



PRODUCT DESCRIPTION

The Tricore Insulated Roof System (Tricore) is a built-up ventilated warm roof system with all the components supplied by Dimond. The system incorporates:

- A steel liner sheet supporting PIR insulation board in thicknesses to achieve a range of thermal insulation R values
- A breathable roof underlay separated from the roof underside by a ventilated air space
- Continuous roof sheet profiles including the capability of sheet lengths up to 90m from ridge to gutter in a grade of material to suit the environmental category.
- Multi layer skylights
- Metal flashings.

DESIGN GUIDELINES

Scope of use:

Tricore is intended to provide an integrated roof solution for roof pitches of 3 degrees and above using an efficient combination of internal lining, thermal insulation, condensation control, weather secure roof covering, natural lighting, acoustic performance, fire performance and rainwater management.

- Tricore is intended to be installed over structural purlins at appropriate spacings to suit both the lining sheet and the roof sheet fastening requirements.
- Not intended for installation over a plywood liner. If this is a consideration, contact Dimond for further assistance.
- The profiled steel lining sheet can be used as a pre-finished ceiling lining and can be installed to rapidly cover the building space during construction as well as act as a safe working platform.
- The rigid PIR insulation is available in a range of thicknesses to achieve thermal insulation R values between 2 and 6 m² °C/W.
- The control of moisture and condensation within the built-up system is achieved with a layer of breathable roof underlay covering the PIR insulation with a ventilated air space between the underlay and the underside of the roof sheet, ensuring no build up of moisture within the system.
- The roof sheet covering can be selected from the Dimond range of long-run roof profiles and coated metal materials to match performance to the environment. This includes the scope to use site-rolled, clip fastened decking profiles to achieve a continuous roof covering sheet in lengths up to 90m from ridge to gutter.
- Multi layer skylights can be incorporated to achieve the required balance between natural lighting levels and thermal insulation.
- Additional layers within the Tricore system, or as a separate ceiling lining, can be introduced to achieve attenuation of rain and airborne noise.
- Not intended for use in severe or very severe marine environments. Sites closer than 500m to sea spray zones consult with Dimond.
- For Fire requirements Tricore can be used to achieve relevant group numbers in a way that the liner sheet becomes an exposed internal surface subject to specific fire engineering design. For more details contact Dimond for assistance.

BUILDING CODE COMPLIANCE

Tricore will comply with the following clauses of the NZ Building Code for a period of 15 years provided it is installed and maintained in accordance with the recommendations referred to in this statement.

- Clause B1, Structure Roof, liner sheet and rail have been tested in accordance with the NZ MRM metal roofing code of practise and published Dimond load span tables for the relevant profile top sheet
- Clause B2, Durability – based on components past history of use and durability of the Galvanised Steel roof rail in a protected environment
- Clause E2 External Moisture as an alternative solution to AS1 – based on past history of use and NZMRM metal roofing code of practise requiring an effective ventilated cavity between the roof underside and the insulation
- Clause H1 Energy Efficiency- PIR thermal conductivity complies with EN13165
- Clauses C3 Fire Safety – Testing of the TriCore Insulated Roof System to AS1366 and EN13501 has confirmed a Group Number 2 classification. Group Number 1s or 2s can be achieved with specific fire engineering design for the complete internal lining solution.
- Clause G6 Airborne and Impact noise- By independent expert opinion

SUPPORTING EVIDENCE

The product has and can make available the following additional evidence to support the above statements:



NZ Metal Roofing Manufacturers Association Inc. (NZMRM)
[Code of Practice](#)



ENVIRONMENTAL

Steel substrate

Manufactured from coated steel produced by NZ Steel at Glenbrook from Ironsand mined off North Island's West coast. Colorsteel is factory painted at NZ Steel, Glenbrook or if its ColorCote its painted at Pacific coil coaters Penrose. Both sites operate within strict environmental controls and recycle cleaning and washing water and control what is exhausted into the environment. Dimond recycle all steel scrap waste and offcuts which can then be remelted down and reused in other steel based products. At the end of its useful life as a roofing profile can be recycled back by being remelted down.

