Let us guide you through BREEAM®

RECTICEL insulation

Guiding you through a smooth BREEAM project

In today's construction industry, sustainability is playing an increasingly important role. BREEAM, Europe's most used assessment and certification method for buildings – supports owners, architects, contractors and other stakeholders – to successfully adopt sustainable building principles.

Obtaining a BREEAM certification and assessing BREEAM criteria can be challenging, as they include aspects that cover the buildings' whole life cycle. This guide offers a helping hand to all key parties involved – whether architects, developers or contractors looking to certify a building in the making, or BREEAM assessors who want to determine the impact of Recticel Insulation® materials on the overall BREEAM score.

In addition to objective information and clear-cut assessment criteria, this guide also focuses on the many benefits Recticel Insulation has to offer in terms of sustainable building construction. These advantages range from our product portfolio – high-performing insulation boards that provide significant energy savings – to other sustainable company elements contributing to BREEAM credits, such as sustainability certificates (e.g. ISO), transport of materials, life cycle cost, waste management, etc.

This guide will support and accelerate your BREEAM project

Striving to forge lasting relationships with all building professionals, Recticel Insulation is committed to putting all the necessary tools and know-how at their disposal. In doing so, we sincerely hope that this guide will support and accelerate your BREEAM project.

BREEAM in a nutshell

BREEAM is one of the most important rating and certification systems for sustainable buildings in Europe. Since its launch in 1990 in the UK, it became an international standard in sustainable construction in more than 70 countries worldwide. The BREEAM criteria challenge and inspire developers, designers and owners to perform better than the local standards and regulations.

A new building or major renovation project in Belgium can be assessed to the BREEAM International scheme for New Construction. The current scheme version, also referenced in this brochure, dates from 2013. Four standard building types can be distinguished: residential, offices, industrial and retail. A tailored set of criteria can be established in a 'bespoke' assessment for non-standard building types.

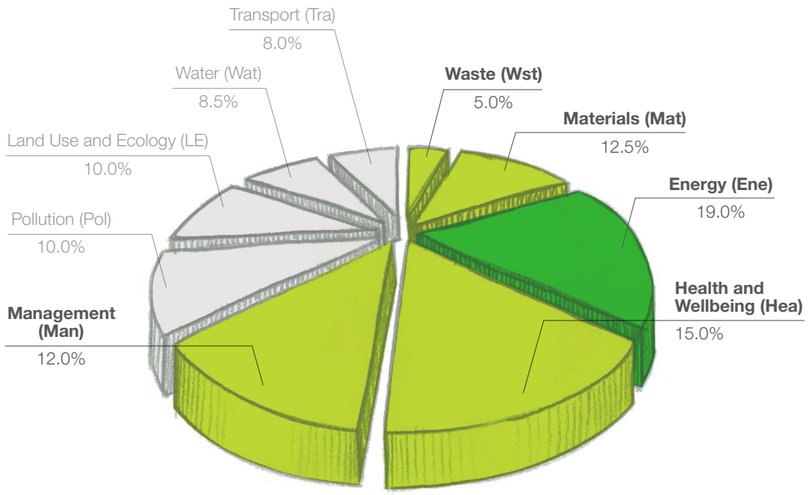
The BREEAM certificate is assigned after a thorough independent assessment of hundreds of criteria, leading to a quotation on 113 to 122 credits*, structured in 9 environmental sections. The overall score is a weighted sum of the individual scores in the different chapters. It is translated to a final rating ranging from pass to outstanding.

Five possible BREEAM ratings

★ ★ ★ ★ ★	Outstanding	≥ 85%
★ ★ ★ ★	Excellent	≥ 70%
★ ★ ★	Very Good	≥ 55%
★ ★	Good	≥ 45%
★	Pass	≥ 30%

* Sometimes it is possible to gain extra exemplary level credits. This is applicable for Hea 02, Mat 01, Mat 03 and Wst 01.

