

# **NURATHERM INSULATED ROOF SYSTEM** Technical Brochure

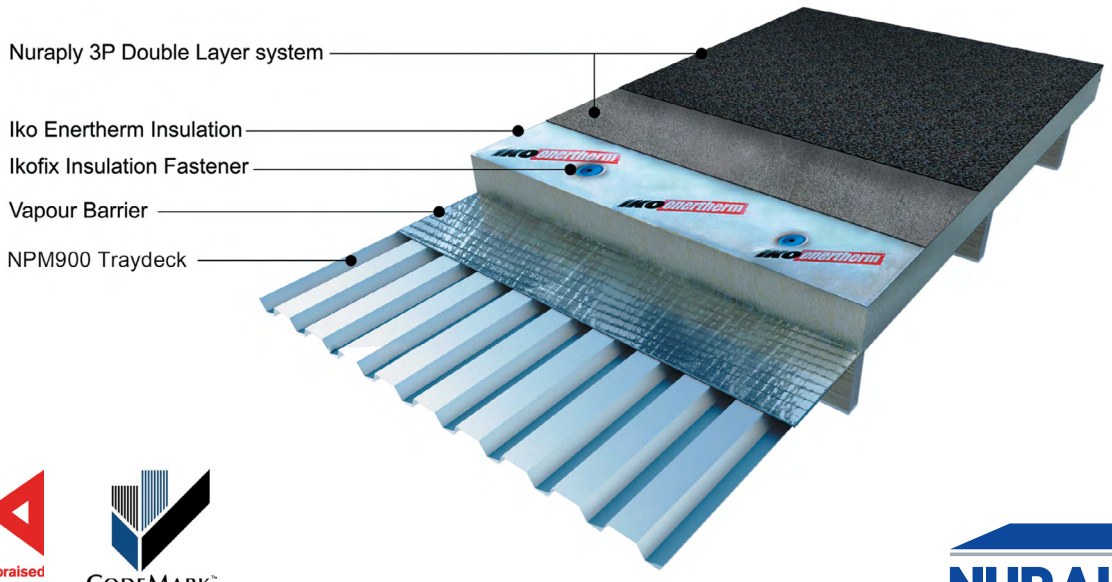
## Key Features and Benefits

The Government and New Zealand consumers are demanding energy efficiency is designed into modern buildings. And with 30-35%[1] of heat going through the roof in an uninsulated house, roof insulation needs to be a focus during a building's design.

Higher standards requires a complete rethink about how we construct our buildings. When it comes to flat roofs, international best practice is to use "warm roof" designs.

These designs put the insulation above the substrate, completely enclosing the roof area with a highly efficient insulation blanket. Nuralite has sourced from Europe the most effective product available and combined it with our respected waterproofing products to make the Nuratherm Insulated Roof system.

- The most effective way to insulate a flat roof - improved insulation, with no thermal breaks.
- Less timber may be required as the rafters can be reduced to the minimum engineering requirements. There is no need to accommodate lofted insulation products and ventilation cavities.
- No cross-ventilation of ceiling void required.
- Roof structure less susceptible to the effects of solar gain and thermal movement as it is insulated from outside temperature extremes.
- A clear ceiling space is created providing ample space for running cables, installing downlights or speakers.
- Can be retro fitted on existing buildings to increase their energy efficiency.




BRANZ Appraised
Appraisal No.732 [2011]

CODEMARK

[1] DBH your guide to Smarter Insulation, October 2007

NURALITE
THE FLAT ROOF EXPERTS




**Insulation set out on plywood**



**Insulation fixing on metal roofing**

## The Nuratherm System

With the traditional approach to flat roofing in New Zealand, the insulation is laid on top of the ceiling and the cavity space is ventilated to dissipate any condensation.

This is an inefficient method as rafters and downlights allow heat to leak through breaks in the insulation.

International best practice is to place the insulation on top of the roof substrate. A vapor barrier is installed before laying the insulation and fixing it with screws. The entire system is encased by two layers of bituminous membrane – the first being a special self adhesive vented sheet.

This method promotes an R-value that is consistent across the entire roof envelope. Using materials with the same R-value, an approximately 10% gain in heating efficiency is achieved over cold roof designs[2].

The system can be installed on plywood, concrete or metal substrates, on new or existing buildings and on flat roofs with minimal falls.

Nuratherm is most cost effective when installed on the Dimond NPM900 metal tray.

