



Specification Document

for

BMI EverGuard® TPO Single Ply Roofing System

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CHAPTER 1 EXTENT OF WORK

1.1 WORK IDENTIFICATION

This specification covers BMI EverGuard® TPO Single Ply membrane roofing and waterproofing solutions' either in new construction or re-covering applications.

The contractor shall refer to the "Particular Specifications" and "Installation Guide" to check which items are relevant.

The works covered by this specification includes:

- ❑ Mechanically fixed single-ply TPO membrane roofing and waterproofing solutions for non-accessible flat, curved and pitched roofs up to 20° degree inclination.

1.2 REGULATIONS, STANDARDS & CERTIFICATIONS

1.2-1 INTERNATIONAL STANDARDS

Materials shall have the characteristics specified by current international regulations or failing these shall meet the conditions specified by current local standards.

Standards of reference are as follows:

- **EN 13956** Flexible sheets for waterproofing - Plastic and rubber sheets for roof waterproofing
- **UEAtc** (European Union for technical Agreement in construction)
- **ASTM** (American Society for Testing Materials)
- **BBA** (British Board of Agreement)
- **DIN** (the German Institute for Standardization)

1.2-2 PRODUCT AND SYSTEM CERTIFICATIONS

- Polymeric sheets for waterproofing according to EN 13956, certified by the notified body 1213-CPR-6897 and provided with the CE mark.
- Reaction to fire according to EN 13501-1. Product fire Class E.
- External fire performance tested according to ENV 1187 and classified according to EN 13501-5: Broof(t1)* and Broof(t4)*.
- Approved according to FM Global
- KOMO certificate.
- EPD (Environmental Product Declaration – Dec. No: EPD10292)
- Comply with LEED® certification points

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1.2 QUALITY ASSURANCE

1.3-1 GENERAL

The Roofing and Waterproofing systems shall be laid in strict conformity with the manufacturer's instructions and the enclosed substrate preparation specifications. Waterproofing material shall be properly stored in a clean covered area and shall be kept dry and away from heat and sun.

During the mobilization period, the Contractor shall submit its works program and its On-Site Quality Control Plan.

1.3-2 PROTECTION AND SAFETY ON SITE

The Contractor shall abide by all means to National and International Labor and health regulations. Safety precautions on Site shall incorporate, but are not limited to:



- All roofs to be fitted at the perimeter by handrails with safety nets.
- All ladders and temporary stairs are well secured at top and bottom.
- Sufficient number of fire extinguishers to be available.
- Required polyethylene sheet or tarpaulin to prevent spraying on adjacent structures or equipment.
- Workers wear safety gloves, protection clothes and all necessary safety equipment.

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1.3-3 FIELD QUALITY CONTROL

Testing welding joints: See “**BMI EverGuard TPO Installation Guide**” attached for welding seam checking.

A. Inspect completed roof sections on a daily basis. It is the contractor’s responsibility to probe all heat-welded seams and perform an adequate number of seam cuts to ascertain seam consistency.

C. Immediately correct all defects, irregularities, and deficiencies identified during inspections. All voids that are found must be patched over per specifications. Do NOT re-weld seam voids more than 24 hours after initial welding of the seam.

D. Remedial work must be performed with materials and in a manner consistent with the balance of the roofing installation so as to minimize the number of repair patches.

1.3-4 EXTENDED INTERNATIONAL GUARANTEE

10 years international guarantee shall be provided by the manufacturer to the benefit of the Client for materials and design of waterproofing (BMI Product Guarantee). For extended “BMI System and Solution Guarantees”, please contact us for a project basis.

The BMI SOLUTION GUARANTEE that covers product system and installation, is applicable if work is performed by a **BMI RoofPro Expert** or Elite and in accordance with the BMI technical specification.