Recticel Insulation® solutions contribute to achieve credits in the highlighted environmental sections

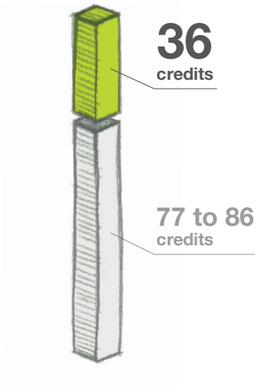


How to calculate a building's BREEAM rating in 4 steps

1. For each of the 9 environmental sections the number of credits awarded is determined by the assessor in accordance with the criteria of each assessment issue.
2. The percentage of credits achieved is then calculated for each section.
3. The percentage of credits achieved in each section is then multiplied by the corresponding section weighting. This gives an overall environmental section score.
4. These section scores are then added together to give the overall BREEAM score. The diagram above shows the weightings of the 9 environmental sections. The percentages reflect the relative importance of these different sections.

Up to 36 credits can be achieved by using Recticel Insulation's solutions

Using Recticel insulation's solutions in combination with other building components, **up to 36 credits can be achieved** on the highlighted environmental sections: Waste, Materials, Energy, Health & Wellbeing, and Management.



Recticel Insulation®

products overview

Recticel Insulation® solutions could impact credits in the five following environmental sections:

⊗ *No impact* ● *Medium impact* ● *Strong impact*

		Management			Health & Wellbeing		Energy	Materials			Waste
Eurofloor	λ_D (W/mK)	MAN 01	MAN 03	MAN 05	HEA 02	HEA 03	ENE 01	MAT 01	MAT 03	MAT 04	WST 01
Eurofloor 300	0.022	⊗	●	●	⊗	●	●	●	⊗	●	●
Eurothane® AL	0.024	⊗	●	●	⊗	●	●	●	⊗	●	●
Eurothane® AL Quattro	0.024*	⊗	●	●	⊗	●	●	●	⊗	●	●
Eurothane® Bi-4(A)	0.024*	⊗	●	●	⊗	●	●	●	⊗	●	●
Eurothane® G	0.026	⊗	●	●	⊗	●	●	●	⊗	●	●
Eurothane® Silver	0.022	●	●	●	●	●	●	●	⊗	●	●
Eurowall®	0.022	⊗	●	●	⊗	●	●	●	⊗	●	●
Eurowall® 21	0.022	⊗	●	●	⊗	●	●	●	⊗	●	●
IP PIR 021	0.021	⊗	●	●	⊗	●	●	●	⊗	●	●
IP PIR 022	0.021	⊗	●	●	⊗	●	●	●	⊗	●	●
	0.022	⊗	●	●	⊗	●	●	●	⊗	●	●

		Management			Health & Wellbeing		Energy	Materials			Waste
Powerdeck®	λ_D (W/mK)	MAN 01	MAN 03	MAN 05	HEA 02	HEA 03	ENE 01	MAT 01	MAT 03	MAT 04	WST 01
Powerdeck® B	0.024	⊗	●	●	⊗	●	●	●	⊗	●	●
Powerdeck® F (A)	0.026	⊗	●	●	⊗	●	●	●	⊗	●	●
Powerline® (C)	0.026	⊗	●	●	⊗	●	●	●	⊗	●	●
Powerroof®	0.024	⊗	●	●	⊗	●	●	●	⊗	●	●
Powerroof® Maxx	0.022	●	●	●	⊗	●	●	●	⊗	●	●
Powerwall®	0.022	●	●	●	⊗	●	●	●	⊗	●	●
L-Ments®	0.024	●	●	●	⊗	●	●	●	⊗	●	●
Rectitape®	0.023**	●	●	●	⊗	●	●	●	●	●	●
Maxx® tape		●	⊗	⊗	⊗	●	●	⊗	⊗	⊗	●
Recticel® PU foam		●	⊗	⊗	⊗	●	●	⊗	⊗	⊗	●
		●	⊗	⊗	⊗	●	●	●	⊗	⊗	●

* 0.028 W/mK for thickness < 60 mm.
** The thermal conductivity of the PIR core equals 0.023 W/mK. The thermal resistance of the panel depends on the thickness, varying from 5.25 to 7.75 m²K/W.

