BREEAM®

with Gyproc for a Sustainable Habitat

July 2016

Gyproc
SAINT-GOBAIN

Contents

The BREEAM® Certification

› What is BREEAM®?

BREEAM® (Building Research Establishment's Environmental Assessment Method) is an environmental assessment method for buildings, created in the UK in 1990.

It is the most important certification worldwide, regarding the number of certified buildings, with 200,000 buildings certified and over a million registered. BREEAM® has different schemes of certification, depending on the country, the building type (office building, retail etc.) and the construction type (new, refurbishment etc.).

› Reference

BREEAM® International New Construction 2013 > *This is the rating system that has been used as a reference in this document*

BREEAM® 2011 for new construction of non-domestic buildings

BREEAM® UK Communities

BREEAM® UK In-Use

BREEAM® UK Refurbishment

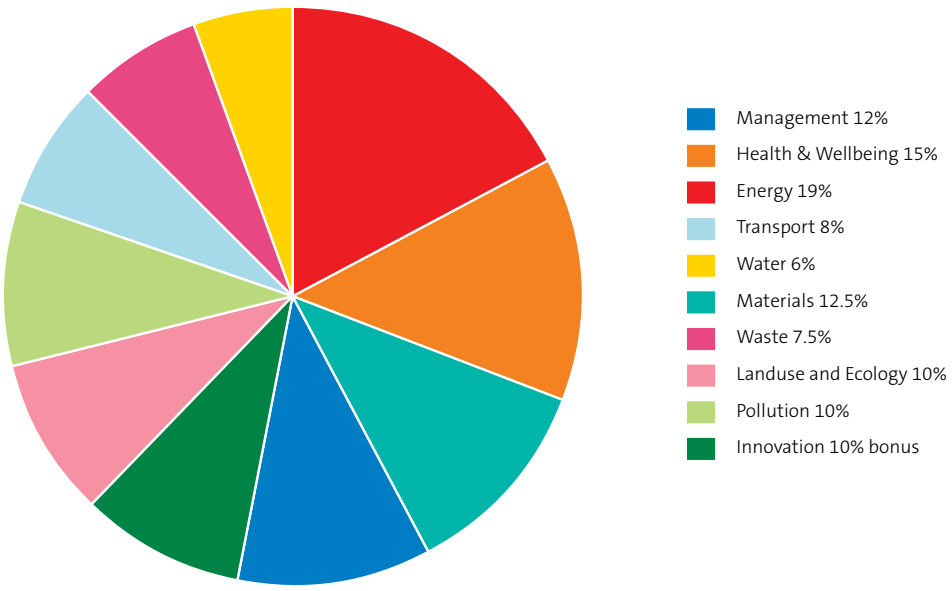
EcoHomes (UK)

BREEAM® Europe Commercial

BREEAM® International Bespoke

› BREEAM® Rating

Credits are awarded in 10 categories according to the performance of the building assessed. These credits are then added together to produce a single overall score.



To achieve a certain BREEAM® rating level, corresponding global score must be reached and corresponding minimum standards must be achieved:

BREEAM® rating level	Needed global score
Pass	30%
Good	45%
Very good	55%
Excellent	70%
Outstanding	85%

BREEAM® sections		Minimum standards by BREEAM® rating levels (credits)				
		Pass	Good	Very good	Excellent	Outstanding
Management	01	1	1	1	1	2
	02	-	-	-	1	2
	04	-	1	1	1	1/3
Health and Wellbeing	01	Criterion 1	Criterion 1	Criterion 1	Criterion 1	Criterion 1
	02	Criterion 1	Criterion 1	Criterion 1	Criterion 1	Criterion 1
	04	Criterion 1	Criterion 1	Criterion 1	Criterion 1	Criterion 1
	08	-	-	-	-	1
Energy	01	-	-	-	6	10
	02	-	-	1	1	1
	04	-	-	-	1	1
Water	01	-	-	1	1	2
	02	-	Criterion 1	Criterion 1	Criterion 1	Criterion 1
Materials	03	-	-	-	-	Criterion 1
Waste	01	-	-	-	-	1
	03	-	-	-	1	1

› Global Contribution

BREEAM® does not certify a specific product, but using Gyproc solutions can help your future project earn up to 41/47 credits. This brochure will develop the contribution of Gyproc products and solutions for these BREEAM® credits.

