



AGC

**Earn LEED® V4.1 Points
With AGC Glass**

Your Dreams, Our Challenge

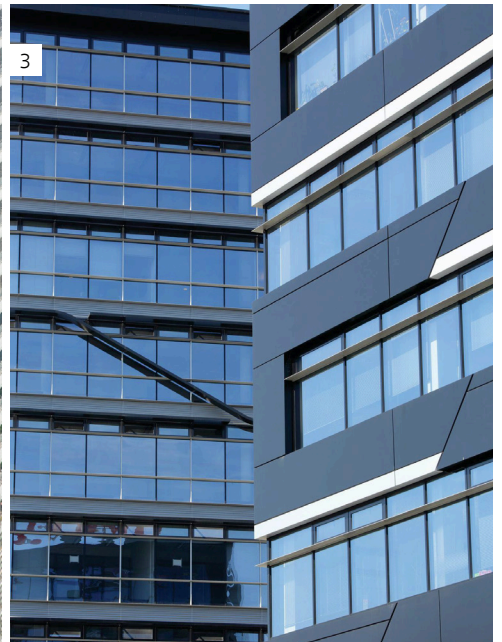
What is LEED®?

LEED® (Leadership in Energy & Environmental Design) is a green building certification system developed by the **US Green Building Council (USGBC)** in which the total performance of a building is compared to a set of specific criteria. USGBC has developed several rating systems, the most widely used being LEED® Building Design and Construction (BD+C), which applies to new constructions and major renovations.

As of late 2016, all new projects must comply with LEED® v4.1, which puts a stronger emphasis on product transparency, information disclosure, and a better life-cycle understanding of the building's materials and components.

How does it work?

LEED® v4.1 BD+C is divided into nine main categories, in each of which a range of established requirements (called credits) are set to assess different parameters of the material or products used in a project. Each credit is eligible for points (unless it is a prerequisite), depending on its relevance to sustainability and well-being.



PICTURE 1 **ROMANIA**
PICTURE 2 **SINGAPORE**
PICTURE 3 **CZECH REPUBLIC**

BUCHAREST, AFI PARK OFFICE - PLANIBEL DARK BLUE AND STOPRAY VISION-50T - ALON YITZHAKI, MYS ARCHITECTS - LEED GOLD
GUOCO TOWER, STOPRAY TITANIUM 37T AND STOPPOL SUPERSILVER CLEAR - SOM - LEED PLATINUM
PRAGUE, ARTGEN - STOPRAY VISION-50T - CMC ARCHITECTS - LEED GOLD

How can AGC Glass Asia help you to gain LEED® credits?

In order to support our customers' efforts to improve their building's rating, AGC Glass Asia analysed how AGC glass solutions could contribute to the certification system. Glass itself is an outstanding material for enhancing building performance and directly or indirectly* impacts three out of nine categories (highlighted in green in the table below).

Integrative Process	Water Efficiency	Indoor Environmental Quality
Location & Transportation	Energy & Atmosphere	Innovation
Sustainable Sites	Material & Resources	Regional Priority

*Most of the contribution to credits comes from the combination of glass and other building materials; together they can help impact the credit.



PICTURE 4 ITALY MILAN, GENERALI TOWER – SUNERGY CLEAR AND STOPRAY VISION-50T - ZAHA HADID ARCHITECTS - LEED PLATINUM

LEED v4.1BD+C Summary

Categories	Credit	Credit reference	Points to which AGC glass products can contribute
Energy and Atmosphere (EA)	Minimum Energy Performance	1-1	Prerequisite
	Optimize Energy Performance	1-2	18
	Renewable Energy Production	1-3	5
Material and Resources (MR)	Building Product Disclosure and Optimization – <i>Environmental Product Declarations (EPD)</i>	2-1	2
	Building Product Disclosure and Optimization – <i>Sourcing of raw materials</i>	2-2	2
	Building Product Disclosure and Optimization – <i>Material Ingredient</i>	2-3	2
	Construction and Demolition Waste Management (MRC5)	2-4	2
Indoor Environmental Quality (EQ)	Low-Emitting Materials	3-1	3
	Thermal Comfort	3-2	1
	Daylight	3-3	3
	Quality Views	3-4	1
	Acoustic Performance	3-5	1