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	BMI Product Guarantee	BMI System Guarantee	BMI Solution Guarantee
EverGuard TPO Membrane 1.5 mm	Membrane cover only. Limited to material replacement. 20 YEAR GUARANTEE	"Edge to Edge" cover against water ingress for BMI System components (membrane, detailing, fixings, insulation and VCL) when installed correctly in accordance with this Guide 20 YEAR GUARANTEE	Complete "Edge to Edge" cover against water ingress for BMI System components and installation, when completed by a BMI RoofPro certified contractor 20 YEAR GUARANTEE
EverGuard TPO Membrane 1.8 mm	Membrane cover only. Limited to material replacement. 20 YEAR GUARANTEE	"Edge to Edge" cover against water ingress for BMI System components (membrane, detailing, fixings, insulation and VCL) when installed correctly in accordance with this Guide 20 YEAR GUARANTEE	Complete "Edge to Edge" cover against water ingress for BMI System components and installation, when completed by a BMI RoofPro certified contractor 20 YEAR GUARANTEE
EverGuard TPO Membrane 2.0mm	Membrane cover only. Limited to material replacement. 25 YEAR GUARANTEE	"Edge to Edge" cover against water ingress for BMI System components (membrane, detailing, fixings, insulation and VCL) when installed correctly in accordance with this Guide 25 YEAR GUARANTEE	Complete "Edge to Edge" cover against water ingress for BMI System components and installation, when completed by a BMI RoofPro certified contractor 25 YEAR GUARANTEE

	BMI Product Guarantee	BMI System Guarantee	BMI Solution Guarantee
EverGuard TPO Extreme Membrane 1.5 mm	Membrane cover only. Limited to material replacement. 25 YEAR GUARANTEE	"Edge to Edge" cover against water ingress for BMI System components (membrane, detailing, fixings, insulation and VCL) when installed correctly in accordance with this Guide 25 YEAR GUARANTEE	Complete "Edge to Edge" cover against water ingress for BMI System components and installation, when completed by a BMI RoofPro certified contractor 25 YEAR GUARANTEE
EverGuard TPO Extreme Membrane 1.8 mm	Membrane cover only. Limited to material replacement. 30 YEAR GUARANTEE	"Edge to Edge" cover against water ingress for BMI System components (membrane, detailing, fixings, insulation and VCL) when installed correctly in accordance with this Guide 30 YEAR GUARANTEE	Complete "Edge to Edge" cover against water ingress for BMI System components and installation, when completed by a BMI RoofPro certified contractor 30 YEAR GUARANTEE
EverGuard TPO Extreme Membrane 2.0mm	Membrane cover only. Limited to material replacement. 35 YEAR GUARANTEE	"Edge to Edge" cover against water ingress for BMI System components (membrane, detailing, fixings, insulation and VCL) when installed correctly in accordance with this Guide 35 YEAR GUARANTEE	Complete "Edge to Edge" cover against water ingress for BMI System components and installation, when completed by a BMI RoofPro certified contractor 35 YEAR GUARANTEE



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CHAPTER 2 SUBMITTALS & MATERIAL SPECIFICATIONS

2.1 SUBMITTALS

Product data: Manufacturer's printed specification and installation instructions, including procedures and materials for termination, penetrations, flashing, compatibility and bonding.

The Contractor shall provide with his submittals all the relevant Standards documentation.

Shop drawings: Indicate layout of sheets including side and end laps, Windup lift calculation, mechanical equipment flashing, parapet flashing, and drain details.

2.2 WATERPROOFING CONTRACTOR CERTIFICATION

The Waterproofing Contractor is required to:

- Submit manufacturer's training certificate.
- Submit manufacturer's approved installers' card.
- Submit complete details about the contractor's company: company profile, list of specialized staff with their respective qualification and experience in the local climatic conditions, evidence of their ability to handle projects of a similar volume, specific experience in the local area and list of equipment.

