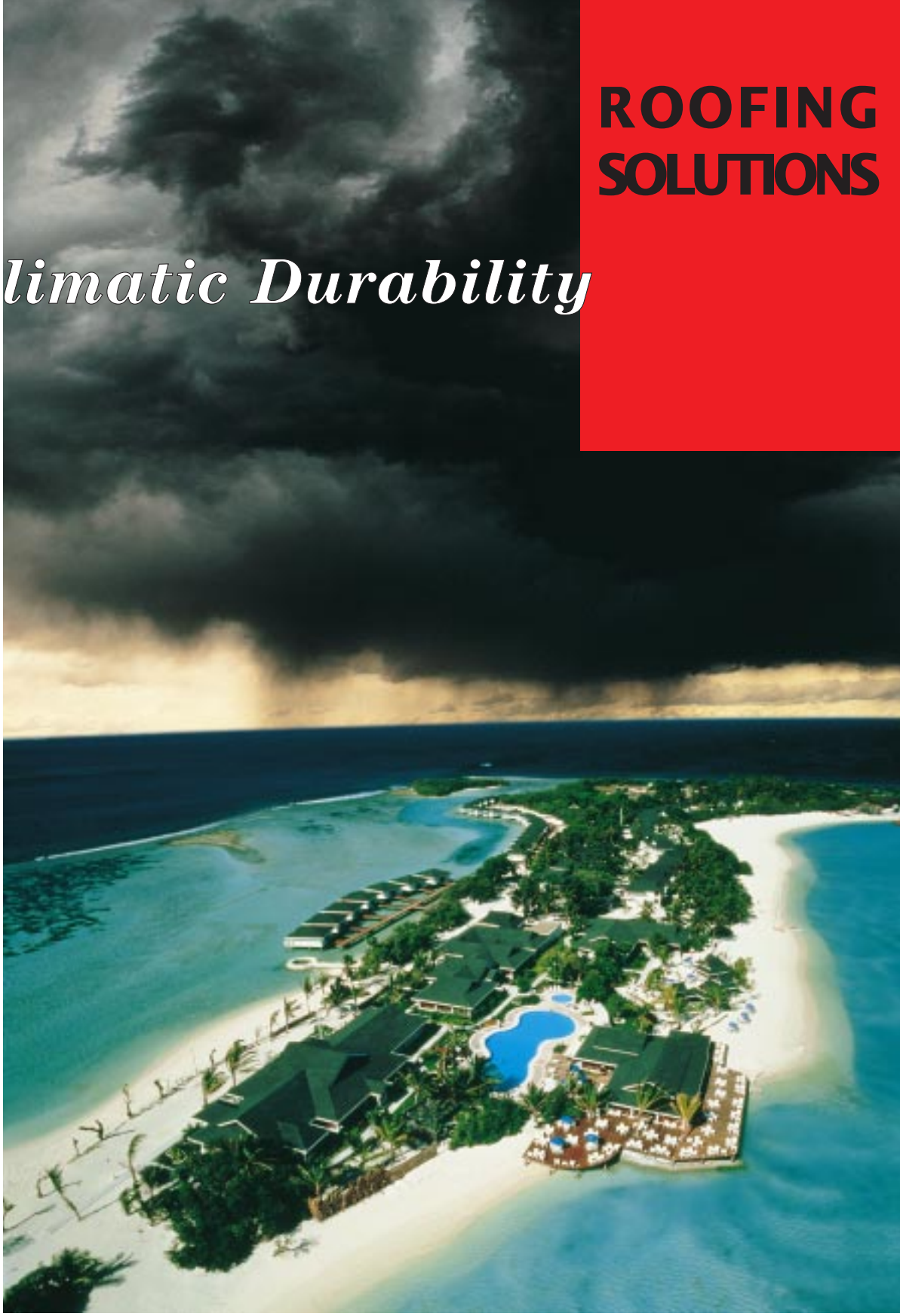
# ROOFING SOLUTIONS

## *Climatic Durability*



AHI ROOFING

A MEMBER OF TASMAN BUILDING PRODUCTS

# A Roof For All Seasons

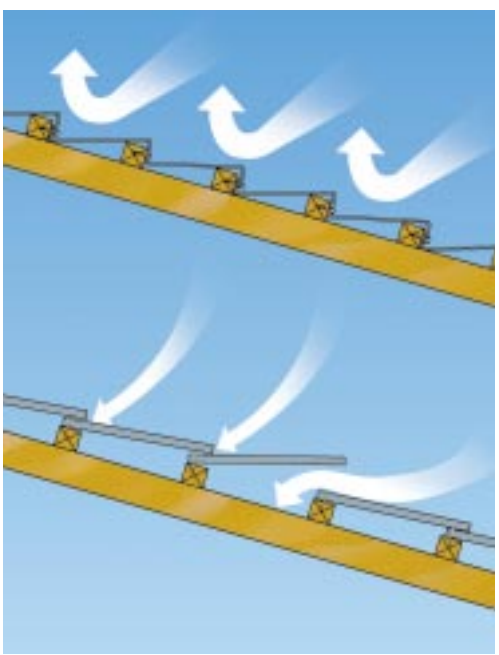
Good performance of roofing in a range of climatic conditions is critical. Some roofing systems perform well under sub-zero conditions but fail when temperatures rise. Others handle the heat, but fail dismally when the cold sets in. Driving rain, high humidity, and hailstorms are all common weather conditions that any good roofing system should handle. Specifiers need to be confident that their proposed roofing system will easily meet the challenges of all climates... that the ability exists for the roofing system to handle the hottest summers, the coldest winters, and a wide range of temperatures. The answer lies with roofing systems from AHI Roofing. This range of roofing products has been thoroughly tested and proven right around the world. The performance information contained within this brochure has been extracted from test reports carried out in all continents of the world... the hot and cold temperatures, and the driest and wettest conditions.

## Testing Scenarios

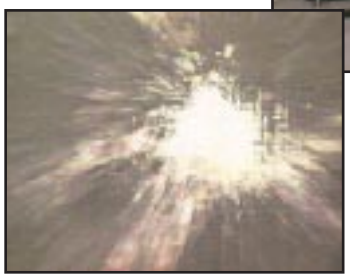
For each climatic test, roofs were designed and erected to the installation and building requirements required by local authorities. Only those localities with the very highest standards were chosen. The after effects were noted, not only after immediate impact but also after prolonged exposure periods. The same roofing panels, that endured and were proven under one extreme, were also proven under the opposite extremes.

