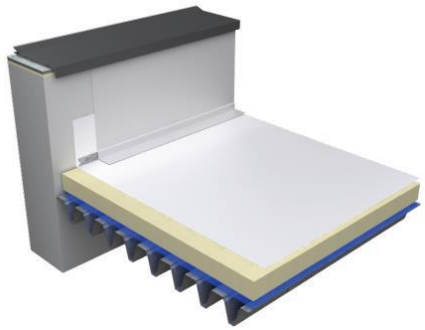
ROOF SYSTEM BMI

Waterproofing and insulation system for flat roofs composed of TPO membrane and PIR thermal insulation

EverGuard TPO System

ROOF SYSTEM

Waterproofing and insulation system for flat roofs



Description

Waterproofing and insulation system for flat roofs composed of EverGuard TPO polyolefin membrane reinforced inside with a polyester mesh armor and polyisocyanurate foam (PIR) thermal insulation.

Contact information

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Summary table: Environmental Parameters, in which products have a specific contribution.
Contribution detailed in LEED and BREEAM sections.

Support Documentation | ***Certifications :*** *EPD, CSR, REACH* | ***Self-declare*** | ***Potential***

Site Mobility	Solar Reflectance Index SRI	Rainwater Management	Exterior Lighting.	…					
Energy Atmosphere	Embodied Energy	Effect of greenhouse gases	Energy Demand Reduction	Equipment Efficiency	Other Polluting gases	Renewable energy	Energy management	…	
Materials	Accredited location	Pre-consumer recycled content	Post-consumer recycled content	Potential reuse	Certified wood	Construction waste	Chemical composition	Rehabilitation intervention level …	
Water	Consumption < reference	Water management	…						
Indoor Environment	Low VOC emissions	Low formaldehyde emissions	Comfort control	Lighting comfort	Acoustic comfort	Air quality	…		
Innovation	Innovation	…							

NOTES:

1. The information included in this document shows product compliance with environmental certification (VERDE, LEED or BREEAM) criteria. The analysis is performed based on the information provided by manufacturer. To ensure the compliance of these credits, it will be necessary during the process of any of the certifications to verify the validity of the information and data provided by the company.
2. This document does not constitute a product certification, nor does it guarantee compliance with local regulations.
3. The conclusions of this study apply only to products included in this report, and are subject to the invariability of product technical conditions.
4. The validity of this document is subject to supporting documents expiration date, regulations variation, and environmental certification systems updates.
5. This document informs about products possible contribution to VERDE, LEED or BREEAM certifications. However, the final decision on whether or not a product meets certification requirements is exclusive to certification bodies: GBCI (Green Business Certification Inc.) for LEED certification and BREEAM ES for BREEAM certification.

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SUMMARY OF CREDITS

LEED v4

ENERGY & ATMSOPHERE (EA)

- EA, Minimum energy performance (prerequisite)
- EA, Energy Efficiency Optimization (credit)

SUSTAINABLE SITES (SS)

- SS, Reduced heat island effect

MATERIAL & RESOURCES (MR)

- MR, Reducing the impact of the life cycle of the building
- MR, Transparency and optimization of construction products - Environmental Product Declaration
- MR, Transparency and optimization of construction products - Sources of raw materials
- MR, Transparency and optimization of construction products - Sources of raw materials

INNOVATION (IN)

- IN, Innovation

Environmental LEED Categories

(LT) Location & Transportation

(SS) Sustainable Sites

(WE) Water Efficiency

(EA) Energy & Atmosphere

(MR) Material & Resources

(IEQ) Indoor Environmental Quality

(ID) Innovation

(RP) Regional Priority

LEED Certification Standards (v4)

EB	Existing Building	RNC	Retail New Construction	DCNC	Data Center NC
NC	New Construction	REB	Retail Existing Building	DCEB	Data Center EB
CI	Commercial Interiors	RCI	Retail Commercial Interiors	WNC	Warehouse NC
CS	Core & Shell	HC	Healthcare	WEB	Warehouse EB
SNC	School New Construction	HNC	Hospitality-New Constr.	NDP	Neighborhood Devel. Plan
SEB	School Existing Building	HEB	Hospitality-Existing Building	ND	Neighborhood Develop.
MRB	Mid Rise Buildings	HCI	Hospitality-Commercial Int.	HO	Homes

