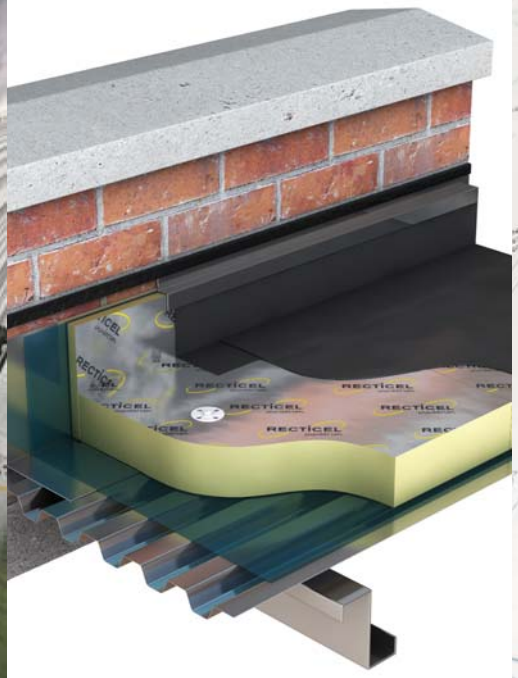
RECTICEL insulation



Eurothane® Silver

Product Guide

PIR insulation for Warm Flat Roofs.

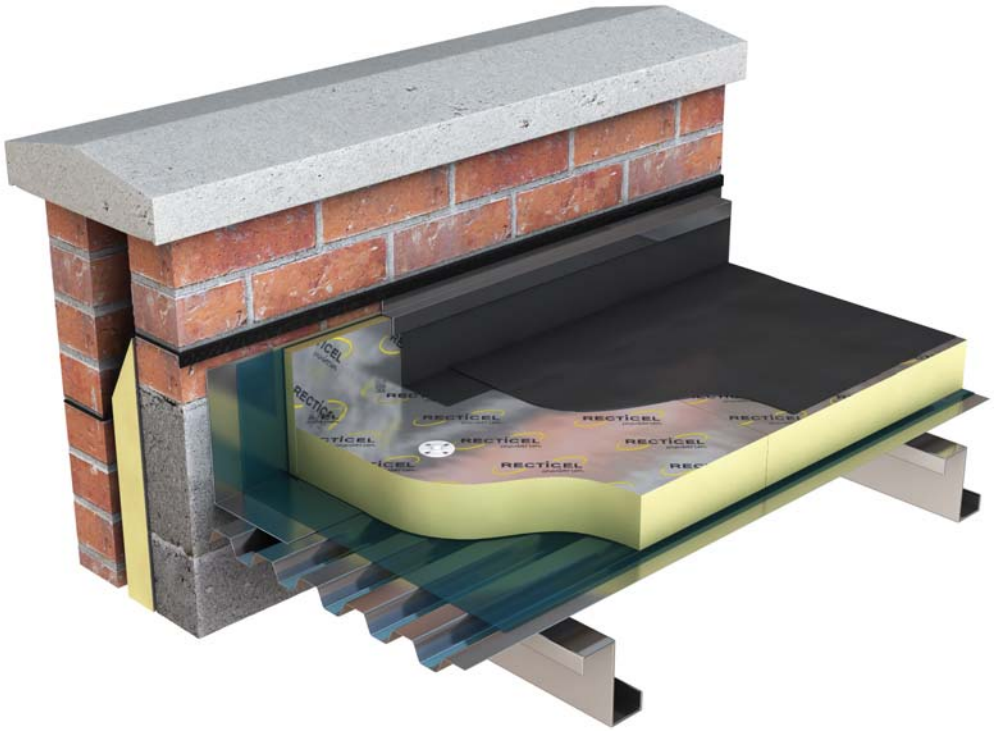
...a better way

Introduction

The Company.

Driven by a culture of innovation, technical competence and flair, Recticel Insulation Products is dedicated to raising the standard of quality of insulation products in the UK.

Recticel Insulation, based at its new state-of-the art facility in Stoke-on-Trent, is part of the International Recticel Group, one of the world's largest producers of PIR insulation products. At Recticel Insulation, quality is at the heart of everything we do. Striving for excellence in quality of both product and service, Recticel Insulation will raise the standards and product demands of the customer by delivering to the UK unparalleled PIR product and service quality. Our mission is, to demonstrate that, on all levels, Recticel Insulation will continue to deliver ***'a better way'*** of Insulation.