2.3 STORAGE OF MATERIALS

EverGuard TPO membranes must be stored in a horizontal position and protected against mechanical damage and from direct sunlight, rain and snow. EverGuard TPO should be transported in covered transportation means and stored in an original closed packaging. Further notice and packaging recommendations are to be observed in the “**BMI EverGuard TPO Installation Guide and its Appendix**”.

The storage of materials is a part of the guarantee so all the materials shall be stored accordingly.

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2.4 PRODUCTS

2.4-1 INTRODUCTION

Best-in-class and unique on the market, **BMI EverGuard® TPO** with more than 300 million m² already installed in the North American and European markets.

A high-quality product performance with a strong focus on the sales approach makes BMI one of the preferred partners to care about your roofs and give a piece of mind. With our product portfolio and services, BMI is able to offer a system solution to all kinds of roofs coroneted with an optimal warranty concept.

Advantages of the Everguard TPO:

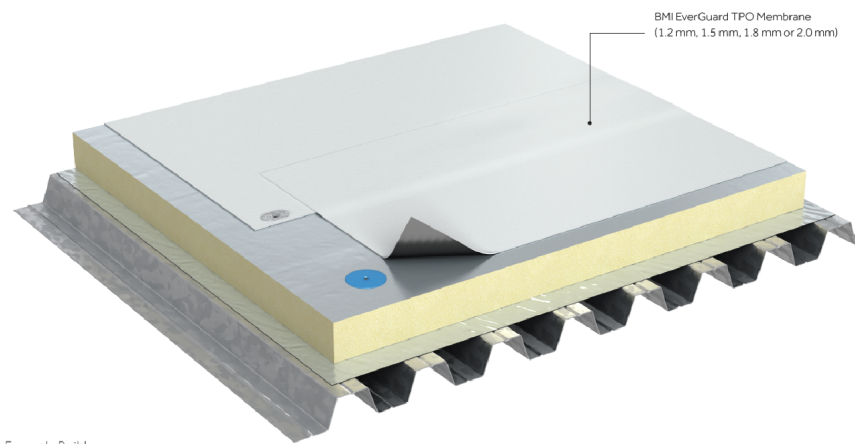
- Lightweight solution
- Hot-air welding: Perfect weldability, with good welding parameters
- High resistance against UV irradiance and all common environmental influences
- High dimensional stability and tensile strength
- Flexible also at low temperatures
- High wind-uplift value
- Chemical resistance
- Free of halogenated flame retardants
- PVC – free, no liquid plasticizers used
- Recyclable



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2.4-2 MAIN PRODUCT

EverGuard® TPO Single Ply roofing membrane for mechanically fixed application:



BMI EverGuard® TPO is a plasticizer and halogen-free single-ply roofing membrane with a **polyester knitted scrim reinforcement**, based on a flexible polyolefin (FPO) according to EN 13956 and DIN SPEC 20000-201:2015-08.

EN 13501-1 class E and EN 13501-5 BroofT1.

Dimensions

Thickness: 1,2 mm- 1,5 mm- 1,8 mm - 2,0 mm

Widths: 1,0/ 1,52 /2,44 / 3,05 / 3,65 m

Roll length: depending on thickness (20 m or 30 m)

Colours

White and Grey.

Application areas :

- For mechanical fixings on UV exposed roofs
- For non-accessible roofs with a sloop (>1%) including utility areas
- On substrates in concrete, steel-deck, timber or wood derivative boards
- On insulation boards: complying with BMI system and approvals recommendation as well as supplier's technical documentation & local regulations
- On new roof or in re-roofing
- On premises with low, medium or high hygrometry
- EverGuard TPO is mechanically fixed and the overlaps have to be welded by hot air

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Technical Properties:

Characteristics	Value of statement	Tolerance	Test Method
Visible defects	Pass	-	EN 1850-2
Length	20 m / 30 m	-0/+5 %	EN 1848-2
Width	1,52 / 3,03	-0,5/+1 %	EN 1848-2
Straightness	≤ 30 mm/5 m	-	EN 1848-2
Flatness	≤ 10 mm	-	EN 1848-2
Mass per unit area	1,22 / 1,53 / 1,84 / 2,05 kg/m ²	-5/+10 %	EN 1849-2
Effective thickness	1,2 / 1,5 / 1,8 / 2,0 mm	-5/+10 %	EN 1849-2
Water tightness	pass	-	EN 1928 (B)
External fire performance	Broof *	-	ENV1187 & EN 13501-5
Reaction to fire	Class E	-	EN 13501-1
Peel resistance of joints	≥ 150 N/50 mm	-	EN 12316-2
Shear resistance of joints	≥ 800 N/50 mm	-	EN 12317-2
Tensile strength	≥ 1150 (MD) / 1150 (CD) N/50 mm	-	EN 12311-2 (A)
Elongation MD and CD	≥ 20 %	-	EN 12311-2 (A)
Resistance to impact	≥ 400/1150 mm	-	EN 12691 (A / B)
Resistance to static loading Methode A/B	≥ 20 kg ≥ 15 kg	-	EN 12730 (A/B)
Tear resistance	≥ 375 N ≥ 475 N	-	EN 12310-2
Dimensional stability	≤ 0,4 % / ≤ 0,3 %	-	EN 1107-2
Foldability at low temperature	≤ -25 °C	-	EN 495-5
UV exposure	pass	-	EN 1297
Hail resistance	≥ 19/19 m/s	-	EN 13583
Water vapour properties	100.000	-	EN 1931

* For more details on tested roofing systems,
Please contact BMI technical department.

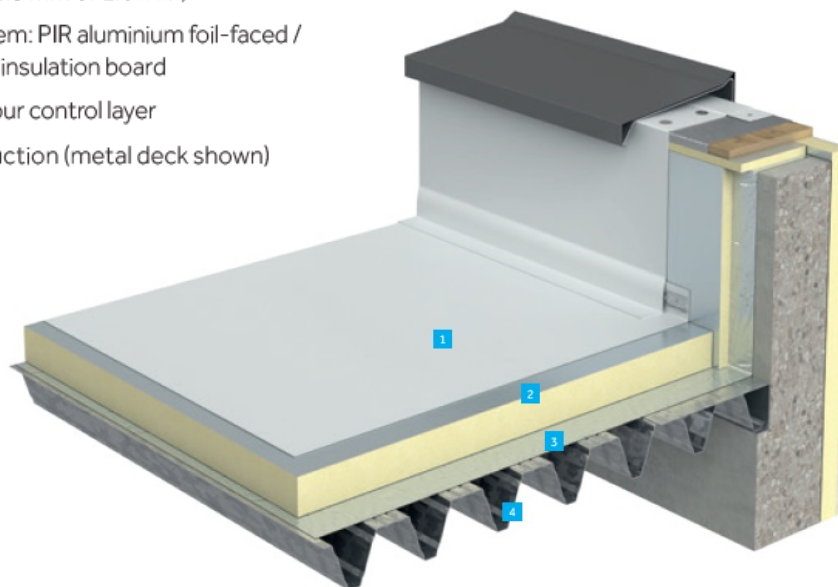
SRI (Solar Reflectance Index) value:

SRI (Solar Reflectance Index) Initial / aged	94/81 83 Aged Title 24
Reflectivity (white) Initial / Aged	0.76/0.68 81.9% Reflectance
Emissivity (white) Initial / Aged	0.90/0.83 0.94

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FM APPROVED SYSTEM and SOLUTION EXAMPLES:

- 1 BMI EverGuard TPO Membrane
(1.2 mm, 1.5 mm, 1.8 mm or 2.0 mm)
- 2 FM Approved System: PIR aluminium foil-faced /
glass tissue-faced insulation board
- 3 BMI approved vapour control layer
- 4 Substrate construction (metal deck shown)
by others



