CODE EVALUATION REPORT

CERUS-1006

PUBLISHED: December 2021
EXPIRATION: December 2023

PRODUCTS: **LONDECK® WALKING DECK SYSTEMS**

REPORT HOLDER: LONSEAL, INCORPORATED

CONTACT DETAILS:
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Carson, CA 90745
USA

CSI DIVISION:
07 00 00 - Thermal and Moisture Protection
09 00 00 - Finishes

CSI SECTION:
07 18 00 - Traffic Coatings
09 65 00 – Resilient Flooring

APPLICABLE CODES:
2018, 2015 International Building Code (IBC)
2018, 2015 International Residential Code (IRC)

EVALUATED:
Physical Properties
Wind Uplift Resistance
Chemical Resistance
Critical Radiant Flux

1.0 APPROVED FOR FOLLOWING:

APPROVED USE:	Walking deck membranes for use in non-roof-fire classified applications including adjacent to swimming pools.
APPROVED INSTALLATIONS:	The walking deck membranes included in this report are approved for installation on code complying plywood or concrete substrates.

2.0 DESCRIPTION:

2.1 General:

Londeck® is a composite polyvinyl chloride (PVC) walking deck membrane system for use as interior floor coverings, and as exterior walking decks subjected to pedestrian traffic, including areas adjacent to pools, spas, or other areas of potential chlorine exposure.

Londeck® walking deck systems consist of Londeck® PVC membrane products adhered to code compliant plywood or concrete substrates installed in accordance with Section 4.0 of this report. Lonsdeck® cementitious underlayment outlined in Section 2.4 of this report is optional and may be applied to the code complying substrate prior to adhesive application where substrate patching is required.

Londeck® walking deck systems are intended for applications subjected to pedestrian foot traffic only. Use of Londeck® for parking structures and areas of vehicular traffic are outside the scope of this report.

2.2 PVC Membranes

2.2.1 Londeck®: Londeck® is a calendared PVC membrane composed of a color layer, backing layer and scrim cloth backing with a 0.08 inches (2.0 mm) total thickness. Londeck® is available in standard sizes of 6ft (1.8 m) or 8 ft 6 inches (2.6 m) width rolls of 60 ft (18.3 m) length, but alternate sizes are available on request. Londeck® has a weight of 0.6 lbs/ft^2 (2.9 kg/m^2) and is available in a variety of embossing and color options.

Londeck® products are Class I with critical radiant flux of > 0.45 kW/m^2 when evaluated per NFPA 253, meeting requirements for use as interior floor finish per Section 804 of the 2018 / 2015 IBC.

2.3 Adhesives

2.3.1 Lonseal #180 Deckhold: Lonseal #180 Deckhold vinyl decking adhesive is a water-based adhesive designed for bonding Londeck® PVC membrane products in exterior applications. The product is sold ready to use and supplied in 4-gallon (15.1 L) pails. Lonseal #180 Deckhold adhesives have a shelf life of up to 2 years when stored unopened and are to be stored at temperatures from 65ºF – 85ºF (18ºC – 29ºC) out of direct sunlight in well ventilated areas.

2.3.2 Lonseal #650: Lonseal #650 vinyl decking adhesive is a two-part solvent free epoxy adhesive designed for bonding Londeck® PVC membrane products in interior and exterior applications of high traffic where potential of concentrated (point loading) exist. The product is sold ready to use, supplied in 0.5 gallon (1.9 L) and 1-gallon (3.8 L) pails. Lonseal #650 adhesives have a shelf life of up to 2 years when stored unopened and are to be stored at temperatures from 65ºF – 85ºF (18ºC – 29ºC) out of direct sunlight in well ventilated areas.

2.3.3 Lonseal #400: Lonseal #400 vinyl decking adhesive is a high strength, Volatile Organic Content (VOC) free contact adhesive designed for bonding Londeck® PVC membrane products in interior and exterior applications. The product is sold ready to use, supplied in 1-gallon (3.8 L) pails. Lonseal #400 adhesives have a shelf life of up to 6 months when stored unopened and are to be stored at temperatures from 65ºF – 85ºF (18ºC – 29ºC) out of direct sunlight in well ventilated areas.