## Under High Winds

Testing was carried out in Florida in the United States, an area which has strict regulations because of regular hurricanes. The roof panels were laid in the normal manner, ie horizontally fastened to wooden battens which in turn were fastened to the plywood “underdeck”. The air stream was provided by the propeller of a 1500 kW aircraft engine wind generator. Water spray was added to the airstream upwind of the eave at a rate equal to 200mm of rain per hour. The roofing panels and the “underdeck” were checked for any uplift or leakage. The wind speeds were steadily increased to 160km/h with no leakage occurring, even after prolonged exposure. The roof remained firm and no uplift close up was observed.



# Under The Impact Of Hailstones



The test method used was in accordance with the Australian Commonwealth Scientific and Industrial Research Organisation's (CSIRO) recommendations of "Resistance of Roof Coverings to Impact of Hailstones". The roof was mounted at 28 degrees and different size ball bearings were dropped from 2 metres. Each drop point received 3 blows from a single size of bearing and any resultant damage was noted. Translating the size and weight of bearings used into hailstones, shows that no damage would be caused by hailstones up to 30mm in the diameter. At 35mm diameter, hailstones might crush the stone chip coating on the crest of the roof, but there are still no dents. Larger hailstones may crush the stone chip coating and cause small dents, however the stone chip coating is still not completely penetrated... even with hailstones up to 90mm diameter.

