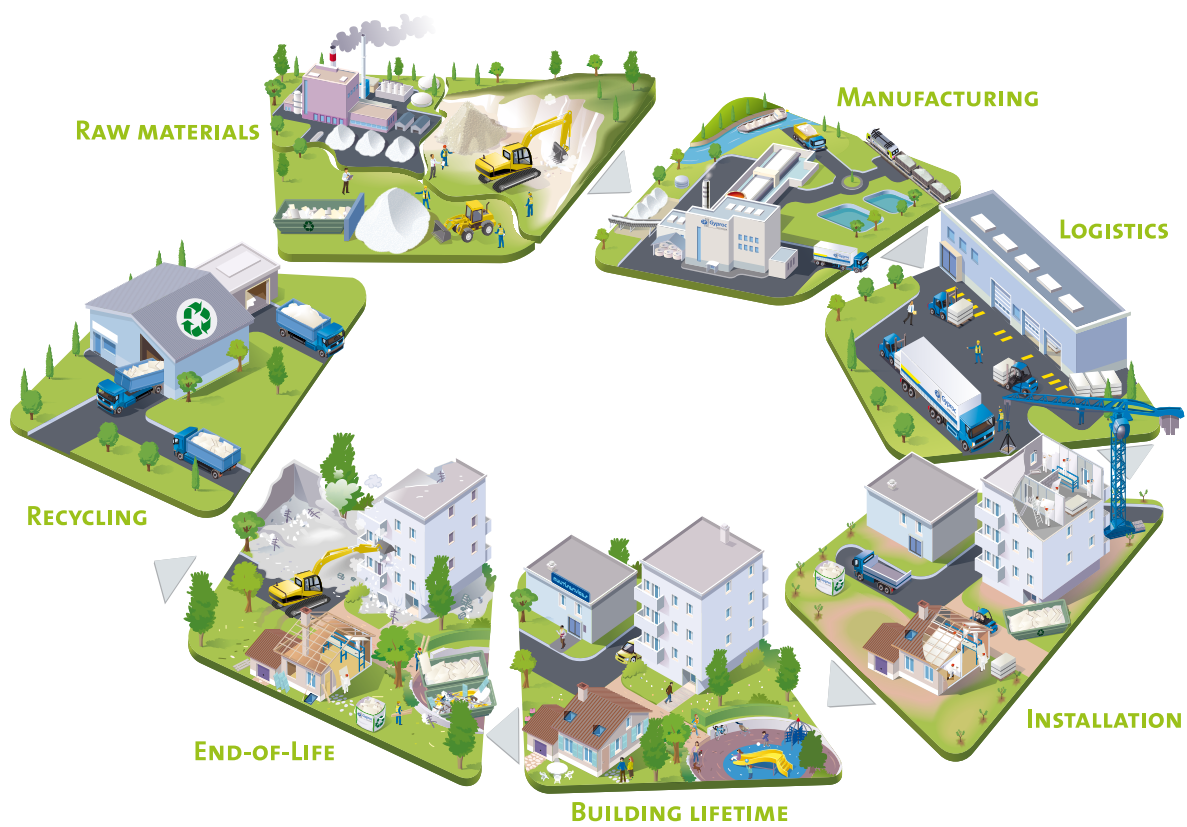




**LEED® v4 with Saint-Gobain Gyproc,  
for a Sustainable Habitat**





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## HOW OUR SOLUTIONS CONTRIBUTE TO SUSTAINABLE BUILDINGS.

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In Saint-Gobain Gyproc, we have been working in the plaster and plasterboards fields for years and are committed to maintaining a strong position thanks to our innovative and sustainable products and services. Our commitment is to minimise the impact of our products and systems on the environment in a number of ways:

➤ **Our business is local, with manufacturing facilities as close as possible to the main construction hotspots**, ensuring that our response is prompt, and that our materials are local to minimise transportation.

➤ **The environmental impact of our products is monitored vigilantly during production and also over the whole of their life cycle.**

**We strongly believe that Life Cycle Assessment (LCA) is the most reliable tool** for evaluating the environmental impacts of our construction solutions. The LCA enables us to assess our environmental impacts over the whole life cycle of our product from the extraction of raw material through to the end of life. The results of the LCA are presented in an Environmental Product Declaration or EPD. We produce all of our EPDs in compliance with international standards and we are committed to verification by an independent third party, to ensure that the information we communicate is credible, in line with the requirements of LEED v4.



- **Gypsum is an infinitely recyclable material.** In order to answer the specific need of our customers, **we offer dedicated recycling services for construction, deconstruction or demolition jobsites.** We are continuously working to increase the recycled content of our products in order to close the loop. For example, our plasterboards use almost 100% recycled paper and contain from 10% to 25% recycled gypsum.

Over the lifetime of buildings, **our solutions contribute to providing comfort, security and health** to the occupiers and users of buildings such as: **acoustic, thermal and hygrometric comfort, flexibility in design and easy maintenance**; and also **visual comfort and fire safety** with solutions with higher resistance performance. **They contribute to maintaining a healthy indoor environment and have very low or no VOC (Volatile organic compounds) emissions.**

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# THE LEED® CERTIFICATION

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## > What is LEED®?

LEED, or Leadership in Energy & Environmental Design, is a green building certification programme that recognises best-in-class building strategies and practices.

LEED® provides rating systems that are voluntary, consensus-based, market-driven, and based on accepted energy and environmental principles. The LEED® rating systems were developed by US Green Building Council committees in 1998. In January 2015, there were more than 76,500 registered projects and 35,000 certified buildings<sup>1</sup>.

To receive LEED certification, building projects must satisfy prerequisites and earn points to achieve different levels of certification. Prerequisites and credits differ for each rating system, depending on the type of building (office, school, home, etc.) and the type of project (new or renovation). In total, there are five rating systems that address multiple project types.

The certification is developed by the US Green Building Council. As a platinum member of this organisation since September 2013, Saint-Gobain has become a key partner of LEED. USGBC released a new version of the LEED certification, called V4, at the end of 2013. This version will be the only one on the market from July 2015.