Insulation for Warm Flat Roofs.

Eurothane Silver is a high performance rigid polyisocyanurate (PIR) foam board for use in warm flat roofs under mechanically fixed single-ply membrane waterproofing systems.

Description.
Eurothane Silver is a closed cell, CFC and HCFC-free (zero ozone depletion), rigid polyisocyanurate foam core faced, both sides, with a multi-layer, coated aluminium foil. It has an exceptionally low thermal conductivity of 0.023 W/mK.

Benefits of Eurothane Silver warm flat roof insulation boards:

Wider choice.
Eurothane Silver, in a wide range of thicknesses, will assist in meeting the appropriate Building Regulation standard with any form of warm flat roof construction.

Quality.
Outstanding product quality manufactured to ISO 9001Quality Systems. All of our products carry the CE Mark to show compliance with the harmonised European Standard BS EN 13165.

Ozone friendly.
Zero ozone depletion potential.

Global warming.
CFCs, HCFCs and HFCs are all powerful greenhouse gases. Pentane on the other hand satisfies the "Green Guide to Specification" and the Intergovernmental Panel on Climate Change (IPCC) confirming a Global Warming Potential of below 5.

All our products have a global warming potential of below 5.

Low thermal conductivity.
The declared thermal conductivity value of 0.023 W/mK is some 30% more efficient than most other insulation materials.

Fire safe.
Eurothane Silver has Factory Mutual (FM) approval. It achieves a Class 1 rating in approved FM systems. Eurothane Silver has LPCB LPS 1181 approval.

Compatibility.
Fully compatible with most synthetic (PVC, EPDM etc) and bitumen based single-ply membrane waterproofing systems.

Warm roof construction.
No requirement for roof ventilation and inherently safe from harmful interstitial condensation.

Reduced risk of condensation.
Condensation within the roof structure is avoided as it is maintained at the same temperature as the inside of the building.

Handling.
Eurothane Silver is lightweight yet tough and resilient. The boards are easily cut using a knife or fine-toothed saw.

Durability.
Eurothane Silver boards are rot-proof, durable and maintenance free.

Lap joint edge profile.
Eurothane Silver is available with a Tongue and Groove edge detail to prevent thermal bridging at board joints.

Design

Waterproofing Systems.

Eurothane Silver boards are compatible with most mechanically fixed and loose-laid and ballasted synthetic (PVC, EPDM etc) and bitumen based single-ply membrane waterproofing systems.

Condensation.

The requirement for a vapour control layer must be assessed with reference to BS 5250 and BS 6229. If required, a minimum 1000g polythene sheet should be used.

Roof Loading.

Eurothane Silver boards are suitable for loads associated with the pedestrian maintenance traffic on the roof; for areas of heavier pedestrian traffic extra precautions should be taken such as the use of specially designed walkways (consult the membrane manufacturer for specific details). Care must be taken to avoid damage to boards by impact or by concentrated loads during installation. When using ballasted systems the roof structure must be designed to accept the additional dead load, minimum 80 kg/m^2.

Roof Drainage.

To ensure adequate drainage the roof should have a minimum finished fall of 1:80. This may mean designing for twice the minimum finished fall to account for building inaccuracies, roof deflection and building settlement.

Thermal Bridging.

With increasing levels of insulation it is vitally important to ensure continuity of the insulation at the junction of elements. At the junction of the roof and the wall packing the eaves with compressible mineral fibre insulation will both prevent thermal bridging and close the cavity.

At upstands and parapets the cavity wall insulation should be continued above the level of the roof to ensure continuity of the wall and roof insulation (See Figures 1 and 2).

Wind Uplift.

The wind uplift force exerted on the roof will vary according to geographical location, site location and building height. Reference should be made to BS 6399 and the membrane manufacturer's recommendations for the number of fixings and the fixing pattern.

Fire Performance.

The fire performance of Eurothane Silver depends upon the choice of waterproofing system. Generally an external fire rating of FAB will be achieved with mechanically fixed systems, whilst ballasted systems are deemed to achieve a fire rating of FAA.

Eurothane Silver is FM Approved to FM Standard 4450. The board achieves a Class 1 rating in these full scale fire tests - a performance comparable to that of mineral fibre. Eurothane Silver has LPCB LPS 1181 approval.

Figure 1.

