



# SUSTAINABLE CEILING SOLUTIONS





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### Challenge

**How can you select the most sustainable ceiling solution for your project?**

With many competing environmental claims it can be difficult and time consuming to research and compare all the options.

### Recommended green products:

				Clean Room Application	LEED® v4 BREEAM WELL DGNB HQE
Cradle to Cradle Certified™	Recycled Content (%)	Environmental Product Declaration	Indoor Air Quality Low Emissions		

MINERAL						
ULTIMA <sup>+</sup>	Bronze	≤ 43	✓	A+	ISO 5	✓
PERLA	Bronze	≤ 79	✓	A+	ISO 5	✓
METAL						
METAL Solutions	Silver	≤ 30		A+		✓
MESH Solutions	Silver	≤ 30		A+		✓
SUSPENSION SYSTEM						
PRELUDE	Silver	25		A+		✓
DGS	Silver	25		A+		✓

### Solution

Finding and specifying high performance sustainable ceiling solutions is now fast and easy.

Just look for the **sustainable ceiling solutions icon** and choose from the complete offering of mineral, metal and mesh ceiling panels and suspension systems.



## Challenge

60% of all materials are consumed by the construction and operation of the built environment, with many of these going to landfill at the end of their life.

The challenge is to retain building materials in the economy, rather than the current linear model of *take, make, dispose*.

## Cradle to Cradle Certified™ design



The Cradle to Cradle™ programme has been developed to meet growing customer demand for sustainable products, with C2C certification already becoming a requirement for building projects in the United States and Europe.

- It adds value to a project
- It helps protect and sustain our environment for future generations by **keeping resources in the economy for longer**.

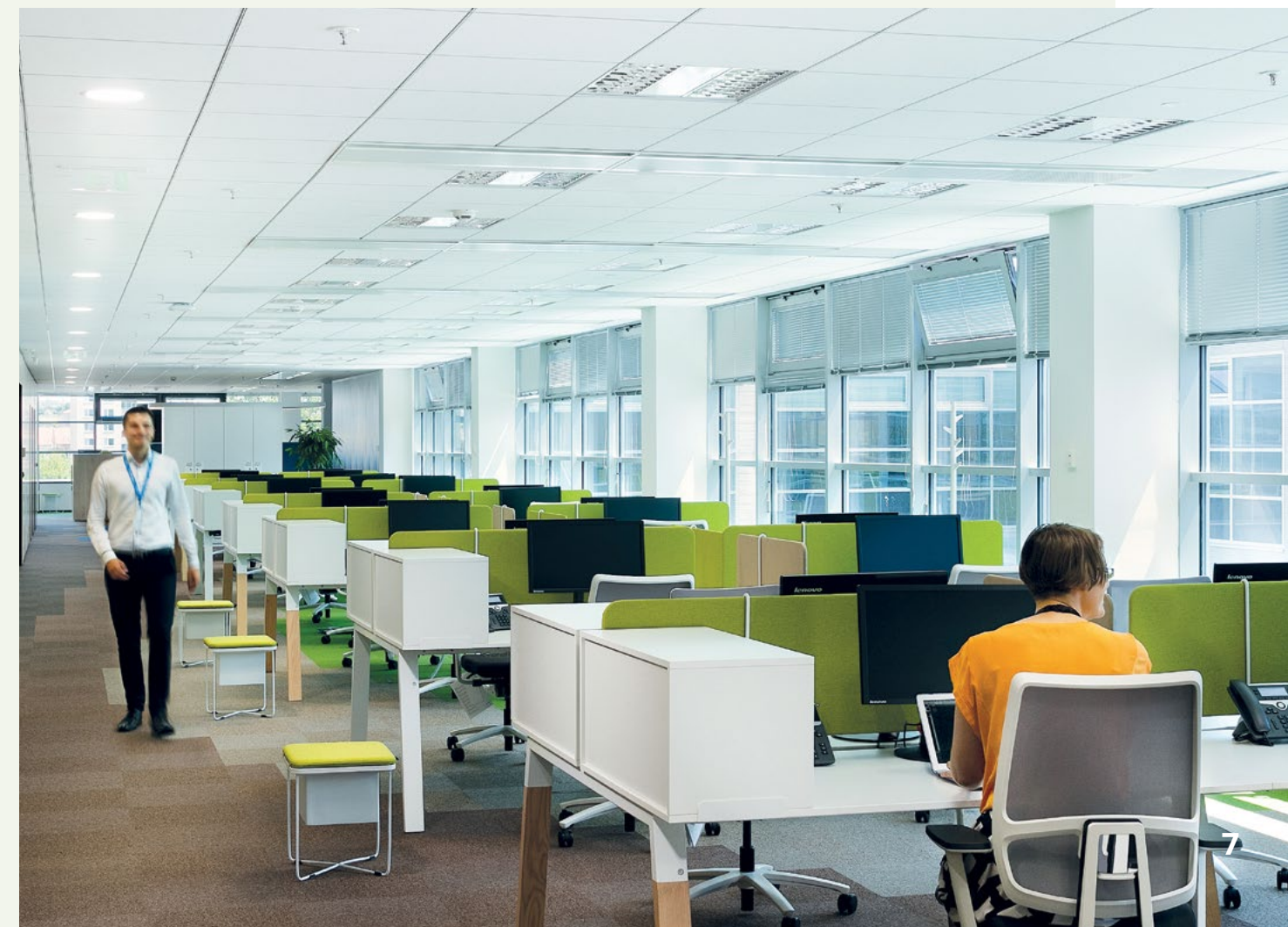
Cradle to Cradle Certified™ products are recognised in LEED® and WELL Building Standard credits.

