



WELL v2.1

LEED v4.1

BREEAM

Certification  
Contributions

HALIO<sup>®</sup>

Smart-Tinting Glass

# Future-Proof Your Building

Halio can contribute in a number of categories towards your WELL, LEED, and BREEAM certifications. The Halio team will work closely with your team to identify and document all applicable contributions.



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The WELL Building Standard (WELL) measures a building's advancement of human health and wellness, referencing existing standards and best practice guidelines set by governmental and professional organizations. WELL v2.1 is the current version of the WELL Building Standard. For more information on WELL, visit [wellcertified.com](http://wellcertified.com).



## LIGHT

Feature	Feature Description	How Halio Can Contribute
L01: Light Exposure and Education (precondition)	Provide access to indoor light exposure and light education.	This WELL feature requires projects to ensure appropriate light exposure in indoor environments by using daylighting or electric lighting strategies. Halio and Halio Black offer occupants the ability to control the amount of daylight in their space to maximize natural light while reducing glare.
L04: Glare Control	Minimize visual discomfort caused by glare from daylight and electric light.	Halio smart-tinting glass allows occupants to maximize the amount of natural light in a space, while reducing glare for all-day comfort, tinting only when necessary to ensure occupant comfort. Tinting is controllable by the occupants or can be set to automatically prevent glare.
L05: Enhanced Daylight Access	Support circadian and psychological health through indoor daylight exposure and outdoor views.	Halio and Halio Black provide occupants with the ability to control the amount of daylight and glare in their spaces, maximizing daylight and reducing glare. Halio tints only when necessary to ensure occupant comfort. No matter the tint level, occupants keep their views and thus stay connected to the outdoors. Halio windows can be controlled independently or in groups, so occupants can choose the level of tint that works best in their environment. Tinting and clearing can be fully automated or manually controlled.
L08: Occupant Control of Lighting Environments	Provide individuals with access to lighting environments that can be customized to their requirements.	Halio windows can be controlled independently or in groups, so occupants can choose the level of tint that works best in their environment. While the system can be fully automated and integrated with building automation/management systems, occupants can override the automation on demand using wall switches, voice assistants, mobile apps, or a desktop interface.

## SOUND

Feature	Issue Description	How Halio Can Contribute
S01: Sound Mapping (precondition)	Incorporate strategic planning and mitigation required to prevent general issues of acoustical disturbance from both externally and internally generated noise.	By incorporating layers of polyvinyl butyral (PVB) between layers of laminated glass, Halio interior glass walls can help deliver acoustic privacy and reduce sound transmission. PVB layers reduce acoustic transmission, transmitting less sound than standard glass partitions. Halio and Halio Black have a sound reduction rating (Rw) of 36 and 38, respectively. Custom configurations that achieve Rw of 45 dB or higher are possible.
S03: Sound Barriers	Increase the level of speech privacy between horizontally adjacent enclosures and highlight design constraints that may hinder acoustical comfort.	By incorporating layers of polyvinyl butyral (PVB) between layers of laminated glass, Halio interior glass walls can help deliver acoustic privacy and reduce sound transmission. PVB layers reduce acoustic transmission, transmitting less sound than standard glass partitions. Halio and Halio Black have a sound reduction rating (Rw) of 36 and 38, respectively. Custom configurations that achieve Rw of 45 dB or higher are possible.

## MATERIALS

Feature	Issue Description	How Halio Can Contribute
X14: Material Transparency	Promote material transparency across building material and product supply chain.	Kinestral Technologies, maker and developer of Halio smart-tinting glass, has published a Health Product Declaration (HPD) for Halio, communicating the potential health impacts of Halio's material ingredients and meeting the requirements of this feature.

Developed by the U.S. Green Building Council, Leadership in Energy and Environmental Design (LEED) is a leading standard of green building design, construction, operations, and maintenance. A voluntary standard for high-performing buildings, LEED can be used for commercial, institutional, and residential buildings and neighborhood developments. LEED v4.1 is the most up-to-date, stringent version of LEED. For more information on LEED, visit [new.usgbc.org](http://new.usgbc.org).