## > LEED® ratings

There are four rating systems that address multiple project types:

- Building Design and Construction
- Interior Design and Construction
- Building Operations and Maintenance
- Neighbourhood Development

**LEED v4 for Building Design and Construction (BD +C)** is used as a reference in this brochure; it includes the following specific rating systems. Points can vary according to each criterion and specific rating systems:

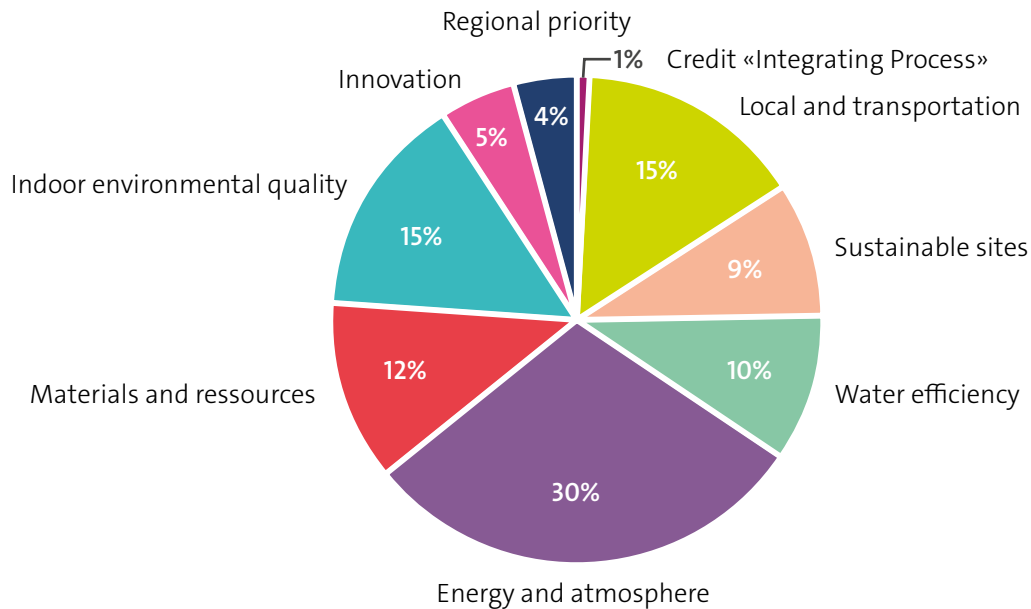
- LEED® v4 BD+C: New Construction
- LEED® v4 BD+C: Core and Shell
- LEED® v4 BD+C: Schools
- LEED® v4 BD+C: Retail
- LEED® v4 BD+C: Data Centres
- LEED® v4 BD+C: Warehouses and Distribution Centres
- LEED® v4 BD+C: Hospitality
- LEED® v4 BD+C: Healthcare

The LEED®v4 rating system Building Design and Construction (BD+C) for New Construction and Major Renovation has eight major categories, six of which can be improved using the plaster and plasterboard solutions from Saint-Gobain Gyproc in the design of the building.

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<sup>1</sup> Source : <http://www.usgbc.org/projects>

# DISTRIBUTION OF THE 8 LEED v4 CATEGORIES FOR BUILDING DESIGN AND NEW CONSTRUCTION



LEED categories	Possible points	Weighting	Saint-Gobain Gyproc impact
Credit «integrative process»	1	1%	YES
Location & transportation	16	15%	N/A
Sustainable sites	10	9%	N/A
Water efficiency	11	10%	N/A
Energy & atmosphere	33	30%	YES
Material & ressources	13	12%	YES
Indoor environmental quality	16	15%	YES
Innovation	6	5%	YES
Regional priority	4	4%	Depending on the countries
<b>TOTAL</b>	<b>110</b>	<b>100%</b>	

LEED® projects can earn 110 points in total. The minimum number of points required for LEED® certification is 40. Higher levels of compliance are possible leading to different rankings, as shown in the table below.

LEED® rating level	LEED® points
Certified	40-49
Silver	50-59
Gold	60-79
Platinum	80 and above

## CONTENT OF THE BROCHURE

Though LEED® does not certify specific products, use of Saint-Gobain Gyproc solutions can contribute to your future LEED project for 13 credits and up to 43 points or more depending on the Regional Priorities. This brochure will develop the contribution of Saint-Gobain Gyproc products and solutions for these LEED® v4 credits.

Categories	Credits	Total points available	Page
Energy & atmosphere	Credit “integrative process”	1	7
	Optimise energy performance	18 (up to 20 for Healthcare)	9
Material & resources	Building product disclosure and optimisation: sourcing of raw materials	2	12
	Prerequisite: construction and demolition waste planning		15
	Construction and demolition waste management	2	16
	Building product disclosure and optimisation: environmental product declaration	2	18
	Building product disclosure and optimisation: material ingredients	2	20
	Building life cycle impact reduction	5 (up to 6 for Core & Shell)	22
	Design for flexibility	(1)* (only for Healthcare)	24
Indoor Environmental Quality	Prerequisite : Minimum Acoustic Performance		26
	Acoustic performance	1 (up to 2 for Healthcare)	28
	Low-emitting materials	3	30
	Construction Indoor Air Quality Management Plan	1	32
	Thermal comfort	1	33
Innovation	Innovation (IN)	5	36
Regional Priority	Depending on the countries	(4)*	
		<b>TOTAL (BD &amp; C)</b>	<b>43 points</b>

The category **Regional Priority** can be added by virtue of local options: it varies for each country. E.g. Ireland: Indoor Air Quality Assessment (improved through use of Activ’Air) & Thermal comfort (design) through use of insulation and air tightness solutions.

For each criterion, you will find the complete details of the requirements and of the pre requisites by clicking on the following pictogram that will immediately redirect you to the corresponding LEED webpage.



\* Points not included in the proposed total « Total (BD&C) 43 points »

# CREDIT: INTEGRATIVE PROCESS



## > Aim

To support high-performance, cost-effective project outcomes through an early analysis of the relationships between systems.

## > LEED® requirements

Beginning in pre-design and continuing throughout the design phases, identify and use opportunities to achieve synergies across disciplines and building systems for Energy- and Water-Related Systems. Use the analyses to inform the owner's project requirements (OPR), basis of design (BOD), design documents, and construction documents.

**For the criteria “Energy-Related Systems, Discovery”,** A preliminary “simple box” energy modelling analysis has to be performed before the completion of schematic design that explores how to reduce energy loads in the building and accomplish related sustainability goals by questioning default assumptions. At least two potential strategies associated with Site conditions, Massing and orientation, Basic envelope attributes, Lighting levels, Thermal comfort ranges, Plug and process load needs, Programmatic and operational parameters need to be assessed.

## > Saint-Gobain Gyproc contribution

By utilising BIM (Building Information Modelling), the objects and drawings for our products can help in the model development to assess energy consumption and lighting, insulation values, interior surface reflectance values and subsequently thermal comfort ranges as well as anticipated operations and maintenance. BIM objects for our products may be obtained by contacting our technical department.

## DOCUMENTATION AVAILABLE

[http://media.saint-gobain.co.uk/App\\_Media/Saint-Gobain/pdfs/BIM\\_Basics.pdf](http://media.saint-gobain.co.uk/App_Media/Saint-Gobain/pdfs/BIM_Basics.pdf)  
<http://www.british-gypsum.com/news/british-gypsum-launches-online-specification-tool>  
<http://www.rigips.cz/elektronicky-katalog-systemu-rigips/>  
<http://www.certainteed.com/pressroom/pressRelease.aspx?id=309>  
<http://www.ecophon.com/uk/Solutions/Cad-Support-Tools/BIM/>



Promenada Mall, Bucharest Romania

# ENERGY AND ATMOSPHERE



# EA CREDIT: OPTIMISE ENERGY PERFORMANCE



## ▪ Aim

To achieve increasing levels of energy performance beyond the prerequisite standard to reduce environmental and economic harm associated with excessive energy use. Maximum points can be awarded for the following rating systems included in our scope:

## ▪ LEED® requirements

### Prerequisite “Minimum energy performance”<sup>2</sup>

Projects have to comply with the prerequisite “Minimum energy performance” to be eligible to meet this criterion. Three options are proposed:

- one option consists of a whole building energy simulation that demonstrates an improvement of 5% (for new construction) in the proposed building performance rating, compared with the baseline building performance rating (using the ANSI/ASHRAE/IESNA standard 90.1-2010 to make the simulation).
- The two other options require compliance with either the “ASHRAE 50% advanced energy design guide”, or “advanced building core performance guide” (or USBGC-approved equivalent standard for projects outside the USA).