Further guidance available at www.breeam.com/BREEAMInt2016SchemeDocument/

Health and Wellbeing

The Green, Bradford University, UK

02. Indoor Air Quality (HEA 02)

2 Credits

› Aim

To recognise and encourage a healthy internal environment through the specification and installation of appropriate ventilation, equipment and finishes.

› BREEAM® Requirements

(1 credit): Products specified within the building must meet the requirements in term of VOCs (Volatile Organic Compounds) emission level.

(1 credit): The concentration level of formaldehydes and VOCs has to be measured post construction (but pre-occupancy) and be below a certain quantity:

- Concentration level of formaldehydes less than or equal to 100 µg/m³ averaged over 30 minutes
- Concentration level of VOCs less than 300 µg/m³ over 8 hours

The testing and measurement of the above pollutants are in accordance with the following standards:

- BS EN ISO 16000-4:2004 diffusive sampling of formaldehyde in air
- EN ISO 16000-6: VOCs in air by active sampling
- BS EN 16017-2: 2003 VOCs – Indoor, ambient and workplace air by passive sampling
- BS EN ISO 16000-3: 2001 Formaldehyde and other carbonyls in air by pumped sampling

› Gyproc Contribution

As you can see in the test reporting below, our Gyproc solutions have a very low VOC content.

Gyproc Products	Total VOC
ThistleBond-it	4.31 g/l
Gyproc Drywall Primer	0.43 g/l
Gyproc Drywall Sealer	2.58 g/l
Gyproc ProMix Finish	6.86 g/l
Gyproc Sealant	153.3 g/l

The current BREEAM® schemes do not include plasterboard as a product category; there is no specific requirement to provide VOC content data. However, it can be relevant for post-construction testing requirements, as clients/ specifiers may request this information from us. The standards used widely in Europe to evaluate VOC levels in plasterboard products are EN 13419 and ISO 16000.

Based upon indicative testing of a sample of plasterboard products, Gyproc plasterboard is estimated not to contain a VOC content or formaldehyde content which exceeds the requirements of European voluntary labelling schemes connected with indoor air quality. None of the ingredients contained in the Gyproc range of undercoat and finishing plasters contain VOCs or formaldehyde which exceeds the requirements of European voluntary labelling schemes connected to indoor air quality. Please contact the technical department for further information.

03. Thermal Comfort (HEA 03)

2 Credits

› Aim

To ensure that appropriate thermal comfort levels are achieved through design, and controls are selected to maintain a thermally comfortable environment for occupants within the building.

› BREEAM® Requirements

To earn credits, thermal modelling has to be carried out using the PMV (predicted mean vote) and PPD (predicted percentage of dissatisfied) indices in accordance with ISO 7730:20051 taking full account of seasonal variations.

Local thermal comfort criteria have been used to determine the level of thermal comfort in the building, in particular internal winter and summer temperature ranges will be in line with the recommended comfort criteria within ISO 7730:2005, with no areas falling within the levels defined as representing local dissatisfaction.

Thermal comfort levels in occupied spaces meet the Category B requirements set out in Table A.1 of Annex A of ISO 7730:2005.

› Gyproc Contribution

The following systems increase the thermal performance of the building structure. Our products can also contribute to high levels of air-tightness in buildings.

Gyproc Products	Function
Hard Coat, Airtite Quiet	Airtight plasters
GypLyner, ThermaLine SUPER	Insulated lining systems
Isover Acoustic Roll, Spacesaver Metac	Mineral wool insulation
Isover Vario	Airtightness membranes

Airtightness tests have been carried out on our plasters and our technical department may provide U-value calculations and condensation risk analysis to assist with the design of the project.

05. Acoustic Performance (HEA 05)

2/4 Credits

› Aim

To ensure the buildings' acoustic performance including sound insulation meet the appropriate standards for its purpose.

› BREEAM® Requirements

For non-residential (2 credits):

All unoccupied spaces comply with the following:

- Indoor ambient noise level targets within National Building Regulations or other appropriate good practice standards.
- Where National Building Regulations or good practice standards do not exist for the building type or do not provide indoor ambient noise targets, the indoor ambient noise levels comply with 'good practice' criteria levels outlined in BS 8233:1999. Refer to summary table below.