2.4 Cementitious Underlayment

2.4.1 MAPEI Mapecem® Quickpatch: Mapecem® Quickpatch is a fast-setting cementitious material used as self-leveling underlayment for installation of Londeck® walking deck membrane systems. The product is available in 25-pound (11.3 kg) and 50-pound (22.6 kg) bags, for mixing with water at the jobsite. Mapecem® Quickpatch is for installations at temperatures from 45ºF-85ºF (7ºC-29ºC) where temperatures are maintained for a minimum of 4 hours after application of the cementitious underlayment.

2.5 Primers

2.5.1 MAPEI ECO PRIM Grip™: ECO Prim Grip™ is a ready-to-use, synthetic resin-based primer with silicate aggregates used to increase adhesion of self-leveling underlayments (MAPEI Mapacem® Quickpatch) to difficult to bond substrates. The product is available in 1-quart (946 mL), 2-gallon (7.57 L) and 4-gallon (15.1 L) options, for jobsite application.

ECO Prim Grip™ is for installations at temperatures from 50ºF-95ºF (10ºC-35ºC) where the substrate temperatures are over 5ºF (2.8ºC) above dew point to prevent condensation between ECO Prim Grip™ and the substrate after application.

ECO Prim Grip™ is not intended for water immersion applications including pools and spas.

2.5.2 MAPEI Primer T™: Primer T™ is a magenta-colored, water-based acrylic primer used to increase adhesion of self-leveling underlayment (MAPEI Mapacem® Quickpatch) to nonporous and porous substrates. The product is available in 1-quart (946 mL), 2-gallon (7.57 L) and 4-gallon (15.1 L) options, for jobsite application.

Primer T™ is for installations at temperatures from 50ºF-90ºF (10ºC-32ºC) where the substrate temperatures are over 5ºF (2.8ºC) above dew point to prevent condensation between Primer T™ and the substrate after application.

2.6 Substrates:

2.6.1 Wood Sheathing: Wood sheathing thickness shall be in accordance with the applicable code and be Exposure 1 grade, complying with US Department of Commerce Product Standard PS-1. Installation of the wood sheathing is to be in accordance with the applicable code requirements for anticipated service loads.

2.6.2 Concrete: Concrete decks shall be in accordance with the applicable code and be of minimum 3,500 psi (24.1 MPa) compressive strength at 28 days cure time.

3.0 DESIGN:

Londeck® systems are non-structural elements approved for use as interior floor coverings, and as exterior walking decks. Use of Londeck® does not require professional design but shall be used in applications where wind resistance maximum requirements are as specified in Section 8.1 of this report.

4.0 INSTALLATIONS:

4.1 General:

Installation of Londeck® walking deck membranes must comply with the manufacturer's published installation instructions, this report, and the applicable code(s). Where conflict exists, this report and the applicable code govern.

4.1.1 Special Inspection:

Use of Londeck® walking deck membrane systems do not require special inspection.

4.2 Substrate:

Wood sheathing substrates are to be structurally sound and free of rot.

Concrete is to be of < 75% relative humidity when measured per ASTM F2170, with maximum 9 pH measured per ASTM F710 with a moisture vapor emission rate (MVER) of maximum 5 lbs per 1,000 ft^2 (2.27 kg per 92.9 m^2) per 24-hour period.

All substrates are to be sloped to drain water away from the structure. Substrates are to be clean and free of bond breaking compounds prior to application of adhesives, primers, or cementitious underlayment (where required). Substrate temperatures are to be a minimum 5ºF (2.8ºC) above the dew point prior to application of primer or cementitious underlayment with measured surface temperature conditions within specifications for the primers and adhesives noted in Section 2 of this report.

4.3 Primers and Cementitious Underlayment:

Where patching of inconsistencies of the substrate are required with the cementitious underlayment - including but not limited to joints, fastener heads, and substrate gaps, voids, or damage - the cementitious underlayment outlined in Section 2.4 of this report is to be installed. Prior to installation of the cementitious underlayment, the substrate is to be cleaned and verified per Section 4.2 of this report, following which a primer outlined in section 2.5 of this report can be applied to increase bond strength. The selection of primer for application prior to cementitious underlayment application will depend on site conditions including substrate type and shall comply with the manufacturer's installation instructions.