Paint Coatings – Pacific coil coaters and NZ Steel both meet international paint quality

Enertherm PIR Insulation – manufactured in Europe and shipped to New Zealand. Not recyclable.

COATINGS & CLASSES

The top roof coated sheet,

Manufactured using different paint coatings available from New Zealand Steel or Pacific Coilcoaters depending on the durability required for the environment the roof or wall will be installed in, in accordance with AS/NZS 2728. As a guide and subject to confirmation from Dimond, for sites beyond 500m of breaking surf (Category 4) Colorcote MagnaFlow™ (ZM8) or Colorsteel Maxx can be used, beyond 500m (Category 3) then ColorCote ZinaCore (ZR8) or Colorsteel Endura, and beyond can use Zinalume. Refer to environmental literature available from Pacific Coilcoaters or New Zealand Steel or contact Dimond on 0800766377

*Between 0-500m of the sea, Tricore cannot be used.

PERFORMANCE OF COMPONENTS

NPM 900 Steel Liner sheet

Maximum spans to support 1 kN foot traffic point load and 2.0 kPa ULS wind load.

NPM 900 Steel	0.55mm	0.75mm
End span (mm)	1800	2200
Internal span (mm)	2700	3400

PIR Insulation

The high quality Enertherm PIR insulation board has a tri-laminated aluminium foil facing to both sides, offering minimal shrinkage over time.

Board sizes are 1m x 1.2m or 2.4m in thickness (as outlined in the Thermal Performance section)

Board density is 32Kg/m³

Compressive strength at 10% deformation is greater than 175kPa (EN 13501 Part 1)

Roof ventilation rail

The 27mm high galvanised roof rail is designed to provide ventilation under the roof sheet by passive air movement and is fixed through the PIR and liner sheet into the structure below. This allows separate roof sheet fixings to be fixed into it, reducing the cold bridging effect.

Vapour control layer

Solitex Mento 1000 connect, is laid vertically directly on top of the PIR board to allow any vapour transfer out of the roof system but prevent downward moisture migration. The connect product ensures all side edges can be overlapped 150mm and fully taped together.

Fixings

All fastener screws are coated to a class 4 standard in accordance with AS3566. Liner sheets are fixed, every 2nd pan into the internal purlin spacings and every pan on sheet ends, using a 12gx20mm tek (for steel purlins) or a T17x 35mm (for timber purlins) 14 g -10 thread's per inch Tek steel screws are used to hold the roof rail onto the steel purlins (timber uses type 17) through the PIR at 300mm centres (or at 150mm centres if the roof fixings are spaced less than 300mm centres eg every rib of LT7 profile) alternating each side of the roof rail to achieve a minimum pull out per screw of 1.5 kN. This has been confirmed by independent test.

Overall Screw Length varies and is dependant on the thickness of PIR.

Top roof sheet

All Dimond roof profiles can be used as a top sheet. Refer to Dimond website and the select the appropriate profile load span data for the selected roof profile. www.dimond.co.nz.

Flashings

All External flashings are shaped and installed to Dimond and NZMRM code of practise for metal roofing and cladding recommendations to provide weathertight junctions between roofing planes.

INSTALLATION

The Tricore system is only installed by trained Dimond recommended installers.

Roof sheets must be handled carefully as they have sharp edges and can be difficult to carry in windy conditions when laying on roofs at height. All working at height safety rules must be observed.

All components must be stored and handled on site correctly with care, with roof fall on dunnage well clear of the ground and clear of any vegetation. Water ponding on the product must be avoided. If water does get trapped between the sheets, the bundle must be separated and each sheet dried, then restacked with dunnage between each sheet so the air can circulate between each sheet and then covered.

Roof Sheets must be covered where storage on site will be greater than 1 week.

PIR Insulation boards are fragile so handling must avoid damage to sheet edges and they must be kept dry on site until they are required to be installed.

Where roofing bundles are lifted up onto the roof, they must be positioned over the buildings rafters to distribute the weight back into the structure and not over load the purlins.

The liner sheet is pan fixed into purlins, before the PIR boards are placed in a brick bond layout, and Mento 1000 connect laid and side edges stuck together, then roof rail screw fixed through PIR and liner sheet into roof structure.

