



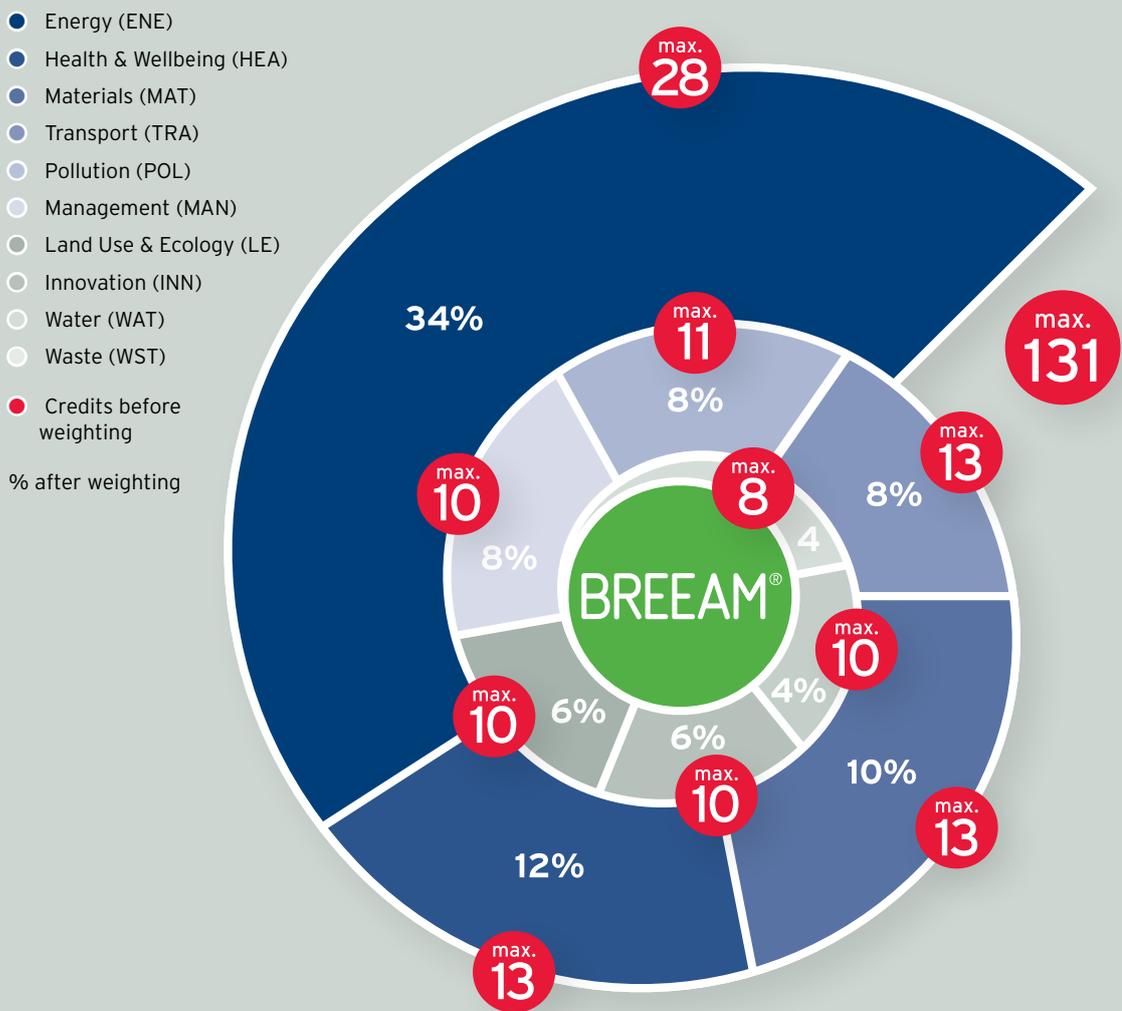
**SOLUTIONS FOR
SUSTAINABLE BUILDINGS
THE GUIDE TO BREEAM**

R
REYNAERS
aluminium

REYNAERS develops innovative and sustainable aluminium solutions, for windows, doors, curtain walls and sun screening that increase the architectural value of buildings and enhance people's living and working environment. By the integration of these solutions in buildings, Reynaers' products can contribute to the overall sustainability level of the building, thus achieving credits for building certificates such as BREEAM.