For the criteria “Optimise energy performance”, following the same methodology and standards as those used in the prerequisite, the energy performance of the project is measured and compared to the baseline. Points are awarded according to the percentage of improvement between the two (see table below).

New Construction	Major renovations	Core and Shell	Points (except school, healthcare)	Points healthcare	Points school
6%	4%	3%	1	3	1
8%	6%	5%	2	4	2
10%	8%	7%	3	5	3
12%	10%	9%	4	6	4
14%	12%	11%	5	7	5
16%	14%	13%	6	8	6
18%	16%	15%	7	9	7
20%	18%	17%	8	10	8
22%	20%	19%	9	11	9
24%	22%	21%	10	12	10
26%	24%	23%	11	13	11
29%	27%	26%	12	14	12
32%	30%	29%	13	15	13
35%	33%	32%	14	16	14
38%	36%	35%	15	17	15
42%	40%	39%	16	18	16
46%	44%	43%	17	19	-
50%	48%	47%	18	20	-

*Points for percentage improvement in energy performance*

<sup>2</sup>Pre-requisite Minimum energy performance: <http://www.usgbc.org/node/2613358?return=/credits/new-construction/v4/energy-&-atmosphere>

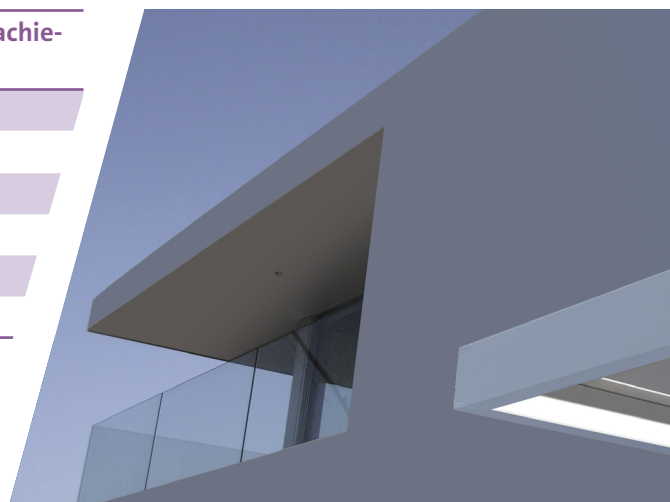
## ▪ Saint-Gobain Gyproc contribution

By reducing the amount of energy consumed, our products can help to meet local regulations and LEED requirements regarding the thermal performance of the building structure. The following range of products can contribute to boosting this criterion: Thermal Insulation Boards, lightweight gypsum plaster, Wall Lining systems (based on adhesive or light weight metal components), Ceiling systems and systems incorporating glass mineral wool. Thermal Insulation can help to reduce heat loss from a building in cold countries and help to reduce heat gains in buildings in hot climates.

Our products can also contribute significantly to drywall and masonry constructions designed to achieve high levels of air-tightness in buildings.

The following systems proposed by Saint-Gobain Gyproc increase the thermal performance of the building structure, depending on the types and thickness of insulation used. They enable energy reduction and reduced energy costs in heating and air-conditioning by minimising the energy loss in winter and overheating in summer.

Examples of Saint-Gobain Gyproc products	Range of performance achieved (U Value)
UK - BG Thermaline Super PIR	To complete
Rigiterm	To complete
Gyplyner	To complete
Airtite Quiet	To complete
France - Placomur	To complete
France - Doublissimo	To complete



*Single family dwelling, Tenerife, Spain*

# MATERIALS AND RESOURCES



ศาสตราจารย์ศิลป์ พีระศรี  
Silpa Bhiraori  
Professor Silpa Bhiraori (Corrado Feroci)  
1893-1962  
ศาสตราจารย์ศิลป์ พีระศรี เป็นผู้ก่อตั้งมหาวิทยาลัยศิลปากร  
The father of the Contemporary Art, The Pioneer of Silpa University

# MR CREDIT: BUILDING PRODUCT DISCLOSURE AND OPTIMISATION: SOURCING OF RAW MATERIAL



## ▪ Aim

To encourage the use of products and materials with available life cycle information and that have environmentally-, economically-, and socially-preferable life-cycle impacts. To reward project teams for selecting products verified to have been extracted or sourced in a responsible manner.

## ▪ LEED® REQUIREMENTS

### • Raw material source and extraction reporting (1 point)

The project has to use at least 20 different permanently installed products from at least five different manufacturers that have publicly released a report from their raw material suppliers that includes all details regarding their responsible extraction policy.

Third-party verified corporate sustainability reports (CSR) that include environmental impacts of extraction operations and activities associated with the manufacturer's product and the product's supply chain are considered as one whole product for credit achievement calculation, if they follow an acceptable framework, such as the GRI (Global Reporting Initiative), the UN Global Compact, The ISO 26 000, etc. In comparison, self-declared reports are valued as one half (1/2).

### • Leadership extraction practices (1 point)

The products that meet the following extraction criteria are valued by LEED: extended producer responsibility, bio-based materials, certified wood products (by the Forest Stewardship Council or USGBC-approved equivalent.), materials with reused & recycled content. As in LEED v3,

*Recycled content = postconsumer recycled content + 1/2 \* preconsumer recycled content*

• **Additional option:** products sourced (extracted, manufactured, purchased) within 160 km<sup>3</sup> of the project site are evaluated at 200% of their base contributing cost.

## ▪ Saint-Gobain Gyproc contribution<sup>4</sup>

Average recycled content for concerned sites in 2013 was 12.6%, with a range of 0% to 60.9%. 1/2\*(recycled raw materials + recycled scrap) + recycled C&D waste. ▶

<sup>3</sup>Equivalent to 100 miles

<sup>4</sup>NB1: The only material that counts as pre-consumer material is material returned from jobsites (cuts around doors, windows, etc.). If it is material damaged at the plant and reused, it does not count. NB2: DSG is not considered a recycled material.

In some countries, for raw materials, we use **desulphurisation gypsum** which is a by-product of coal power-plants that comes from the desulphurisation of flue gas of the thermal coal power plants. We prevent this by-product going to landfills (by the power company) and in this way reduce the extraction of natural gypsum.

**Paper sourcing.** Through on-going work with our paper suppliers, in Europe we are able to provide plasterboards with 97.4% to 100% recycled paper. In cases where the paper is not from a recycled source, we ensure that it comes from sustainably managed forests in Europe. One way to guarantee that commitment is with the FSC label.