Man 01:
Sustainable procurement – Fabric performance

Weight
1 credit (0.5%),
non-residential projects only.

Aim
To improve and assess the building fabric quality by thermographic analysis or measurement of the building's air tightness.

Assessment criteria
The credit is awarded by either performing an air leakage test or by thermographic verification of the building fabric.

In case the thermographic analysis is chosen:
- Performing a thermographic survey upon construction completion (ISO 6781);
- Assessment by a certified professional (ISO 18436-7);
- Continuity of insulation, avoidance of thermal bridging, avoidance of air leakage;
- Rectification of all defects identified.

In case the air leakage test is chosen:
- Performing an air leakage test (ISO 9972 / EN 13829) and reporting air leakage paths;
- Rectification of all defects identified;
- Final air leakage less than v50 < 5 $m^3/h/m^2$ or compliant to the local legislation if more stringent.

Recticel Insulation® products and solutions

All Recticel Insulation® products show excellent thermal insulation properties with thermal conductivities down to 0.021 W/mK. The boards have high precision cut straight edges, very strict tolerances and up to four side tongue & groove profile to ensure gaps between boards are minimised. Expanding Recticel® PU foam should be used to fill voids and assure insulation continuity at nodes and where Recticel® products connect to other construction elements like windows and doors.

Recticel Insulation® boards are produced with the most suitable laminating foils for each application. Rectitape® and Maxx® tape should be applied to seal the joints and corners between insulation boards to minimise air flow around the insulation. These tapes guarantee an optimal wind tightness of the insulating shield and improve the building's air tightness.

Construction details and application instructions to avoid thermal bridging and air leakage can be consulted at our website.

Thermal bridging by a supporting structure in wood or steel can be avoided by applying continuous insulation systems, like Eurothane® G for internal walls, Powerroof® and Powerwall® insulation boards or L-Ments® self-supporting roof systems.

Man 03:

Construction site impacts – Transport of construction materials and waste

Weight
1 credit (0.5%).

Aim
To monitor and reduce the construction site's environmental impact in terms of transport of materials and waste.

Assessment criteria
Transport distances must be recorded for all materials used in major building elements from factory gate to construction site and for all waste from building site to recovery facility.

Recticel Insulation® products and solutions

Building insulation typically involves large volume transports. The extremely high thermal performance of Recticel Insulation® products, with λ_D values down to 0.021 W/mK, allows for creating better insulated buildings with less insulation volume to be transported.

All Recticel Insulation® products are transported from our production facility in Wevelgem directly to the construction site. A full truck load equals 70 m³ insulation. Incomplete truck loads are combined with other orders to optimise transport distances and truck loading ratios. Intermediate storage is unusual for large projects, allowing for minimal transport distances. For construction sites near inland waterways transport by ship can also be considered. Ships can be loaded at the quay of business park Wevelgem-Zuid on the river Leie. One ship load equals 24 truck loads.

Man 05:
Life cycle cost and service life planning

Weight
3 credits:
- **1 credit** (0.5%) for conducting Life Cycle Costing (LCC) in concept design stage;
- **1 additional credit** (0.5%) for applying more detail and implementing the LCC study results in the design;
- **1 additional credit** (0.5%) for updating the LCC during technical design stage and developing a maintenance strategy informed by the LCC analysis.

Aim
To take design decisions informed by whole life costs for construction, maintenance and operation.

Assessment criteria
- LCC analysis in accordance with ISO 14686-5;
- Study period 40 and 60 years, including construction, operation and maintenance;
- Updates of the LCC study report from concept design stage up to technical design.

Recticel Insulation® products and solutions

Insulation materials and thicknesses are a typical parameter to optimise in conducting LCC analysis. About 70% of the total life cycle cost of a building is related to the use phase, with the lion's share going to energy consumption for heating and cooling. Insulation is one of the few construction elements having a pay-back time, thanks to the operational energy savings over the whole lifespan of the building.