## ENERGY AND ATMOSPHERE (EA)

Credit	Credit Description	How Halio Can Contribute
Minimum Energy Performance (Prerequisite)  <b>BD+C</b> <b>ID+C</b> <b>O+M</b>	Establish the minimum level of energy efficiency for the proposed building and systems to reduce environmental and economic impacts associated with excessive energy use.	Halio smart-tinting glass can ensure that a project has energy efficient windows that help meet the energy performance standards set by LEED. By regulating light transmission based on the weather, the sun's position, and user preferences, Halio reduces the amount of energy needed to cool a building as well as the amount of electrical lighting required for a space.  With a dynamic solar heat gain coefficient (SHGC) range of 0.51 to 0.09, Halio can reduce energy consumption by as much as 20%.
Optimize Energy Performance  <b>BD+C</b> <b>ID+C</b> <b>O+M</b>	Achieve increasing levels of energy performance beyond the prerequisite standard to reduce environmental and economic impacts associated with excessive energy use.	Halio can be tuned to perform optimally for specific climates and performance. When optimized for energy performance, Halio can reduce energy consumption by reducing the load on a building's HVAC system by helping regulate temperature; Halio tints to block solar heat, clearing to allow it to enter a building. Halio further adds to energy efficiency by reducing the need for artificial lighting.

## MATERIALS AND RESOURCES (MR)

Credit	Credit Description	How Halio Can Contribute
Building Product Disclosure and Optimization - Material Ingredients: Material Ingredient Reporting (Option 1)  <b>BD+C</b> <b>ID+C</b>	Select products for which the chemical ingredients in the product are inventoried to at least 0.1% (1000ppm). Acceptable material disclosure methods include: a self-published manufacturer inventory (disclosing material name and CAS numbers, or role, amount and GreenScreen v1.2 benchmarks), a Health Product Declaration disclosing all known hazards, or Cradle to Cradle v2 Basic Level certification or Cradle to Cradle v3 Bronze Level.	Kinestral Technologies, developer and maker of Halio smart-tinting glass, has published a Health Product Declaration (HPD) for the Halio product, communicating the potential health impacts of Halio's material ingredients and meeting the requirements of LEED Material and Resource credits.

## HEALTH AND WELLBEING

Credit	Credit Description	How Halio Can Contribute
<p>Daylight</p> <p><b>BD+C</b> <b>ID+C</b></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>Daylight affects our endocrine and nervous systems as well as our circadian rhythms. A growing body of research has shown that when we get enough daylight, we feel better, sleep better, focus more easily, become less anxious, and feel less stressed. When we don't get enough daylight, we become less productive and less healthy.</p> <p>But daylight can also quickly become negative as the earth rotates on its axis. Glare can cause eye strain, negatively affecting vision as well as causing headaches and fatigue—which, in turn, may cause irritability and discomfort.</p> <p>Halio and Halio Black provide occupants with the ability to control the amount of daylight and glare in their spaces, maximizing daylight and reducing glare. Halio tints only when necessary to ensure occupant comfort. No matter the tint level, occupants keep their views and thus stay connected to the outdoors. Halio windows can be controlled independently or in groups, so occupants can choose the level of tint that works best in their environment. Tinting and clearing can be fully automated or manually controlled.</p>
<p>Quality Views</p> <p><b>BD+C</b> <b>ID+C</b></p>	<p>To give building occupants a connection to the natural outdoor environment by providing quality views.</p>	<p>With Halio smart-tinting glass, blinds and shades become unnecessary. Spaces can be designed to provide occupants unobstructed views of the outdoors, even during peak sun hours. When used as interior walls and partitions, Halio provides privacy while still allowing for access to views.</p>
<p>Daylight and Quality Views</p> <p><b>O+M</b></p>	<p>Connect building occupants with the outdoors, reinforce circadian rhythms, and reduce the use of electrical lighting by introducing daylight and views into the space.</p>	<p>Halio and Halio Black provide occupants with the ability to control the amount of daylight and glare in their spaces, maximizing daylight and reducing glare. Halio tints only when necessary to ensure occupant comfort. No matter the tint level, occupants keep their views and thus stay connected to the outdoors. Halio windows can be controlled independently or in groups, so occupants can choose the level of tint that works best in their environment. Tinting and clearing can be fully automated or manually controlled.</p>
<p>Acoustic Performance</p> <p><b>BD+C</b> <b>ID+C:</b> <b>Excluding Retail</b></p>	<p>Provide workspaces and classrooms which promote occupants' well-being, productivity, and communications through effective acoustic design.</p>	<p>Halio smart-tinting glass incorporates layers of polyvinyl butyral (PVB) between layers of laminated glass to deliver acoustic privacy to interior applications, and reduce sound transmission in exterior applications. Halio and Halio Black have a sound reduction rating (Rw) of 36 and 38, respectively. Custom configurations that achieve Rw of 45 dB or higher are possible.</p>

Building Research Establishment Environmental Assessment Method (BREEAM) is an international sustainability assessment method for master-planning projects, infrastructure, and buildings through third-party certification of a project's environmental, social, and economic sustainability performance. For more information on BREEAM, visit [breeam.com](http://breeam.com).

