



## INFORMATION ABOUT LEED

LEED (Leadership in Energy and Environmental Design) is a green building system that was developed by the U.S. Green Building Council (USGBC) in 1998.

LEED is a tool for buildings of all types and sizes, providing third-party validation of buildings' performance on the basis of a points-based system in which green building projects earn points for satisfying specific green building criteria.

Buildings earn points in seven credit categories:

1. Sustainable Sites (SS);
2. Water Efficiency (WE);
3. Energy and Atmosphere (EA);
4. Material & Resources (MR);
5. Indoor Environmental Quality (IEQ);
6. Innovation in Design (ID); and
7. Regional Priority (RP).

A project can be awarded 100 base points and 10 bonus points (for Innovation in Design and Regional Priority).

Depending on the number of earned points, the project receives a level of LEED certification (Certified, Silver, Gold or Platinum).

LEED ratings	LEED v2.2	LEED 2009 (v3)
<b>Certified</b>	26-32 points	40-49 points
<b>Silver</b>	33-38 points	50-59 points
<b>Gold</b>	39-51 points	60-79 points
<b>Platinum</b>	52-69 points	80+ points

In the USA and a number of other countries around the world, LEED certification is the recognized standard for measuring building sustainability.

The LEED green building rating is designed to promote design and construction practices that increase profitability while reducing the adverse environmental impact of buildings and improving occupants' health and well-being.

## INFORMATION ABOUT LEED

LEED applies to green building projects, not to products. Individual products can help to gather points under the rating system, as in the case of for example AGC's Cradle to Cradle Certified glass.

For more information, please visit the following sites:

- Cradle to Cradle: <http://www.mbdc.com>  
<http://c2c.mbdc.com/c2c/itemDetails.php?item=531>;  
<http://c2c.mbdc.com/c2c/itemDetails.php?item=532>;
- AGC: <http://www.yourglass.com/agc-glass-europe/gb/en/toolbox/index.html>

Driven by a concern to improve the quality of the environment, AGC Glass Europe manufactures glass products that are used in green building projects.

These glass products can give you points in the LEED green building rating system in the following five domains (for New Constructions & Major Renovations):

- Energy and Atmosphere : 1-28 points;
- Material & Resources : 1-4 points;
- Indoor Environmental Quality: 1-3 points;
- Innovation in Design: 1-5 points.
- Regional Priority 1 point



### 1. ENERGY AND ATMOSPHERE (EA)

**1 - 28 points available**

#### **EA - Credit 1: Optimize Energy Performance**

**1-19 points available**

LEED is intended to “encourage architects and other professionals to achieve increasing levels of energy performance above the baseline in the prerequisite standard to reduce environmental and economic impacts associated with excessive energy use”.

For Credit 1, a building can be awarded between 1 and 19 points, depending on the building's overall energy performance (an energy cost saving of between 12% and 48% for new buildings).

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: superinsulating coatings save energy used for heating, while solar control coatings save energy used for air conditioning.

## INFORMATION ABOUT LEED

### THERMAL INSULATION

Energy consumption has been a source of growing concern over the past few decades, meaning that limiting heat losses through glazing has become a priority for AGC Glass Europe.

AGC Glass Europe boasts a wide range of superinsulating coated glass, also called low-emissivity (low-e) glass, 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.

These types of double glazing have excellent insulating properties, since the heat loss is completely cancelled out: the amount of heat entering the building through solar gain is greater than the heat leaving the building through windows, leading to a positive overall balance, i.e. a situation where the solar gain is greater than the heat loss. In this way the windows actually contribute to the heating of the house, leading to energy savings that correspond to about 6 kg of CO<sub>2</sub> per square metre per annum, or 120 kg of CO<sub>2</sub> per dwelling per annum.

With a U<sup>1</sup> coefficient of 1.1, superinsulating glass has double the insulating power of ordinary double glazing (U = 2.8) and four times that of single glazing (U = 5.8). This represents an annual saving in CO<sub>2</sub> emissions of 620 kg for an average home in Europe compared with standard double glazing, or 2,120 kg compared with single glazing.

AGC can provide low-e glass and solar control glass that enable double glazing to be manufactured with a U value of up to 0.9 W/m<sup>2</sup>.K and triple glazing with a U value of up to 0.5 W/m<sup>2</sup>.K.