Thanks to the high quality and durability of Recticel insulation® products, it can be assumed that the service life of the insulation boards is at least equal to that of the construction element in which it is enclosed. Re-use of insulation boards in constructions is not common, although the physical, mechanical and thermal properties of the material do not deteriorate within the 40 and 60 years study periods.

Hea 02:
Indoor air quality – minimising sources of air pollution

Weight
- **1 credit** (1.1%) can be achieved if measured total volatile organic compound (TVOC) and formaldehyde concentrations in the indoor air meet the requirements;
- **2 exemplary level credits** (2.0%) can be achieved when formaldehyde concentration is even lower.

Aim
To create a healthy indoor climate through the use of low-emission materials and the provision of adequate ventilation.

Assessment criteria
- Measurements of TVOC and formaldehyde concentrations in the indoor air must be performed before building occupancy;
- Sampling methods to be used are in line with the ISO 16000 series;
- The 8 hour average TVOC concentration is less than 300 µg/m³;
- The 30 minute average formaldehyde concentration is less than or equal to 100 µg/m³ (and 60 or 10 to achieve the 1 and 2 exemplary level credits).

Recticel Insulation® products and solutions

The formaldehyde and TVOC content in the indoor environment results from the emissions of all finishing materials and furniture in the building. Insulation materials thus only have a minor influence on the result. However, Recticel Insulation products are low TVOC and formaldehyde emission materials:
- formaldehyde emission < 60 µg/m³
- TVOC emission: < 300 µg/m³

In combination with other low-emission materials and finishings, the requirements can be achieved.

Hea 03:
Thermal comfort

Weight

2 credits:

- **1 credit** (1.1%) for carrying out thermal modelling and achieving the required thermal comfort;
- **1 additional credit** (1.1%) for applying a heating/cooling strategy that is based on the results of the thermal modelling analysis.

Aim

To create a thermally comfortable environment for building occupants.

Assessment criteria

1st credit:

- Thermal modelling is carried out in accordance with ISO 7730, taking account of seasonal variations;
- Comfort category B is met for occupied spaces.

2nd credit:

- The temperature control strategy is informed by the results of the thermal modelling
- The heating/cooling strategy takes into account zoning, occupancy, user control, interaction of systems, etc.

Recticel Insulation® products and solutions

Thermal comfort is influenced by a variety of factors, but a well insulated and air-tight building envelope is obviously crucial.

Other factors influencing the thermal comfort include internal thermal mass to buffer peaks in heat load, the ventilation strategy in relation to draught, solar shading or overheating prevention measures and correctly dimensioned and controlled heating (and cooling) systems to supply (or remove) the remaining heat.

Local thermal discomfort may be caused by asymmetric thermal radiation, i.e. a too large temperature difference between heat emitters and other construction elements at lower temperatures. Recticel Insulation provides solutions for the thermal insulation of the building envelope, thereby avoiding cold walls, floors or ceilings. A well insulated building envelope also allows for using low temperature heating systems like underfloor heating, thermo-active concrete slabs and climate ceilings.

Ene 01:
Energy efficiency

Weight
Up to 15 credits (11.9%)

Aim
To improve the energy performance of buildings

Assessment criteria
The energy performance of a building is compared to that of an equivalent notional building. This notional building just meets the current building energy performance standard.
To calculate the improvement over the current standards (i.e. the energy performance ratio, EPR), a triple metric approach is followed, taking into account the operational energy demand, the primary energy consumption and the total resulting carbon dioxide emissions.

Recticel Insulation® products and solutions

The ‘fabric first’ approach suggests that efforts to reduce a building’s carbon footprint should primarily focus on minimising the building’s energy demand by optimising the building envelope characteristics. Heating and cooling make up the largest part of a building’s energy demand. A well insulated building fabric is therefore key to optimise the building’s energy performance.