# BREEAM®

**New Construction (NC)**

**In-Use**

**Refurbishment and Fit-Out (RFO)**

## ENERGY

Issue	Issue Description	How Halio Can Contribute
ENE 01 Reduction of energy use and carbon emissions  <b>NC</b>	To minimize operational energy demand, primary energy consumption, and CO2 emissions.	Halio can help projects decrease energy use. By regulating light transmission based on the weather, the sun's position, and user preferences, Halio reduces the amount of energy needed to cool a building and the amount of lighting required for the space.
ENE 04 Low carbon design  <b>NC RFO</b>	To encourage the adoption of design measures, which reduce building energy consumption and associated carbon emissions and minimize reliance on active building services systems.	Halio can help projects decrease energy use. By regulating light transmission based on the weather, the sun's position, and user preferences, Halio reduces the amount of energy needed to cool a building and the amount of lighting required for the space.
ENE 71 Energy savings  <b>In-use</b>	To encourage and recognize energy savings of the asset for various energy sources and systems; thereby reducing energy consumption of the asset.	Halio can help projects decrease energy use. By regulating light transmission based on the weather, the sun's position, and user preferences, Halio reduces the amount of energy needed to cool a building and the amount of lighting required for the space.

## HEALTH AND WELLBEING

Issue	Issue Description	How Halio Can Contribute
<p>HEA 01 Visual comfort</p> <p><b>NC</b> <b>RFO</b></p>	<p>To encourage best practice in visual performance and comfort by ensuring daylighting, artificial lighting, and occupant controls are considered.</p>	<p>Daylight affects our endocrine and nervous systems as well as our circadian rhythms. A growing body of research has shown that when we get enough daylight, we feel better, sleep better, focus more easily, become less anxious, and feel less stressed; when we don't get enough daylight, we become less productive and less healthy.</p> <p>But daylight can also quickly become negative as the earth rotates on its axis. Glare can cause eye strain, negatively affecting vision as well as causing headaches and fatigue – which, in turn, may cause irritability and discomfort.</p> <p>Halio and Halio Black provide occupants the ability to control the amount of daylight and glare in their space, maximizing daylight and reducing glare, tinting only when necessary to ensure occupant comfort, while keeping them connected to the outdoors.</p> <p>Halio windows can be controlled independently or in groups, so occupants can choose the level of tint that works best in their environment.</p>
<p>HEA 02 Glare control</p> <p><b>In-use</b></p>	<p>To reduce problems associated with glare in internal occupied areas.</p>	<p>Halio smart-tinting glass allows for occupants to control the amount of daylight and glare into their space, maximizing daylight and reducing glare, and providing occupants a clear view of the exterior to the outdoors.</p>
<p>HEA 04 Thermal comfort</p> <p><b>NC</b> <b>RFO</b></p>	<p>To ensure the building is capable of providing an appropriate level of thermal comfort.</p>	<p>Halio can be tuned to perform optimally for specific climates. Project teams can customize the Halio Insulated Glass Unit (IGU) by selecting low-e coatings, adding additional polyvinyl butyral (PVB), or adding a third pane of glass to increase insulation value. Halio also can be programmed to tint when the sun gets too hot or too bright or to clear to allow heat to transmit into a space. Tinting and clearing can be fully automated or manually controlled based on occupant preferences to optimize comfort levels.</p>
<p>HEA 05 Acoustic performance</p> <p><b>NC</b> <b>RFO</b></p>	<p>To ensure the building is capable of providing an appropriate acoustic environment to provide comfort for building users.</p>	<p>By incorporating layers of polyvinyl butyral (PVB) between layers of laminated glass, Halio interior glass walls can help deliver acoustic privacy and reduce sound transmission. PVB layers reduce acoustic transmission, transmitting less sound than standard glass partitions. Halio and Halio Black have a sound reduction rating (Rw) of 36 and 38, respectively. Custom configurations that achieve Rw of 45 dB or higher are possible.</p>
<p>HEA 20 Acoustic conditions</p> <p><b>In-use</b></p>	<p>To ensure the acoustic performance of the building meets the appropriate best practice standards.</p>	<p>By incorporating layers of polyvinyl butyral (PVB) between layers of laminated glass, Halio interior glass walls can help deliver acoustic privacy and reduce sound transmission. PVB layers reduce acoustic transmission, transmitting less sound than standard glass partitions. Halio and Halio Black have a sound reduction rating (Rw) of 36 and 38, respectively. Custom configurations that achieve Rw of 45 dB or higher are possible.</p>