



Evaluation Report CCMC 12658-R Dörken DELTA[®]-MS dampproofing membrane

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1. Opinion

It is the opinion of the Canadian Construction Materials Centre (CCMC) that Dörken “DELTA[®]-MS” dampproofing membrane, when used as a material for dampproofing in accordance with the conditions and limitations stated in Section 3 of this Report, comply with the National Building Code (NBC) of Canada 2015:

- Clause 1.2.1.1.(1)(b) of 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:
 - Article 9.13.2.2. Dampproofing Materials

This opinion is based on CCMC's evaluation of the technical evidence in Section 4 provided by the Report Holder.

Ruling No. 09-38-236 (12658-R), authorizing the use of the products in Ontario, subject to the terms and conditions contained in the Ruling, was made by the Minister of Municipal Affairs and Housing on 2009-12-30 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

The products are made from a high-density, polyethylene, quasi-rigid plastic sheet membrane, and extruded in such a way that results in a dimpled surface on one side and a smooth surface on the other. Dimples are 8 mm high.

“DELTA[®]-MS” is a brown membrane that is available in rolls 20.0 m (65 ft. 7 in.) long and 1.07 m (3 ft. 6 in.) to 3.0 m (9 ft. 10 in.) wide.

A range of accessories, fasteners, sealants and mould strips is available to assist in the correct application of “DELTA[®]-MS” membranes.

“DELTA[®]-MS” profiles and anchors are illustrated in Figures 1, 2 and 3.

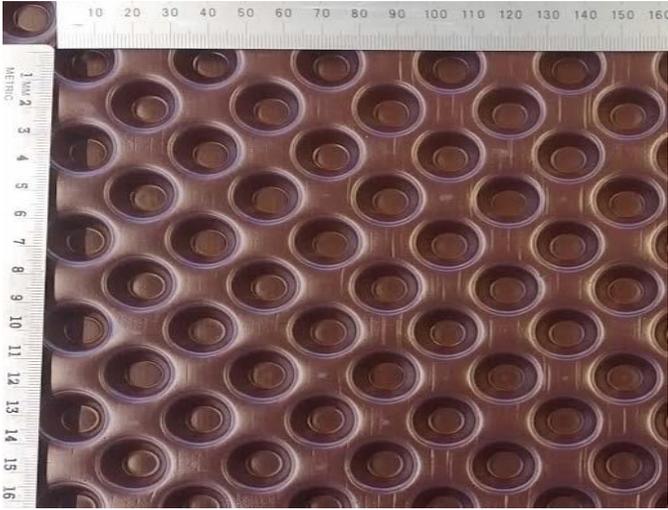


Figure 1. “DELTA[®]-MS” dampproofing membrane – face in contact with the soil

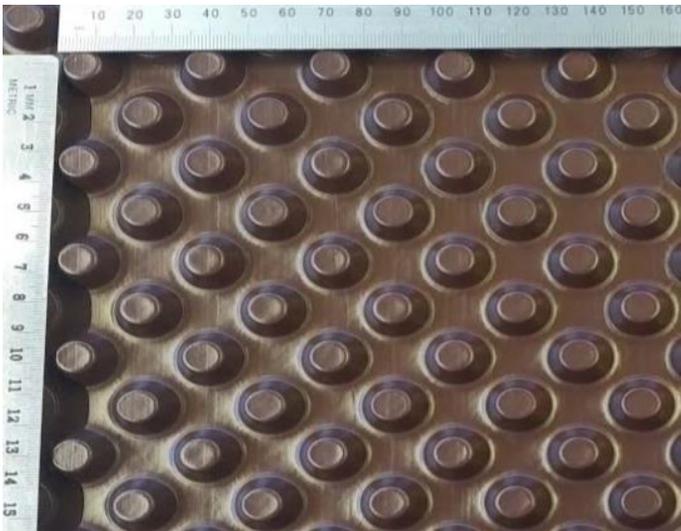


Figure 2. “DELTA[®]-MS” dampproofing membrane – face in contact with the wall



Figure 3. “DELTA[®]-MS” dampproofing membrane – anchor

3. Conditions and Limitations

CCMC's compliance opinion in Section 1 is bound by Dörken "DELTA®-MS" dampproofing membrane being used in accordance with the conditions and limitations set out below.