BREEAM (British Research Establishment Environmental Assessment Method) is a certification system for comparing sustainable buildings that exceed national standards. As a quality label, it encourages the market to focus on the environmental impact of products in buildings.

As this label assesses the overall building concept, they have specified 9 main categories, with multiple issues, on which the building is evaluated. Credits are awarded and weighted for each category in order to generate the final score for the building, ranging in levels from pass to outstanding.



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

Kendal College
a brighter future

Welcome
to Kendal College

Using Reynaers' solutions in combination with other building components, up to 22 credits can be gained on the following issues (according to BREEAM Europe Commercial 2009) :

www.kendal.ac.uk

Architect: Taylor Young Architects

Category	Issue	Max. Credits				
			Window Door	Sliding door	Curtain wall	Sun screening
● Health & Wellbeing (HEA)	HEA1 - Daylighting	max 1*	1	1	1	0
	HEA2 - View Out	max 1	1	1	1	0
	HEA3 - Glare Control	max 1	0	0	0	1
	HEA7 - Potential for Natural Ventilation	max 1	1	1	1	0
	HEA10 - Thermal Comfort	max 2	2	2	2	2
	HEA13 - Acoustic Performance	max 1	1	1	1	0
	HEA14 - Office Space	max 2	2	2	2	2
● Energy (ENE)	ENE1 - Energy Efficiency	max 15*	6	6	6	0
	ENE5 - Low or Zero Carbon Technologies	max 3*	0	0	3+1*	3+1*
● Materials (MAT)	MAT1 - Materials Specification	max 4*	2	2	2	0
	MAT5 - Responsible Sourcing of Materials	max 3*	1	1	1	1
● Pollution (POL)	POL8 - Noise Attenuation	max 1	1	1	1	0

* For these issues, it is possible to gain one extra innovation credit based on exemplary performance, as described in the assessment criteria.

HEALTH & WELLBEING (HEA)

BREEAM

Lead architect: Ron Arad Architects - Executive architect: Jaspers & Evers

HEA1 - DAYLIGHTING

AIM

To give building users sufficient access to daylight

ASSESSMENT CRITERIA

- Provision of daylight designed in compliance with national best practice
- Optimal light parameters and room dimensions-
Daylight illuminance
Daylight factor
Uniformity ratio
- Light simulation study required

HEA2 - VIEW OUT

AIM

To allow occupants to refocus their eyes from close work to an external view to reduce the risk of eyestrain

ASSESSMENT CRITERIA

- Providing adequate view outs
- Design plans showing indoor layout, windows and proximity to external obstructions



credit



1



1



1



0

REYNAERS SOLUTIONS

Good access to daylight is one of the major benefits of completely glazed curtain walls or roofs (CW series) and sliding doors (CP series). This credit can therefore be readily achieved by integrating these solutions into the building. The correct integration of windows can also provide building users with uniform daylight illuminance exactly where needed.

Selecting the correct glazing with high light transmittance or solar control will, in the light simulation study, prove that the required daylight factor can be achieved, resulting in the BREEAM credit for this issue.



credit



1



1



1



0

REYNAERS SOLUTIONS

A room with a view is the best commercial argument in real estate. In general, people spend more than 90% of their time indoors and more than 30% of the time in offices in front of a computer screen. So it's no surprise that people will appreciate a pleasant view of the world outside. Looking through a window allows them to refocus their gaze from the intensive work on a screen or other detailed work, preventing tired eyes or headaches. All Reynaers systems provide building occupants with this external view, making it possible to achieve the appropriate BREEAM credit. The use of sun screening systems such as BS 100 or BS 30 will not obstruct the view and gives the perfect combination of light, view and shading.