Our environmental actions are not just limited to our processes and products. **We also try to minimise our impact on the local biodiversity.** Our quarries are continuously restored in order to preserve the natural site and its biodiversity. We also work on the effects of this exploitation on local communities and the environment. This included the visual impact of operations, dust, noise and vibration, added road traffic and any repercussions on the natural surroundings.

In addition, every year, **Saint-Gobain publishes its Corporate Social Responsibility or CSR report**, which is based on the GRI (Global Reporting Initiative) framework. As a result, it obtained in 2013 the A+ application level (“A” meaning that our level of transparency is very high, thanks to the numerous published KPI, and “+” meaning that parts of those KPI have been verified by an independent third party). In this report, Saint-Gobain details its environmental policy, including supply chain topics.

Since January 2009, the Group took its commitment to the **UN Global Compact** one step further by endorsing the Caring for Climate statement and the CEO Water Mandate for Water Resource Protection as part of the UN’s Millennium Development Goals.

**Saint-Gobain has also developed a Timber Policy that** defines the responsible conduct with which Saint-Gobain subsidiaries are required to comply when buying and/or selling timber products. It specifies a set of common operating rules such as using timber harvested in responsibly managed concessions in order to preserve natural resources. Consequently, our solutions with wood frames are certified FSC or PEFC. (Referring to Raw material source and extraction reporting) {Delete this sentence if it is not the case in your country.}

▪ **DOCUMENTATION AVAILABLE**

- Recycled content attestation on request
- Saint-Gobain Timber Policy [www.saint-gobain.com](http://www.saint-gobain.com),
- Saint-Gobain annual Corporate Social Responsibility report (GRI A+),  
[www.saint-gobain.com](http://www.saint-gobain.com),
- If the manufacturing site and quarry/mine is located within 160km of the jobsite, see the attestation of the location of the quarries and the manufacturing plants and their distance from the jobsite.
- The environmental brochure : Providing Solutions for Sustainable Habitat



*Natural gypsum quarry, Cormeilles France*

# MR PREREQUISITE: CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT PLANNING



## ▪ Aim

To reduce construction and demolition waste disposed of in landfills and incineration facilities by recovering, reusing, and recycling materials.

## ▪ LEED® requirements

A construction and demolition waste management plan has to be implemented specifying the materials that will be separated or combined and the description of the diversion strategies planned for the project. This plan has to indicate where the materials will be taken and how the recycling facility will process the materials.

It is required to provide a final report detailing all major waste streams generated, including disposal and diversion rates, with percentages.

## ▪ Saint-Gobain 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.

## ▪ DOCUMENTATION AVAILABLE

- A certificate can be delivered to indicate the amount of waste from the jobsite that has been diverted from landfills and sent to recycling units.
- Ask for more information about our local recycling services documentation.



*Recycling gypsum in Bala plant, Turkey*

# MR CREDIT: CONSTRUCTION & DEMOLITION WASTE MANAGEMENT



## ▪ Aim

To reduce construction and demolition waste disposed of in landfills and incineration facilities by recovering, reusing, and recycling materials.

## ▪ LEED® requirements

The project must recycle and/or salvage non-hazardous construction and demolition materials. Calculations can be weight or volume with the following options:

- Option 1: diversion of the construction and demolition material
  - Divert 50% and Three Material Streams (1 point)
  - Path 2. Divert 75% and Four Material Streams (2 points)
- Option 2: reduction of total waste material (no more than 12.2 kg of waste per m<sup>2</sup>). (2 points)

## ▪ Saint-Gobain Gyproc contribution

Gypsum is fully and infinitely recyclable. We try to increase the recycled content of our products to reach 25% recycling content in the plasterboards. Almost 100% of the paper in our plasterboards is recycled.

To avoid gypsum waste ending up in landfills, either from construction or deconstruction jobsites, we offer recycling services to our contractors in more than 14 countries. Additionally, dry wall solutions have a high level of separability from the structure or envelope of the building. They are easy to dismantle, and reuse. This increases the likelihood of plasterboards being sorted into recyclable dedicated streams. A certificate can be delivered to indicate the amount of waste that has been diverted from landfills and sent to recycling units. In addition to boards, all our metal profiles can be recycled through established recycling processes that are common in all countries.

**Regarding construction waste,** we try to reduce the amount of waste by offering custom solutions to our installers in order to minimise the construction waste and cut-off during the installation stage.

We provide contractors with tailored solutions to recycle gypsum waste from construction or deconstruction on their job sites, such as containers or big bags.

**Regarding demolition waste,** Saint-Gobain Gyproc is working to build partnerships with stakeholders in order to recycle plaster and plasterboards at the end of its life. In the same way, there have been new recycling projects launched in France, in particular within the Eurogypsum project called Gypsum to Gypsum, to conduct a European Life + project entitled “From Production to Recycling: A Circular Economy for the European Gypsum Industry with the Demolition and Recycling Industry”

▪ **Documentation available**

- A certificate can be delivered to indicate the amount of waste that has been diverted from landfills and sent to recycling units.
- Local recycling services documentation/website



*Plasterboard waste*

# MR CREDIT: BUILDING PRODUCT DISCLOSURE AND OPTIMISATION: ENVIRONMENTAL PRODUCT DECLARATIONS



## ▪ Aim

To encourage the use of products and materials with available life cycle information and that have environmentally, economically, and socially-preferable life cycle impacts. To reward project teams for selecting products from manufacturers who produce products with verified improved environmental life cycle impacts.

## ▪ LEED® requirements

Two aspects are included in this credit: disclosing the result of your life cycle assessment (LCA) thanks to Environmental Product Declarations and demonstrating a reduction of the environmental impact.

### • Option 1. Environmental Product Declaration (EPD) (1 point)

In its entirety the project must use at least 20 different permanently installed products sourced from at least five different manufacturers that meet one of the disclosure criteria below.

1. Products with a publicly available, critically-reviewed life cycle assessment conforming to ISO 14044 that have at least a cradle to gate scope (valued  $\frac{1}{4}$ )
2. Environmental Product Declarations which conform to ISO 14025, 14040, 14044, and EN 15804 or ISO 21930 and have at least a cradle to gate scope:
  - 2.1 Industry-wide (generic) EPD -- Products with third-party certification (Type III) (valued  $\frac{1}{2}$ )
  - 2.2 Product-specific Type III EPD -- Products with a third-party certification (Type III) (value 1).

### • Option 2. Environmental impact reduction - Multi-Attribute Optimisation (1 point)

For 50%, by cost, of the total value of permanently installed products, the project must use third-party certified products that demonstrate impact reduction, below industry average, in at least three environmental impacts of the LCA methodology.

• **Additional option:** products sourced (extracted, manufactured, purchased) within 160 km of the project site are evaluated at 200% of their base contributing cost.

