UL Solutions Evaluation Report

ULC ER40477-01

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UL Solutions Category Code: ULEY7 – Weather Barrier for Canada

CSI MasterFormat®
DIVISION: 07 10 00 - Dampproofing and Waterproofing
Sublevel 2: 07 14 00 - Fluid Applied Waterproofing
Sublevel 3: 07 14 16 - Cold Fluid-Applied Waterproofing

COMPANY:

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1. Subject:

COATLOK U-192

2. Scope of evaluation

2015 National Building Code of Canada, NBCC (Sept. 28, 2018)
2020 National Building Code of Canada, NBCC (July 15, 2019)

Clause 1.2.1.1.(1)(a) Compliance with this Code (Acceptable Solution from Division B)
Part 5 – Environmental Separation
Article 5.9.1.1 Compliance with Applicable Standards

Part 9 – Housing and Small Buildings
Clause 9.25.2.2.(1)(h) Insulation Materials
Article 9.25.2.5 Installation of Spray-Applied Polyurethane

Clause 1.2.1.1.(1)(b) Compliance with this Code (Alternate Solution from Division B)
Part 9 – Housing and Small Buildings
Article 9.13.2.2 Dampproofing Materials
Article 9.13.3.2 Waterproofing Materials

The products underwent evaluation for the following properties:

- Waterproofing membrane physical properties
  (thickness, tensile strength, water absorption, water vapour permeance, low temperature flexibility, crack bridging, peel adhesion strength, biological resistance, UV exposure, hydrostatic pressure)
- SPF physical properties (Heatlok Soya - CAN/ULC-S705.1)
- SPF application (Heatlok Soya - CAN/ULC-S705.2)
- Frost heaving performance

3. Reference documents

ICC-ES AC29	Acceptance Criteria for Cold, Liquid-Applied, Below-Grade, Exterior Dampproofing and Waterproofing Materials
ASTM C1306	Hydrostatic Pressure Resistance of a Liquid-applied Waterproofing Membrane
ASTM D5385	Hydrostatic Pressure Resistance of Waterproofing Membranes
ASTM E96	Water Vapour Transmission of Materials
ASTM E154	Standard Test Methods for Water Vapor Retarders used in Contact with Earth Concrete Slabs, on Walls, or as Ground Cover
CAN/CGSB-37.50	Hot-Applied, Rubberized Asphalt for Roofing and Waterproofing
CAN/CGSB-37.58	Membrane, Elastomeric, Cold-Applied Liquid, for Non-Exposed Use in Roofing and Waterproofing
CAN/ULC-S705.1	Standard for Thermal Insulation, Spray Applied Rigid Polyurethane Foam, Medium Density - Material Specification
CAN/ULC-S705.2	Standard for Thermal Insulation, Spray Applied Rigid Polyurethane Foam, Medium Density - Application

4. Uses

The Huntsman Building Solutions **COATLOK U-192** membrane is intended for use as a building foundation waterproofing membrane in housing and small buildings with cast concrete or concrete masonry units (CMU) foundations.

This Report does not address the use of the COATLOK U-192 for extended periods of the material exposure prior to backfilling, pressure treated wood or insulated concrete form (ICF) foundations, areas of contaminated soil conditions, puncture / impact resistance of the membrane or soil gas control requirements. Additional evaluations and testing other than noted in this Report are typically required to meet these and other applications.

5. Product description

The COATLOK U-192 is a spray applied elastomeric polyurea, waterproofing membrane intended for the waterproofing of below-grade concrete foundations. The material is applied by Huntsman Building Solutions trained / authorized applicators to suitably prepared and primed (COATLOK PRE 206) concrete foundations to a minimum 2.5 mm (100 mils) dry film thickness. Backfilling is conducted in accordance with local code requirements including the utilization of a protection board.

An optional application of a spray polyurethane foam (SPF) insulation may be applied to the exterior face of the foundation prior to the COATLOK U-192 application. The SPF Heatlok Soya serves as a primer for uneven or rough concrete wall surfaces providing a uniform smooth surface for the waterproofing membrane application. The SPF must meet CAN/ULC-S705.1 and be installed in accordance with CAN/ULC-S705.2 by Huntsman Building Solutions trained / authorized applicators. The SPF may be applied to a maximum thickness of 65 mm.