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PICTURE 5 **SINGAPORE**
PICTURE 6 **BULGARIA**

GUOCO TOWER, STOPRAY TITANIUM 37T AND STOPSOL SUPERSILVER CLEAR - SOM - LEED PLATINUM
SOFIA, AIRPORT CENTRE – STOPRAY TITANIUM 37T AND IPLUS ENERGY N – CIGLER MARANI ARCHITECTS - LEED GOLD

Energy and Atmosphere (EA)

AGC GLASS PRODUCTS CAN INFLUENCE
PREREQUISITE + 23 OUT OF 33 POINTS AVAILABLE

Credit	Intent	AGC Solution
<p>Minimum Energy Performance 1-1</p> <p>→ PREREQUISITE</p>	<p>To reduce the environmental and economic harm of excessive energy use by achieving a minimum level of energy efficiency for the building and its systems.</p>	<p>AGC is at the forefront in developing coated glass that meets prerequisite requirements for all climate zones.</p> <p>Our various solar control solutions both magnetron-coated (eg: Stopray, Planibel Low-E) and pyrolytic-coated (eg: Stopsol, Sunergy and Planibel G) ranges, offers customers limitless creativity for using coated glass in multiple ways – as a monolithic glass pane to advanced double/triple glazed units with highly prized low-emissivity characteristics achieving performance levels of 0.4-0.5 W/(m².K).</p>
<p>Optimize Energy Performance 1-2</p> <p>→ UP TO 18 POINTS</p>	<p>To achieve increasing levels of energy performance beyond the prerequisite standard to reduce environmental and economic harms associated with excessive energy use.</p>	
<p>Renewable Energy Production 1-3</p> <p>→ UP TO 5 POINTS</p>	<p>To reduce the environmental and economic harms associated with fossil fuel energy by increasing self-supply of renewable energy.</p>	<p>SunEwat is AGC’s range of energy-generating glazing. This product enhances a building’s ability to produce energy from a renewable energy resource. It offers various types of energy-generating solutions, either transparent (for window applications), or opaque (for spandrel and cladding applications).</p>

Material and Resources (MR)

AGC GLASS PRODUCTS CAN INFLUENCE
8 OUT OF 13 POINTS AVAILABLE

Credit	Intent	AGC Solution												
<p>Building Product Disclosure and Optimization – Environmental Product Declarations (EPD) 2-1</p> <p>→ UP TO 2 POINTS</p>	<p>To reward project teams for selecting products from manufacturers who have verified improved environmental life-cycle impacts.</p>	<p>AGC is the forerunner in Asia to provide EPDs verified by an external assessor for the following ranges of products:</p> <ul style="list-style-type: none"> • Float & Tinted Glass • Pyrolytic-coated Glass (Stopsol, Sunergy, Planibel G) • Magnetron-coated Glass (T-Sunlux, Sunlux Gold SS, Stopray, Planibel Low-E) <p>..... and many more to come</p>												
<p>Building Product Disclosure and Optimization – Sourcing of raw materials 2-2</p> <p>→ UP TO 2 POINTS</p>	<p>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 verified to have been extracted or sourced in a responsible manner.</p>	<p>On average, AGC products contain at least 25% recycled glass (internal and external cullet). The average recycled content is detailed below and varies from one plant to another.</p> <p>Contact us for project-specific data.</p> <table border="1"> <thead> <tr> <th colspan="2">AGC Glass Asia average*</th> <th>Recognition in LEED® v4.1</th> </tr> </thead> <tbody> <tr> <td>Internal cullet</td> <td>17.0%</td> <td>Not recognized**</td> </tr> <tr> <td>External cullet, pre-consumer</td> <td>8.4%</td> <td>50% recognition</td> </tr> <tr> <td>External cullet, post-consumer</td> <td>0%</td> <td>100% recognition</td> </tr> </tbody> </table> <p>* Value based on 2022 data. **As per the definition in 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. Accordingly, cullet re-used in the same process cannot be considered as "recycled" and is regarded as reutilized material.</p>	AGC Glass Asia average*		Recognition in LEED® v4.1	Internal cullet	17.0%	Not recognized**	External cullet, pre-consumer	8.4%	50% recognition	External cullet, post-consumer	0%	100% recognition
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Material and Resources (MR)