Recticel Insulation® boards show very low thermal conductivities. Lambda values down to 0.021 W/mK allow for minimising transmission heat losses with a minimal impact on the usable floor area.

Thanks to our extensive research and development, Recticel Insulation® products provide a stable thermal conductivity in a variety of conditions, allowing to guarantee energy savings over the building’s entire lifetime. Moreover, in all countries where Recticel Insulation® is active, the most important and relevant certificates apply to our products. In Belgium, an additional Keymark quality label is awarded by licensed and independent experts for most of our products.

Mat 01:
Life cycle impacts

Weight

Max. 2 credits (2 x 1.8%) for industrial buildings; **up to 6 credits** (6 x 1.1%) for all other building types.
An **exemplary level credit** is available for LCA studies that achieve at least 85% in the BREEAM Mat 01 calculator.

Aim

To use robust and appropriate life cycle assessment (LCA) tools, allowing to specify construction materials with a low environmental impact.

Assessment criteria

- An LCA study is conducted using an LCA tool;
- The level of detail, the tool's output metrics and the source data quality determine 70% of the achieved score;
- The remaining 30% is determined by the tool's capability to account for the impact of the building fabric, building services and landscaping;
- The score is calculated with the BREEAM Mat 01 calculator and is rescaled to a number of credits achieved.

Recticel Insulation® products and solutions

These BREEAM credits are awarded for the use of a reliable LCA tool, methodology and input data, not for the actual results of the LCA study.

Environmental Product Declarations for PU insulation boards were established by PU Europe in 2014 and are available on the internet. They are in accordance with ISO 14025 and EN 15804 and contain all necessary information to achieve the highest possible score in the BREEAM Mat 01 calculator. The LCAs were based on information from Recticel Insulation as well as other PU manufacturers throughout Europe. The complete life cycle was considered, including raw materials manufacturing, transport, insulation board manufacturing, installation in the building and waste processing at end-of-life.

For more information: www.excellence-in-insulation.eu

Mat 03:
Responsible sourcing of materials

Weight

Up to 3 credits (3 x 1.8% for industrial buildings, 3 x 1.1% for other building types) plus **1 exemplary level credit** (1.0%). The criteria related to timber are a pre-requisite to achieve other credits and do not allow to earn a credit as such.

Aim

To use responsibly sourced materials in the following building elements:

- structural frame
- ground floor
- upper floors
- roof
- external walls
- internal walls
- foundation/substructure
- fittings
- hard landscaping

Note that insulation materials are considered separately in the Mat 04 issue and are therefore not included in the Mat 03 issue.

Assessment criteria

- At least 80% of the materials (excluding insulation) that make up a building element must be responsibly sourced;
- Responsible sourcing is demonstrated through auditable third party certification schemes;
- The rigour of the certification scheme determines the number of points that can be awarded for a certain material: the more stringent the certification scheme, the more points achieved;
- The number of credits awarded is determined in the BREEAM Mat 03 calculator based on a weighted average of the points achieved for the different materials in the building.

Recticel Insulation® products and solutions

Although insulation products are not included in Mat 03, certain Recticel Insulation products can contribute to the overall Mat 03 score.

The self-supporting roof system L-Ments® contains timber which is 100% legally harvested and legally traded, and 70% PEFC certified (tier level 3).

The manufacturing process of Recticel Insulation's polyurethane boards is covered by an environmental management system which is certified to the ISO 14001 standard. The certificate can be downloaded from our website.

For more information:
www.recticelinsulation.be/certificate/iso-14001-2004

Mat 04:
Insulation

Weight
1 credit (1.8% for industrial buildings, 1.1% for other building types).

Aim
To use responsibly sourced insulation materials.

Assessment criteria
80% of all new insulation materials in external walls, ground floor, roof and building services is certified in accordance with a responsible sourcing scheme. For foam insulation, both the insulation manufacturing process and the supply chain process of the major raw materials need to be certified.