## Solution

Ceiling solutions with Cradle to Cradle™ certification are designed to be safe, healthy and **endlessly re-usable**.

**Cradle to Cradle™** reframes design as a positive, regenerative force.

Our certification helps customers purchase and specify products that are designed for recycling using manufacturing processes which minimise water consumption, adopt renewable energy strategies and acknowledge social responsibility.





### Cradle to Cradle Certified™ Armstrong products



#### Ultima+ Ultima+ OP Ultima+ dB



With its new smoother lightly textured and durable surface, Ultima+ offers a brighter "blue-white" colour providing class leading light reflectance.

Available in various densities to fit every acoustic need and in multiple dimensions and best in class edge details.

#### Mesh Solutions



With our custom metal capabilities, you can create a monolithic look with extra-wide metal panels or a radial effect with trapezoids tailored to fit your space.

Faceted, flat, or curved, custom metal ceilings have the unique sizes, shapes, finishes, and perforations to make your next project standout.

#### Perla Perla OP 0.95 Perla OP 1.00 Perla dB



With its smooth plain surface, the Perla range provides a modern visual combined with versions adapted to every acoustic need.

Available in a large selection of sizes and best in class edge details.

#### Prelude & DGS Suspension Systems



Prelude is a range of exposed suspension systems which combine exceptional stability with ease of installation.

Drywall Grid System (DGS) is a range of precision engineered suspension components for flat, curved or domed plasterboard ceilings.

#### Metal Solutions



The Armstrong portfolio of metal ceilings range extends from systems for simple and economical installation through to fully customised project solutions supported by dedicated design teams.

## Challenge

The World Health Organization reports that 30% of new and renovated buildings receive excessive complaints related to indoor air quality.

In addition, poor air quality, and elevated temperatures consistently lowered employee performance by up to 10%.

## In certain indoor spaces such as laboratories

It is essential to limit the number of airborne particles by creating a Clean Room-type environment using products certified in accordance with ISO 14644-1.

Armstrong offers solutions for areas requiring minimal to the most stringent requirements.

## Solution

Armstrong Ceilings products:

- achieve low or very low VOC and formaldehyde emission levels.
- have all been classified E1 for formaldehyde (*best test result possible*).
- for a large majority, achieve A+ (*the best performance level under the stringent French VOC labelling system*).

