Stratmore Construction Solutions Limited
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Class 1

Building Product Information Sheet

Product Name

Krystol Internal Membrane

Product description and its intended use

Krystol Internal Membrane (KIM) is a chemical admixture in dry powdered form, effective in creating waterproof concrete. KIM is used in place of externally applied surface membranes to protect against moisture transmission, chemical attack and corrosion of reinforcing steel. KIM-HS is supplied in New Zealand.

Product identifier *(if applicable)*:

Product Code: K-310 (KIM-HS)

Place of manufacture

Canada

Legal and trading name of the manufacturer(s):

Kryton Internal Inc

Address for service:

STREET NAME	1645 East Kent Avenue	SUBURB	
CITY, COUNTRY	Vancouver, British Columbia, Canada	POSTCODE	V5P 2S8

Website:	www.kryton.com
Email address:	info@kryton.com
Phone No. *(if applicable)*:	+001 604 324 8280

Legal and trading name of the importer:

Stratmore Construction Solutions Limited			
STREET NAME	185 Rata Street	SUBURB	Naenae
CITY, COUNTRY	Lower Hutt New Zealand	POSTCODE	5011

Website:	www.stratmore.co.nz
Email address:	info@stratmore.co.nz

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Phone No. *(if applicable)*:	+64 4 567 8436

NZBN *(if applicable)*:	9429040948867

Relevant Building Code clauses:

B1 Structure: Performance B1.2.1, B1.3.2, B1.3.3 €, B1.3.4 (d)

B2 Durability: Performance B2.3.1a (50 years) for precast and poured insitu concrete.

E1 Surface Water: Performance E1.3.3 (c) when used as a waterproof admixture in concrete drains or channels.

E2 External Moisture: Performance E2.3.2 and **E2.3.3**

F2 Hazardous Building Materials: Performance F2.3.1

Statement on how the building product is expected to contribute to compliance:

Krystol Internal Membrane (KIM), specified and installed in accordance with the technical data sheets and the application instructions, will meet (or assist in meeting) the following provisions (clauses) of the New Zealand Building Code:

B1 Structure: Performance B1.2.1, B1.3.2, B1.3.3 €, B1.3.4 (d)

Krystol Internal Membrane will assist in meeting the above provisions by reducing the permeability of hardened concrete, increasing the sulphate resistance of the concrete, reduce shrinkage and cracking of the concrete and increase freeze/thaw resistance of the concrete. These factors also contribute to prevent corrosion of reinforcing steel thereby helping to meet B1 Structure provisions.

B2 Durability: Performance B2.3.1a (50 years) for precast and poured insitu concrete.

Concrete incorporating KIM admixture complies with the requirements of B2 Durability sub clauses a not less than 50 years.

Krystol Internal Membrane meets the requirement for durability performance as the crystalline growth that occurs to make the substrate waterproof is permanent and integral to the substrate. If hairline cracking should occur (up to 0.5mm), then self-sealing of the substrate will occur.

Krystol Internal Membrane will not adversely affect concrete into which it is incorporated and will have its expected durable life.

Concrete incorporating Krystol Internal Membrane will have improved properties that are likely to extend the life of the concrete. Incorporation of Krystol Internal Membrane into concrete will significantly reduce its permeability relative to an equivalent concrete at the same water/cement ratio.

Compliance is shown by the following reports:

Ref # 247 British Board of Agreement (BBA) Testing & Certification KIM

- KIM reduced water permeability of the concrete by 70% during hydrostatic testing.
- KIM lowered water vapour permeability in the concrete by 17%
- KIM improved the resistance of concrete to freeze / thaw expansion by 87%. This is a direct correlation to durability.
- KIM reduced drying shrinkage by 25%.
- KIM increased compressive strength by 9% and flexural strength by 7% over the control.
- Adding KIM to the concrete had no detrimental effects on the properties of the concrete

Ref # 427 BCIT - Self-sealing of KIM Concrete Study KIM

- With initial water flow of 0.4l/min and average crack size of 0.7 mm, KIM treated concrete self-sealed after 10 days, whereas the control continued to leak.
- With initial water flow of 0.27l/min and an average crack size of 0.6 mm, KIM treated concrete self-sealed after 6 days, whereas the control continued to leak.

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Ref # 425 University of Hawaii - Evaluation of Corrosion Inhibiting Admixtures in Concrete Exposed to Marine Environment KIM

- "The panel using 2% KIM performed well, with low half-cell readings and no visible signs of corrosion after 10 years of exposure."
- Control panels (no admixture or Pozzolan) with a water-cement ratio of 0.40 experienced corrosion-induced cracking and rust residue.

