



BREEAM® WHICH STANDS FOR BUILDING RESEARCH ESTABLISHMENT ENVIRONMENTAL ASSESSMENT METHOD (WWW.BREEAM.ORG) IS A VOLUNTARY BUILDING CREDITS-BASED SYSTEMS. UNDER THIS CERTIFICATION, A VALIDATION OF THE BUILDING' S PERFORMANCES

AGAINST A SET OF SPECIFIC GREEN BUILDING CRITERIA IS SOUGHT BY THE ASSESSOR. AN OVERALL SCORE LEVEL IS THEN GIVEN TO THE BUILDING. SEVERAL BREEAM® RATING SYSTEMS TARGETING DIFFERENT CONSTRUCTION AND BUILDING TYPES ARE DEVELOPED AND UPDATED BY BRE UK. THE BREEAM CERTIFICATION SCHEME IS THE MOST USED GLOBALLY.

BREEAM INTERNATIONAL NEW CONSTRUCTION 2013, WHICH CAN BE USED TO ASSESS OFFICE, RETAIL AND INDUSTRIAL BUILDINGS IN EUROPE, IS ARTICULATED INTO 10 CATEGORIES. IN 2012, AGC GLASS EUROPE COLLABORATED WITH THIRD-PARTY BREEAM CERTIFIED ASSESSORS TO HELP CUSTOMERS IMPROVE THEIR CERTIFICATION LEVEL. THESE ASSESSORS ANALYZED THE COMPANY'S GLASS PRODUCTS TO ASSESS THE NUMBER OF CREDITS THEY COULD CONTRIBUTE UNDER THE CERTIFICATION SYSTEM. AGC GLASS SOLUTIONS CONTRIBUTE TO ACHIEVE A HIGHER LEVEL OF BUILDING CERTIFICATION THROUGH SOME OF THESE CATEGORIES AS SHOWN BELOW.

HEALTH & WELLBEING (HEA)

AIM

AGC PRODUCTS CONTRIBUTION

Daylighting (HEA 01)

To ensure daylighting, artificial lighting and occupant controls are considered at the design stage to ensure best practice visual performance and comfort for building occupants.

Maximum potential points: 4

Glass is unique amongst all building materials because of its ability to admit natural light from the glazed façade. Light can as well enter the building through the glazing used in doors and partition walls. AGC proposes glass products with a broad range of visible light transmittance efficiencies while limiting energy transfer through the glass.

This helps our clients meeting the provision of daylight in compliance with national best practices and allows for at least 80% of the office net let table area to receive proper daylight according to this BREEAM criterion.

Planibel low E, iplus Top 1.0, iplus Energy N, iplus Energy NT, etc. Thermobel promises excellent solar gains, achievable both with double glazing units, including **Thermobel Top, Thermobel Advanced, Thermobel Twin Top** and triple glazing: **Thermobel TG Top, Thermobel TG LS**. are all adequate products in this respect.

Glare control and view out (HEA 01)

To reduce problems associated with glare in occupied areas through the provision of adequate controls and to offer occupants the possibility to refocus their eyes from close work and enjoy an external view, thus reducing the risk of eyestrain and breaking the monotony of the indoor environment.

Maximum potential points: 1

Glass offer an incomparable way to view out the countryside with a wide range of vision and façades products, including our **iplus AF, Thermobel Stopray and Thermobel Stopsol**, our insulating glass units with solar control.

AGC also proposes an integrated solution for areas experiencing glare control issues. **Thermobel STORE®** is an insulating glazing unit with adjustable blinds integrated between two panes of glass, enabling constant control over the light entering a building, solar control and complete privacy.

Volatile Organic Compounds (HEA 02)

To recognize and encourage a healthy internal environment through the specification of interior finishes and fittings with low VOC (Volatile Organic compounds) emissions.

Maximum potential points: 3

BREEAM requires that paints and varnishes applied on the interior of the building comply with low Volatile Organic Compounds (VOC) emissions.