After application of primer, the cementitious underlayment is applied from 1/16 inches – 3 inches (1.5 mm – 76 mm) thickness to form a smooth surface for application of the Londeck® walking deck membrane.

4.4 Adhesives:

Depending on the substrate type, the adhesives outlined in Section 2.3 of this report are to be applied in accordance with the manufacturer's installation instructions. The adhesive is to be applied uniformly over the substrate surface before the installation of the Londeck® walking deck membrane.

4.5 Walking Deck Membrane:

Following the adhesive application, the Londeck® membrane is be to laid into the adhesive avoiding the trapping of air bubbles, and all wrinkles removed. A three-section roller of minimum 100 lbs (45 kg) weight is rolled in both directions to ensure uniform embedment of the Lonsdeck® membrane into the underlying adhesive layer. A second roller pass should be done after 2-3 hours.

For exterior applications, all seams shall be a minimum 1-1/2 inches (38 mm) wide overlap weld along membrane edges and ends. For interior installations, all seams must be heat or chemically welded. All seams are to be welded by qualified installers in accordance with the manufacturer's installation instructions.

The walking deck system should be cured for a minimum of 24 hours before subjected to light foot traffic, and a minimum of 72 hours before subjecting to heavy foot traffic and furnishing placement.

5.0 LIMITATIONS

- Installation of Londeck® walking deck systems are to comply with the applicable codes, this report, and the manufacturer's installation instructions.
- Use of the Londeck® walking deck systems are limited to pedestrian traffic. Use in areas subject to vehicular traffic is outside the scope of this report.
- Londeck® walking deck systems are intended for use in areas subject to wind pressures not exceeding design pressure resistance ratings detailed in Section 8.1 of this report.
- Londeck® walking deck membrane systems are only to be used in non-roof-fire classified applications.
- Londeck® are manufactured in Tsuchiura-shi, Japan with inspections performed by QAI Laboratories.

6.0 SUPPORTING INFORMATION:

The following data has been evaluated for Londeck® walking deck membrane assemblies:

- Data outlining compliance for critical radiant flux of floor coverings per ASTM E648.
- Data outlining compliance for use as a walking deck per ICC-ES AC39.
- Wind uplift testing per FM 4474.

7.0 MARKING:

Londeck® products are labeled as shown in Figure 1 below.