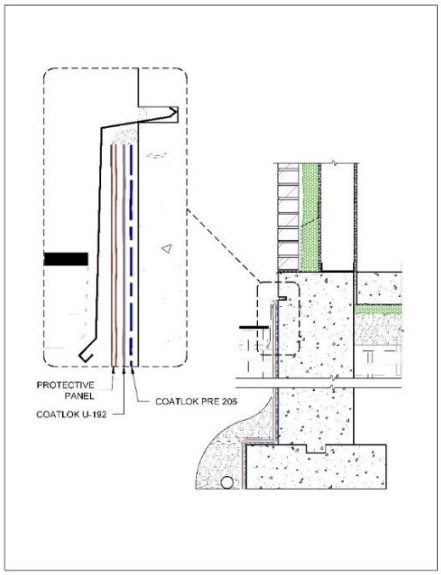

Figure 1
Coatlok U-192 membrane applied on Coatlok PRE 206 primer

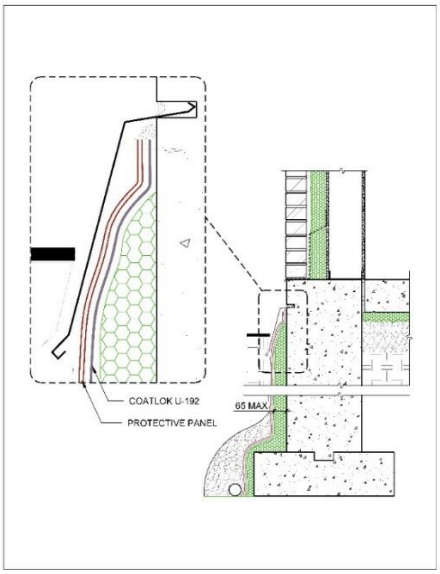

Figure 2
Coatlok U-192 membrane applied on Heatlok Soya

The COATLOK U-192 elements are under a UL Solutions quality audit program where UL Solutions Field Staff audit material manufacturing facilities, details of the product are on file at UL Solutions and are described by COATLOK U-192 documentation, Revision 1.

6. Performance characteristics

The COATLOK U-192 waterproofing material was evaluated for the performance characteristics as reported below in "Table 1: COATLOK U-192 Performance Characteristics":

Table 1: COATLOK U-192 Performance Characteristics

Properties	Requirements	Results
Dry Film Thickness	Report	Min 2.5 mm (100 mils)
Tensile Strength	Report	11.9 kPa
Water Absorption	≤ 3%	-3 / 0 %
Water Vapour Permeance	≤ 43 ng/Pa·s·m^2	20 ng/Pa·s·m^2
Low Temperature Flexibility[1]	-20°C	Compliant
Crack Bridging Resistance[1]	10 cycles at 20°C 30 cycles at -26°C 5 cycles at -26°C (preconditioned)	Compliant Compliant Compliant
Peel Adhesion Strength[1]	≥ 175 N/m	2,710 N/m
Biological Resistance	No loss of film integrity	Compliant
UV Exposure[1]	90% tensile strength of unaged material	Compliant
Hydrostatic Pressure[1]	≥ 48kPa for 5 days	Compliant

* Note 1 - Substrate primed with COATLOK PRE 206 primer at approx. 5 mils (0.13mm) thickness

SPF Frost Heaving Evaluation

Foundation walls are subject to soil freeze forces during typical Canadian winters. Soil movement due to ice lensing (moisture-susceptible soils freezing and expanding) and adfreezing (ice lenses adhered to cold foundations) may cause differential movement or cracking of the foundation (frost heaving)*. The COATLOK U-192 / SPF waterproofing assembly is required to resist these forces. Laboratory testing was undertaken to evaluate the COATLOK U-192 / SPF waterproofing assembly for freeze / thaw performance, the evaluation was undertaken without the use of the code required protection board.

Representative test samples of SPF at 25 and 65 mm thickness with COATLOK U-192 water proofing membrane (100 mils thickness) applied were placed in a test jig simulating a basement foundation wall assembly The test jig simulated the interior basement temperature, exterior air (cooling plate) and frost susceptible silt soil (Devon silt). The test jig was instrumented with temperature and vertical displacement sensors. The test assembly was initially subjected to a constant freezing temperature of -12°C for a period of 3 weeks to simulate downward freezing during the winter months. The temperature was then cycled between approximately +10°C and -10°C for periods of 12 to 24 hours to simulate spring freeze-thaw for 100 cycles.

Temperature sensors verified soil freeze-thaw cycling was occurring and that daily frost penetrations of up to 15 cm was achieved. Displacement sensors recorded an initial 1.5 cm heave as the soil froze, and daily heave (~2 mm) and settlement (~0-5 mm) during the temperature cycling. The soil freezing gradients and daily heave observations were consistent with expected soil behavior.