The sound insulation between acoustically sensitive rooms and other occupied areas comply with the following:

- Sound insulation between acoustically sensitive rooms and other occupied areas comply with targets within national regulations or other appropriate good practice standards.
- Where relevant national regulations or good practice standards do not exist for the building type or do not provide sound insulation performance targets, the sound insulation between acoustically sensitive rooms and other occupied areas complies with the following privacy index: D_w + LAeq,T > 75
- Where privacy is viewed to be critical by the client and/or design team (e.g. doctors consulting room, consulting room within a bank) or where the room is adjacent to noisy space, such as a music room, the area should comply with an enhanced privacy index: D_w + LAeq,T > 85
  D_w is the weighted sound level difference between the two spaces
  LAeq,T is the measured indoor ambient noise level in the acoustically sensitive room

Rooms/areas used for speech (including meeting rooms and rooms for public speaking) or rooms used for music performance and rehearsal, achieve reverberation times as detailed below:

- Demonstrate that the reverberation time or equivalent absorption area for relevant spaces complies with targets within relevant national regulations or other appropriate good practice standards.
- Where relevant national regulations or good practice standards do not require the control of reverberation time, achieve reverberation times compliant with Table 21. In addition, if relevant to assessed building, all areas used for teaching, training and educational purposes achieve reverberation times compliant with Table 22.

Best practice upper limit indoor ambient noise level

Function of area	Noise Level* (dB LAeq,T)
Courtrooms/ Recording studios/ Concert hall/ Theatres	30
Bedrooms/ Seminar/ Consulting/ Treatment rooms	35
Meeting rooms	35-40
Private offices/ Courtrooms (public address)/ Laboratories / General spaces (staffrooms, restrooms)	40
Bars	40-45
Open visit areas (Prisons)	45
Library areas/ Open offices	40-50
Informal café/ Canteen areas/ Catering kitchens	50
Restaurant areas	40-55
Manual workshops	55

* Final occupier may accept upper value where privacy is not deemed by the final occupier to be an issue.

For residential (4 credits):

The building meets the acoustic performance standards and testing requirements as detailed below:

Airborne and impact sound insulation values comply with the performance improvement standards, as compared to the relevant national regulations outlined in Table 23*.

Airborne and impact sound insulation levels comply with the performance standards outlined in Table 24* unless otherwise stated within these criteria.

› Gyproc Contribution

We propose solutions for acoustic insulation (plasterboard and ceiling solutions) and for acoustic absorption (ceiling solutions).

The acoustic insulation performance will allow reducing the passage of sound from one area into another. In addition to providing sound insulation our products and systems can be designed to reduce structure borne noise known as impact sound between floors.

The acoustic absorption performance will allow improving the sound absorption within the room, resulting in a much better quality of sound within the area concerned due to less reverberation off of 'hard' surfaces.

The quantified performances, in term of acoustic, of a sample of our products are listed below:

Gyproc Products	Insulation Performance R_w (dB)
GypWall QUIET SF	61–65 R_wdB
GypWall QUIET IWL	66–70 R_wdB
GypWall AUDIO	67–80 R_wdB
GypFloor SILENT	40–63 R_wdB / 63–55 Ln_wdB

Gyproc Products	Absorption Performance α_w
Rigitone	0.25 (LM)–0.70(LM) α_w / 0.45–0.90 NRC
Gyptone Tiles	0.60–0.80 α_w / 0.65–0.80 NRC
Gyptone Plank	0.65–0.75 α_w / 0.60–0.75 NRC
Gyptone BIG	0.35–0.75 α_w / 0.40–0.75 NRC

Additional guidance on acoustic standards are available for healthcare project in HTM 08-01, school projects in TGD-021-5 from the department of education, hotel standards through Bord Fáilte and BS 8233 for various construction types and internal environments.

**All items highlighted in blue are hyper links linking to an external web document.*

Energy

01. Energy efficiency (ENE 01)

15 Credits

› Aim

To recognise and encourage buildings that minimise their operational energy consumption through good design.

› BREEAM® Requirements

1. Option 1 – Use of Approved Building Energy Calculation Software (15 credits)

The energy performance of the building is calculated from design information using approved energy calculation (modelling) software and the number of credits achieved is based on the predicted energy performance of the assessed building compared to the performance of an equivalent national building designed to meet, but not improve on, the current building energy performance standard.

The Energy Performance Ratio for International New Constructions (EPRINC) is calculated using BREEAM's® Ene 01 calculator.

2. Option 2 – Energy efficient design features (10 credits)

Where Option 1 is not available or feasible in the country of assessment, the energy performance of the building is determined using Option 2 Checklist A5.