Assembly No. 391691-0-0

Membrane:	EverGuard TPO
Substrate:	Steel deck
Insulation:	Mineral wool / PIR
Fixation:	Mechanical
Slope:	0.5000
Wind uplift:	60
Hail:	SH
Internal fire resistance:	1
External fire resistance:	A

Assembly No. 442665-0-0

Membrane:	EverGuard TPO
Substrate:	Steel deck
Insulation:	Mineral wool / PIR
Fixation:	Mechanical
Slope:	0.5000
Wind uplift:	135
Hail:	SH
Internal fire resistance:	1
External fire resistance:	A

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2.4-3 SYSTEM COMPONENTS

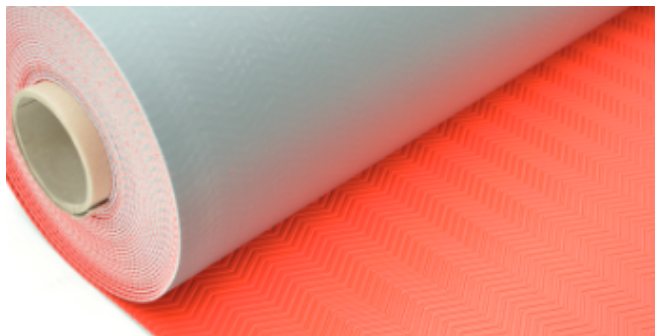
EVERGUARD TPO 1,5 mm DETAILING MEMBRANE (unreinforced)



EverGuard TPO 1,5 mm thick unreinforced detailing membrane is intended to be used in the formation of internal/external corners when the angle does not fit to the prefabricated corners, for field fabricated pipe flashings, sealant pockets and scuppers when the use of pre-moulded accessories are not feasible.

- Thickness: 1.5 mm
- Width: 0.6 m
- Length: 15.24 m
- Colour: White or grey

EVERGUARD TPO Walkway Membrane



EverGuard TPO Walkway Membrane is a weather resistant TPO membrane which is red in colour and incorporates an aggressive, non-slip, interlocking herringbone tread pattern.

- Thickness: ≥ 1.9mm (inclusive embossing profile)
- Width: 0.74 m
- Roll Length: 15 m
- Colour: Red

The EverGuard TPO walkway membrane is intended for use on EverGuard TPO roofing membranes as well as delineating safe access routes, the membrane provides protection to the waterproofing membrane against mechanical damage in areas exposed to repetitive foot traffic.

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Vapour Control Layer (VCL)

The presence of a vapour control layer helps to maintain the airtightness of the roof. The specification of the vapour control layer is dependent upon a number of factors, such as deck type, method of attachment of the VCL and method of attachment of the insulation and waterproofing.

BMI supplies a range of high performance polyethylene, aluminium-polyester-composite foils and bituminous vapour control layers for use with its single ply roofing systems.

Loose Laid VCL

For mechanically fastened situations, the **Monarflex range** of reinforced polyethylene VCL or **Parevapo PE** polyethylene VCL's provide a quick and cost effective method of vapour control.

Monarflex VCL membranes are loose-laid with laps sealed with Monobond LT tape, and are secured to the roof deck through the mechanical fastening of the insulation board. Monarflex multi-layer VCL's are manufactured from virgin polyethylene with built-in reinforcement grids of HDPE making them highly resistant to tears and damage. Some also have a layer of aluminium foil for higher water vapour resistance for a minimum of performance. For further guidance and product information contact your BMI Technical Support. Lay the Monarflex vapour control layer without folds or wrinkles, allowing for minimum 100mm side and end laps. Seal all laps with Monobond LT double-sided sealant tape. Turn the vapour control layer up at all upstands, kerbs and penetrations etc. to maintain an air tight barrier.

Parevapo PE : polyethylene vapour barrier, thickness $\geq 300 \mu\text{m}$

Parevapo PE is loose-laid directly on a masonry support with a smooth, regular and neat appearance.