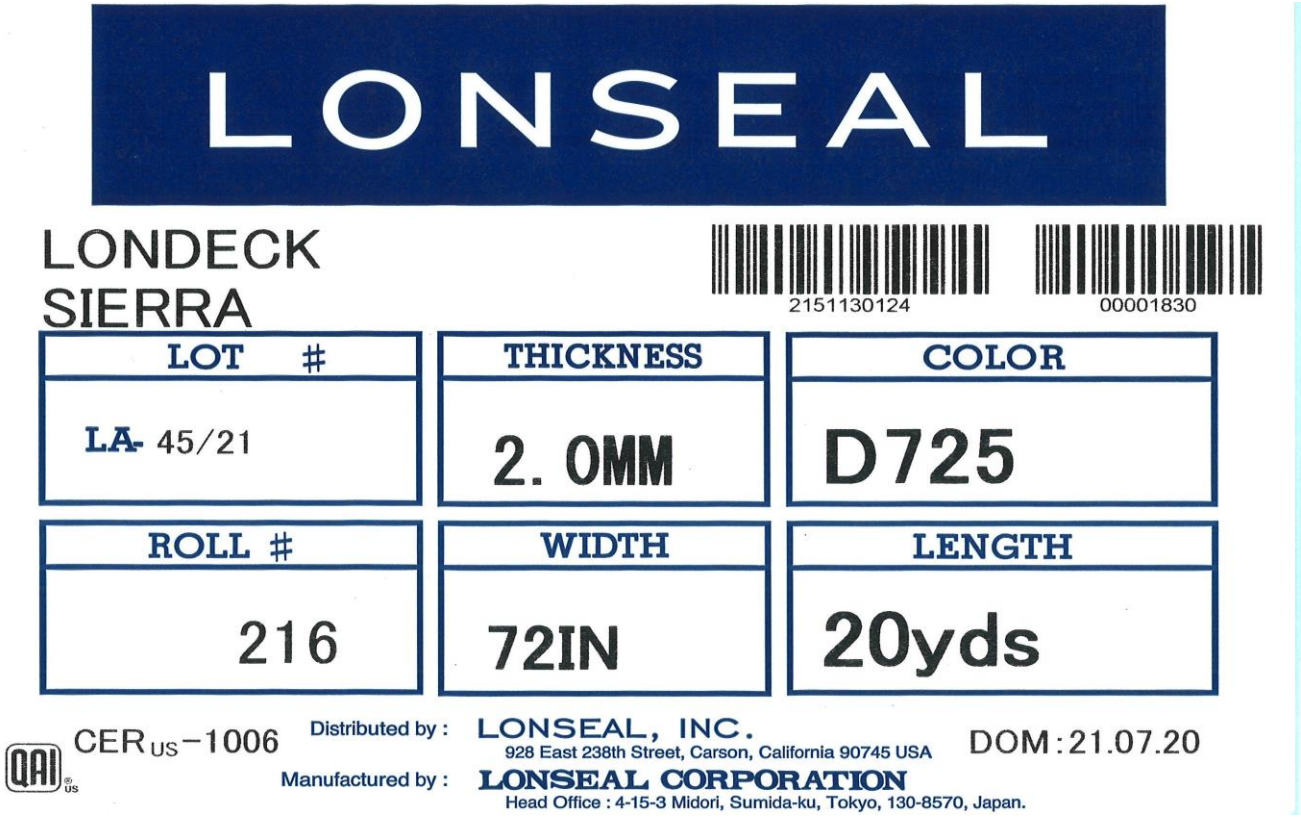

Figure 1. Londeck® Example Finished Product Label

8.0 RESULTS / RATINGS AND DETAILS:

8.1 WIND UPLIFT RESISTANCE RATINGS:

Substrate	Wood Sheathing		Concrete	
Primer	N/A	N/A	N/A	N/A
Cementitious Underlay	Mapseam® Quickpatch			
Adhesive	#180 Deckhold	#650 Epoxy	#180 Deckhold	#650 Epoxy
Membrane	Londeck®			
Uplift Resistance	45 psf	45 psf	90 psf	250 psf

9.0 ELIGIBILITY OF REPORT

The attached report has been reviewed by a QAI Registered Professional Engineer approved by the specific state Board of Professional Engineers noted on the specific P.E. seal(s).

Per section 1703 of the IBC, QAI is an independent third-party testing, inspection and certification agency accredited by the International Accreditation Service, Inc. (IAS) for this specific scope (see IAS PCA-118, PCA-119). QAI can confirm that based on its IAS accreditation it meets IBC Section 1703.1 on Independence, Section 1703.1.2 on Equipment and Section 1703.1 on Personnel.

This Evaluation report has been designed to meet the performance requirements of IBC Section 1703.4 and contains the required information to show the product, material or assembly meets the applicable code requirements.

The product is labeled per section IBC 1703 and subject to follow-up inspection per IBC 1703.6 using QAI IAS accredited ISO 17020 inspection program (see IAS AA-635, AA-723).

For more information regarding QAI Laboratories, please visit www.qai.org.

The above is an example of the QAI registered Listing mark. The Listing mark may only be used by the Report Holder per the QAI service agreement on products defined in this report. The 'us' indicator in the 8 o'clock position indicates the product complies with the properties evaluated with limitations outlined in this report for use in the US market. A 'c' indicator in the 4 o'clock position indicates the product has been evaluated for use in the Canadian market.

10.0 REFERENCED STANDARDS

ASTM E648 *"Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source"*.
FM 4474 *"Standard for Evaluating the Simulated Wind Uplift Resistance of Roof Assemblies"*.
ICC-ES AC39 *"Walking Decks"*.