E1 Surface Water: Performance E1.3.3 (c) when used as a waterproof admixture in concrete drains or channels.

Krystol Internal Membrane will assist in meeting this requirement by rendering the concrete drain or channel substrate waterproof.

E2 External Moisture: Performance E2.3.2 and **E2.3.3**

Krystol Internal Membrane when installed in accordance with the application instructions meets the requirements of clauses E2.3.2 and E2.3.3 per E2 AS/3 (CCANZ CP 01) of the NZBC. Compliance with CCANZ CP 01 is achieved by a significant reduction in water permeability under pressure of concrete containing KIM compared to control substrates thereby providing results exceeding the requirements of weathertight concrete, CCANZ CP 01 Section 4.5.

Compliance is shown by the following reports:

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- KIM lowered water vapour permeability in the concrete by 17%
- KIM improved the resistance of concrete to freeze / thaw expansion by 87%.
- KIM reduced drying shrinkage by 25%.
- KIM increased compressive strength by 9% and flexural strength by 7% over the control.
- Adding KIM to the concrete had no detrimental effects on the properties of the concrete.

Ref # 83a Civil Engineering Testing Center (CETC), Kuwait University KIM

- KIM treated concrete exhibited an 89.9% reduction in permeability over the same untreated concrete mix design (control) with an average depth of water penetration of 3.7 mm for the KIM treated sample and 36.7 mm for the control.

Ref # 427 British Columbia Institute of Technology (BCIT) – DIN1048 Testing KIM

- KIM average water penetration of 3.5 cm; whereas the controls average penetration of 12.5 cm.
- KIM treated concrete reduced permeability by 72% compared to untreated concrete.

Ref # 467 Nelson-USACE-CRD48-Permeability-2020KIM

- KIM admixture reduced the water permeability by 97% compared to the plain concrete.
- The strength of the KIM treated concrete was slightly higher at test ages up to 56 days.
- The KIM concrete had no change in air content compared to the plain concrete.

The reports clearly show a reduction in moisture penetration far below even that specified for weathertight concrete under CCANZ CP 01.

The building structure design must incorporate details for waterstops and waterproofing of joints, junctions, penetrations and the like as these are not covered by the use of Krystol Internal Membrane in concrete.

F2 Hazardous Building Materials: Performance F2.3.1

Krystol Internal Membrane meets this requirement and will not present a health hazard to people. Concrete containing Krystol Internal Membrane is safe for contact with potable water, certified by NSF to NSF/ANSI Standard 61 Drinking Water System Components – Health Effects.

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Limitations on the use of the building product:

KIM is an effective waterproofing system for rigid concrete structures only and may not reliably self-seal dynamic, moving cracks and joints.

The building structure design must incorporate details for waterstops and waterproofing of joints, junctions, penetrations and the like as these are not covered by the use of KIM admixture.

Design requirements that would support the use of the building product:

To ensure compliance with the NZBC, design of the building or structure (into which the Krystol Internal Membrane Admixture is to be added into the concrete), needs to comply with the relevant NZ building standards including NZS3101 and 3109 for concrete structures and with reference to CCANZ CP 01 as appropriate.

Installation requirements:

To ensure compliance with the NZBC, Krystol Internal Membrane Admixture must be used in accordance with the current Krystol Internal Membrane Technical Data and the Application Instruction 1.11 Cast in Place Concrete. For buildings or structures requiring building consent, KIM shall only be supplied by a ready-mixed concrete supplier that is certified to the requirements of NZS 3104.

The most recent version of "KIM Guidelines and Procedures – NZ" must be followed for specific design requirements relating to the concrete (structure) incorporating Krystol Internal Membrane.

These resources can be downloaded from: https://www.krystol.co.nz/new-construction-waterproofing/

The relevant NZ building standards including NZS3101 and 3109 for concrete must be followed for design of the structure incorporating concrete with KIM admixture.

Maintenance Requirements:

Krystol Internal Membrane admixture does not require any maintenance.

No maintenance is required to preserve the waterproofing performance of concrete treated with the Krystol Waterproofing System provided that significant building movement or cracking does not occur. Regular checks must be made for cracks or damage and where necessary, repairs made.

Is the building product/building product line subject to warning or ban under section 26?:

☐ Yes ☒ No

If yes, description of the warning or ban under section 26:

Date: 22 July 2024