Manufacturing 1 m<sup>2</sup> of low-e double glazing involves the emission of 25 kg of CO<sub>2</sub>. However, the CO<sub>2</sub> gain by replacing 1 m<sup>2</sup> of single glazing with low-e double glazing is 91 kg of CO<sub>2</sub> per year. Thus the CO<sub>2</sub> emitted during manufacturing is offset after 3.5 months' use of the product. In the event that basic double glazing is replaced with low-e double glazing, it takes about 10.5 months to offset those CO<sub>2</sub> emissions.

### SOLAR CONTROL

AGC Glass Europe manufactures solar control glass (Stopsol, Stopray, Sunergy, Planibel Energy N, Energy NT & Light) 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 costs and providing wide range of light-reflection and light-transmission levels.

---

<sup>1</sup> The thermal performance of glazing is characterized by its U value (or heat loss factor), which is a measure of the rate of heat loss per square metre of glazing or other construction material for a temperature difference of 1 Kelvin across the material. The lower the U values of a glazing product, the lower the heat loss, i.e. the greater the thermal insulation effect.

## INFORMATION ABOUT LEED

Some glass products such as Stopray, Sunergy Planibel Energy N and Planibel Energy NT combine solar control and thermal insulation.

### **EA - Credit 2: On-Site Renewable Energy**

#### **1-7 points available**

LEED is intended to “encourage and recognize increasing levels of on-site renewable energy self-supply in order to reduce environmental and economic impacts associated with fossil fuel energy use”.

For Credit 2, a building can be awarded between 1 and 7 points, depending on the energy produced by the renewable systems as a percentage of the building annual energy costs (between 1% and 13%).

AGC Glass Europe produces glass with high-transmissivity and conductive coatings, as well as light-concentrating mirrors, contributing directly to the performance of thermal and/or photovoltaic solar power applications.

### **EA - Credit 6: Green Power**

#### **2 points available**

LEED is intended to “encourage the development and use of grid-source, renewable energy technologies on a net zero pollution basis”.

For Credit 6, a building can be awarded 2 points if at least 35% of the building’s electricity comes from renewable sources and a renewable energy contract with a term of at least two years has been signed.



## **2. MATERIAL & RESOURCES (MR)**

### **1-4 points available**

LEED encourages recycling, building reuse, waste management, the use of regional materials and the specification of renewable materials.

### **MR - Credit 4: Recycled Content**

#### **1 point available**

LEED is intended to “increase demand for building products that incorporate recycled content materials, thereby reducing impacts resulting from extraction and processing of virgin materials”.

A building can be awarded 1 point for 10% recycled content and 2 points for 20% recycled content.

AGC Glass Europe conducts an environmental policy that encourages recycling. One of its objectives is to develop new products with better environmental performances throughout their entire lifetime, including the recycling stage.

AGC products contain an average value of at least 30% recycled glass (in some cases up to 40%). The use of cullet prevents CO<sub>2</sub> emissions, since less energy is required to melt cullet, replaces raw material coming from natural resources and saves carbonated raw materials.

## INFORMATION ABOUT LEED

AGC conducts an environmental policy that encourages recycling. One of its objectives is to develop new products with better environmental performances throughout their entire lifetime, including the recycling stage as glass is endlessly recyclable.

The main objective of AGC environmental policy is to use as much glass cullet as possible in its production processes. The use of cullet avoids CO<sub>2</sub> emissions, since cullet requires less energy to melt, and replaces carbonated raw materials. AGC Glass Europe recycles around 1,000,000 tonnes of cullet per year, saving about 1,150,000 tonnes of raw material and 300,000 tonnes of CO<sub>2</sub> emissions.

AGC products contain an average value of at least 30% recycled glass. Pursuant to the definition of ISO 14021, pre-consumer recycled content does not include reutilized materials generated in a process and capable of being reused as a substitute for a raw material without being modified in any way. So cullet coming from a certain process and used in the same process cannot be considered to be "recycled" and is regarded as reutilized material.

AGC uses cullet from other plants, such as processing or automotive plants. The pre-consumer cullet content of our products accounts for between 0 to 21%, depending on the plant.