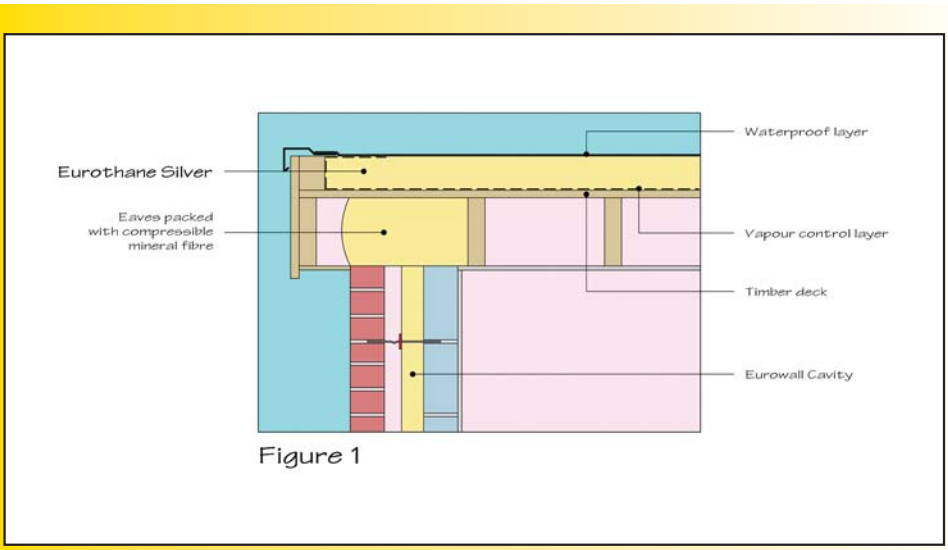


Figure 1

Figure 2.

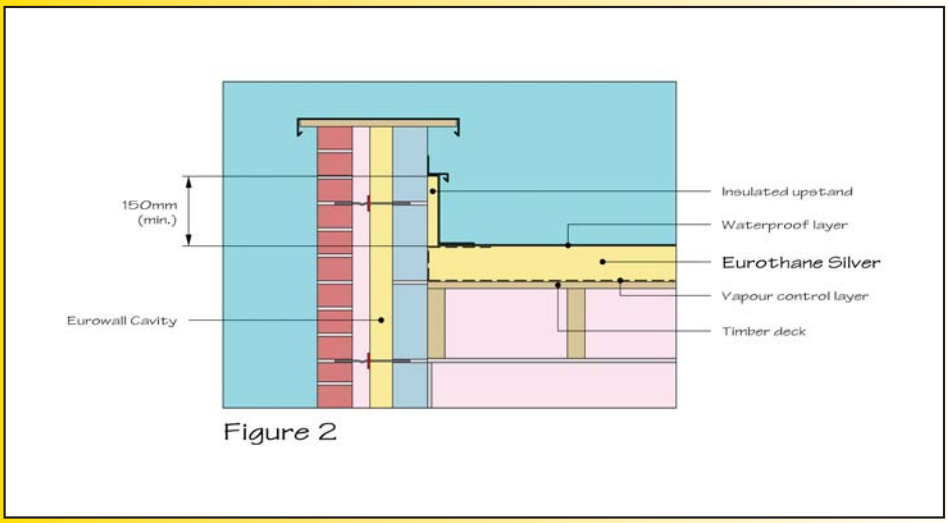


Figure 2

Installation

Timber Deck - Figure 3.

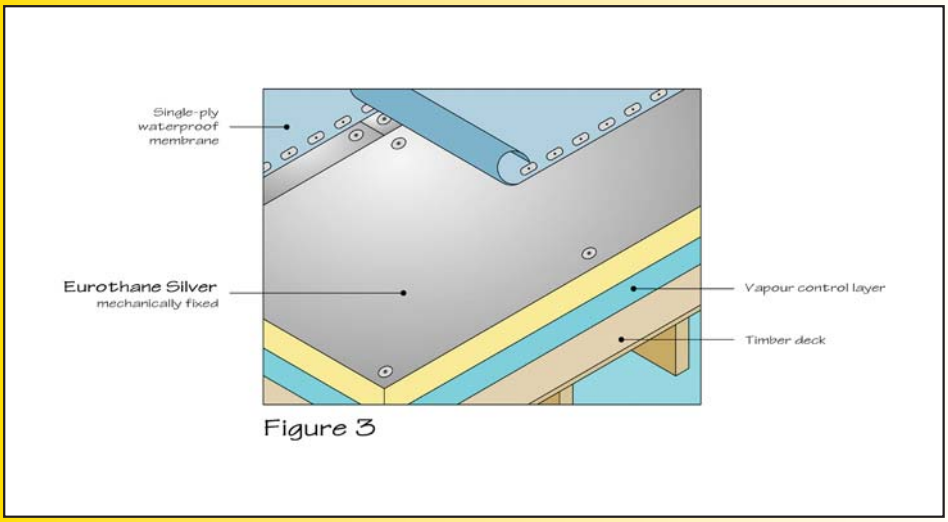


Figure 3

The usual procedure for construction (Figure 3) is:

