NRC·CNRC
Institute for Research in Construction

Evaluation Report CCMC 13134-R

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Duradek Ultra

1. Opinion

It is the opinion of the Canadian Construction Materials Centre (CCMC) that "Duradek Ultra" when used as a waterproof membrane covering for decks and balconies subject to light pedestrian traffic in accordance with the conditions and limitations stated in Section 3 of this Report, complies with the National Building Code 2005:

- Clause 1.2.1.1.(1)(b), Division A, as an alternative solution that achieves at least the minimum level of performance required by Division B in the areas defined by the objectives and functional statements attributed to the following applicable acceptable solutions:
  - Section 9.26. Roofing

This opinion is based on CCMC's evaluation of the technical evidence in Section 4.1 provided by the Report Holder.

Ruling No. 05-02-126 (13134-R) authorizing the use of this product in Ontario, subject to the terms and conditions contained in the Ruling, was made by the Minister of Municipal Affairs and Housing on 2005-04-05 pursuant to s.29 of the Building Code Act, 1992 (see Ruling for terms and conditions). This Ruling is subject to periodic revisions and updates.

2. Description

"Duradek Ultra" is a polyvinyl chloride membrane with a 1.5-mm nominal thickness and a laminated, heat-set polyester fabric attached to the back. The surface is embossed to provide a textured finish. The membrane is manufactured in rolls that are 1 372 mm or 1 829 mm wide and 18.29 m or 22.86 m long. The product can also be cut to a required length.

The product is available in six colours: Classic, Surcoseal, Heritage, Marble, Supreme, and Chip. A typical roof/deck application is shown in Figure 1.