HEA3 - GLARE CONTROL

AIM

To reduce problems associated with glare in occupied areas through the provision of adequate controls

ASSESSMENT CRITERIA

- Provision of controllable shading systems
- Shading control on all windows, glazed doors and roof lights
- Specifications of shading systems and controls required for evidence



Architect: Barbist Architektur

HEA7 - POTENTIAL FOR NATURAL VENTILATION

AIM

- To recognize and encourage adequate cross flow of air in naturally ventilated buildings
- Flexibility in mechanically ventilated buildings for future conversion to a natural ventilation strategy

ASSESSMENT CRITERIA

- Fresh air delivered via natural ventilation
- Openable windows (option 1): Opening window area to be at least 5% of internal floor area
- Other natural ventilation strategy with adequate cross air flow (option 2)
- Provide at least two levels of user-control of the fresh air supply
- Ventilation design study required



REYNAERS SOLUTIONS

Although almost everyone appreciates sunlight, it is important to control glare, for instance on computer screens. With our sun shading systems (BS 40 and BS 100), Reynaers offers excellent control of shading and glare. The ability to rotate BS 100 louvres allows the best balance between daylight, view outside and shading. By moving the BS 40 screens horizontally, glare can be controlled, either manually or by a motor. With the integration of these solutions one BREEAM credit can be obtained.

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BS 40



BS 100



REYNAERS SOLUTIONS

The best way to get natural fresh air into a building is by opening a window or sliding element (CS and CP series). The turn and tilt position of a window gives the user two levels of fresh air supply. These windows can also be integrated in curtain wall systems (CW series), achieving natural ventilation in the building. Based on the ventilation study, the total natural ventilation needs to be set-up correctly in order to gain the BREEAM credit. With the Ventalis system, available in Eco system, CS 68, CS 77, CP 130 and CP 155, an adequate cross air flow strategy can be achieved, although a ventilation study on the building will be required.



CS 86-HI

HEA10 - THERMAL COMFORT

AIM

To ensure, with the use of design tools, that appropriate thermal comfort levels are achieved

ASSESSMENT CRITERIA

• **Option 1 (1 credit)**

- Analysis of thermal comfort level using Predicted Mean Vote (PMV) and Predicted Percentage of Dissatisfied (PPD)

- Thermal comfort levels in accordance with European Standard EN ISO 7730
- Thermal comfort study required

• **Option 2 (2 credit)**

- Thermal comfort levels in accordance with European Standard EN 15251
- Thermal modeling and full dynamic thermal analysis required
- Thermal modeling for guidance for design decisions

HEA13 - ACOUSTIC PERFORMANCE

AIM

To ensure the acoustic performance of the building meets the appropriate standards for its purpose

ASSESSMENT CRITERIA

- Sufficiently low internal noise levels
- Adequate sound insulation between rooms
- Remedial works if necessary
- Noise study by qualified acoustician required

HEA14 - OFFICE SPACE

AIM

To recognize steps taken to provide a good working environment in smaller office areas within the building

ASSESSMENT CRITERIA

- Achieving a number of Health & Wellbeing issues for a part of the office space floor area



Architect: Leach Rhodes Walker



REYNAERS SOLUTIONS

A comfortable temperature will greatly improve people’s feelings of well-being and their productivity. Reynaers solutions, in combination with the suitable glazing, provide the required insulation to achieve the right level of thermal comfort. Reducing draughts and improving thermal comfort also depends on the correct installation of airtight elements. A high quality production system and the use of Reynaconnect will therefore guarantee air tightness of the total solution.

Beside the thermal insulation aspect, an effective shading system will also greatly improve thermal comfort during summer.

To achieve these BREEAM credits, thermal dynamic analysis are required to guide design decisions.



REYNAERS SOLUTIONS

All Reynaers systems can achieve acoustic results (Rw) ranging from 40dB up to 60dB, depending on the system and the glass specifications. We can offer an appropriate acoustic insulating system to achieve low internal noise levels in most situations, in line with the BREEAM credit.



REYNAERS SOLUTIONS

For retail and industrial buildings with an office area less than 500m², one or two additional BREEAM credits can be achieved based on the efforts already taken. Once BREEAM credits are gained on Hea2, Hea3, Hea7, Hea10 or Hea13, using Reynaers systems, a further one or two additional BREEAM credits are awarded with no need for additional effort.

