification. Add product attributes, performance characteristics, material standards and descriptions as applicable. Use of such phrases as "or equal," "or approved equal" or similar phrases may cause ambiguity in specifications. Such phrases require verification (procedural, legal and regulatory) and assignment of responsibility for determining "or equal" products.

2.01 CRYSTALLINE WATERPROOFING

Specifier Note: Include in the following Paragraph manufacturer's name, address, phone number, fax number, e-mail address and website URL.

A. Manufacturer: Kryton International Inc.

- 1. Contact: 1645 East Kent Avenue.; Vancouver, BC V5P 2S8; Telephone: (800) 267- 8280, (604) 324-8280; Fax: (604) 324-8899; E-mail: [info@kryton.com](mailto:info@kryton.com); website: [www.kryton.com](http://www.kryton.com).
- 2. Single Source Responsibility: Provide components and materials specified in this section from a single manufacturer.

Specifier Note: Substitution procedures must be either in the Contract Conditions or in Section 01 25 00 - Substitution Procedures. Do not include substitution procedures here.

3. Substitution Limitations:

- a. Substitutions: [In accordance with [Contract Conditions] [Section 01 25 00 - Substitution Procedures] [No substitutions permitted].

Specifier Note: Include an overall description of the system, assembly, product or material. Include required properties or characteristics that do not obviously belong under other titles. Examples: Configuration, size and colour.

B. Description:

Specifier Note: Paragraph below should list obligations for compliance with specific code requirements particular to this section. General statements to comply with a particular code are typically addressed in Contract Conditions and Section 01 41 00 - Regulatory Requirements. Repetitive statements should be avoided.

1. Regulatory Requirements:
  - a. In accordance with Section [01 41 00 - Regulatory Requirements].
2. Compatibility:
  - a. Ensure components and materials are compatible with specified accessories and adjacent materials.

Specifier Note: Performance characteristics are usually stated with some form of evaluation or verification. Performance usually, but not universally, applies to systems and assemblies. Performance criteria can include structural, safety, fire resistance, vapour retardancy, acoustical, thermal, operational capacity and durability properties.

Specifier Note: The term "Design Criteria" is used when describing the intended characteristics of a product for which the Contractor is assigned design responsibility.

C. [Performance] [Design] Criteria:

1. To maintain performance criteria stated by manufacturer without defects, damage or failure, provide concrete waterproofing admixture that has been manufactured and added to concrete mix at time of concrete batching.
2. Coordinate and schedule addition of concrete admixture with concrete batching.

D. Materials:

1. Waterproofing Admixture:
  - a. Crystalline Waterproofing Admixture: To ASTM C494/C494M, self-sealing, chloride free, dry powder admixture consisting of cement, quartz silica and other chemicals.
    - 1) Colour: Grey.
    - 2) Hydrostatic Head Resistance: 140 m (460 feet).
    - 3) Self-Sealing: 0.5 mm (0.02 inches).
    - 4) Compressive Strength of Concrete With Waterproofing Admixture: In accordance with Section [03 30 00 - Cast-in-Place Concrete].
    - 5) Acceptable Material: Krystol Internal Membrane (KIM) manufactured by Kryton International Inc.

Specifier Note: KIM HS is designed for applications where freeze/thaw resistance is not a project requirement.

- b. Crystalline Waterproofing Admixture (HS): To ASTM C494/C494M, self-sealing, chloride free, dry powder admixture consisting of cement, quartz silica and other chemicals, with reduced air-entrainment.
  - 1) Colour: Grey.
  - 2) Hydrostatic Head Resistance: 140 m (460 feet).
  - 3) Self-Sealing: 0.5 mm (0.02 inches).
  - 4) Compressive Strength of Concrete With Waterproofing Admixture: In accordance with Section [03 30 00 - Cast-in-Place Concrete].
  - 5) Acceptable Material: Krystol Internal Membrane - HS (KIM-HS) manufactured by Kryton International Inc.

2. Waterstop System for Concrete Construction Joints:

Specifier Note: Krystol Waterstop Grout and Krystol Waterstop Treatment are used together to prevent water penetration through static concrete construction joints.