## ▪ Saint-Gobain Gyproc contribution

Saint-Gobain Gyproc has produced more than 150 Environmental Product Declarations (EPDs). Our EPDs are product-specific and based on Life Cycle Assessments Cradle to Grave (including cradle to gate), and compliant with international standards: ISO 14025, 14040, 14044, and EN 15804 or ISO 21930. We have an LCA internal service dedicated to performing the LCA calculation in accordance with the International standards required by LEED and we commit to having our EPDs independently verified by an external third-party. Consequently, it fulfils option 2.2 listed above. ▶

**Our product can contribute to the additional option:** our business is local, our products are sourced and manufactured locally. Most of the time our solutions can satisfy the additional option and are evaluated at 200% of their base contributing costs.

In addition, we work with our local distribution partners and we try to shorten the distance when shipping finished products to installers and building sites. (Give more information about your eco-logistics initiatives or delete this sentence).

#### ▪ DOCUMENTATION AVAILABLE

- Download our Environmental Product Declarations (EPD); see the table below Environmental Product Declarations.
- Read our Life Cycle Assessment or LCA leaflet to understand why this methodology is the most comprehensive for assessing the environmental impacts of a construction product.
- If the manufacturing site is located within 160km<sup>5</sup> of the jobsite, see the attestation of the location of the quarries and the manufacturing plants and their distance from the jobsite.
- Discover our environmental strategy -Providing Solutions For Sustainable Habitat:
  - in our Environmental Brochure:  
[www.saint-gobain-gyproc.com/about-us](http://www.saint-gobain-gyproc.com/about-us)
  - in our Video: <https://www.youtube.com/watch?v=ntkJktlWMF4>



The environmental impacts of this product have been assessed over its whole life cycle. Its Environmental Product Declaration has been verified by an independent third party.

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<sup>5</sup>160 km is equivalent to 100 miles

## ▪ Aim

To encourage the use of products and materials for which life cycle information is available and that have environmentally-, economically-, and socially-preferable life cycle impacts. To reward project teams for selecting products with inventoried chemical ingredients using an accepted methodology and for selecting products verified to minimise the use and generation of harmful substances. To reward raw material manufacturers who produce products verified to have improved life cycle impacts.

## ▪ LEED® requirements

### • Option 1: material ingredient reporting (1 point)

The project has to use at least 20 different permanently installed products from at least five different manufacturers that demonstrate that the chemical inventory of the product is at least 0.1% (1000 ppm).

### • Option 2: material ingredient optimisation (1 point)

The products must document their material ingredient optimisation for at least 25%, by cost, of the total value of permanently installed products in the project. One methodology recognised by LEED is the REACH optimisation. When the product contains no ingredients listed on the REACH Authorisation or Candidate list, it is valued at 100% of cost for the calculation.

### • Option 3: product manufacturer supply chain optimisation (1 point)

Manufacturers must be engaged in validated and robust safety, health, hazard, and risk programmes with independent third party verification of their supply chain.

• **Additional option:** products sourced (extracted, manufactured, purchased) within 160 km of the project site are evaluated at 200% of their base contributing cost.

## ▪ Saint-Gobain Gyproc contribution

Saint-Gobain Gyproc products can contribute to option 2 and 3

### • Option 2

Calcium Sulphate Dihydrate (EINECs number 231-900-3) has full registration under the REACH regulations through a joint submission. According to this registration, Calcium Sulphate is not classified as hazardous under The Classification, Labelling and Packaging (CLP) Regulation.

Concerning Saint-Gobain Gyproc (at the time this brochure was published), our gypsum products and solutions contain no Substances of Very High Concern (SVHC) under the terms of REACH appearing on the list of candidate substances or subject to authorisation, in concentrations higher than 0.1% in weight, similar to their packaging.

Furthermore, our policy involves avoiding the use of any SVHC listed in the candidate list above 0.1% in weight and we follow publications and updates closely. ►

### • Option 3

Saint-Gobain Gyproc is engaged in robust safety, health, hazard, and risk programmes with a strong link to its supply chain, as explained in the engagement letter by our Chairman & CEO and in our Environmental Health & Safety charter.

Furthermore, 65% of Saint-Gobain Gyproc sites are certified ISO 14001 (an environmental management system) by an independent third party.

Following our purchasing policy, Saint-Gobain suppliers should conform to the Supplier Charter including various themes: respect the right to development, employee rights, occupational health and safety, environmental commitment and legal compliance commitment. We established a three-step process:

- 1) validation of the charter by our suppliers;
- 2) evaluation of CSR performance of our suppliers following 21 environmental, social and ethical criteria, integrating the assessment of the supply chain from our suppliers;
- 3) social audits carried out on site.

### ▪ Documentation available

- The Environmental Health & Safety charter and engagement letter signed by the Chairman & CEO of the Group;
- The ISO 14 001 certificate from your plants and quarries, on request when it is the case.



*Natural gypsum*

# MR CREDIT: BUILDING LIFE CYCLE IMPACT REDUCTION



## ▪ Aim

To encourage adaptive reuse and optimise the environmental performance of products and materials.

## ▪ LEED® requirements

LEED requires the demonstration of reduced environmental effects during initial project decision-making by reusing existing building resources or demonstrating a reduction in materials use through life cycle assessment. One of the following options must be achieved:

- 1. Historic building reuse:** maintain the existing building structure, envelope and interior non-structural elements of a historic building or designate the building to a historic district (5 points);
- 2. Renovation of abandoned or blighted building:** maintain at least 50%, by surface area, of the existing building structure, enclosure, and interior structural elements for buildings that meet local criteria of abandoned or are considered blighted (5 points);
- 3. Building and material reuse:** reuse or salvage building materials from off site or on site (2 to 4 points).
- 4. Whole building life cycle assessment (LCA):** the LCA must demonstrate a minimum of 10% reduction, compared with a baseline building, in at least three of the six impact categories (including global warming potential). At the same time, no impact shifting has to be observed (no increase by more than 5% compared with the baseline building in other impact category) (3 points).

## ▪ Saint-Gobain Gyproc contribution

The low weight of our materials means that they are highly suited for fitting out historic buildings and renovating abandoned buildings. The low load they impose means they do not impact the structural capacity of the building.

Thanks to our lightweight materials, the structural elements (building frame and foundations) can be reduced in weight and thickness, because they have to bear less weight.

We perform Life Cycle Assessment (LCA) to assess our environmental impact over the whole life cycle of our product from extraction of raw material through to end of life. This approach allows us to contribute at the material level to option 4 Whole building Life Cycle Assessment (LCA). These impacts include, among others, energy and water, air emissions, soil and waste generation. The results of the LCA are presented in an environmental Product Declaration or EPD. ▶

Our lightweight solutions allow for less energy consumption and CO2 emissions during manufacturing and transport compared to traditional building materials (cement, brick, etc.)

As discussed above, dry-wall systems are designed for deconstruction to facilitate reuse of mineral or glass wool insulation and metal components for future re-development per option 3 Building and material reuse.

Eco-innovation is Saint-Gobain's policy for differentiating value to our customers by developing and distributing innovative products and solutions that help reduce the environmental impact of buildings and infrastructures over their entire life cycle: a key aspect to help reach the 10% reduction required by this credit.



*The new SCS Mall, Vienna, Austria*

*This credit only applies to Healthcare.*

## ▪ Aim

To conserve resources associated with the construction and management of buildings by designing for flexibility and ease of future adaptation and for the service life of components and assemblies.