CREDIT SHEET
LEED v4

CATEGORY
(EA) ENERGY & ATMSOPHERE

- **EA, Minimum energy performance (prerequisite)**
- **EA, Energy Efficiency Optimization (credit)**
  (NC, CS, SNC, RNC, HC, HNC, DCNC, WNC)

Aim	Reduce the environmental and economic damages of excessive energy consumption by obtaining a minimum level of energy efficiency in the building and its systems. Achieve increasing levels of energy performance beyond the prerequisite standard.
Compliance data	The polyisocyanurate (PIR) foam composite thermal insulation membranes, which are part of BMI's EVERGUARD system, have very low thermal conductivities and must be taken into account when calculating the efficiency and energy savings of buildings, contributing to the reduction of primary energy consumed. The thermal conductivity of this insulation is between 0.023 and 0.028 W / mK, depending on the product as shown in the BMI PIR insulation product environmental declaration and technical data membranes. The thermal conductivity of this product can be used to perform the energy simulation of the target building, according to LEED requirements. NOTE: The final result to determine the total points depends on the design of the building, its location, orientation, materials, definition of the envelope and systems used..
Assessment procedure	**Option 1: Energy simulation.** Demonstrate, through an energy simulation, the improvement in the energy efficiency of the proposed building compared to a reference building (defined according to the ANSI / ASHRAE / IESNA standard 90.1-2.010, Appendix G, with errata). Savings of 2-5% must be demonstrated for the prerequisite and 3-50% for the credit, which vary depending on the certification system (rating system). These savings have a score between 1 and 20 points. **EP * Option1**: Achieve at least 54% energy savings compared to the reference building. * EP- Exemplary performance: Exemplary performance (Bonus point)
Analysis example	NA
Backup documents	***01_1-Fichas técnicas-Aislamiento PIR BMI.pdf***
Reference standard	*EN 13165:2012 + A2:2016* *ANSI/ASHRAE/IESNA 90.1-2010, apéndice G, con erratas* *Estándares aprobados por USGBC*

CATEGORY
(SS) SUSTAINABLE SITES

SS, Reduced heat island effect (NC, CS, SNC, RNC, HC, HNC, DCNC, WNC)

Aim

Minimize the effects on microclimates and habitats of human and wildlife by reducing heat islands.

Compliance data

The EverGuard TPO waterproofing membranes, white finish color reference "EverGuard TPO White", installed in the most superficial layer of the BMI EVERGUARD system, have a solar reflectance index SRI between 98.1 and 98.9, depending on set out in the SRI index test report, attached.
This test has been carried out according to ASTM E 1980-11..

Assessment procedure

Use roofing materials with an SRI that meets or exceeds the values in the table:

	Inclination	initial SRI	30 years SRI
Low slope roof	< 2:12	82	64
Very sloping roof	>2:12	39	32

Meet SRI values at three years. If no information is available after three years, use materials that meet the initial SRI value

Analysis example

NA

Backup documents

01_1-Ensayo índice SRI-Láminas TPO BMI.pdf

Reference standard

ASTM E 1980-11, "Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces"
ASTM E 903-12, "Standard Test Method for Solar Absorptance, Reflectance, and Transmittance of Materials Using Integrating Spheres"
ASTM C 1371-15, "Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers

CATEGORY
(MR) Material & Resources

MR, Building Life Cycle Impact Reduction (NC, CS, SNC, RNC, HC, HNC, DCNC, WNC)

Aim

Encourage the reuse and use of materials with less environmental impacts.

Compliance data

BMI EverGuard TPO membranes have a Type III EPD verified by an independent third party.
The PIR isolation of the EverGuard TPO system has a sectoral EPD, carried out by IBU-Institut Bauen und Umwelt e.V. from Berlin, also according to ISO 14025 and UNE-EN 15804 + A1
The impacts of the materials calculated in the corresponding EPDs can be used to carry out the LCA of the target building.
NOTE: The final result to determine the total points depends on the construction systems used for the structure and the building enclosures.