› Gyproc Contribution

The following systems increase the thermal performance of the building envelope.

Gyproc products	Function
Hard Coat, Airtite Quiet	Airtight plasters
GypLyner, ThermaLine SUPER	Insulated lining systems
Isover Acoustic Roll, Spacesaver Metac	Mineral wool insulation
Isover Vario	Airtightness membranes

Materials

Niemeyer Center, Asturias, Spain

01. Life cycle impacts (MAT 01)

2/6 Credits

› Aim

To recognise and encourage the use of robust and appropriate life cycle assessment tools and consequently the specification of construction materials with a low environmental impact (including embodied carbon) over the full life cycle of the building.

› BREEAM® Requirements

To earn credits a measure of the life cycle environmental impact of the building elements has to be done using a life cycle assessment (LCA) tool. Credits are awarded on the basis of the percentage of BREEAM® Mat 01 calculator points achieved. This score is based on the robustness of the LCA tool used and the scope of the assessment in terms of elements considered.

› Gyproc Contribution

Understanding the environmental performances of construction products is a growing expectation for professionals in the building chain. In Saint-Gobain, we strongly believe that Life Cycle Assessment is the most reliable tool available to assess the green credentials of construction products and to enable companies to communicate credible, fact-based information about their products to consumers. It is also a powerful tool to improve the environmental features of our products.

Therefore Saint-Gobain has decided to promote the use of LCAs in the building industry and to communicate actively on its products LCA results which are presented in an Environmental Product Declaration in compliance with international standards. We are committed to verification by an independent third party.

We have 11 third party verified Environmental Performance Declarations (EPDs) available on the EPD international public database: www.environdec.com or by contacting our Technical Department.

Gyproc products having third party verified EPD available:

- 12.5mm WallBoard
- 12.5mm FireLine
- Gyproc Finish Plaster
- Gyproc Hard Coat
- 6mm Glasroc F MULTIBOARD
- 15mm Glasroc F FIRECASE
- 12.5mm Glasroc H TILEBACKER
- Gyptone BIG 12.5mm with Activ'Air®
- Gyptone Ceiling Tiles 10mm with Activ'Air®
- Isover Spacesaver
- Gypframe Metal components

03. Responsible sourcing of materials (MAT03)

3 Credits

› Aim

To recognise and encourage the specification of responsibly sourced materials for key building elements.

› BREEAM® Requirements

To achieve points for any given building element (walls, floors, roof, etc.), at least 80% of the materials that make-up that element must be responsibly sourced. Each of the applicable specified materials comprising the main building elements are evaluated and associated to a tier level regarding its responsibility sourcing. These tier levels will then be translated into BREEAM® credits thanks to the BREEAM® Mat 03 Calculator. The Responsible Sourcing Certification Schemes are precisely defined. For plasters and plasterboards they correspond to the following:

- BRE Global BES6001 Product or Standard certification
- Environmental Management System (EMS) for the key process (plaster or plasterboard manufacture) and eventually for the supply chain extraction process (gypsum extraction and/or production of synthetic gypsum from flue gas desulphurisation)
- Recycled material
- Reused materials

› Gyproc Contribution

At Saint-Gobain we believe that a good Environmental Management System should be put in place for our processes. Certification, like ISO 14001, is an effective way to include environmental issues in overall unit management. It is also a way to build in a commitment to continuous improvement and to preventing pollution. In 2004, our local manufacturing Gyproc site in Kingscourt was ISO 14001 certified.

BES 6001 is an independent audited standard from Building Research Establishment (BRE) that assesses the responsible sourcing of construction products. Independently verified responsible sourcing is a key requirement for customers seeking assurance that they are sourcing materials responsibly and sustainably.

The following Gyproc products have been certified to BES 6001, achieving a rating 'Very Good' or 'Excellent' as shown for their responsible sourcing.

Achieving BES 6001 'Excellent' means that certified products will achieve Tier Two under MAT 03 in BREEAM® 2011, providing 3.5 of a maximum 4 points. It also means that all certified products are Tier One under MAT 2 for Code for Sustainable Homes, making it easier for customers to achieve a higher number of points towards credits at no additional cost.

100% of the paper used in our plasterboards comes from sustainably managed forests.