## ▪ LEED® requirements

Increase building flexibility and ease of adaptive use over the life of the structure by employing at least three of the strategies described in LEED, such as: design for future vertical expansion on at least 75% of the roof and the use of demountable partitions for 50% of applicable areas.

## ▪ Saint-Gobain Gyproc contribution

Our lightweight solutions, such as drywall constructions are easily demountable. By minimising the load on the buildings' foundations they contribute to lighter constructions for future building extensions.

The low weight of drywall systems means they can be built in any location in the building without the need to consider changes to the structural and load bearing elements of the building, giving complete design and reconfiguration freedom.

## ▪ Documentation available

Saint-Gobain Gyproc Healthcare brochure



*Bangkok Chain Hospital. Bangkok, Thailand*

# INDOOR ENVIRONMENT QUALITY



# EQ Prerequisite: Minimum Acoustic Performance



*This prerequisite applies to Schools.*

## ▪ Aim

To provide classrooms that facilitate teacher-to-student and student-to-student communication through effective acoustic design.

## ▪ LEED® requirements

The following two options apply for Heating, Ventilation and Air Conditioning (HVAC) systems for background noise, exterior noise, reverberation time and classrooms and core learning spaces from less than 566 Cubic Meters.

### Option 1

The project must prove that for each room the total surface area of acoustic wall panels, ceiling finishes, and other sound-absorbent finishes equals or exceeds the total ceiling area of the room (excluding lights, diffusers, and grilles).

Or

### Option 2

The project must prove through calculations described in ANSI Standard S12.60-2010 that rooms are designed to meet reverberation time requirements as specified in that standard.

## ▪ Saint-Gobain Gyproc contribution

We propose solutions for sound insulation (plasterboard and ceiling solutions) to reduce unwanted noise from one space to another and for acoustic absorption, as well as wall and ceiling solutions installed horizontally or vertically that are designed to provide optimum acoustic environments within each space for schools in order to ensure a well-designed learning environment.

• The sound insulation performance will reduce the passage of sound from one area to another. In addition to providing sound insulation, our products and systems can be designed to reduce impact sound transmission between floors (e.g. footsteps). ►

Examples of products and solutions	Sound insulation
GypWall Quiet SF	61-65 RwdB
GypWall Quiet IWL	66-70 RwdB
GypWall Audio	67-80 RwdB
GypFloor Silent	40-63 RwdB / 63-55 LnwdB

- The acoustic absorption performance will improve 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.

Specify what would be the main systems specified in schools.

Example of products and solutions	Acoustic Absorption Performance
Rigitone	0.25 (LM) - 0.70(LM) $\alpha_w$ / 0.45-0.90 NRC
Gyptone tiles	0.60 - 0.80 $\alpha_w$ / 0.65-0.80 NRC
Gyptone Plank	0.65 -0.75 $\alpha_w$ / 0.60-0.75 NRC
Gyptone Big	0.35 - 0.75 $\alpha_w$ / 0.40-0.75 NRC



*Ghelamco Arena. Football host stadium Gent, Belgium*

# EQ CREDIT: ACOUSTIC PERFORMANCE



## ▪ Aim

To provide workspaces and classrooms that promote occupants' well-being, productivity, and communication through effective acoustic design.

## ▪ LEED® requirements

For all occupied spaces, the project has to meet specific requirements for:

- heating, ventilating and air conditioning (HVAC) background noise,
- sound isolation,
- reverberation time,
- sound reinforcement and masking

For schools<sup>6</sup>: additional focus on more stringent requirements regarding HVAC background noise and Sound transmission.

For healthcare<sup>7</sup>: additional focus on more stringent requirements regarding speech Privacy, sound isolation, background noise, acoustical finishes and exterior site noise.



## ▪ Saint-Gobain Gyproc contribution

We propose solutions for sound insulation (plasterboard and ceiling solutions) and for acoustic absorption (ceiling solutions). Some are specifically designed for schools.

- **Lightweight partition and ceiling systems can be specified to improve the sound insulation** properties between adjacent areas within the same property or between adjacent properties of a different occupancy. The sound insulation performance will reduce the passage of sound from one area to another. In addition to providing sound insulation, our products and systems can be designed to help reduce impact borne noise known as impact sound transmission between floors. A drywall system can achieve sound insulation from 35 to 80 dB (Rw).
- **The acoustic absorption performance** will improve 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. Our solutions are designed to provide sound absorption and sound reflection where required to give optimum ambiance in the space.

<sup>6</sup>Requirements for schools: <http://www.usgbc.org/node/2614139?return=/credits/new-construction/v4>

<sup>7</sup>Requirements for healthcare: <http://www.usgbc.org/node/2614141?return=/credits/healthcare/v4>

<sup>8</sup><https://itunes.apple.com>

Examples of Products and solutions	
Sound insulation	UAE - GypWall QUIET
	France – Placo Duo’Tech 25
	Spain –PlacoPhonique
	UK- Soundbloc
Sound absorption	Acoustic studs
	Scandinavia- Gyptone acoustic ceiling
	Thailand – Gyproc Framing ML50A Ceiling
	India – Gyptone BIG Boards
	Denmark – Gyptone Quattro 50

### ▪ Documentation Available

- Download our acoustic simulator application Gyproc dBstation<sup>8</sup> to determine the best performing acoustic solution according to the noise pollution of your exterior environment. dBStation is the first Saint-Gobain interactive, touchscreen-based platform that simulates the acoustic performance of our solutions. {Only available in France, Sweden, the US and Germany}.
- The acoustic certificates of the plasterboards solutions or ceiling tiles
- Performance of our products and systems tested and officially assessed. Test reports are available on request.

<sup>8</sup><https://itunes.apple.com>



*Mercadnate Theatre Bari, Italy*

# EQ CREDIT: LOW-EMITTING MATERIALS



## ▪ Aim

To reduce concentrations of chemical contaminants that can damage air quality, human health, productivity, and the environment.

## ▪ LEED® requirements

This credit covers volatile organic compound (VOC) emissions into indoor air and the VOC content of materials, as well as the testing methods by which indoor VOC emissions are determined. Different materials must meet different requirements to be considered compliant for this credit. The building interior and exterior are organised into seven categories, each with different thresholds for compliance.

Walls, ceilings, and flooring are defined as building interior products; each layer of the assembly, including paints, coatings, adhesives, and sealants, must be evaluated for compliance. Insulation is tracked separately.

## ▪ Saint-Gobain Gyproc contribution

• **Saint-Gobain Gyproc solutions are low VOC-emitting materials, (VOC emissions are close to 0) and do not emit formaldehyde or ammonia in any significantly measurable amounts.**

They contribute to maintaining a healthy indoor environment free of pollution and are characterised by a level of Formaldehyde and VOC emissions that is close to 0 (test according to ISO 16000). VOC emission tests conducted on our boards have proven to be compliant with the most stringent international standards.

• **Following the French regulation on VOC & construction products** (introduced in April 2011), our solutions rank highest, scoring an A+.