Assessment procedure

Option 4: Building life cycle analysis (structure and enclosure)

Carry out the LCA (Life Cycle Analysis) of the enclosure and the building structure that shows a reduction, with respect to a reference building, of at least 10% in a minimum of three of the six impacts listed below. One of the three must necessarily be the global warming potential (emission of greenhouse gases):

- Global warming potential (CO2 eq.)
- Destruction of the stratospheric ozone layer (kg of CFC-11)
- Acidification of soil and water sources (moles H + or kg SO2)
- Eutrophication (kg of N or PO4)
- Formation of tropospheric ozone (kg NOx or kg C2H4)
- Depletion of non-renewable energy sources (MJ)

No impact category evaluated within the LCA can increase more than 5% with respect to the reference building.

EP * Option 4: Improve the required thresholds of the six impact measures.
*
EP- Exemplary performance: Exemplary performance (Bonus point).

Analysis example

NA

Backup documents

04_1-DAP-Láminas TPO BMI.pdf
04_2-DAP-Aislamiento PIR BMI.pdf

Reference standard

ISO 14025-2006 / ISO 21930:2017 / ISO 14040-2006 / ISO 14044-2006 / DIN-EN 15804+A1
RCP, Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report V1.7, IBU
Part B: Requirements on the EPD for Plastic and Elastomer Roofing and Sealing Membrane Systems

CATEGORY
(MR) Material & Resources

MR, Transparency and optimization of construction products - Environmental Product Declaration (NC, CS, SNC, RNC, HC, HNC, DCNC, WNC)

Aim

Encourage the use of products and materials that have information on their life cycle and that demonstrate a reduction in the impacts associated with it..

Compliance data

BMI EverGuard TPO membranes have a EPD verified by an independent third party, according to ISO 14025 and UNE-EN 15804 + A1, and may contribute to obtaining credit.
The PIR isolation of the EverGuard TPO system has a sectoral EPD, carried out by IBU-Institut Bauen und Umwelt e.V. from Berlin, also according to ISO 14025 and UNE-EN 15804 + A1.
In order to contribute to the fulfillment of option 2, it will be necessary to compare the product with the industry average.

Assessment procedure

Option 1. Environmental Product Declaration (EPD) (1 point)
Use a minimum of 20 products permanently installed in the building (from 5 different manufacturers) that meet one of the following criteria:

- LCA public and reviewed by an independent third party (these products compute 25%)
- EPD (Environmental Product Declaration):
  - Generic industry WTP (computed at 50%)
  - Product-specific EPD (Type III) (computed at 100%)

EP * Option1: Install 40 products (from at least 5 manufacturers) that meet the requirements.

Option 2. Feature optimization
Use 50% (computed according to cost) of the products permanently installed in the building that demonstrate, certified by an independent third party, a reduction of impacts with respect to the industry average, in at least three of the following categories:

- Global warming potential (CO2 eq.)
- Destruction of the stratospheric ozone layer (kg of CFC-11)
- Acidification of soil and water sources (moles H + or kg SO2)
- Eutrophication (kg of N or PO4)
- Formation of tropospheric ozone (kg NOx or kg C2H4)
- Depletion of non-renewable energy sources (MJ)

EP * Option2: Buy 75% of products that meet the requirements.
*
EP- Exemplary performance: Exemplary performance (Bonus point)

Analysis example

NA

Backup documents

04_1-DAP-Láminas TPO BMI.pdf
04_2-DAP-Aislamiento PIR BMI.pdf

Reference standard	*ISO 14025-2006 / ISO 21930:2017 / ISO 14040-2006 / ISO 14044-2006 / DIN-EN 15804+A1* *RCP, Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report V1.7, IBU* *Part B: Requirements on the EPD for Plastic and Elastomer Roofing and Sealing Membrane Systems*

CATEGORY
(MR) Material & Resources

MR, Transparency and optimization of construction products - Sources of raw materials
(NC, CS, SNC, RNC, HC, HNC, DCNC, WNC)

Aim

Encourage the use of products and materials for which there is information available on the life cycle and that have life cycle impacts, preferably environmental, economic and social. Ask project teams to select products from manufacturers who have verified that they have been extracted or collected from sources in a responsible way

Compliance data

According to the table on page 37 of the GAF guide, the content of pre-consumer recycled material in EverGuard TPO membranes is 1%, which is why they contribute to the fulfillment of this criterion..