**AGC GLASS PRODUCTS CAN INFLUENCE
8 OUT OF 13 POINTS AVAILABLE**

Credit	Intent	AGC Solution
<p>Building Product Disclosure and Optimization – Material Ingredient 2-3</p> <p>→ UP TO 2 POINTS</p>	<p>To reward project teams for which the chemical ingredients in the product are inventoried using an accepted methodology and for selecting products verified to minimize the use and generation of harmful substances.</p>	 <p>AGC products can help secure these points as most of our portfolio is Cradle to Cradle Certified™.</p>
<p>Construction and Demolition Waste Management 2-4</p> <p>→ UP TO 2 POINTS</p>	<p>To reduce construction and demolition waste disposed of in landfills and incineration facilities through waste prevention and by reusing, recovering, and recycling materials.</p>	<p>Windows and glazings are products ready to be installed and do not generate waste on the construction site. There is no cutting and therefore no losses on site.</p> <p>In terms of packaging, the steel racks are sent back to the manufacturers for reuse. Only a few elements are left on site: cardboard, wood and plastic, all of which are recyclable.</p> <p>In addition to reducing the amount of waste generated on site, AGC has established a stringent target of Zero Waste to Landfill. We target to achieve less than 1% of waste to be sent to landfill by 2025.</p>

Indoor Environmental Quality (EQ)

AGC GLASS PRODUCTS CAN INFLUENCE
9 OUT OF 16 POINTS AVAILABLE

Credit	Intent	AGC Solution
<p>Low-Emitting Materials 3-1</p> <p>→ UP TO 3 POINTS</p>	<p>To reduce concentrations of chemical contaminants that can damage air quality, human health, productivity and the environment.</p>	<p>LEED® recognises glass as an inherently non-emitting VOC material, which means no testing report is required, provided the products do not include integral organic-based surface coatings, binders or sealant.</p> <p>Voluntary VOC tests were conducted for AGC’s Mirox MNGE, Lacobel and Matelac. The following tests done are as per the standards on the potential release of VOC emissions, showing very low levels of VOC and formaldehyde emissions.</p> <ul style="list-style-type: none"> • Under the French regulations, AGC Glass Europe’s Mirox MNGE, Lacobel and Matelac are rated A+ or A (the two best performance classes) • Under ASTM D5116-10 AGC Glass Asia’s Mirox MNGE passes the TVOC Emission Rate ≤ 1.0 and Formaldehyde Emission Rate ≤ 0.1
<p>Thermal Comfort 3-2</p> <p>→ UP TO 1 POINT</p>	<p>To promote occupants’ productivity, comfort, and well-being by providing quality thermal comfort.</p>	<p>AGC provides a wide range of coated glass products (e.g. Stopray, Sunergy, Stopsol, Planibel Low-E, T-Sunlux, Sunlux Gold SS) that can be assembled into various configurations. Good insulation helps retain a comfortable indoor temperature level while the solar factor reduces overheating.</p>
<p>Daylight 3-3</p> <p>→ UP TO 3 POINTS</p>	<p>To connect building occupants with the outdoors, reinforce circadian rhythms and reduce the use of electrical lighting by introducing daylight into the space.</p>	<p>Glass is unique amongst all building materials in its ability to let natural light enter the building through glazed façades, doors and partition walls. Our glass products such as Stopray, Sunergy Clear, Stopsol, Planibel Low-E, T-Sunlux, Sunlux Gold SS and Clearsight gives a range of light transmission to fit your project designs.</p> <p>*Requires consultants to do some calculations & simulations. It is not purely just on glass light transmission.</p>