Top Roof fixings are installed either through the roof fixing clips for clip fixed profiles or through roof ribs for screw fixed profiles similar to normal roof fixings situations, into the roof rail. The typical roof fixing screw lengths are reduced to rib height plus 15mm to allow for fixing into just the roof rail.

Fixing on all roof ribs, every rail is recommended.

Side lap fixings may be required for both the roof sheet and the liner sheet if purlin spans over 1.5m centres for 0.4mm BMT and 2m for 0.55mm.

Refer to the full Tricore installation instructions at www.dimond.co.nz for more information not covered here.

ACOUSTIC PERFORMANCE

The Tricore Acoustic performance guideline table (refer to the online literature www.dimond.co.nz) provides a design guide for expected performance based on acoustic laboratory testing and expert opinion from Marshall Day Acoustics. This information is given as a guide only for a reasonable expectation of performance since the as built performance will depend on construction details and quality of finish that are outside the scope of this statement, and require consideration by an appropriately qualified acoustics engineer where the acoustic performance of a building is a critical design factor.

FIRE RESISTANCE

Testing of the Tricore Insulated Roof System to AS1366 and EN13501 has confirmed a Group Number 1 Classification for compliance with the NZ Building Code, Clause C3.

Specific fire engineering design for the complete internal lining solution is necessary in cases where a Group Number 1s or 2s classification is required. In these cases, please contact the Dimond Roofing Technical Service on 0800roofspec for guidance.

Tricore is not intended for use on walls, but may be used as an external wall cladding system within strict limitations on wall height and distance from the boundary. As these limitations can change over time with advice from MBIE, please contact the Dimond Roofing Technical Service on 0800roofspec for guidance.

THERMAL PERFORMANCE

Enertherm PIR Insulation available in the various thicknesses give the following

PIR Thickness	R value* (m ² °C/W)
50	2.25
70	3.15
80	3.60
100	4.50
120	5.45
140	6.35

*Based on PIR only without the additional R value from surface effects and additional Tricore components

NATURAL LIGHTING STRIPS

Using profiled 1.4mm or 1.7mm thick Durolite GRP top sheets to match selected roof profile with either a

- single layer using Durolite top sheet with Lexan 10mm 5 wall under the roof rail to achieve nominal visible light transmission levels of 50% and has a nominal R value of 0.33m² °C/W

or

- twin layer with Durolite top sheet, 4mm thick polycarbonate with a 70mm air space between the 10mm Lexan Twinwall to achieve nominal visible light transmission levels of 40% when and has a nominal R value of 0.49m² °C/W

Natural lighting strips run from Ridge to gutter, sometimes with end lapped joints for lengths over 20m.

Only suitable for use as single lighting strips.

Not suitable for 2 or more natural lighting wide strips.

DURABILITY AND MAINTENANCE

The top roof sheet and lining sheet material coating must be selected correctly for the environment to which the Tricore system will be exposed and the wind and foot traffic loads, so a minimum 15 year durability is achieved.

Regular Maintenance every 6 to 12 months including removal of debris and manual washing by waterblasting or similar must be carried out on the top roof surface to avoid dirt and debris build ups. All rubbish and debris must be removed off the roof. Roof fixing Screw heads should be inspected and replaced if they are showing major signs of corrosion greater than 50% over the head.

The roof underside must not be subject to condensation or high relative humidity conditions for prolonged periods, particularly since any surface corrosion cannot be detected or maintained. The Tricore ventilated cavity is included to prevent such moist conditions from occurring.

WARRANTY

Durability of the Tricore system components is warranted for a period of 15 years provided all the components have been supplied by Dimond and Nuralite.

The selected roof coatings must meet the Colorcote/Colorsteel environmental category they will be installed into.

All regular maintenance must have been carried out over the warranty period.

SPECIAL CONDITIONS

The system components must be supplied by Dimond and must be installed by Dimond recommended installers.

For sites closer than 500m from salt spray zones please consult with Dimond before selecting and ordering the materials as warranty conditions may be affected. www.dimond.co.nz

FOR FURTHER INFORMATION

Contact: Dimond Roofing Technical ph. 0800 Roofspec (0800 766 377) or Dimond sales 0800 346 663

Website: www.dimond.co.nz

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