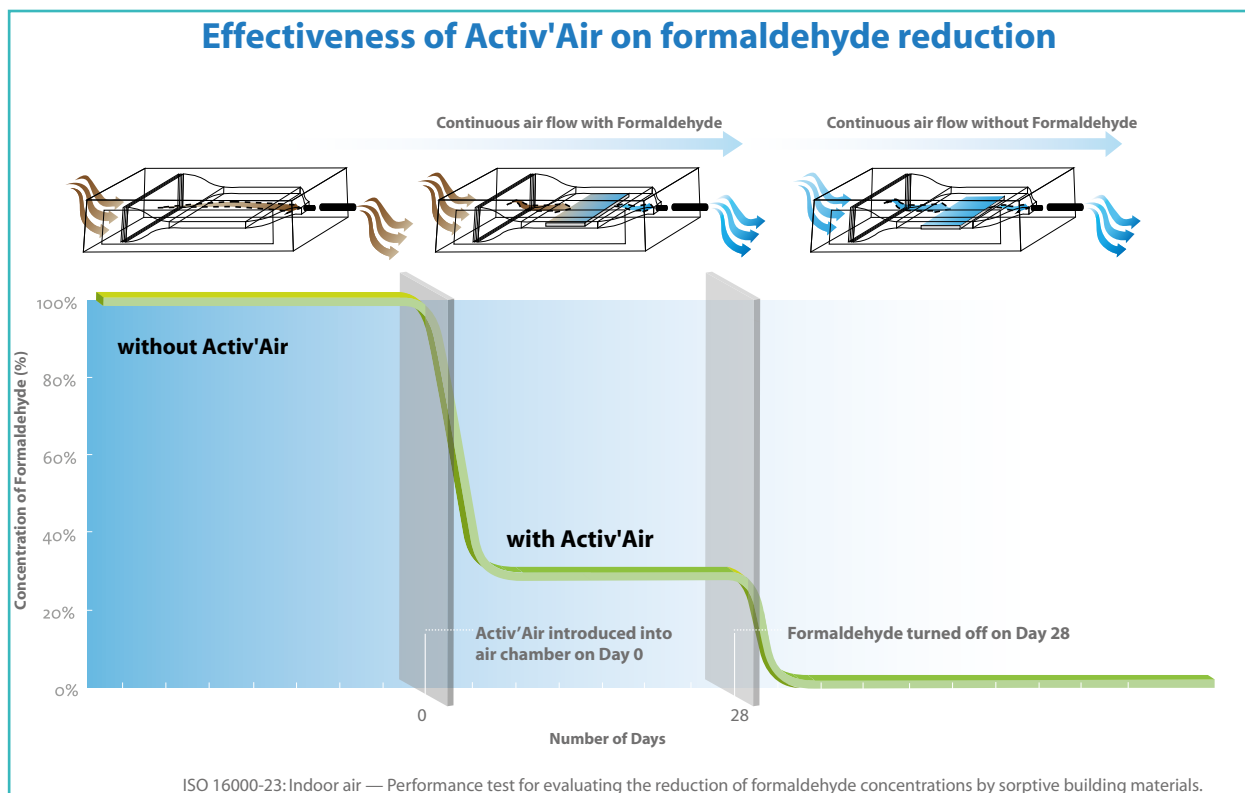
Formaldehydes and VOC emissions are classified according to class in this label<sup>9</sup>, the limit values of the emissions' class refer to the total VOC emissions and also to the evaluation of 10 single substances (in µg/m<sup>3</sup>). As follows in the table below for the Total VOC and Formaldehydes: ▶

Emissions Classes	C	B	A	A+
Formaldehyde	>120	<120	<60	<10
TVOC	>2000	<2000	<1500	<1000



<sup>9</sup>EUROFINS

- During construction, our plaster and plasterboards solutions are more ergonomic than traditional building products (cement, brick, etc.), which reduces manual handling. They also do not irritate the skin.
- Beyond this, our Activ'Air /AirRenew patented technology reduces VOCs by 70% of the Formaldehyde already present in the Indoor Air when 1m<sup>2</sup> of Activ'Air is installed per 1m<sup>3</sup> volume of the room.



*Activ Air performance test for evaluating the reduction of formaldehyde concentrations by sorptive building material. ISO 16 000-23: Indoor Air*

#### ■ Documentation available

- VITO Test that shows the performance of the Activ'Air/AirRenew technology
- Eurofins Tests for European products available on request {remove this sentence if you do not have this test in your country};
- National certifications, VOC declaration when it is the case
- GreenGuard certificate for CertainTeed products in the United States;



*USD Science Block, Dublin, Ireland*

# EQ CREDIT: CONSTRUCTION INDOOR AIR QUALITY MANAGEMENT PLAN



## ▪ Aim

To promote the well-being of construction workers and building occupants by minimising indoor air quality problems associated with construction and renovation.

## ▪ LEED® requirements

At the project level, this credit is awarded for developing and implementing an air quality (IAQ) management plan for the construction and preoccupancy phases of the building. The plan must address a list of requirements, in particular: protect absorptive materials that are stored and installed on site from moisture damage.

## ▪ Saint-Gobain Gyproc contribution

One of the main properties of natural gypsum is its ability to regulate humidity in internal spaces. Saint-Gobain Gyproc provides moisture resistant products as well as solutions that prevent condensation and enhanced protection against mould growth. Certain rooms in a house generate greater amounts of moisture through daily household activities, especially in bathrooms and kitchens. Our moisture resistant solutions are designed for areas that accommodate sinks, showers and baths, as the likelihood of walls getting damp is much higher and a consistently increased level of relative humidity may be present.

The enhanced value of dry wall construction, including the faster drying capacity of gypsum undercoat plasters (in lieu of sand/cement), can reduce the volume of moisture present during construction and thereby reduce the risk of condensation and mould growth in addition to more efficient construction time.

### Examples of products and solutions

Gyproc WallBoard MR

Isover Vario KM Duplex

Glasroc H

Wallboard duplex?



Oakfield Primary School, UK

### ▪ Aim

To promote occupants' productivity, comfort, and well-being by providing quality thermal comfort.

### ▪ LEED® requirements

The project must meet the requirements for both thermal comfort design and thermal comfort control. The building must be designed (heating, ventilating, air-conditioning systems, building envelope) to meet the requirements of specific standards on thermal comfort (ASHRAE standard 55-2010 or ISO and CEN standards). In addition, individual thermal comfort controls must be provided for at least 50% of individual occupant spaces. For all shared multi-occupant spaces, a group thermal comfort control can be installed. Thermal comfort controls allow occupants, whether in individual spaces or shared multi-occupant spaces, to adjust at least one of the following in their local environment: air temperature, radiant temperature, air speed, and humidity.

### ▪ Saint-Gobain Gyproc contribution

Using a range of our thermal systems and lightweight gypsum plaster can help to reduce the amount of energy consumed: Wall Lining systems (based on adhesive or light weight metal components), Ceiling systems and systems incorporating glass mineral wool can help to meet local regulations, Building Regulation standards and LEED requirements, regarding the thermal performance of the building structure.