Dimond

This has a special profile which has been developed in partnership with Dimond Roofing. Because of the savings in building structure by using NPM900 metal tray, a Nuratherm roof can be installed for around the same cost as a traditional cold roof on plywood.

Tapered boards are available to repitch a low slope roof. Once installed they add an additional fall of 1:60 so can be used to replace screed on concrete roofs or remove ponding on existing roofs.

[2] $E^3$ Simulation Report, October 2007

## Warranty and Building Code Verification

Nuralite warrants Nuraply 3P and the Enertherm insulation against material defects for 20 years from the date of installation.

The warranty must be applied for at the completion of the job. For this extended warranty to remain current the customer must maintain the roof and have it inspected every five years by a qualified Nuralite applicator.

The product installation is covered by a separate workmanship warranty issued by the applicator. Nuralite will inspect the completed job if requested.

CODEMARK

CodeMark is a product certification system administered by the Ministry of Business Innovation and Employment (MBIE) which must be accepted by Councils so long as the product or system is designed and used within the scope of the CodeMark certificate.

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BRANZ has appraised the entire Nuratherm system and has concluded that it complies with NZBC E2 – weathertightness and B2 – durability.

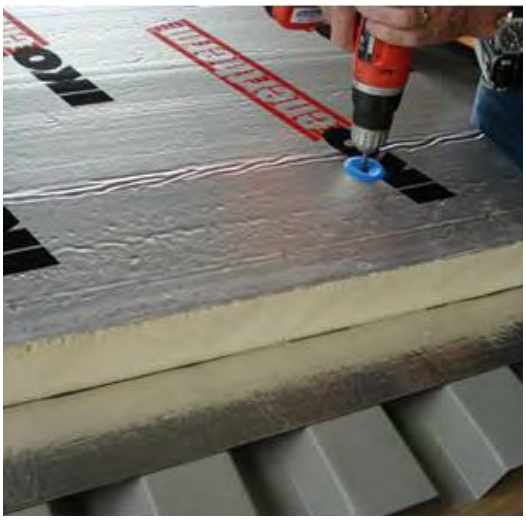
We are happy to work with you on any building consent issues, especially if something outside the scope of usual work is planned.

## Applicators

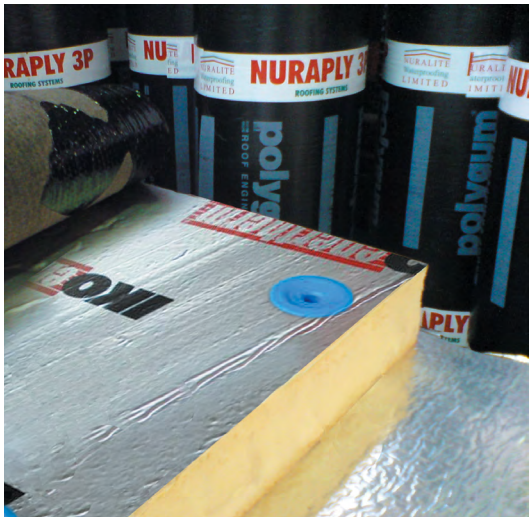
All of our authorized applicators have been trained at our premises followed by on-site training. Most applicators have been working with our systems for many years.

We work closely with applicators to ensure quality standards are maintained. Our applicators install both the insulation and waterproofing systems.

Because it comes in lightweight sheets, the insulated roof system is simple and quick to install.



A) Secure Insulation




B) Self Adhesive Basesheet Installed




C) Weld Capsheet

## General Application Method

1. In all H1 zones, a vapour layer is laid upon the substrate, with the joints being welded shut. Depending on the project timetable, this layer can be left exposed to act as temporary waterproofing.

2. The Enertherm insulation is set out over the vapour barrier. The sheets are staggered in a brick bond fashion to prevent movement which could result in gaps in the insulation. The insulation is secured using screws with a flange, especially designed for insulated roofs (Photo A).

3. A 3PV - SA base layer is installed. Being self adhesive it is quick to apply but is completely waterproof. (Photo B).

4. A cap sheet of Nuraply 3P or Nuraply 3PM is welded onto the base layer. The joints are welded shut to ensure a watertight solution. (Photo C).

## Things to consider

**Thermal modeling**
If building a home which does not comply with H1 via the Schedule method, a Nuratherm roof can provide valuable energy saving units to offset against other areas like oversized glazing. Due to the absence of thermal bridges (via rafters or downlights) a warm roof requires approximately 10% less energy to heat a house compared to a cold roof house build using materials with similar R values[2].