Assessment procedure

Option 2. Leadership Practices in Extraction (1 point)
Use products that meet at least one of the responsible extraction criteria listed below for at least 25%, by cost, of the total value of construction products permanently installed in the building. The materials of the structure and the enclosure cannot constitute more than 30% of the value of the compliant products of the building:

- Responsibility extended to the producer.
- Bio-based materials.
- Wood products.
- Reuse of materials.
- Recycled content.
- USGBC approved program.

For the purposes of the calculation for obtaining the credit, the products obtained (by extraction, manufacture or purchase) less than 160 km from the project site will be computed at 200% of the base cost (Location Valuation Factor MR).

EP * Option 2: Use products that meet at least one of the cited responsible extraction criteria for at least 50%, by cost, of the total value of construction products permanently installed in the building

Analysis example

NA

Backup documents

03_2-Guía GAF-Láminas TPO BMI.pdf

Reference standard

NA

CATEGORY
(MR) Material & Resources

MR, Transparency and optimization of construction products - Sources of raw materials
(NC, CS, SNC, RNC, HC, HNC, DCNC, WNC)

Aim

Encourage the use of products and materials whose life cycle information is available and which have preferable life cycle impacts from an environmental, economic and social point of view. Reward project teams that select products whose chemical ingredients have been inventoried using an accepted methodology and products that are shown to minimize the use and generation of harmful substances. Reward raw material manufacturers who manufacture products that are shown to have improved life cycle impacts.

Compliance data

BMI EverGuard TPO membranes have a Health Product Declaration (HPD).

Assessment procedure

Option 1. Transparency in the composition of the product
Use a minimum of 20 products permanently installed in the building (from 5 different manufacturers) that indicate the composition of the product in one of the formats:

- List of components identified by name and CASRN (Chemical Abstract Service Registration Number) or GreenScreen score.
- Safety data membrane (HPD) indicating dangerous products according to the open standard Health Product Declaration
- C2C certified products (Cradle to Cradle) C2Cv2 basic level / C2Cv3 bronze level

Option 2. Improvement of material components
Use a minimum of 25% of products permanently installed in the building (% according to cost) that demonstrate that they do not contain dangerous substances:

- GreenScreen v1.2: Products that do not contain ingredients classified as level 1.
- C2C certified products with a level above C2C v2 Gold / C2Cv3 Silver.
- Products that do not contain substances from the REACH Authorization list (Registration, Evaluation, Authorization and Restriction of Chemicals) or from the list of candidate substances to be included (Candidate list)

EP * Option 2: Purchase at least 50%, assessed by cost, of all permanently installed building products that meet the criteria of option 2.

Analysis example

NA

Backup documents

06_1-Ficha de seguridad-Láminas TPO BMI.pdf
06_2-HPD TPO-Láminas TPO BMI.pdf
06_3-HPD Extreme TPO-Láminas TPO BMI.pdf

Reference standard

Reglamento CE 1272/2008 (CLP)

CATEGORY
(ID) Innovation

ID, Innovation (NC, CS, SNC, RNC, HCNC, HNC, DCNC, WNC)

Aim

Encourage projects to achieve exceptional or innovative performance.

Compliance data

The EverGuard TPO waterproofing membranes from BMI, according to studies provided, can promote the durability of the building and therefore propose an innovation strategy consisting of reducing the impact on the building's life cycle.
They can also help meet the exemplary credit performance requirements:

- SS - Heat Island
- MR - Reduction of the impact of the building's life cycle.
- MR - Transparency and optimization of construction products - Environmental product declaration.
- MR - Transparency and optimization of construction products - Raw material sources
- MR - Management of construction and demolition waste

Assessment procedure

Option 1: Innovation

Achieve relevant and measurable environmental efficiency using a strategy not covered by the LEED rating system.
Identify the following:

- The objective of the proposed innovation credit;
- the proposed requirements for compliance;
- proposed submissions to demonstrate compliance; Y
- the design approach or strategies used to meet the requirement.

Option 3: Exemplary Performance (EP)

Achieve exemplary performance on an existing LEED v4 prerequisite or credit that enables exemplary performance as provided in the LEED Reference Guide, v4 edition. Points for exemplary performance are typically earned for doubling credit requirements or meeting the next incremental percentage threshold.