- Based on the evidence provided, the products have been classified as Type "2" for use in vertical applications in depths up to 3.7 m below grade. Application depths greater than 3.7 m are considered to be outside the scope of this evaluation
- The products must be installed in accordance with the manufacturer's instructions. In the event of conflict between the manufacturer's instructions and this Report, this Report shall govern.
- The products were evaluated for use against cast-in-place and concrete block foundations only and must cover the foundation wall from the top of the footing to the final grade.
- The products must be used in locations where the foundation wall is well-drained in accordance with Subsection 9.14.2., Foundation Drainage, of Division B of the NBC 2015.
- The products are dimpled membrane drainage systems designed to act as a protective layer or a capillary breaking layer against the foundation wall to protect the wall against transient or intermittent water that may come in contact with the wall's surface.
- The products must be protected from exposure to ultraviolet (UV) light (sunlight) within a maximum of 30 days of installation.
- Long-term performance of the dampproofing system depends on local conditions such as the soil type, hydrogeology of the site, mineralogy and presence of microorganisms in the soil (i.e., iron ochre), as well as compatibility of the filter with the soil, among other issues. Compliance with this Report does not exempt the project from requiring proper engineering design of the drainage system.
- The performance of fixtures used to anchor the products in the wall was evaluated for a single anchor. It is the responsibility of the manufacturer to define the pattern and spacing of anchors, considering the anchor strength as well as site-specific issues such as the type of soil, how it will interact with the products, as well as the backfilling method used.
- The top of the membrane and all vertical joints and terminations must be mechanically fastened and sealed to prevent soil particles from entering behind the membrane. Accessories used to anchor the product are part of the evaluation.
- The products' label and/or packaging must be clearly identified with the following:
 - manufacturer's name or logo; and
 - the phrase "CCMC 12658-R."

4. Technical Evidence

The Report Holder has submitted technical documentation for CCMC's evaluation. Testing was conducted at laboratories recognized by CCMC. The corresponding technical evidence for this product is summarized below.

4.1 Performance Requirements

4.1.1 Technical Evidence

Table 4.1.1. Test Results for Dörken "DELTA®-MS" dampproofing membrane

Property		Unit	Requirement	Result
Compressive strength (initial)		kPa	150	223
Dynamic impact resistance (mean failure energy)		J	≥ 2.45	8.3
Creep resistance (residual thickness at 25 years/10°C)		%	≥ 40% at 25 years/10°C	77.5
Cold bending at -30°C		N/A	No visible crack	No visible crack
Tensile strength	at yield	kN/m	≥ 8	XD ⁽¹⁾ 8.1
	elongation at break	%	≥ 25	XD 29.8
	Anisotropy ratio	N/A	≥ 0.5	1.1
	Tensile strength in print area	kN/m	≥ 90% of tensile strength	100%
Heat aging for 8 weeks	dimensional change	%	≤ 1	MD ⁽¹⁾ -0.6, XD -0.5
	weight change	%	≤ -0.1	0.0
	residual compression strength	%	≥ 80 of initial	107.8

Table 4.1.1. Test Results for Dörken “DELTA®-MS” dampproofing membrane (cont.)

Property		Unit	Requirement	Result
Resistance to alkaline environment	appearance	N/A	No visible crack	No visible crack
	residual compression strength	%	≥ 80 of initial	101.5
	cold bending at -30°C	N/A	No visible crack	No visible crack
Geometrical properties:				
Orientation of the dimples		-	Report value	Diagonal
Number of dimples per unit area		dimples/m ²	Report value	1 560
Overall thickness		mm	Report value	8.43
Sheet thickness		mm	Report value	0.48
Hollow core thickness		mm	Report value	7.95
Anchorage performance	anchorage efficiency	kN/anchor	Report value	0.95

Note to Table 4.1.1:

(1) “MD” refers to the machine direction of the product; “XD” refers to cross direction of the product.

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