Gyproc products with BES 6001 certification

'Very Good' rating	'Excellent' rating
WallBoard*	Gypframe metal
FireLine*	Hard Coat plaster
SoundBloc*	Glasroc F MULTIBOARD
Plank	Glasroc F FIRECASE
CoreBoard	Glasroc H TILEBACKER
DuraLine	
WallBoard Premium	
Bonding	
Airtite Quiet	
Skimcoat	
Carlite Finish	
Plasterboard Compound	

*incl. Moisture Resistant & Foilback (i.e. Duplex) types

04. Insulation (MAT 04)

2 Credits

› Aim

To recognise and encourage the use of thermal insulation which has been responsibly sourced a low embodied environmental impact relative to its thermal properties.

› BREEAM Requirements

1 Credit: Embodied Impact

The Green Guide rating for the thermal insulation materials must be determined. For each type of thermal insulation used in the relevant building elements, the volume weighted thermal resistance provided by each type of insulation is calculated as follows:

(Area of insulation (m^2) x thickness(m)) /Thermal Conductivity (W/ m.K)
OR
Total volume of insulation used (m^3)/Thermal conductivity (W/m.K)

Green Guide Rating	Points/element
A+	3
A	2
B	1

1 Credit: Responsible Sourcing

At least 80% (by volume) of the thermal insulation used in the assessed building elements (external walls, ground floor, roof or building services) must be responsibly sourced i.e. each insulation product must be certified in accordance with either tier levels 1, 2, 3, 4, 5 or 6 as described in BREEAM® issue Mat 03 Responsible sourcing of materials.

› ISOVER Contribution

Credit 1 – Embodied Impact:

ISOVER Spacesaver, Steel Frame Infill Batt, Acoustic Roll

The above Isover products correspond to the BRE Global Green Guide online generic specification glass wool insulation (various densities) references: 815320005 and 815320004, which achieve a summary rating of A+ within Domestic, Health, Industrial, Commercial, Retail and Education.

Credit 2 – Responsible Sourcing:

ISOVER is an ISO 14001:2004 (Environmental Management System) accredited manufacturing facility. This accreditation ensures that all products are manufactured to the stringent standards set out by this management system.

ISOVER mineral wool is made from Recycled materials – up to 86% recycled glass.

05. Designing for robustness (MAT 05)

1 Credit

› Aim

To recognise and encourage adequate protection of exposed elements of the building and landscape, therefore minimising the frequency of replacement and maximising materials optimisation.

› BREEAM® Requirements

Areas of the building have been identified (both internal and external) where vehicular, trolley and pedestrian movement occur.

The design of these areas incorporates suitable durability and protection measures or design features/ solutions to prevent damage to the vulnerable parts of the building. This must include, but is not necessarily limited to:

Protection from the effects of high pedestrian traffic in main entrances, public areas and thoroughfares (corridors, lifts, stairs, doors, etc.).

Where relevant, protection against any internal vehicular or trolley movement within 1m of the internal building fabric in storage, delivery, corridor and kitchen areas.

Protection against, or prevention from, any potential vehicular collision where vehicular parking and manoeuvring occurs within 1m of the external building façade for all car parking areas and within 2m for all delivery areas.

› Gyproc Contribution

This primarily applies to corridor walls having a Severe duty rating as assessed under BS 5234. Gyproc offer products with a very high level of impact resistance and durability. They are very well adapted to spaces with high frequentation like corridors, educational buildings, stairs, etc.

Systems	Boarding	Duty Rating (BS 5234)
GypWall	10mm MultiBoard or 2 layers of alternative Gyproc boarding	Severe
GypWall QUIET	19mm Plank & 12.5mm SoundBloc or 2 layers of 15mm SoundBloc	Severe
GypWall QUIET SF	19mm Plank & 12.5mm SoundBloc or 2 layers of 15mm SoundBloc	Severe
GypWall QUIET IWL	2 layers of 15mm SoundBloc	Severe
GypWall STAGGERED	2 layers of 12.5mm SoundBloc	Severe
GypWall SUPERIOR	12.5mm Habito & 12.5mm SoundBloc	Severe
GypWall ROBUST	1 layer of 15mm DuraLine	Severe
GypWall EXTREME	1 layer of 12.5mm Rigidur	Severe*

** Note: 'Severe' Duty is the highest classification available under BS 5234. Additional structural performance tests above and beyond Severe Duty have been carried out.*

Waste

Need Caption

01. Construction waste management (WST 01)

3 Credits

› Aim

To promote resource efficiency via the effective and appropriate management of construction waste.