**Retro fitting**
If a building is being renovated, consideration should be given to boosting the thermal efficiency by adding insulation outside of the current building envelope. By adding retro fitted insulation, improvement in air conditioning loads can be achieved without disturbing the inside core of the building.

**Detailing**
Ensure that the insulation is correctly detailed in all specification drawings. Generic Membrane Roofing details will not suffice. Visit www.nuralite.co.nz for a set of Nuratherm Roof details and contact Nuralite if you have any questions.

**Acoustics**
Airborne Sound Transmission - overall rating is STC 37 (Rw 36dB). Rainfall - an artificial rainfall rate off 112mm/hr the roof produces a noise level LIAM norm of 50dB.

**Parapets**
With the Insulation being installed upon the substrate, attention needs to be paid to parapet heights. This is particularly relevant if a retrofit to an existing building is proposed.

**Condensation**
The Nuratherm warm roof system specification has been developed based on normal residential environmental conditions. Adequate ventilation must be provided to bathrooms, laundries, habitable spaces and other areas where moisture may be generated or may accumulate.

For unusual building conditions, consult a Nuralite expert as a specific vapour control layer specification may be required.

**Remedial Work**
Instead of repitching old rusted metal tray roofs, consider replacing it with Nuratherm over Dimond NPM900. A cost effective way to remedy the problem and improve building performance in one go. Enertherm is available as a tapered board to provide additional fall if none currently exists

**Compressive Strength**
10% deformation @ 175kPa (17.5 ton/m2). No need for addition roof cover boards, will not cup or bow. Finished surface suitable for typical roof maintenance and foot traffic. If heavier loads are anticipated, please contact Nuralite.

# Technical Information

A comprehensive set of details and specifications are available at www.nuralite.co.nz.

The Nuralite advisors are all very experienced and willing to help either on the phone, in your office or on site. Call 09 579 2046 or 0800 Nuralite (0800 6872548).

## Waterproofing Membrane

Refer to the technical literature for Nuraply 3PM for detailed information.

## Entertherm Insulation

IKO Enertherm ALU is a 100 % CFC-free insulation board with a rigid polyisocyanurate foam core, faced with aluminium tri-laminate foil on both sides. Enertherm's unique properties combine to give it a significantly higher insulation value per mm of insulation than insulation products which use traditional methods.

The insulation board is designed for the application in mechanically fixed, or loose laid (ballast) or using specific adhesives.

## Application

Thermal insulation of flat roofs – regardless of its slope.

## Technical Characteristics

- Core density: 32 kg/m³
- Compression strength at 10% deformation: ≥175 kPa (EN 13165)
- Performance under the influence of an equally distributed load: class C
- λd-value (EN 13165 – declared value) : 0,022 W/Mk
- Tensile strength perpendicular to surface: > 80 kPa (EN 1607)
- Facing: aluminium tri-laminated foil
- Fire reaction: Class E according to EN 13501 part 1

## Thermal Performance

λd value according EN 13165 = 0,022 W/mK

| | | Flat | | | | | Tapered (1:60) | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Thickness | in mm | 30 | 50 | 70 | 80 | 100 | 40-60 | 60-80 | 80-100 | 100-120 |
| R value | [m²K/W] | 1.35 | 2.25 | 3.15 | 3.60 | 4.5 | 2.25 | 3.15 | 4.05 | 5 |
| **Minimum** for H1 | Zone | | | 1 & 2 | 3 | | | | | |

Vapour diffusion resistance coefficient:
PIR boards: μ = 60
ALU-facing: μ > 100.000

Chemical resistance: only degraded by concentrated leach and acids. Most in practice used paintings and solvents have no influence on the foam.
Fungus resisting: PIR insulation boards have no potential on growing micro organisms.
Enertherm is resistance to vermin attack as PIR is not a source of food.
Enertherm is easy to handle and does not irritate installer. There are no special safety requirements for installing Enertherm Insulation.
Moisture resistance. Does not easily absorb water because of its closed cell structure.

## Dimensions and Thickness

1000mm x 1200mm x 70mm
1000mm x 1200mm x 80mm

Other thicknesses are available. Sheets may be double stacked for very high insulation values.

**Nuralite Waterproofing Ltd**
53A Victoria Street, Onehunga, Auckland 1061
Ph 09 579 2046 Fx 09 579 5136
E info@nuralite.co.nz

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