Credits	Industrial	Retail
1	Three of the following credits: HEA2, HEA3, HEA6, HEA7, HEA8, HEA10, HEA11, HEA13	Three of the following credits: HEA2, HEA3, HEA6, HEA7, HEA11, HEA13
2	Six of the following credits: HEA2, HEA3, HEA6, HEA7, HEA8, HEA10, HEA11, HEA13	Four of the following credits: HEA2, HEA3, HEA6, HEA7, HEA11, HEA13
Innovation	All of the credits	All of the credits



ENERGY (ENE)

BREEAM

Architect: Webb Gray Architects

ENE1 - ENERGY EFFICIENCY

More than 40% of the energy used within the European Union goes towards heating, cooling, lighting and managing the buildings in which we live and work. This figure must be reduced by at least 60% before 2050 in order to meet current global climate change targets. Reynaers is uniquely positioned to help reducing the environmental impact of new and existing buildings. Our declared intent and philosophy is to continue innovating towards a greener planet and the objective of zero-energy building across Europe by 2020.

AIM

- To recognize and encourage buildings that are designed to minimize their operational energy consumption
- Remark: most important BREEAM issue



ASSESSMENT CRITERIA

- **Option 1 or 2 (maximum 15 credits)**
 - Defining the building energy performance using the National Calculation Methodology (Option 1) or an energy Dynamic Simulation Modeling Tool (Option 2)
 - Energy modeling study required
 - Approved software and qualified modeling engineer required
- **Option 3 (maximum 10 credits)**
 - Defining the building energy performance using Checklist A7: Energy Design Features
 - Covers issues such as U-values, lighting efficiency, renewable technologies
 - Requirements depending on building location



Architect: Leach Rhodes Walker



credits



6



6



6



0

REYNAERS SOLUTIONS

Our window and door solutions (CS series), sliding doors (CP series) and curtain walls (CW series) provide exceptional insulation and create buildings with excellent energy performance. With our high-insulation range, in combination with triple glazing, your buildings' energy performance can be improved by up to 18% compared to the Ashrae standard. This results in six BREEAM credits.

ENE1		Credits		Credits
Windows & Doors	CS 59-Pa	2	CS 68	5
	ES 45-Pa	2	CS 77	6
	CS 24-SL	4	CS 86-HI	6
	CS 38-SL	5	CS 104	6
	ES 50	5		
Sliding systems	CP 45-Pa	2	CP 130-HI	5
	CP 50	4	CP 155-HI	6
	CP 96	4		
Curtain wall systems	CW 50	6	CW 65-EF-HI	6
	CW 60	6	CW 86(-EF)-HI	6

ENERGY (ENE)

ENE5 - LOW OR ZERO CARBON TECHNOLOGIES

AIM

To reduce carbon emissions by encouraging local energy generation from renewable sources to meet a significant proportion of the energy demand

- Installation of most appropriate low or zero carbon technology for the building
- Feasibility study and energy modeling simulation required

Breeam ENE5	Credits
Feasibility study	1
CO ₂ reduction >10%	2
CO ₂ reduction >15%	3
CO ₂ reduction >20%	4

ASSESSMENT CRITERIA

- Resulting in a reduction in the building's CO₂ emissions

MATERIALS (MAT)

BREEAM

Architect: Stride Treglown Architects

MAT1 - MATERIALS SPECIFICATION

AIM

To recognize and encourage the use of construction materials with low environmental impact over the full life cycle of the building

ASSESSMENT CRITERIA

- **Option 1**
 - Using materials with good green guide UK BRE rating
 - Output from BREEAM MAT1 Calculator required
- **Option 2**
 - Evaluating a range of material options for the building
 - Nationally recognised Life Cycle Assessment study or carbon footprint study required

* For this issue it is feasible to gain one innovation credit in the event of reaching a CO₂ reduction of >20%



REYNAERS SOLUTIONS

Our building integrated photovoltaic solutions for curtain walls and sun shading systems (CW 60 solar, BS 100, BS 30 Solar) provide excellent performances to meet the aim of this issue. All photovoltaic (PV) technologies can be used once they are integrated in the glass. However, the type of PV cells and the available PV area will affect the amount of energy produced. Also, with our RB 10 Solar the solar panels can be integrated in the balustrade. For BS 100 Solar we create a combined advantage with HEA3, because it is a controllable shading system. Due to the integration of PV panels, the CO₂ reduction can be from 10% to 20% because part of the energy consumption of the building is produced on site in the roof, façade, shading system or balustrade, contributing to the ideal of a zero-energy building. With this reduction in CO₂, up to four BREEAM credits can be achieved, including one innovation credit.