- a. Waterstop Grout: Non-shrink, non-toxic, fast setting grout with hydrophillic crystals for waterproofing construction joints.
  - 1) Colour:
    - a) Internal: Red.
    - b) External: Grey.
  - 2) Working Time: ((20 degrees C) [68 degrees F]), 50% RH) - 35 minutes.

- 3) Hardening Time: ((20 degrees C) [68 degrees F]), 50% RH - 5 hours.
- 4) Acceptable Material: Krystol Waterstop Grout manufactured by Kryton International Inc.

Specifier Note: In some circumstances, Krystol Waterstop Treatment may be used as a dampproofing treatment on joints not subject to hydrostatic pressure. Consult with a Kryton International Inc. representative for specific project requirements.

- b. Waterstop Treatment: Cementitious powder with hydrophilic crystals for waterproofing.
  - 1) Colour: Gold/yellow.
  - 2) Working Time: 30 minutes.
  - 3) Hardening Time: 3 hours.
  - 4) Acceptable Material: Krystol Waterstop Treatment manufactured by Kryton International Inc.

3. Surface Treatment Systems:

Specifier Note: Krystol T1 is a crystalline waterproofing surface treatment. Complete coverage requires either two coats of Krystol T1 or one coat of Krystol T1, followed by one coat of Krystol T2.

- a. Cementitious Waterproofing: Cementitious, grey brush-applied surface treatment to trigger crystalline waterproofing.
  - 1) Acceptable Material: Krystol T1 manufactured by Kryton International Inc.

Specifier Note: Krystol T2 is used after Krystol T1 to stop water movement through a concrete surface.

- b. Cementitious Waterproofing: Cementitious, brush-applied second-coat surface treatment.
  - 1) Acceptable Material: Krystol T2 manufactured by Kryton International Inc.

Specifier Note: Krystol Broadcast is designed for application onto a fresh concrete surface and is power troweled into the concrete surface during final finishing.

- c. Broadcast Waterproofing System: Powder compound of Portland cement, silica sand and various other active chemicals, containing non-toxic, fugitive dye.
  - 1) Colour: [Grey] [White].
  - 2) Acceptable Material: Krystol Broadcast manufactured by Kryton International Inc.

Specifier Note: Krystol T1, Krystol Bari-Cote and Krystol Plug are used together for the Krystol Crack Repair System.

4. Crack Repair System:

Specifier Note: Krystol Bari-Cote is designed to repair leaking cracks, holes and joints.

- a. Waterproofing Grout: High strength, grey waterproof grout.
  - 1) Hydrostatic Head Resistance: 140 m (460 feet).
  - 2) Acceptable Material: Krystol Bari-Cote manufactured by Kryton International Inc.

Specifier Note: Krystol Plug can be used to immediately arrest the seepage or flow of water through concrete voids.

- b. Waterproofing Plug for Concrete Repairs: Single-component grey hydraulic grout, non-shrink and fast setting with high bond strength.
  - 1) Acceptable Material: Krystol Plug manufactured by Kryton International Inc.

**PART 3 EXECUTION**

3.01 EXAMINATION

- A. Verification of Conditions: Verify that conditions of substrates previously installed under other sections or contracts are acceptable for product installation in accordance with manufacturer's instructions prior to crystalline waterproofing

admixture installation.

1. Inform [Owner] [Architect] [Consultant] of unacceptable conditions immediately upon discovery.
2. Proceed with installation only after unacceptable conditions have been remedied [and after receipt of written approval from [Owner] [Architect] [Consultant]].

Specifier Note: Specify actions required to prepare the surface, area or site for incorporation of the section's primary products. Describe requirements for exposure or removal of existing assemblies, components, products or materials.