Separation Layer

Monarplan NTS 300: 300 g/m² non-woven geotextile

Monarplan NTS 300 should be applied between the substrate and vapour control layer (Parevapo PE) if the masonry support is not smooth, regular and neat.

Verecran 100: glass fleece is recommended as a separation layer on top of EPS insulation boards

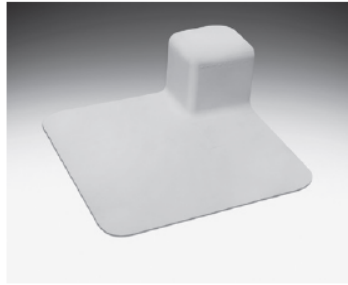
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EVERGUARD® TPO Prefabricated Corners

EverGuard TPO Prefabricated Corners aid speed of installation on site, and are used to reinforce internal and external corners with no stretching or cutting. Available in white and grey colors.



Fluted corner



Universal Corner



Inside Corner

EVERGUARD TPO Metal Bar:

The Fixation Bar is designed for securing and sealing membrane terminations at upstands in accordance with current BMI specifications.

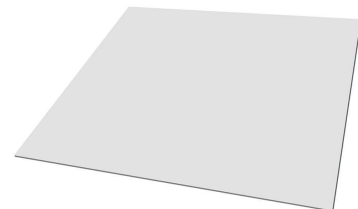
The 3 metre long bar incorporates pre-drilled holes at 150 mm centres.



EVERGUARD TPO METAL SHEET – 1000 x 2000 x 1,2 mm

EverGuard TPO Coated Metal is a 0.6 mm hot dipped galvanised steel sheet coated with a layer of 0.6 mm non-reinforced TPO film for an overall thickness of 1.2 mm. The sheet is cut into appropriate widths and used to fabricate metal drip edges or other roof perimeter edging profiles. The coated metal can also be used to provide mechanical restraint at any changes in level, abutments or roof area perimeters.

- Pre-cut sheet: 1 m x 2 m.
- Coils: 1 m on 30 m.
- Colour: White or grey



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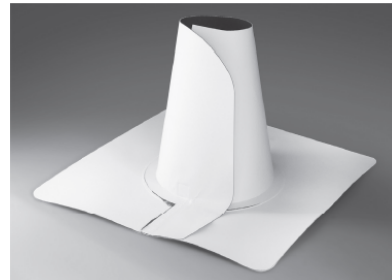
EVERGUARD TPO Pipe Flashings:

Pipe flashings are moulded preformed TPO pipe flashings designed to suit a range of pipe diameters, achieving a watertight seal. There are two types available, one for pipes venting at roof level and one for pipes that are continuous.

Available in white and grey colors.



Vent Boot



Split Pipe Boot

MECHANICAL FIXING FASTENERS:

Screw fasteners are manufactured from high grade carbon steel which are case hardened to achieve the properties essential for long term performance and have an organic corrosion resistant finish to meet UEAtc Part 2 requirements. The fasteners are also available in austenitic stainless steel offering exceptional corrosion resistance for extended warranty projects and for refurbishment.



Tubular washers are precision moulded from high grade Polypropylene / Polyamide and extensively tested to ensure resistance to the extreme temperatures and mechanical stresses encountered within the roofing system.

Prior to application of the EverGuard TPO reinforced membrane, a wind uplift calculation must be carried out in accordance with EN 1991: Parts 1 – 4 to determine the correct fixing centres specific to the project. For confirmation of the appropriate

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size of washers and fasteners refer to the “**BMI Drill-Tec fastener**” product datasheet.

EVERGUARD CLEANER 5L :

A seam cleaner used to clean exposed or contaminated seams prior to heat welding to remove any residual soap or to revitalize aged membranes.

If the membrane stays open more than 12 hrs, then the overlap seams should be cleaned with TPO Cleaner prior to heat welding.