Analysis example

NA

Backup documents

05_1-Guía resistencia química-Láminas TPO BMI.pdf
05_2-Análisis durabilidad-Láminas TPO BMI.pdf

Reference standard

ISO 175
EN 12316-2 ; EN 12310-1 y 2
EN 13970:2004

OTHER CONSIDERATIONS

Other considerations

Description There is other evidence that does not fall within the LEED v4 reference categories, but that may be of use to the evaluating technician. These are:

Backup documents
05_1-Código de conducta a proveedores-BMI.pdf
08_1-Declaración proveedor palets-BMI.pdf
08_2-Declaración proveedor palets-BMI.pdf

Reference standard *NA*

SUMMARY OF CREDITS
BREEAM

MANAGEMENT
- GST 03, Responsible Construction Practices

HELTH AND WELBEING
- SYB 03, SYB 04, Thermal comfort

ENERGY
- ENE 01, Energy Efficiency.
- ENE 04, Low Carbon Design.

MATERIALS
- MAT 01, Life Cycle Impacts

WASTE
- RSD 01, Construction and Demolition Waste Management

INNOVATION
- INN 01, Innovation

BREEAM ES Environmental categories

Management | Health and Wellbeing | Energy | Transport | Water | Materials | Waste | Land use and ecology | Pollution | Innovation

BREEAM ES Certification Standards

URB	BREEAM ES Urbanism	**VIV**	BREEAM ES Housing	**USO**	BREEAM ES in use
NC	BREEAM ES New Construction				

CREDIT SHEET
BREEAM ES

CATEGORY
MANAGEMENT

GST 03, Responsible Construction Practices.
(BREEAM ES NEW CONSTRUCTION 2015 - BREEAM ES HOUSING 2020)

Aim	Recognize and promote work areas managed in a respectful, responsible and consistent way with the environment and society
Compliance data	The suppliers of wooden pallets for the packaging of BMI products, declare that the wood for the manufacture of their pallets has been legally obtained and marketed. They can therefore contribute to the achievement of this criterion.
Assessment procedure	**Breeam ES housing 2020. Prerequisite:** All wood and wood derivatives used during the project construction process is "legally harvested and traded wood" (see relevant Definitions). Breeam ES new build 2015: Point 8 of the GST3 criterion assesses the legal use of wood. To do this, it requests confirmation that all the wood used in the project is harvested and legally marketed wood.
Analysis example	NA
Backup documents	***07_1-Declaración proveedor palets-BMI.pdf*** ***07_2-Declaración proveedor palets-BMI.pdf***
Reference standard	*NA*

CATEGORY
HEALTH AND WELLBEING

SYB 03, SYB 04, Thermal comfort..
(BREEAM ES NEW CONSTRUCTION 2015 - BREEAM ES HOUSING 2020)

Aim

Guarantee, through design, the achievement of adequate levels of thermal comfort, as well as the selection of the necessary control devices to maintain a thermally comfortable environment for the building's occupants.

Compliance data

BMI's EVERGUARD system contributes to credit requirements through the thermal insulation provided by the polyisocyanurate (PIR) foam membrane incorporated into this product.

The standards listed below require that the thermal envelope design, in conjunction with the building systems, maintain thermal comfort conditions within specified ranges. Thermal insulation helps to avoid thermal asymmetries, temperature variation over time, vertical temperature differences, etc., which are parameters limited by these standards.

Assessment procedure

BREEAM values, among others, the following aspects in this criterion:

1. A thermal modeling (or analytical measurement / evaluation of the building's thermal comfort levels) has been carried out using the PMV (estimated average vote) and PPD (estimated percentage of dissatisfied) indices, in accordance with the UNE- standard. EN ISO 7730: 2006, and taking into account seasonal variations.
2. The local thermal comfort criteria have been used to determine the level of thermal comfort of the building, especially the intervals of the interior temperatures of winter and summer, which must comply with the comfort criteria recommended by the UNE- standard. EN ISO 7730: 2006, without there being any zone whose levels may produce local dissatisfaction.
3. The levels of thermal comfort in occupied spaces meet the Category B criteria established in Table A.1 of Annex A of the UNE-EN ISO 7730: 2006 standard.
4. For upgraded buildings, PMV and PPD indices based on the previous modeling have to be reported to BREEAM through the BREEAM Assessment Tool...