### 3.02 INSTALLATION

- A. Coordinate installation of products in accordance with [01 73 19 - Installation].
- B. Coordinate crystalline waterproofing work with work of other trades for proper time and sequence to avoid construction delays.
- C. Perform concrete work in accordance with Section [03 30 00 - Cast-in-Place Concrete] and CAN/CSA A23.1-04/A23.2.
- D. Cure concrete in accordance with Section [03 39 00 - Concrete Curing].
- E. Install concrete containing crystalline waterproofing admixture in accordance with [manufacturer's literature] [Kryton International Inc. Application Instruction 104 – Instructions for Site Superintendent: Use of KIM Admixture].
- F. Place and finish concrete containing crystalline waterproofing admixture in accordance with [manufacturer's literature] [Kryton International Inc. Application Instruction 105 - Instructions for Placers and Finishers: Use of KIM Admixture].
- G. Install, place and finish crystalline surface treatment in accordance with [manufacturer's literature] [Kryton International Inc. Application Instruction 101 – Application using Dry Broadcast Method. Krystol Broadcast] [Application Instruction 401 – Surface Preparation prior to Krystol Application] [Technical Data Sheet 801 – Krystol T1 & T2].
- H. Install, place and finish crystalline joint waterproofing in accordance with [manufacturer's instructions] [Kryton International Inc. Application Instruction 201 Krystol Waterstop System (Internal Method)] [Application Instruction 202 Krystol Waterstop System (External Method)] [Application instruction 203 Krystol Waterstop System (Shotcrete) – Horizontal and Vertical Construction Joints].
- I. Install, place and finish repair systems in accordance with [manufacturer's instructions] [Kryton International Inc. Application Instruction 301 – Krystol Crack Repair System] [Application Instruction 302 – Waterproofing form for Tie Holes] [Application instruction 303 – Waterproofing Pipe Penetrations] [Application Instruction 304 – Waterproofing an Existing Drywell].

### 3.03 APPLICATION

- A. Coordinate application of [systems] [components] [products] in accordance with Section [01 73 13 - Application].

### 3.04 FIELD QUALITY CONTROL

Specifier Note: Specify requirements for quality control and related quality assurance for onsite activities and installed materials, manufactured units, equipment, components and accessories.

- A. Tests, Inspection: Coordinate [field] [site] test with Section [01 45 00 - Quality Control].
- B. Perform quality control testing in accordance with [manufacturer's literature] [Kryton International Inc. Application Instruction 106 - Instructions for Quality Control Testing: Use of KIM Admixture].

Specifier Note: Specify requirements if manufacturers are to provide field quality control with onsite personnel for instruction or supervision of product installation, application, erection or construction. Manufacturers' field reports are included under PART 1, Submittals.

- C. Manufacturer Services:

Specifier Note: Use the following Subparagraphs only when manufacturer's field services are provided and are required to verify the quality of the installed components. Establish the number and duration of periodic site visits required by the manufacturer and specify below. Consult manufacturer for services required. Delete if field services are not required.

1. Coordination: Coordinate manufacturer's services with Section [01 45 00 - Quality Control]. Have manufacturer review work involved in handling, installation/application, protection and cleaning of product[s] and submit written reports in acceptable format to verify compliance of work with Contract.

2. **Manufacturer's Field Services:** Provide manufacturer's field services, consisting of product use recommendations and periodic site visits, for product installation inspection in accordance with manufacturer's instructions.
3. **Site Visits:** Schedule site visits to review work at stages listed:
  - a. After delivery and storage of products, and when preparatory work on which work of this Section depends is complete, but before installation begins.
  - b. [Twice] during progress of work, at [25%] and [60%] of completion.
  - c. Upon completion of work, after cleaning is carried out.
4. **Reports:** Obtain reports within [3] days of review and submit immediately to [Owner] [Architect] [Consultant].

Specifier Note: Specify protection methods completed after installation, but prior to acceptance by the owner. Protection of surrounding areas and surfaces during application or installation is included under PART 3, Preparation. Include only statements unique to this Section.

Specifier Note: Coordinate the following Article with Section 01 76 00 - Protecting Installed Construction.

### 3.05 PROTECTION

- A. Protect installed product from damage during construction in accordance with Section [01 76 00 - Protecting Installed Construction].

**END OF SECTION**