NOTE: Unexposed membrane left in inventory for a year or more may need to be cleaned as instructed above.



TPO Contact Adhesive:

TPO Contact Adhesive of BMI is a contact-type bonding adhesive specially designed for bonding smooth back TPO single-ply roofing membranes and flashings to various roofing substrates including sheet metal, concrete, wood among others.



Application amount: 250 - 300 g/m²

Drum : 20 lt

Pallet : 24 drums/pallet

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CHAPTER 3 INSTALLATION PROCEDURE

Please consult “**BMI EverGuard® Installation Guide**” for all details before starting the application.

Substrates:

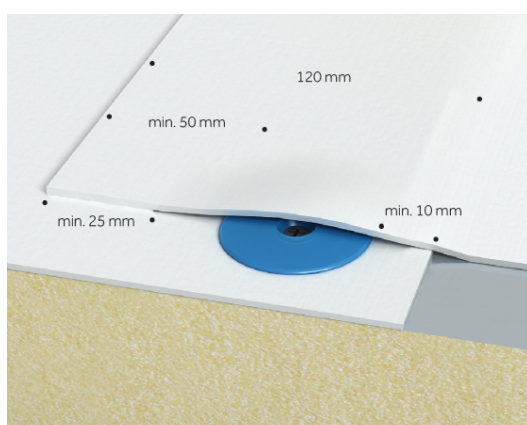
The load bearing structure (trapezoidal metal sheet, concrete or wooden) must comply with all associated national standards and regulations, ensuring that the load bearing capacity is sufficient for any additional loads imposed upon the construction. It is important to consider the possibility of future deflection of the construction when designing roof drainage.

Substrate preparation:

Prepare substrate surfaces thoroughly prior to application of new roofing materials. This is particularly important for refurbishment applications.

Providing a smooth, even, sound, clean, and dry substrate minimises the likelihood that underlying deficiencies will cause premature deterioration or even failure of the new roofing system.

Application: Overlapping sheets are welded together to form a homogenous lap using hot air equipment. The EverGuard TPO membrane is mechanically attached through to the structural deck using fasteners of appropriate length. The fasteners are required to penetrate the structural deck to a minimum distance which is dependent upon substrate type. The fasteners are subsequently waterproofed / protected by hot air welding the overlapping adjoining sheet. Fixing centres are determined following completion of a wind uplift calculation, carried out during the initial design stage.



Example side lap overlap with tube washer fixing



Example side lap overlap with seam plate fixing.

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Perimeter Fixing & Angle Changes shall be done according to the BMI Install Guide as attached.

Parapets and all membrane terminations shall be done according to the BMI **EverGuard TPO Installation Guide** as attached.

Walkways: Weld EverGuard TPO Walkway directly to the underlying EverGuard TPO single ply roofing membrane, by first pre-welding before fully welding along the edge. All edges of the EverGuard TPO Walkway should be fully welded in this manner. Leave a 15 mm gap between adjacent sections of walkway where the crossing over a lap in the single ply roofing membrane below. A gap should also be left where the walkway membrane impedes the flow of water across the roof.

New termination of the ventilation units shall be done with a TPO metal sheet and metal bar around them for mechanical fixing. All corners shall be done with prefabricated TPO corners.

All EverGuard® coated metal and membrane flashing corners must be reinforced with pre-formed corners or non-reinforced membranes.

See for further application details the guidelines of **BMI EverGuard® TPO Installation Guide**.

"The present document has been established on the base of the information provided and is purely indicative and non exhaustive. It cannot be substituted to recommendation and/or specifications made by professionals such as project manager, designing/engineering consultant, architect, and advisors. BMI cannot be liable in this regard. You must strictly ensure that the technical solution fits your project and has been validated by professionals and comply with any applicable regulations. You will find some technical documentation on our website: www.bmigroup.com/international"