1) If required a vapour control layer, normally 1000g polythene, is laid over the deck, ensuring a sealed 150mm overlap at the end and side laps. At roof edges, parapets, abutments etc allow sufficient extra polythene to either lap back on top of the insulation or to dress into the upstand by at least 250mm.

2) The Eurothane Silver boards are mechanically fixed using screw fixings incorporating a 50mm diameter washer within 50mm to 150mm of the edge or the corner of each board. Typically 6 fixings per board for a 2500x1200mm board. Additional fixings may be required in areas of especially high wind loads or around the perimeter of the roof where the wind uplift is greatest.

3) The vapour control layer should be turned back over the top of the boards and sealed.

4) The single-ply waterproof membrane is then laid in accordance with the manufacturer's recommendations either mechanically fixed or loose-laid and ballasted.

5) To prevent moisture ingress into the system during installation lay only sufficient Eurothane Silver boards that can be waterproofed in the same working period. Correctly seal and weather any joints or edges at the end of the day's work.

Metal Deck - Figure 4.

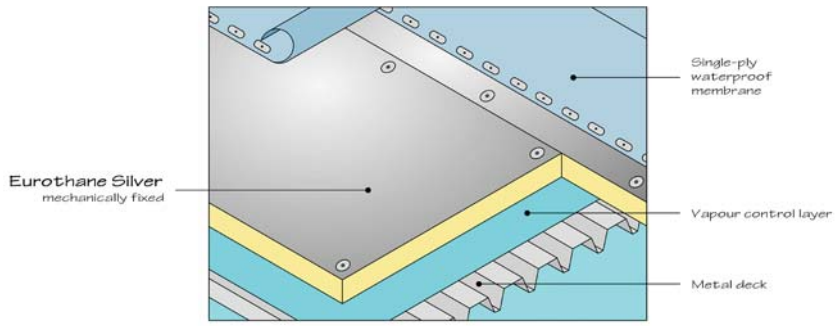


Figure 4

The usual procedure for construction (Figure 4) is:

1) If required a vapour control layer, normally 1000g polythene, is laid over the deck, ensuring a sealed 150mm overlap at the end and side laps. At roof edges, parapets, abutments etc allow sufficient extra polythene to either lap back on top of the insulation or to dress into the upstand by at least 250mm.

2) The Eurothane Silver boards are mechanically fixed using screw fixings incorporating a 50mm diameter washer within 50mm to 150mm of the edge or the corner of each board. Typically 6 fixings per board for a 2500x1200mm board. Additional fixings may be required in areas of especially high wind loads or around the perimeter of the roof where the wind uplift is greatest.

3) The boards should be laid either with their long edges across the troughs or diagonally across the roof to ensure that the short ends are fully supported (see table below).

4) The vapour control layer should be turned back over the top of the boards and sealed.

5) The single-ply waterproof membrane is then laid in accordance with the manufacturer's recommendations either mechanically fixed or loose-laid and ballasted.

6) To prevent moisture ingress into the system during installation lay only sufficient Eurothane Silver boards that can be waterproofed in the same working period. Correctly seal and weather any joints or edges at the end of the day's work.

Spanning on Metal Decks	
Eurothane Eurodeck Thickness (mm)	Maximum Span (mm)
30	100
40	150
45	175
50	200

Installation

Concrete Deck - Figure 5.