** Note: Additional information on adfreezing and frost heaving avaiable at NRC Publications, Adfreezing and frost heaving of foundations - NRC Publications Archive - Canada.ca*

The COATLOK U-192 waterproofing membrane and SPF remained visually intact without any signs of deterioration, shearing or compression following 100 freeze-thaw cycling. The freeze-thaw conditioned materials were tested for waterproofing performance, maintaining a hydrostatic pressure resistance performance of greater than 189 kPa.

7. Installation

Installation of the waterproofing membrane and SPF must comply with this report and the manufacturer's published installation instructions. The manufacturer's published installation instructions are to be always available at the jobsite during installation.

- COATLOK U-192 and COATLOK PRE 206 primer installation must be by a trained installer in accordance with the manufacturer's directions.
- SPF installation must be by a licensed installer in accordance with the manufacturer's directions and follow CAN/ULC-S705.2 requirements.
- See Huntsman Building Solution COATLOK Application Guide, Rev: 01.27.22
- The waterproofing material is to be cured for a minimum 24 hr. period prior to any backfill being placed against the foundation wall.
- Protection board must be placed against the wall to protect the membrane during backfilling activities, see NBCC Sentence 9.13.3.4.(3) requirement.
- Backfilling activities to comply with NBCC Subsection 9.12.3.

8. Conditions of use

The COATLOK U-192 material described in this Report has been evaluated in accordance with code sections listed in Section 2.0, subject to the following conditions:

- Materials and methods of installation must comply with this report and the manufacturer's published installation instructions. In the event of a conflict between the manufacturer's published installation instructions and this report, the manufacturer shall be consulted.
- This product is manufactured in Boisbriand, QC., the manufacturing facility is under UL Solution audit of quality elements.
- A maximum 65 mm thickness of SPF may be applied to the concrete foundation prior to COATLOK U-192 application.
- Application of SPF as part of the waterproofing system limited up to building code Zone 7A with a maximum design 5999 HDD.
- The maximum allowable design hydrostatic pressure of the COATLOK U-192 over COATLOK Pre 206 primer for applications applied directly to concrete substrates (Figure 1 above) is 344 kPa (50 psi). The maximum allowable design hydrostatic pressure for COATLOK U-192 over HEATLOK Soya for applications applied to concrete substates (Figure 2 above) is 189 kPa (27 psi).
- Heatlok Soya material to remain under quality auditing by ISO17065 accredited party.

9. Supporting evidence

Huntsman Building Solutions has submitted technical documentation for UL Solutions review. Testing was conducted at ISO/IEC 17025 accredited laboratories. The test data submitted for this product is summarized below.

- Sample Selection of test materials at the Huntsman manufacturing facility by an ISO 17025 accredited testing laboratory.
- Test data in accordance with ULC-EC40477-01 by an ISO 17025 accredited testing laboratory.
- Test data in accordance with ASTM D5385 by an ISO 17025 accredited testing laboratory.
- Freeze-thaw cycling evaluation by University of Alberta Geotechnical Centre.

- Test data in accordance with ICC-ES AC29, Acceptance Criteria for Cold, Liquid-Applied, Below-Grade, Exterior Dampproofing and Waterproofing Materials, compliant test report from an ISO/IEC 17025 accredited testing laboratory.
- Test data in accordance with CAN/ULC-S705.1 for Heatlok Soya by an ISO 17025 accredited testing laboratory.
- Test data in accordance with ICC-ES AC29, Acceptance Criteria for Cold, Liquid-Applied, Below-Grade, Exterior Dampproofing and Waterproofing Materials, compliant test report from an ISO/IEC 17025 accredited testing laboratory.

10. Identification

The Huntsman Building Solutions **COATLOK U-192** foundation waterproofing material described in this evaluation report is identified by a marking bearing the report holder's name (Huntsman Building Solutions), the plant identification, and the evaluation report number **ULC ER40477-01**. Product drums to be identified with expiry dates. The validity of the evaluation report is contingent upon this identification appearing on the product drums.

11. Client location / contacts

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12. Use of UL Solutions Evaluation Report

12.1 The approval of building products, materials or systems is under the responsibility of the applicable code authorities.

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12.3 The current status of this report, as well as a complete directory of UL Solutions Evaluation Reports, may be found at UL.com/Solutions via Product iQ®.

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