Analysis example

NA

Backup documents

01_1-Fichas técnicas-Aislamiento PIR BMI.pdf

Reference standard

EN 13165:2012 + A2:2016

CATEGORY
ENERGY

- **ENE 01, Energy Efficiency.**
- **ENE 04, Low Carbon Design.**
  (BREEAM ES NEW CONSTRUCTION 2015 - BREEAM ES HOUSING 2020)

Aim

Recognize and promote buildings designed to minimize energy demand, primary energy consumption and CO2 emissions.
Drive the adoption of design measures to reduce the building's energy consumption and associated carbon emissions and minimize dependence on active building installations..

Compliance data

Polyisocyanurate (PIR) foam composite thermal insulation membrane, which are part of BMI's EVERGUARD system, have very low thermal conductivities and must be taken into account when calculating the efficiency and energy savings of buildings.
The thermal conductivity of this insulation is between 0.023 and 0.028 W / mK, depending on the product as shown in the environmental declaration of the product and technical data membrane of the BMI PIR insulation, and can be used to carry out the energy simulation of the building object, according to BREEAM requirements.
NOTE: The final result to determine the total points depends on the design of the building, its location, orientation, materials, definition of the envelope and systems used.

Assessment procedure

ENE 01: The energy efficiency of the building is calculated through a simulation with a computer program approved by the Ministry of Industry, Energy and Tourism.
The energy efficiency coefficient is calculated through the BREEAM ES Assessment Tool, and based on this coefficient, the corresponding score is awarded.
The energy efficiency coefficient takes into account operational energy demand, primary energy consumption and total CO2 emissions.
ENE 04: The project team conducts a passive design analysis (see NA01) of the proposed building during the preliminary project phase and identifies opportunities for the implementation of solutions to reduce energy demand.
The building employs passive design measures to reduce the building's demand, primary energy consumption and CO2 emissions by at least 5% in line with the conclusions of the passive design analysis..

Analysis example NA

Backup documents ***1-Fichas técnicas-Aislamiento PIR BMI.pdf***

Reference standard *EN 13165:2012 + A2:2016*

CATEGORY
MATERIALS

MAT 01, Life Cycle Impacts (BREEAM ES NEW CONSTRUCTION 2015 - BREEAM ES HOUSING 2020)

Aim

Recognize and promote the use of robust and appropriate tools for life cycle analysis and, consequently, the specification of building materials with a low environmental impact (also in terms of embodied carbon) throughout the entire life cycle of the building.

Compliance data

Option 1: Environmental Product Declaration (EPD)
BMI EverGuard TPO membrane have an exclusive EPD and verified by an independent third party.
The PIR isolation of the EverGuard TPO system has a sectoral EPD, carried out by IBU-Institut Bauen und Umwelt e.V. of Berlin, according to ISO 14025 and UNE-EN 15804 + A1.
NOTE: The final result to determine compliance with this option depends on the EPD of other construction products.

Option 2: Life Cycle Analysis
The impacts evaluated in the EPD can be used to carry out the LCA of the building, thus contributing to the fulfillment of option 2. The data of the EPDs are verified with the ISO 15804 standard and have numerous available indicators of environmental impacts, generation of waste, water consumption and energy consumption.
NOTE: The final result to determine compliance with this option depends on the construction systems used for the building's structure and enclosures..

Assessment procedure

Option 1: Environmental Product Declaration (EPD)
If at least 12 points are achieved following the method of calculation in the Methodology section, which evaluates the type and quantity of EPD available for certain construction products used in the building.

Option 2: Life Cycle Analysis
The project uses a life cycle analysis (LCA) tool to measure the environmental impact of the life cycle of building elements.

Exemplary Level
85% of the points are obtained for both new construction and rehabilitation according to the BREEAM calculator.