Glass products are not included in the product categories targeted by this VOC criterion since glass is an inert product that does not release VOCs. The painted decorative interior glass products are not considered either by this certification. As we however spend around 90% of our time indoor and that indoor decorative glass applications may represent a substantial part of office buildings, AGC developed painted glass products with very low levels of VOCs and formaldehyde emissions. The tests were conducted according to the ISO 16000 on **Mirox**, **Lacobel** and **Matelac** products.

Potential for natural ventilations (HEA 02)

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

Maximum potential points: 1

Openable windows can be used in order to provide fresh air in the office building. Our vision & façades products used in openable window strategy help to achieve a point for this credit.

Thermal Comfort (HEA 03)

To use design tools to ensure that appropriate thermal comfort levels are achieved.

Maximum potential points: 2

When seated by the windows, occupants of the building may experience thermal discomfort due to coldness coming from the window or direct solar radiation during winter and summer times. The use of efficient coated glass can help to optimize thermal comfort and meet the comfort criteria of BREEAM through their solar control and efficient insulating properties and thanks to the quality of the window frame of our double and triple glazing's. AGC offers a wide range of coated glass with low solar factors and high thermal insulation that will limit these discomfort effects (e.g., **Stopray**, **Thermobel**, **Planibel LOW-E**, **iplus**, etc.)

Acoustic Performance (HEA 05)

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

Maximum potential points: 4
(residential buildings), **2** (non-residential)

The acoustic glass of AGC, **Stratophone** and assembled in units of **Thermobel Phonibel**, **Thermobel Phonibel S** and **Thermobel Phonibel ST**, effectively reduce the noise from the outside world, enhancing the acoustic comfort for the building occupants (sound reduction of 51dB possible for Thermobel Phonibel).

ENERGY (ENE)

AIM

AGC PRODUCTS CONTRIBUTION

Energy Efficiency (ENE 01)

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

Maximum potential points: 15

In the field of energy performance optimization, AGC Glass Europe is at the forefront of the development of coated glass. This type of glass contributes directly to reducing energy consumption: super insulating glazing save energy used for heating, while solar control glazing save energy used for air conditioning.

Thermal Insulation: limiting heat losses through glazing has become a priority for AGC Glass Europe. AGC developed a wide range of super insulating coated glass, also called low emissivity (low-e) glass, for different application (double glazing, triple glazing), including **Planibel G**, **Planibel G fast**, **Planibel A**, **Planibel Top N+**, **Planibel I-Top**, **Planibel Top N+T**, **Planibel TRI** and **Planibel Top 1.0**. Also, it can be further enhanced by our insulating glazing units as **Thermobel Top**, **Thermobel Advanced**, **Thermobel Twin Top**, **Thermobel Sunergy**, **Thermobel Warm E**, **Thermobel LS**.

Solar control: AGC manufactures solar control glass with both pyrolytic coating (**Thermobel Stopsol** - **ipasol**, **Thermobel Sunergy**) and magnetron coating (single glazing as **Stopray** or **Planibel LOW-E**, or in insulating glazing units, as **Thermobel Stopray**) that allows

sunlight to pass through a window or façade while radiating and reflecting away a lot of the heat of the sun, making indoor spaces much cooler and saving on air-conditioning. These products are well suited to tertiary buildings with air conditioning to maintain a comfortable temperature while at the same time minimizing energy consumption and providing wide range of light-reflection and light-transmission levels

Some glass products such as **Stopray**, **Sunergy**, **Energy N**, **Energy NT & Light**, or in insulating glazing unit as **Thermobel Stopray** and **Sunergy** combine solar control and thermal insulation.

Low or Zero Carbon Technologies (ENE 05)

To reduce carbon emissions and atmospheric pollution by encouraging local energy generation from renewable sources to supply a significant proportion of the energy demand.

As part of the world leader in glass production, AGC benefits from the latest glass technologies to make renewable energy a success. We produce glass solutions for three main solar applications: photovoltaic modules, thermal collectors and concentrating solar mirrors. For instance, **SunEwat** is a laminated safety glass with embedded photovoltaic cells and generates electricity while acting as a building material. **SunEwat can be installed in double glazing** to provide the necessary thermal insulation.