Recticel Insulation® products and solutions

The manufacturing process of Recticel Insulation's polyurethane boards is covered by an environmental management system which is certified to the ISO 14001 standard. The certificate can be downloaded from our website.

The raw materials for the PU foam production are MDI, polyol and pentane. Recticel Insulation's main suppliers for these substances operate an environmental management system for their production process, which is certified to the ISO 14001 standard.

For more information: www.recticelinsulation.be/certificate/iso-14001-2004

Wst 01:
Construction waste management

Weight
3 credits:
- **1 credit** (0.8%) for controlling and reducing the amount of construction waste produced;
- **1 credit** (0.8%) for procedures that aim at sorting, reusing or recycling different waste groups;
- **1 credit** (0.8%) for diversion from landfill of more than 50% of the demolition and construction waste.

1 exemplary level credit (1.0%) is available if more than 75% of the demolition and construction waste is diverted from landfill.

Aim
To maximise resource efficiency and appropriate management of construction waste.

Assessment criteria
- The necessary waste management targets, procedures, monitoring and reporting systems are in place and are being applied on site;
- Data on waste collection and processing is reported, showing the percentage of waste that was reused, recycled, returned to the supplier or sent for energy recovery.

Recticel Insulation® products and solutions

Recticel Insulation® products are shipped to the construction site with a minimal amount of packaging waste.
The insulation boards are wrapped in 100% recyclable polyethylene foil and stacked on polyurethane or polystyrene blocks to avoid the use of pallets.

Recticel Insulation is member of Clean Site System. This system was set up by VAL-I-PAC and aims at collecting and recycling plastic wrapping foils at a minimal cost for the contractor.

The polystyrene foam blocks can be recycled into different high-grade applications, e.g. insulating screed, or even into new raw materials.

PU foam construction and demolition waste is considered as combustible residual waste.
This waste stream can be incinerated with energy recovery, which is considered as diversion from landfill.

For more information: www.cleansitesystem.be

Balk van Beel: the BREEAM challenge

Project:
Balk van Beel

Location:
Leuven, Belgium

Project developer:
Ertzberg

Architect:
Stéphane Beel Architects

Contractor:
Willemen General Contractor

Insulation:
Powerdeck® F, insulation for flat roofs

Recticel Insulation puts focus on sustainability and contributes to ‘outstanding’ BREEAM certificate

For a number of years, the new district of Tweewaters in Leuven has been undergoing a complete metamorphosis. Project developer Ertzberg is turning the entire zone into an highly ecological neighbourhood. The Balk van Beel is part of this Tweewaters city master plan and a big importance was given to sustainability.

In both 2012 and 2013, the project received a prestigious BREEAM award, and with a score of 87.81% it was praised as an ‘outstanding’ building. At that time, Balk van Beel was the first most sustainable residential building on the European mainland.

“Ertzberg wanted to show that an inspiring, ecologically sound construction and a comfortable living space can go hand in hand.”

Energy efficiency and waste management

To realise the project, Ertzberg decided to collaborate with reliable partners who deliver high-quality products and also put emphasis on environmental protection and sustainability. Recticel Insulation was selected to provide the roof insulation.

The high-performance insulation contributed to the credits achieved in the ‘energy efficiency’ section of the BREEAM assessment. Special attention was also given to waste management on site. During construction, the waste streams were kept separate and transported accordingly, so the trimmings of the insulation boards could be grinded to pellets in order to be used as energy source for a waste-to-energy plant. For future projects, waste streams can also be used again in the product chain as parts or ingredients for new products.

Towards a sustainable future

With challenging projects like Balk van Beel, Recticel Insulation wants to show that an inspiring, ecologically sound construction and a comfortable living space can go hand in hand. Since sustainability is part of our company’s philosophy, we were very excited to work on this project. Moreover, we keep on looking for new methods to produce and process in a more sustainable way.
By doing so, we want to meet even more demanding BREEAM challenges in the future.

Looking for further information about Recticel Insulation® products and solutions?

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