ICC EVALUATION SERVICE®

ICC-ES Evaluation Report

ESR-2151

Reissued May 2020
Revised May 2021
This report is subject to renewal May 2022.

www.icc-es.org | (800) 423-6587 | (562) 699-0543 *A Subsidiary of the International Code Council®*

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
Section: 07 18 13—Pedestrian Traffic Coatings
Section: 07 54 00—Thermoplastic Membrane Roofing
Section: 07 54 19—Polyvinyl-Chloride Roofing

REPORT HOLDER:

DURADEK U.S. INC.

EVALUATION SUBJECT:

DURADEK ULTRA ROOF AND WALKING DECK MEMBRANE

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2018, 2015, 2012 and 2009 *International Building Code*® (IBC)
- 2018, 2015, 2012 and 2009 *International Residential Code*® (IRC)

Properties evaluated:

- Physical properties
- Wind resistance
- Fire classification
- Chemical resistance
- Impact resistance

2.0 USES

The Duradek Ultra system is a walking deck and classified (rated) roof covering system for use directly over USG Durock cement board Next Gen and plywood substrates, as described in Section 3.2.3 of this report. When installed in accordance with this report, the system has a Class A roof classification, Class C roof classification, or is nonclassified, as described in Table 1.

3.0 DESCRIPTION

3.1 General:

The Duradek Ultra system consists of a membrane, a deck adhesive, and a substrate, as specified in Section 3.2, installed in accordance with Section 4.0.

3.2 Materials:

3.2.1 Membrane: Duradek Ultra membrane is a calendered polyvinyl chloride (PVC) film laminated to a woven, heat-set polyester fabric. The surface of the PVC film is factory-printed and top-coated with a PVC/acrylic finish. The membrane complies with ASTM D4434, Type II. The membrane is produced in a variety of colors and patterns and is available in rolls of various widths and lengths. The membrane weighs approximately 55 ounces per square yard (1864 g/m^2) and is nominally 0.060 inch [60 mils (1.5 mm)] thick.

3.2.2 Adhesives:

3.2.2.1 Duradek D763: A white-colored, water-based, liquid adhesive with a shelf life of six months when stored in unopened containers at temperatures between 45° and 80°F (10° and 26.7°C).

3.2.2.2 Duradek D811-23-S and Duradek D811-23-W: A yellow-colored, liquid contact adhesive with a shelf life of six months when stored in unopened containers at temperatures between 45° and 80°F (10° and 26.7°C).

3.2.2.3 Mapei Ultra Flex 2: A single-component, polymer-modified thin-set mortar with a shelf life of one year when stored in unopened containers at 73°F (23°C) and 50 percent relative humidity.

3.2.3 Substrates:

3.2.3.1 Plywood: Minimum $^5/_8$-inch-thick (15.9 mm) exterior-grade with tongue-and-groove edges or blocked edges, complying with US Department of Commerce Product Standard PS-1 or PS-2.

3.2.3.2 USG Durock Cement Board Next Gen: Minimum nominally $^1/_2$-inch-thick cement panel, manufactured by United States Gypsum Company.

3.3 Impact Resistance:

The Duradek Ultra System described in this report complies with requirements for impact resistance in accordance with ASTM D3746.

4.0 INSTALLATION

4.1 General:

Installation of the Duradek Ultra system must be in accordance with the report holder's published installation instructions, the applicable code and this report. The report holder's installation instructions must be available on the jobsite during application. Installation is limited to conditions when the weather is dry and the ambient air temperature is a minimum of 45°F (7.2°C). Materials must not be applied if precipitation is occurring or expected during application.

4.2 Preparation of Substrates:

Substrates must be structurally sound, clean and dry, and must be sloped a minimum of $^1/_4$ inch per foot (2 percent slope).

4.2.1 Plywood: Plywood must be applied to framing in accordance with the requirements of the applicable code. All unsupported edges must be blocked. All penetrations through and terminations of the sheathing must be protected with metal flashing in accordance with the requirements of the applicable code and the report holder's published installation instructions.

4.2.2 USG Durock: Where USG Durock is used as a substrate, it must be installed over a plywood substrate complying with, and installed in accordance with, Sections 3.2.3.1 and 4.2.1. See Footnote 3 of Table 1 for additional installation details for this substrate using Mapei Ultra Flex 2 polymer-modified thin-set mortar and screws.

4.3 Membrane Installation:

The membrane must be adhered to the substrate with either Duradek D763, Duradek D811-23-S or Duradek D811-23-W adhesive. Duradek D763 must be applied to the substrate with either a U-notched trowel having $^{1}/_{32}$-inch-deep-by-$^{1}/_{16}$-inch-wide (0.8 by 1.6 mm) notches spaced $^{1}/_{32}$ inch (0.8 mm) apart or a textured roller. The minimum coverage is 1 gallon per 190 square feet (1L/4.66 m^2). Duradek D811-23-S and Duradek D811-23-W must be applied with either a brush or a roller at a coverage rate of 1 gallon per 70 to 90 square feet (1L/1.71 m^2 to 1L/2.21 m^2). The minimum application temperature for both adhesives is 45°F (7.2°C).