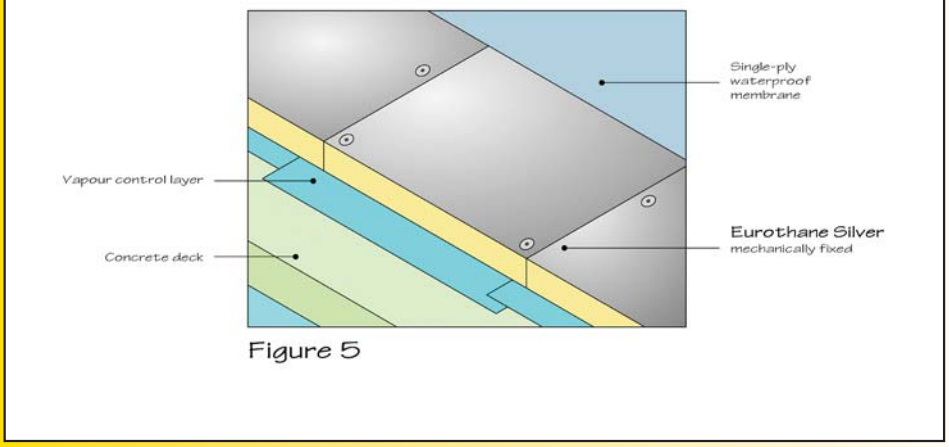


Figure 5

The usual procedure for construction (Figure 5) is:

1) The concrete deck must be dry, clean, and smooth and laid to the correct fall.

2) If required a vapour control layer, normally 1000g polythene, is laid over the deck, ensuring a sealed 150mm overlap at the end and side laps. At roof edges, parapets, abutments etc allow sufficient extra polythene to either lap back on top of the insulation or to dress into the up stand by at least 250mm.

3) The Eurothane Silver boards are mechanically fixed using either screw or hammer (expansion) fixings incorporating a 50mm diameter washer within 50mm to 150mm of the edge or the corner of each board. Typically 6 fixings per board for a 2500x1200mm board. Additional fixings may be required in areas of especially high wind loads or around the perimeter of the roof where the wind uplift is greatest.

4) The vapour control layer should be turned back over the top of the boards and sealed.

5) The single-ply waterproof membrane is then laid in accordance with the manufacturer's recommendations either mechanically fixed or loose-laid and ballasted.

6) To prevent moisture ingress into the system during installation lay only sufficient Eurothane Silver boards that can be waterproofed in the same working period. Correctly seal and weather any joints or edges at the end of the day's work.

Heat Loss Calculations.

The method of calculating U-values is the Combined Method (see BS EN ISO 6946) which as well as assessing the thermal bridge effect of mortar joints, timber studs etc also accounts for air gaps in the insulation and mechanical fasteners penetrating the insulation.

Timber Deck Plasterboard Ceiling	
Eurothane Silver Thickness (mm)	U-Value (W/m²K)
30	0.52
40	0.42
50	0.36
60	0.31
70	0.27
80	0.24
90	0.22
100	0.20
110	0.18
120	0.17
130	0.16
140	0.15
150	0.14
160	0.13
170	0.12
180	0.12
190	0.11
200	0.11

Single Ply mechanically fixed waterproofing, Eurothane Silver Insulation board, Metal lined VCL, 25mm Timber deck, Joist cavity Bridged by 50x200 joists at 450mm centres, 12.5mm plasterboard and 2mm skim. - Thermally broken fixings assumed

Metal Deck Plasterboard Ceiling	
Eurothane Silver Thickness (mm)	U-Value (W/m²K)
30	0.68
40	0.52
50	0.43
60	0.36
70	0.31
80	0.27
90	0.24
100	0.22
110	0.20
120	0.19
130	0.17
140	0.16
150	0.15
160	0.14
170	0.13
180	0.13
190	0.12
200	0.11

Single ply mechanically fixed waterproofing, Eurothane Silver Insulation, Metal lined VCL, Profile metal deck, Inside. - Thermally broken fixings used.

Concrete Deck (150mm) Plasterboard Ceiling	
Eurothane Silver Thickness (mm)	U-Value (W/m²K)
30	0.55
40	0.45
50	0.37
60	0.32
70	0.28
80	0.25
90	0.23
100	0.21
110	0.19
120	0.17
130	0.16
140	0.15
150	0.14
160	0.13
170	0.13
180	0.12
190	0.11
200	0.11

Single ply mechanically fixed waterproofing, Eurothane Silver Insulation, Metal lined VCL, 150mm Concrete deck, 25mm batten cavity, 12.5mm Plasterboard, Plaster Skim, Inside. - Thermally broken fixings used.