# Under Snow Loads

*Roofing systems from AHI Roofing have been proven under extreme snow load conditions all around the world*

The testing ground chosen was in Hokkaido, Japan, which is well known for high snow falls. The conditions of snow build-up were measured over a 4-month period through the peak of winter, and all after-effects were noted. The interior temperature of the test house was maintained at approximately 20°C. Over the period of the test the maximum snow depth was 50cm. Throughout the period of snow build-up and the subsequent thawing, the system from AHI Roofing maintained a constant barrier. There was no evidence of leakage anywhere in the entire roof area. As snow on the eaves melted, there was no tendency for snow to build up in the gutters. Icicles formed on the tiles, but these were easily accommodated by the guttering. Most importantly, no damage was seen to have been caused to the roof structure by the weight of the snow. The tile profile maintained its shape, and the stone chip coating was in good condition with no signs of delamination or discolouration.

# Under Heavy Rain

This test was set up by the CSIRO's Experimental Building Station in Australia. The Station has an apparatus for low-speed dynamic rain-penetrating tests. A 1200mm diameter 8-blade fan is driven by an 18.65 kW electric motor. The windstream from this fan is discharged into the test chamber via a 1230mm square duct. Water is introduced into the windstream and can be directed horizontally, vertically or any direction in between. Under all angles, and with a water application of 50 ml/s/$m^2$ of roof area (equivalent to 180mm of rain per hour).

*Rain penetration tests play a major part in the development of every roof tile profile from AHI Roofing.*

# ROOFING SOLUTIONS

## *Under Ultraviolet Exposure*

Systems from AHI Roofing have colour durability that lasts literally for years. This basic integrity has been proven under accelerated weathering tests in laboratories, and with prolonged actual exposure in the most UV-prone areas in the world.
Laboratory tests were carried out in accordance with the American Society for Testing and Materials (ASTM). Various coloured roofing panels were time tested for 5000 hours with no noticeable or little difference in colour. A simple correlation to natural weathering equates these 5000 hours to 10 years of actual outdoor exposure. Naturally this correlation is dependent on a variety of climatic conditions.
Manufacture of Decra products started in 1956. The first exports began in 1964. Now the products are available in virtually every country around the world. The company is recognised as the market leader, and their products are renown for their long life and weatherability.
The New Zealand climate is subject to some of the highest levels of UV exposure in the world.
Full copies of the test reports mentioned are available from your AHI Roofing representatives.

**WEATHERING RESISTANCE**
• Accelerated Weathering Test to American Society for Testing and Materials standard (ASTM) G26.

**WEATHERING SECURITY**
• High Speed Dynamic Rain Penetration and High Wind Loading Tests – by Construction Research Laboritory Inc, Miami, Florida, USA.
• Low Speed Dynamic Rain Penetration Test – by the Experimental Building Station, Australia.

**HURRICANE/CYCLONE WIND RESISTANCE**
• Hurricane test by Construction Research Laboratory Inc, Miami, Florida, USA.
• Cyclone Loading Test to the Wind Loading Code, Australian Standard 1170, Part 2 1975 – by Cyclone Testing Station, Australia.

**CORROSION RESISTANCE**
• Salt/fog Test to ASTM B117.
• 100% Relative Humidity Test to ASTM D2247.

**CONCENTRATED LOADING**
• Concentrated Force on Roofing Tiles to Australian Standard 1582. Rule 5.2, 1973 by Cyclone Testing Station, Australia.

**FIRE RESISTANCE**
• Class A&B under UL790 (ASTM E-108) when applied in accordance with instructions.

**RESISTANCE TO THE IMPACT OF HAILSTONES**
• Hailstone test by Commonwealth Scientific and Industrial Research Organisation, Division of Building, Construction and Engineering, Australia.

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