### **MR - Credit 5: Regional Materials** **1-2 points available**

LEED is intended to "increase demand for building materials and products that are extracted and manufactured within the region, thereby supporting the use of indigenous resources and reducing the environmental impacts resulting from transportation".

Credit 5 encourages the use of local construction materials in the case of at least 10% (1 point) or 20% (2 points) (based on cost) of the total materials value. Two conditions have to be met to obtain these points:

- the place where the raw material (for glass: sand, etc.) is extracted must be within 500 miles of the construction site;
- the place where the final product is manufactured that will be installed on site must be within 500 miles of the construction site.

AGC Glass Europe and its baseline "Glass Unlimited" reflect the possibilities offered by its production facilities made up of 18 float glass plants and some 100 processing units located throughout Europe, from Spain to Russia.

With its worldwide network, AGC Glass Europe can help customers to locate a materials source within 500 miles of their project site.

Transport by ship or rail involves a lower level of emissions of CO<sub>2</sub>, NO<sub>x</sub>, SO<sub>2</sub> and dust than transport by truck. An increasing volume of our raw materials is transported by ship and train. Currently more than 55% of all raw materials (including heavy fuel oil) is transported by ship or train, taking about 52,000 trucks off the road on an annual basis.

## INFORMATION ABOUT LEED



### 3. INDOOR ENVIRONMENTAL QUALITY (IEQ)

---

#### 1-3 points available

LEED promotes the creation of healthy, attractive interior spaces.

This criterion takes account of the use of low-emissivity adhesives, sealants and other coatings while also providing appropriate lighting, exterior view and thermal comfort.

#### **EQ - Credit 6.2: Controllability of systems – Thermal comfort**

##### **1 point available**

LEED is intended to “provide for a high level of thermal comfort system control by individual occupants or by specific groups in multi-occupant spaces to promote the productivity, comfort and well-being of building occupants”.

Operable windows can be used instead of comfort controls for occupants and, in combination with other requirements, are worth 1 point in the LEED rating system.

#### **EQ - Credit 8.1: Daylight & Views, Daylight 75% of Spaces**

#### **EQ - Credit 8.2: Daylight & Views, Views for 90% of Spaces**

##### **1-2 points available**

LEED intends to “provide for the building occupants a connection between indoor spaces and the outdoors through the introduction of daylight and views into the regularly occupied areas of the building”. LEED excludes unoccupied areas.

For Credit 8.1, a building project can receive 1 point if this building “achieves daylighting in at least 75% of all regularly occupied areas”.

For Credit 8.2, a building project earns 1 point if it “achieves direct line of sight to the outdoor environment via vision glazing between 30 inches and 90 inches above the finish floor for building occupants in 90% of all regularly occupied areas”.

AGC Glass Europe manufactures glass products with low emissivity and excellent visible light transmission, involving outstanding solar control. This can help to maximize natural light and views by optimizing energy performance.

## INFORMATION ABOUT LEED



### 4. INNOVATION IN DESIGN (ID)

---

**1-5 points available**

**ID - Credit 1: Innovation in Design**

**1-5 points available**

LEED is intended to “provide design teams and projects the opportunity to achieve exceptional performance above the requirements set by LEED Green Building Rating System and/or Innovative performance in Green Building categories not specifically addressed by the LEED Green Building Rating System”.

Projects can earn credit by means of exceptional performances in terms of indoor environmental quality, energy efficiency, materials and resources, and so on.

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

- thermal insulation (Planibel G, Planibel G fasT, Planibel A, Planibel Light, , Planibel Top N+, Planibel I-Top, Planibel Top N+T, Planibel TRI, Planibel Top 1.0, etc.);
- solar control (Stopsol, Stopray, Sunergy, Planibel Energy N, Planibel Energy NT, Planibel Light);
- noise control (Stratophone);
- health (antibacterial glass);
- safety and security (Stratobel, tempered glass, Pyrobel, etc.).

### 5. REGIONAL PRIORITY

---

**1 point available**

**RPC - Credit 1: Regional Priority – Optimize Energy Performance**

**1 point available**

LEED is intended to “provide an incentive for the achievement of credits that address geographically-specific environmental priorities”.

LEED 2009 recognizes that different regions have their own specific energy challenges and hence reward project that address pre-defined local needs. Regional Priority Credits (RPC) are existing credits that have been emphasized as critical local needs and can also earn bonus points.