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REYNAERS SOLUTIONS

The full life cycle assessment of materials used for the construction of your building will provide the environmental impact of the building. Therefore the different building elements can be assessed. The Green Guide Rating system in UK indicates that Reynaers systems range from B to A+. Together with good ratings on walls, roofs or floors, two BREEAM credits can be gained.

MAT5 - RESPONSIBLE SOURCING OF MATERIALS

AIM

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

ASSESSMENT CRITERIA

- Using materials with responsible origin
 - Environmental Management System (EMS) needed
 - ISO 14001 or BES6001:2008 or other EMS
- EMS for key process (manufacturing) and/or supply chain (extraction)
- Output BREEAM MAT5 Calculator required



POLLUTION (POL)

BREEAM

Architect: Space Architects

POL8 - NOISE ATTENUATION

AIM

To reduce the likelihood of noise from the new development affecting nearby noise-sensitive buildings

ASSESSMENT CRITERIA

- Sufficiently low external noise levels
- Remedial works if necessary
- Noise impact study by qualified acoustician required



REYNAERS SOLUTIONS

To create a full cycle of responsible sourcing, the whole process must be taken into account, from the production of aluminium billets, to the manufacturing of the finished elements. Therefore, Reynaers has incorporated the ISO 14001 certificate in its processes and looks for suppliers with this certification to ensure responsible sourcing. To complete the cycle, it is also important that the manufacturer initiates an Environmental Management Scheme (EMS). A total of 80% of the building elements must be responsibly sourced to gain credits, with Reynaers systems achieving maximum one BREEAM credit for this issue.



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REYNAERS SOLUTIONS

All Reynaers systems can achieve acoustic results (Rw) ranging from 40dB up to 60dB, depending on the frame system and the glass specifications. In most situations, we can offer an appropriate acoustic insulating system to achieve low external noise levels, in line with the BREEAM credit.

REYNAERS CAN HELP YOU TO ACHIEVE BREEAM CREDITS.

Using Reynaers' solutions, in combination with other building components, up to 22 BREEAM credits can be achieved. The feasibility to obtain these credits were analyzed and confirmed by an independent and qualified expert engineering company, ENCON, specialized in optimizing energy consumption.

To assist you in achieving these credits, Reynaers' specialists can help you to select the most appropriate solutions for your project and provide you with the necessary documents, required for the BREEAM assessment. This will include the general documents and certificates, but also project specific information, all to increase your BREEAM score.

Some Reynaers' references with BREEAM certificates:

- V&D Distribution centre (NL) - Good
- Mediacité (BE) - Very Good
- St. Mary Axe (UK) - Very Good
- St. David's Hospice (UK) - Very Good
- The Cooperative Supermarket - Very Good
- Airport Plaza (BE) - Very Good
- Onyx (BE) - Very Good
- Severn Trent HQ (UK) - Excellent
- Selby War Memorial Hospital (UK) - Excellent
- Radisson Blu Hotel, East Midlands Airport (UK) - Excellent
- Kendal College (UK) - Excellent
- Eleven Brindleyplace (UK) - Excellent
- Trowbridge County Council (UK) - Excellent

For more information, visit www.reynaers.com to find your local Reynaers' contact.

ABOUT REYNAERS ALUMINIUM

Reynaers Aluminium is a leading European specialist in the development and marketing of innovative and sustainable aluminium solutions for windows, doors, curtain walling, sliding systems, sunscreening and conservatories. Besides offering an extensive range of standard solutions, the company also develops solutions that are tailored to the individual customer or project. Research, product development and testing are conducted at the Reynaers Institute, the sector's largest private innovation and testing centre, located in Duffel (Belgium). In addition, the company also provides extensive technical support and advice to fabricators, contractors and architects.



TOGETHER FOR BETTER

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