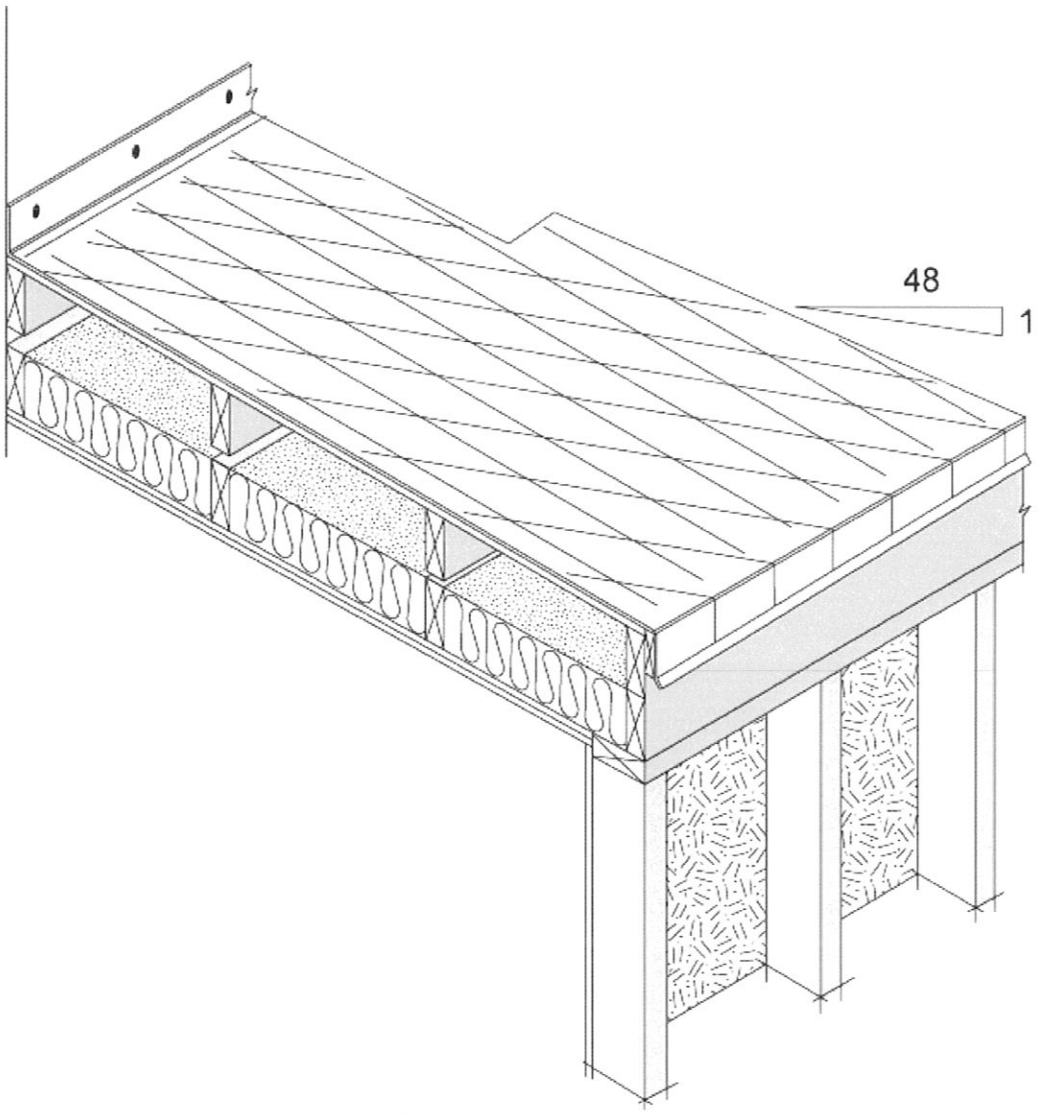

Figure 1. "Duradek Ultra" – typical roof/deck application

3. Conditions and Limitations

CCMC's compliance opinion in Section 1 is bound by the "Duradek Ultra" being used in accordance with the conditions and limitations set out below.

- the product can be used as a waterproof membrane that is fully adhered to a continuous solid substrate, such as plywood or concrete decks and balconies that are subject to light pedestrian traffic;
- the product must be used only in conjunction with plywood or concrete substrates. The membrane must be fully adhered to the substrate with adhesives D−763-1 and D-811, and applied as per the installation manual;
- the "Duradek Ultra" deck membrane can be considered as an alternative solution to materials referenced in Section 9.26 Roofing of Division B of the NBC 2005;
- the product is limited for use in areas that are subject to traffic loads generated by residential occupancies only;
- the product must not be exposed to chemical attack or spillage. In situations where extended contact with chemicals or pollutants may occur, the suitability of the product must be determined;

- the roof/deck must provide a minimum slope of 1:48;
- any physical or chemical damage to the membrane must be repaired in accordance with the manufacturer's instructions;
- the product must not be installed with butt seam joints;
- joints must be shingle-lapped in order to shed water;
- the product must be installed by approved applicators only and in strict conformance with the current installation instructions dated 95-05-01;
- the product or its packaging must be identified with the following information:
    - manufacturer's name or logo; and
    - the phrase "CCMC 13134-R."

4. Technical Evidence

CCMC's Technical Guide for "Duradek Ultra" sets out the nature of the technical evidence required by CCMC to enable it to evaluate a product as an acceptable or alternative solution in compliance with the NBC 2005. The Report Holder has submitted test results for CCMC's evaluation. Testing was conducted at independent laboratories recognized by CCMC. The corresponding test results for "Duradek Ultra" are summarized below.

4.1 NBC 2005 Compliance Data for "Duradek Ultra" on which CCMC Based its Opinion in Section 1

4.1.1 Material Requirements

The following table summarizes the test results for material properties of the product.

4.1.1.1 Material Properties

Table 4.1.1.1 Material Properties

Property	Unit	Requirement	Result
Overall thickness	mm	Report Value	1.56
Coating thickness	mm	Min. 0.4 (no measurement less than 0.32)	1.16

4.1.2 Performance Requirements

The following table summarizes the performance test results for the product.

4.1.2.1 Performance Properties

Table 4.1.2.1 Performance Properties

Property	Unit	Requirement	Result
Load strain energy	kN/m	Min. 30	41 MD/33XD (1)
Water vapour transmission	g/m²/d	Max. 4.0	3.14
Water absorption mass	%	3.0	3.0
Static puncture	Rating	≥3	3
Dynamic puncture	Rating	≥3	4
Low temperature impact (original)	-	8 out of 10 pass	Pass
Low temperature impact (after weathering)	-	8 out of 10 pass	Pass
Low temperature flexibility (original)	-	Material shall not crack or exhibit any visible defects	Pass
Low temperature flexibility (after heat aging)	-	Material shall not crack or exhibit any visible defects	Pass
Low temperature flexibility (after weathering)	-	Material shall not crack or exhibit any visible defects	Pass
Lap joint strength (un-aged)	%	Min. 75% of original membrane	Pass
Lap joint strength (after heat aging)	%	Min. 70% of original membrane	Pass
Resistance to accelerated weathering (visual)	-	No cracking, blistering or colour change	Pass (2)
Abrasion resistance (weight loss)	g	0.4	Pass (3)
Abrasion resistance (depth of wear)	mm	Max. 0.30	Pass
Adhesion to substrate	N	125	306/142 (4)
Slip resistance (dry condition)	Rating	leather ≥0.50 and rubber ≥ 0.70	Pass
Slip resistance (wet condition)	Rating	leather ≥0.60 and rubber ≥ 0.65	Pass

Notes to Table 4.1.2.1

(1) MD = machine direction; XD = across roll direction

(2) Tested for 5 000 h exposure to QUV exposure. Deemed equivalent to 2 000 h Xenon.

(3) Method A of ASTM D 1242-95(2006), "Water Vapor Content of Gaseous Fuels by Measurement of Dew-Point Temperature," deemed as equivalent. 0.0508-mm loss of thickness.

(4) Obtained with water-based adhesive D-763-1/Obtained with solvent-based adhesive D-811.

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