Technical Details

Eurothane Silver board is available in the following dimensions:

Length (mm)	2500
Width (mm)	1200
Thickness (mm)	30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150

Some thicknesses may be subject to minimum order quantities. Other sizes available on request. Eurothane Silver insulation is also available as a tapered board through our specialist single layer tapered insulation division Gradient Insulation Limited.

GRADIENT FLAT ROOFING The Tapered Roofing Experts www.gradientuk.com

Thicker boards, above 100 mm, are available with a lap joint edge detail to prevent thermal bridging at board joints. Subject to order quantity other board lengths are available in order to avoid longitudinal cutting of the boards.

Specifications Clause.
The flat roof insulation shall be ..... mm thick Recticel Eurothane Silver CFC and HCFC-free, rigid PIR foam with multi-layer, coated aluminium foil, facings to both sides. Insulation to be installed as work proceeds in accordance with BBA Certificate No. 95/3113 and Recticel Insulation Products instructions.

Eurothane Silver Designation Code.
PUR - EN 13165 - T2 - DS(TH)8 - DLT(2)5 - CS(10/Y)150 - TR80 - WL(T)2

Compressive Strength.
The compressive strength exceeds 150kPa at yield.

Thermal Conductivity.
The declared thermal conductivity, λD-value of Eurothane Silver is 0.023 W/mK when tested using BS EN 13165: 2001.

Moisture Vapour Transmission.
The foil faces of the Eurothane Silver board give it an almost infinite water vapour resistance value. The joints between boards however will facilitate the passage of moisture vapour under normal conditions of temperature and humidity; a practical value for the moisture vapour resistance of the system is 100 MNs/g.

Specific Heat Capacity.
The specific heat capacity is 1.4 kJ/kgK.

Durability.
When correctly installed, Eurothane Silver boards are maintenance free and have an indefinite life at least equal to that of the building.

Storage.
Eurothane Silver boards are supplied wrapped in polythene to provide short term protection. On site the boards should be stored in dry conditions, clear of the ground, on a clean level surface.

Resistance to Solvents.
The foam is not resistant to ketonic solvents. Boards that have been in contact with harsh solvents, petrol, mineral oil, or acids, should not be used.

Reaction to Fire.
Euroclass F (BS EN 13501-1)
Class 1 (BS 476, Part 7)
FM Approval Class 1 (FM Standard 4450)
LPCB LPS 1181 approval.

Health and Safety.

Eurothane Silver Insulation boards are inherently safe to handle. During cutting or machining any dust generated is of nuisance value only. Large scale machining should be connected to a dust extraction system. Please note that the reflective surface on this product is designed to enhance its thermal performance. As such, it will reflect light as well as heat, including ultraviolet light. Therefore, if this board is being installed during bright weather, it is advisable to wear UV eye protection, and if the skin is exposed for a significant period of time, to protect the bare skin with a high SPF sun cream. The reflective facing used on this product can become slippery when wet. Ensure care is taken to avoid skin and eye contact with any sharp edges. Do not stand on or otherwise support your weight on this board unless it is fully supported by a load bearing surface. A comprehensive health and safety data sheet is available from Recticel Insulation Products upon request.

References.

BBA Certificate No. 95/3113.
The Building Regulations and supporting documents.
Thermal Insulation: avoiding risks.
Limiting Thermal Bridging and Air Leakage: Robust Construction Details for Dwellings and Similar Buildings (DTLR/DEFRA).
CIBSE Guide A3 - Thermal Properties of Building Structures.
BS 5250 Code of Practice for Control of Condensation in Buildings.
BS 6229 Code of Practice for Flat Roofs with Continuously Supported Coverings.
BS 6399 Loadings for Buildings.
BS 8000 Workmanship on Building Sites.
Part 4 Code of Practice for Waterproofing.
BRE Digests, Information Papers and Good Building Guides.
Single Ply Roofing Association (SPRA) Design Guide for Single Ply Roofing 2007 Edition.
Information Document: BRUFMA ID/1/2009 - MECHANICAL FIXINGS FOR RIGID POLYISOCYANURATE (PIR) AND POLYURETHANE (PUR) ROOFBOARDS BENEATH SINGLE-PLY WATERPROOFING MEMBRANES.
Information Document: BRUFMA ID/3/2009 - GREEN ROOFS AND BALLASTED ROOFS: PROTOCOL FOR THE SECUREMENT OF RIGID POLYISOCYANURATE (PIR) AND POLYURETHANE (PUR) ROOFBOARDS BENEATH SINGLE-PLY WATERPROOFING MEMBRANES.

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