A minimum 2-inch (51 mm) width of Duradek D811-23-S or Duradek D811-23-W adhesive must be used at the perimeter of the deck and on walls, edges and right-angle corners. Membrane seams must be overlapped a minimum of $^{3}/_{4}$ inch (19.1 mm) at edges and ends, and heat-fused with a hot-air seaming tool. Exposed edges, posts and trim strips must be sealed with sealant in accordance with the report holder's published installation instructions.

4.4 Method of Repair:

A portion of the membrane larger than the affected area must be removed and a new piece of material must be prepared that is $1^{1}/_{2}$-inch (38 mm) larger in dimension than the piece removed. Duradek D763, Duradek D811-23-S or Duradek D811-23-W adhesive must be applied to the substrate and the patch must be placed into the space so it overlaps the existing sheet by $^{3}/_{4}$ inch (19 mm). The patch must be welded to the existing sheet using a hot-air seaming tool.

4.5 Wind Resistance:

The roof deck construction over which the Duradek Ultra system is installed must be designed to resist the minimum design wind pressures set forth in the applicable code. The allowable wind uplift pressures for the roof assemblies are noted in Table 1.

Metal edge securement systems must be listed in accordance with 2011 edition of ANSI/SPRI/FM 4435 ES-1, and designed and installed for wind loads in accordance with 2018 and 2015 IBC Section 1504.5 and 2018 and 2015 IBC Chapter 16 [2003 edition of ANSI/SPRI/FM 4435 ES-1, and designed and installed for wind loads in accordance with 2012 and 2009 IBC Section 1504.5 and 2012 and 2009 IBC Chapter 16].

4.6 Roof Covering Classification:

See Table 1 for fire-classified assembly details.

5.0 CONDITIONS OF USE

The Duradek Ultra walking deck and roof covering system described in this report complies with, or is a suitable alternative to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

5.1 Installation must comply with this report, the report holder's published installation instructions and the applicable code. If there is a conflict between the report holder's installation instructions and this report, this report governs.

5.2 The Duradek Ultra system may be installed adjacent to swimming pools or spas, or in areas subject to related chemical exposure.

5.3 Wind uplift pressure on any roof area, including edge and corner zones, must not exceed the allowable wind pressure for the roof covering installed in that particular area. Refer to Table 1.

5.4 The allowable wind uplift pressures listed in Table 1 are for the roof covering system only. The deck and framing to which the system is attached must be designed for the applicable components and cladding wind loads in accordance with the applicable code.

5.5 The membrane is manufactured under a quality control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

6.1 Data in accordance with the ICC-ES Acceptance Criteria for Walking Decks (AC39), dated June 2017 (editorially revised May 2018).

6.2 Data in accordance with the ICC-ES Acceptance Criteria for Membrane Roof Covering Systems (AC75), dated July 2010 (editorially revised March 2018).

6.3 Report of fire classification testing in accordance with ASTM E108.

6.4 Report of simulated wind uplift testing in accordance with FM 4474 Appendix B.

6.5 Report of impact resistance testing in accordance with ASTM D3746.

7.0 IDENTIFICATION

7.1 Each roll of membrane is identified with the Duradek U.S. Inc. name and address, product name (Duradek Ultra), and the evaluation report number (ESR-2151).

The Duradek D763, D811-23-S and Duradek D811-23-W adhesives are identified with the Duradek U.S. Inc. name and address, the product designation, batch number keyed to the date of manufacture, and product expiration date.

The Mapei Ultraflex 2 mortar, USG Durock cement board Next Gen and the Rock-on Hi-Lo thread screws are identified with their product name and company name.

7.2 The report holder's contact information is the following:

DURADEK U.S. INC.
8288 129TH STREET
SURREY, BRITISH COLUMBIA V3W 0A6
CANADA
(604) 591-5594
www.duradek.com
duradek@duradek.com

TABLE 1—FIRE CLASSIFICATION AND WIND RESISTANCE ASSEMBLIES

SYSTEM NO.	FIRE CLASSIFICATION	MAXIMUM ALLOWABLE WIND UPLIFT (psf)	SUBSTRATE[2]	ADHESIVE (membrane to substrate)	MEMBRANE
1	A[1]	200	Plywood/cement board[3]	Duradek D763	Duradek Ultra
2	A[1]	200		Duradek D811-23-S and Duradek D811-23-W	
3	Nonclassified	200	Plywood	Duradek D763	
4	C[1]	240		Duradek D811-23-S and Duradek D811-23-W	

For **SI:** 1 inch = 25.4 mm; 1 psf = 47.8 Pa.

[1]Maximum slope for fire classification assemblies is $^1/_4$:12 (2 percent slope).
[2]See Section 3.2.3 for additional substrate specifications.
[3]USG Durock cement board Next Gen attached to plywood substrate with Mapei “Ultraflex 2” polymer modified mortar, troweled down with a $^1/_4$-inch-by-$^1/_4$-inch square-notched trowel, with notches spaced $^1/_4$ inch on center; and screwed to plywood with $1^1/_4$-inch-long Rock-on #9 Hi-Lo thread screws spaced 6 inches on center around the perimeter of the cement board.