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# Chevaline Dexx Roof and Deck Membrane System

## Building Compliance Technical Report - Addendum

**Executive Summary**

This addendum to the Chevaline Dexx Roof and Deck Membrane System Building Compliance Technical Report sets out the analysis of the relevance of heat aging testing to the compliance of Dexx with respect to the NZ Building Code.

## Background

BRANZ report DC16839-01-1 referenced in the Chevaline Dexx Roof and Deck Membrane System Building Compliance Technical Report (R1.1 Issued 6/11/2023) presents tests on Dexx to AS 4654:2012 Waterproofing membranes for external above-ground use Part 1: Materials. The membrane passes all the tests with the exception of heat aging.

This analysis considers the relevance of heat aging testing to demonstrating the compliance of Dexx to the NZ Building Code for durability.

## Analysis

The NZ Building Code is performance based and sets out the outcomes to be achieved. Compliance with the Building Code can be established by compliance with an approved Acceptable Solution (a prescriptive "deemed to satisfy" solution) or Verification Method (a method or process by which compliance may be demonstrated). Acceptable Solutions and Verification Methods often include Standards by reference. Standards do not have any particular standing with respect to compliance with the Building Code unless they are referenced in an Acceptable Solution or Verification Method.

The Chevaline Dexx Roof and Deck Membrane System is outside the scope of Acceptable Solution E2/AS1 External Moisture and the materials are not included in Acceptable Solution B2/AS1 Durability, and there are (therefore) no standards referenced as a means of compliance. Verification Method B2/VM1 provides for the verification of durability by proof of performance, taking into account the expected service conditions by one or more of the following:

a) In-service history,

b) Laboratory testing,

c) Comparable performance of similar building elements.

AS 4654 is not referenced in the NZ Building Code "system". It has no special status but does provide some information about performance (and durability) that may be considered, such as heat aging, temperature resistance and ultraviolet light resistance.

For many products the likely durability must be deduced from tests that are intended to accelerate the deterioration that might be experienced in practice. For polymers, tests such as UV testing, hot/cold cycles, heat aging etc are relatively common in national and international standards for specific products. New Zealand does not have a standard for these products and the relevance of standards from other countries to New Zealand conditions needs to be inferred.

Heat aging is one of many tests that are used to accelerate the effects of long-term service in use. Some accelerated tests are more relevant than others, and some may, unintentionally, induce degradation of the product's properties through mechanisms not likely to be experienced in the actual use of the product. The use of accelerated tests should be considered in the context of the actual service conditions. For Dexx the expected service conditions are dominated by resistance to immersion in water (if used in an application where it is subject to ponding) or exposure to UV and mechanical damage (if not protected).

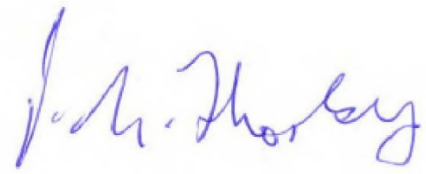
And always, the results of accelerated aging tests should be balanced by consideration of actual in-service history where that is available.

Dexx is in the fortunate position of having a long history of use in New Zealand, in particular longer than the durability requirements of the Building Code. This history of use is invaluable in reaching an overall view about the compliance of the product with the Building Code.

The Chevaline Dexx Membrane System has a successful history of use as a roof and deck membrane system in New Zealand for more than 30 years. Inspections on several buildings with Dexx installed between 1988 and 1991 reported by Joyce in 2005 show the system performing well (after about 17 years). More recent inspections by Tekton on several other buildings with Chevaline Dexx applied showed the membranes in good condition and performing well after 12 years with no indication of likely failure.

**Conclusions**

When looking at all of the testing and balanced with the long in-service history that exceeds the 15 year durability of B2.3.1(b), it is not unreasonable to put aside the heat aging and to conclude that Chevaline Dexx Membrane System complies with B2.3.1(b).



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