Analysis example NA

Backup documents

04_1-DAP-Láminas TPO BMI.pdf
04_2-DAP-Aislamiento PIR BMI.pdf

Reference standard

ISO 14025-2006 / ISO 21930:2017 / ISO 14040-2006 / ISO 14044-2006 / DIN-EN 15804+A1
RCP, Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report V1.7, IBU
Part B: Requirements on the EPD for Plastic and Elastomer Roofing and Sealing Sheet Systems

CATEGORY
WASTE

RSD 01, Construction and Demolition Waste Management (BREEAM ES NEW CONSTRUCTION 2015 - BREEAM ES HOUSING 2020)

Aim

Encourage resource efficiency through effective and appropriate management of construction waste..

Compliance data

BMI has performed a EPD on its EverGruard TPO membrane. The following are the kg of waste produced per 1m2 functional unit for an average EverGuard TPO sheet during the building construction process, according to the EPD calculation:

WASTE	WEIGHT PER m2 OF PRODUCT (1.94kg)
Product losses	10%; 0.194kg
Plastic waste	0.00454kg
Wood waste	0.0681kg
Cardboard waste	0,0327kg
Metal waste	0.000908kg

In the case of PIR insulation membrane, there is a sectoral EPD, which lists the following waste generated per m2 of product in the construction phase:

WASTE	WEIGHT PER m2 OF PRODUCT (4.42kg)
Product losses	2%; 0.194kg
Packaging waste	0.63kg

Assessment procedure

The client will ensure that a pre-execution audit will be carried out for all existing buildings, structures and hard surfaces (see NA02) to determine the feasibility of a possible rehabilitation or reuse, and if not, maximize the recovery of material from demolition for subsequent use, giving priority to those applications of higher quality or value. The requirements to carry out the audit are:

- - The audit should be carried out in the Preliminary or equivalent phase, before the dismantling or demolition works in order to use the results to guide the design, consider what materials can be reused, and set management objectives and ensure that all contractors are involved in the process of maximizing reuse and recycling opportunities.

Analysis example

NA

Backup documents

04_1-DAP-Láminas TPO BMI.pdf
04_2-DAP-Aislamiento PIR BMI.pdf

Reference standard

ISO 14025-2006 / ISO 21930:2017 / ISO 14040-2006 / ISO 14044-2006 / DIN-EN 15804+A1
RCP, Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report V1.7, IBU
Part B: Requirements on the EPD for Plastic and Elastomer Roofing and Sealing Sheet Systems

CATEGORY
INNOVATION

INN 01, Innovation
(BREEAM ES NEW CONSTRUCTION 2015 - BREEAM ES HOUSING 2020)

Aim

Encourage innovation within the construction sector through the recognition of advantages in the area of sustainability that are not rewarded through the Standard Requirements.

Compliance data

BMI's EverGuard TPO Flat Roof Insulation and Waterproofing System can help meet exemplary performance on the requirement:

- ENE 01 - Energy efficiency
- MAT 01 - Life cycle impacts

Assessment procedure

They can be obtained by a combination of the following options:

Exemplary level in existing Requirements
Some BREEAM credits give the option of obtaining an extra score for demonstrating exemplary efficiency through the achievement of the exemplary level criteria defined in those credits.

Approved innovations
An extraordinary point may be obtained for each Innovation Request Approved by BREEAM ES provided that the criteria defined in an approved innovation request form are met.

Analysis example

NA

Backup documents

See corresponding requirements

Reference standard

NA

OTHER CONSIDERATIONS

Other considerations

Description

There is other evidence that does not fall within the categories of the BREEAM ES reference, but that may be useful for the evaluating technician. These are:

Backup documents

02_1-Ensayo índice SRI-Láminas TPO BMI.pdf
04_3-Guía GAF-Láminas TPO BMI.pdf05_1-Código de conducta a proveedores-BMI.pdf
06_1-Guía resistencia química-Láminas TPO BMI.pdf
06_2-Análisis durabilidad-Láminas TPO BMI.pdf
07_1-Ficha seguridad-Láminas TPO BMI.pdf
07_2-HPD TPO-Láminas TPO BMI.pdf
07_3-HPD Extreme TPO-Láminas TPO BMI.pdf

Reference standard

ISO 175
EN 12316-2 ; EN 12310-1 y 2
Reglamento CE 1907/2006 (REACH) y CE 1272/2008 (CLP)
ASTM E 1980-11, ASTM E 903-12, ASTM C 1371-15