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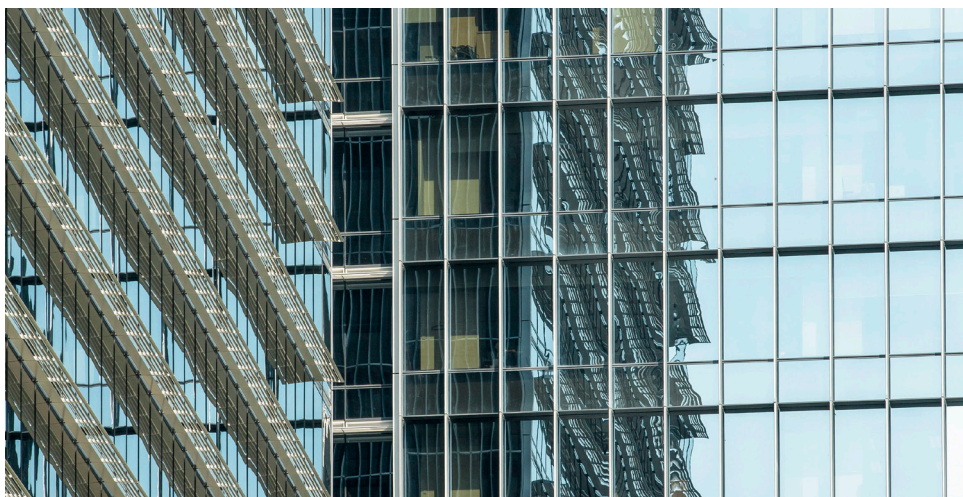
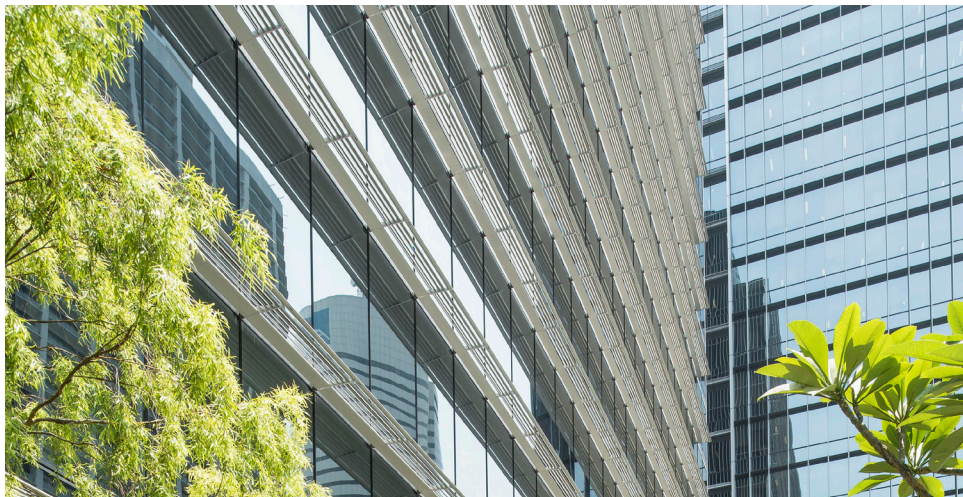
Indoor Environmental Quality (EQ)

AGC GLASS PRODUCTS CAN INFLUENCE
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Credit	Intent	AGC Solution
<p>Quality Views 3-4</p> <p>→ UP TO 1 POINT</p>	<p>To give building occupants a connection to the natural outdoor environment by providing quality views.</p>	<p>With AGC products, building occupants can visually connect with the outdoor environment while performing their everyday tasks. Project teams can use glazing products to capitalize on desirable views while factoring in the energy and comfort implications. AGC's float and coated glass products can help to meet your needs.</p>
<p>Acoustic Performance 3-5</p> <p>→ UP TO 1 POINT</p>	<p>To provide workspaces that promote occupants' well-being, productivity and communications through effective acoustic design.</p>	<p>Well-designed acoustics can enhance the environmental quality of the space by facilitating communication, increasing productivity, improving the well-being of workers or aiding in noise control and speech privacy. AGC's software can support in calculating the acoustic performance.</p> <p>*Terms & Conditions apply, contact AGC for more information.</p>

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