For efficient and effective insulation of the structure, they can provide a continuous insulation layer over the whole external wall area, helping to reduce the thermal bridge effects at lintels and reveals. Our range of laminates are extensively used in both new and existing buildings to provide internal lining and insulation in one fixing operation.

Drywall systems incorporating thermal laminates provide room-located insulation resulting in comfortable conditions in rooms faster, primarily when the space is heated in regular patterns.

Ceilings and wall lining systems insulated with mineral wool or thermal boards can help to reduce heat loss from a building in cold countries and help to reduce heat gains in buildings in hot climates. In addition, our products can contribute significantly to drywall and masonry constructions in achieving high levels of air-tightness in buildings.

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### Examples of products and solutions

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Gyproc ThermaLine laminates

Drilyner BASIC

Gyplyner using Isover Mineral Wool

Airtite Quiet plaster

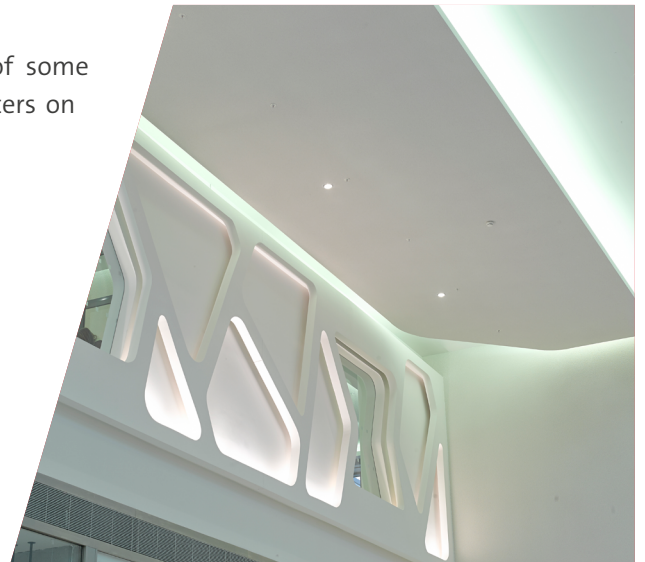
France - Placomur

France - Doublissimo

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#### ▪ Documentation available

Test results sheets and certificates for the airtightness of some solutions such as Gyproc HardCoat and Airtite Quiet plasters on concrete block work, are available on request.



*Snake wall" Cerny Most shopping center, Prague, Czech Republic*

# INNOVATION



## ▪ Aim

To encourage projects to achieve exceptional or innovative performance

## ▪ LEED® requirements

There are 3 ways to earn credits for the “Innovation” criteria. Project teams can use any combination of the three options:

- innovation: by achieving significant, measurable environmental performance using a strategy not addressed in the LEED green building rating system;
- pilot: by achieving one pilot credit from USGBC’s LEED Pilot Credit Library;
- exemplary performance strategies: an exemplary performance point is typically earned for achieving double the credit requirements or the next incremental percentage threshold.

## ▪ Saint-Gobain Gyproc contribution

### Option 1. Innovation

Saint-Gobain has developed an Eco-innovation Policy to develop innovative products and solutions that help reduce the environmental impacts of buildings and infrastructure over their whole life cycle such as the following products: Activ’Air, Habito, Ergolite, Climafit Protekto, etc.

### Indoor Air Quality (IAQ) : Activ’Air®/ AirRenew® technology

Our innovative products can help improve the indoor air quality with air purifying technology.

Activ’Air®/ AirRenew® gypsum boards and ceiling tiles, offer the possibility to avoid health problems associated with being exposed to pollutants such as formaldehyde and other volatile organic compounds (VOCs) present within enclosed spaces. Activ’Air®/ AirRenew® patent technology takes the VOCs and converts them into safe, inert compounds that, once captured in the product, cannot be released back into the air. It reduces VOCs by 70% of the Formaldehyde already present in the Indoor Air when 1m<sup>2</sup> of Activ’Air®/ AirRenew® is installed per 1m<sup>3</sup> volume of the room, (based on tests and analysis, see VITO test report and table p 30-31).

### Option 2. Pilot credit from USGBC’s LEED Pilot Credit Library<sup>10</sup>

#### Examples:

- **Design for adaptability (Home):** (cf. option 2: Open building structural systems) Saint-Gobain Gyproc lightweight solutions, ceiling and wall partitions are easy to handle and to install and allow for easy redefining of rooms and floor plans with minimal renovation and material waste. ▶

<sup>10</sup>Source: <http://www.usgbc.org/pilotcredits>

- **Acoustic comfort:**

Requirements: provide acoustic comfort by minimising intruding noise into and within buildings. Our performance boards and ceiling solutions can provide better noise reduction performance. As with all constructions, it is vitally important that joints around wall perimeters are sealed with Gyproc Sealant and surrounding or adjoining walls are also upgraded to prevent sound transferring through the weakest element of the construction.

Additionally, our acoustic studs allow a high level of sound insulation to be achieved while using minimum floor area, thus maximising available room areas.

- **Green training for contractors, traders , operators and service workers**

(Requirement: Employ contractors, subcontractors, & building traders who are certificate holders under a qualified green building training programme prior to the commencement of the work of the individual's part on the project).

- **Material ingredients product manufacturer supply chain optimisation**

(Requirement: manufacturers: Engage in validated and robust safety, health, hazard, and risk programmes)

- **Social equity within the supply chain**

(Requirement: this credit addresses social equity for those involved in the production of materials and products used in the project, including the stages of raw materials extraction, processing, manufacturing, and assembly of final components and products).

### Examples of product and solution

Denmark- Gyptone acoustic ceiling tiles with Activ Air

UK - Gyproc Activ'Air

US - AirRenew gypsum Board

France - Lutèce 25 Air'Pur Plaster

Belgium –Duo'tech

Ireland - Soundbloc

UK - Gyptone Casoprano

### DOCUMENTATION AVAILABLE

- VITO test report for Activ'Air
- Brochure on Activ'Air {depending on the countries}
- Brochure on Gyptone acoustic ceiling tiles with Activ'Air



*Nokia Siemens networks, India*



*Glenstal Abbey, Limerick, Ireland*



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

- 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 Saint-Gobain Gyproc solutions are assets for other green building certifications:

- LEED 2009 with Saint-Gobain Gyproc
- BREEAM with Saint-Gobain Gyproc
- HQE with Saint-Gobain Gyproc
- DGNB with Saint-Gobain Gyproc

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This brochure only provides an indication on the possible credits which our gypsum-based products could yield in relation to a LEED rating system. It is intended as a guide in the choice of appropriate gypsum-based products in relation to the LEED credit rating system and has no binding value. The LEED credit rating of a project is influenced by a variety of factors, such as the type of building, configuration of all the other elements of the building in addition to the gypsum products, etc. The final rating is subject to the performance of a LEED assessment as per the LEED methods and procedures available on their site. It is the user's responsibility to choose the appropriate building environmental assessments methods destined to ensure that the building meets regulatory requirements at national, local or regional level.





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