› BREEAM® Requirements

Procedures are in place for sorting, reusing and recycling construction waste into at least five defined waste groups (gypsum waste group: plasterboard, render, plaster, cement, fibre cement sheets, mortar) either on-site or off-site through a licensed external contractor. A significant quantity of non-hazardous construction and demolition (C&D) waste (where applicable) generated by the project has been diverted from landfill according to the figures within table below:

BREEAM® target rates for diversion from landfill	Where the national C&D waste recovery rate is < 40% (by weight)	Where the national C&D waste recovery rate is ≥ 40% (by weight)
1 credit	≥ 50% (by weight) or ≥ 40% (by volume)	≥ 10% improvement over national rate (up to where 95% of total waste created is diverted to landfill)
Exemplary level	≥ 75% (by weight) or ≥ 65% (by volume)	≥ 35% improvement over national rate (up to where 95% of total waste created is diverted to landfill)

› Gyproc Contribution

Gypsum is 100% and infinitely recyclable. We offer recycling services in 14 countries within our activity that allow our customers to sort out, collect and recycle all the gypsum-based waste from the jobsite (construction, renovation and demolition).

Plasterboard solutions are very much designed for deconstruction, and therefore have a high level of separability from the structure or envelope of the building. They are easy to dismantle and move. This increases the likelihood of plasterboards being sorted into recyclable dedicated streams and the reuse of insulation and metal components.

Additionally, we supply custom sizes of plasterboards and metal which eliminate waste by designing them based on the construction. All our metal profiles are recyclable using an established recycling process.

Innovation

Pap Promet Showroom, Sveta Nedelja, Croatia

01. Innovation (INN 01)

10 Credits

› Aim

To support innovation within the construction industry through the recognition of sustainability related benefits which are not rewarded by standard BREEAM® issues.

Innovation BREEAM® credits can be earned in two ways:

1. Exemplary level of performance in existing BREEAM® issues

› BREEAM® Requirements

Where the building demonstrates exemplary performance by meeting defined exemplary level performance criteria in one or more of following BREEAM® assessment issues:

- Ene 01 Energy efficiency
- Mat 01 Life cycle impacts
- Mat 03 Responsible sourcing of materials
- Wst 01 Construction site waste management

› Gyproc Contribution

Our products, thanks to their performances, can contribute to the achievement of exemplary level of performance for the following BREEAM® issues (see associated below).

BREEAM® criteria	Details on the exemplary level of performance
Ene 01 Reduction of CO2 emissions	Saint-Gobain Gyproc and Isover solutions can contribute to achieving 'carbon negative' building performance in terms of its total modelled operational energy consumption
Mat 01 Life cycle impacts	Solutions contribute to achieving exemplary levels with either Route 1: Green Guide or Route 2: EPDs
Mat 03 Responsible sourcing of materials	Gyproc solutions can contribute to achieving 70% of the available responsible sourcing points
Wst 01 Construction site waste management	Gyproc solutions contribute to achieving exemplary levels of resource efficiency and % diverted waste

01. Innovation (INN 01)

10 Credits

2. Approved innovations

› BREEAM® Requirements

One innovation credit can be awarded for each innovation application approved by BRE Global, where the building complies with the criteria defined within an approved innovation application form.

› Gyproc Contribution

- Activ'Air® technology takes formaldehyde and converts them into safe, inert compounds that, once captured in the product, cannot be released back into the air. It removes 70% of formaldehyde in the air and keeps working for 75 years, based on tests and analysis, even after multiple renovations.

Eurofins report n°767325–53: confirms the absorption of 23 µg/m².h for Activ'Air® products such as Activ'Air® WallBoard, SoundBloc and DuraLine as well as Gyptone ceiling tiles and BIG boards.

- We strongly believe that LCA is the most reliable tool available to assess the green credentials of construction products and enable companies to communicate credible, fact-based information about their products to consumers. We have conducted LCA and verified EPDs for our products as highlighted under section MAT 01 above.

WORLD GREEN BUILDING COUNCIL

To reach our goal of becoming the reference in sustainable habitat, Saint-Gobain is deeply involved in the Green Building Councils:

- Founding member of the Irish Green Building Council
- Member of the Corporate Advisory Board of the World GBC
- Partner of the European Regional Network
- Platinum member of the US GBC
- Member in more than 30 national GBCs around the world

Discover how Gyproc solutions are assets for other green building certifications:

- LEED with Gyproc

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