Maximum potential points: 2

MATERIALS (MAT)

AIM

AGC PRODUCTS CONTRIBUTION

Life Cycle Impacts (MAT 01)

To recognise and encourage the use of Life Cycle Assessment (LCA) tools to choose low environmental impact building materials.

The BREEAM International MAT 01 calculator allows to determine whether a project has used an appropriate LCA tool and be evaluated regarding the best environmental profiles of selected materials. The LCA must include at least the mandatory building elements indicated in the 'Materials assessment scope' section of the BREEAM International Mat 01 calculator. The LCA must be rigorous (3rd party review). AGC has **developed a LCA** for a variety of thicknesses of the **Planibel**, **iplus** and **Thermobel** range.

Maximum potential points: 6

Responsible Sourcing of Materials (MAT 03)

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

Credits will be awarded if 80% of the materials used in the building are responsibly sourced. AGC's key glass production processes together with sand extraction suppliers & sodium carbonate production/extraction suppliers are certified with ISO14001. ISO 14001 is an environmental management system testifying of the responsible sourcing of our activities. All of our production sites are ISO 14001 certified as well as most of our fabrication. AGC also gathers recycling content information and endorse suppliers who can provide EMS certificate for the recycling process.

Maximum potential points: 3

POLLUTION (POL)

AIM

AGC PRODUCTS CONTRIBUTION

Noise Attenuation (POL 05)

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

Evidences that the noise level of the new development will not exceed the average noise level of the neighborhood in a radius of 800m need to be provided to receive one credit. Our acoustic glass products, **Stratophone** and **Thermobel Phonibel**, effectively reduce the noise from the new development (a sound reduction of 51dB is possible with these products). Other AGC glass products will play a role in reducing the noise too.

Maximum potential points: 1

WASTE (WST)

AIM

AGC PRODUCTS CONTRIBUTION

Construction Site Waste Management (WST 01)

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

We minimize waste packaging thanks to our transportation system used to deliver glass. This limits the needs for sorting out the waste due to glass delivery on a project.

In addition, AGC is always seeking new ways to minimize the portion of glass from construction and demolition sent to landfill. For instance, in France, we initiated a project where we focus our efforts on the recovery and recycling of "domestic glass cullet" coming from building dismantling. The collected waste glass are then melted back into our float glass manufacturing process and used to produce new float glass. For refurbishment projects where substantial areas of glass needs to be replaced, the recycling of this glass in our production process can help a project meet its target under the waste management category of BREEAM.

Maximum potential points: 3

INNOVATION (INN)

AIM

AGC PRODUCTS CONTRIBUTION

Innovation

To provide an additional recognition for a procurement strategy, designed feature, management process or a technological development that innovates in the field of sustainability, above and beyond the level that is currently recognized and rewarded within the standards of BREEAM issues.

AGC provides glass products that boost exceptional levels of thermal insulation, solar control, light transmission and health protection in its wide range of glass products:

- Noise Control: **Stratobel, Stratophone and Thermobel Phonibel,**
- Hygiene: glass with antibacterial effect - **AB glass,**
- Safety & Security: **Stratobel, Stratophone, tempered glass, Pyrobel, Thermobel Stratobel,**
- PV cells integrated in glass: **SunEwat** (also assembled in Thermobel),

Maximum potential points: 10*

This credit is only influenced by glass products.

Glass products in combination with other building materials can contribute to influence this credit.

** Hardly achievable, depending if an innovation application is approved by BRE Global. Thus, it is not included in the overall potential points.*

AGC GLASS EUROPE, A LEADER IN FLAT GLASS

AGC Glass Europe is the European branch of AGC, the world's leading flat glass producer. Its baseline, Glass Unlimited, reflects its core assets: innovative strength in advanced glass technologies, a global sales network and an industrial presence stretching from Spain to Russia. AGC Glass Europe has representatives worldwide - See www.yourglass.com for further addresses.

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