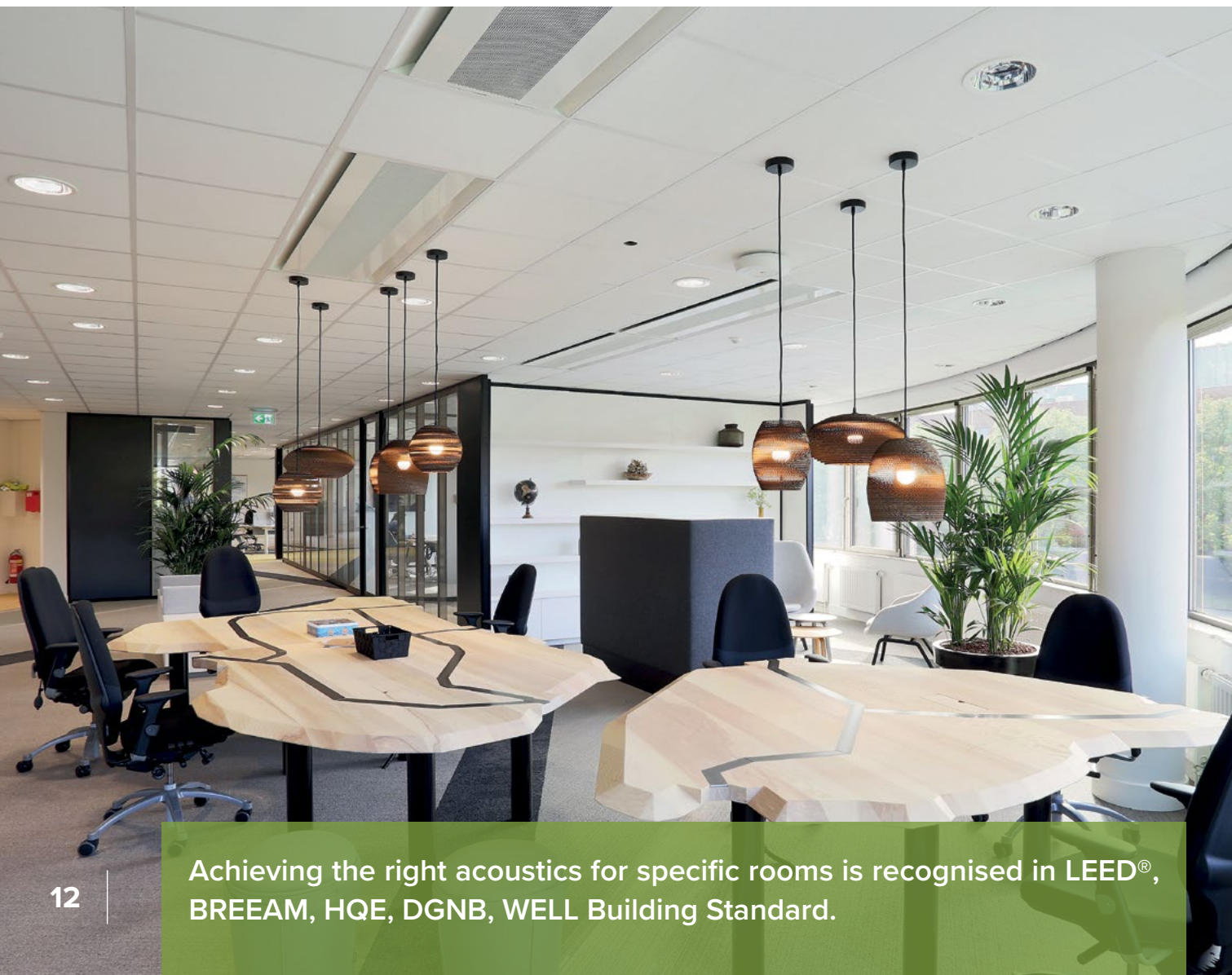




### Challenge

In a recent study 77% of people prefer quiet when they need to concentrate and 53% of workers are distracted by others when trying to focus. Speech has been identified as the most distracting sound, but all other sources have an effect.

In all types of spaces, choosing the right acoustical ceiling solution, whether the requirement is for **intelligibility**, **concentration** or **confidentiality** will ultimately enhance the end user's overall comfort.



Achieving the right acoustics for specific rooms is recognised in LEED®, BREEAM, HQE, DGNB, WELL Building Standard.

### Solution

#### Collaborative areas

Ceiling clouds, canopies and vertical baffles are appropriate solutions to complement low/high furniture systems within and between areas.

**Select absorptive products**  
(up to 1.00  $\alpha_w$  with OP range & Optima L Canopies).

#### Focus areas

High attenuation and moderate absorption rated ceilings, high attenuation rated walls, and electronic sound masking are all design elements to consider.

**Select ceiling systems with high attenuation performance**  
(up to 43 dB for Ultima<sup>+</sup> dB Planks).

#### Privacy areas

High to moderate absorption and attenuation rated ceilings, moderate to high furniture panels, and electronic sound masking are all design elements to consider.

**Select ceiling systems with high attenuation performance**  
(up to 43 dB for Ultima<sup>+</sup> dB Planks).

## Challenge

The light reflectance of the ceiling, floor and wall surfaces play the second most important role for overall illumination of the room, directly affecting working comfort, wellbeing and productivity.



## Solution

Specifying high light reflectance ceilings contribute to LEED®, BREEAM, HQE, DGNB and Well Building Standard credits.

A well-design ceiling with high light reflectance:

- Improves space illumination, allowing for fewer light fixtures
- Reduces electrical light output and lowers maintenance costs
- Reduces cooling load

High light reflectance ceilings, such as **Ultima+** or **Perla** return up to 87% of the light back into the space.

Island ceilings, such as **Optima L Canopies**, installed over a working place improve the light reflection for better comfort for the end-user.



## Challenge

An analysis in 2006 of 24 studies on the relationship between temperature and performance indicated a 10% reduction in performance at both 30°C and 15°C compared with a baseline between 21°C and 23°C, leaving little doubt as to the impact thermal comfort has on office occupants.



## Solution

The thermal mass of the buildings structure absorbs daytime thermal gains. During the night, the heat stored in the thermal mass of the building is released back to the room. Contact between the air within the room and the buildings thermal mass is needed in order for thermal transfer to occur.

**Island ceilings** provide an ideal solution in these instances. How? By adding design elements to a space and helping to maintain acoustical and visual comfort.

### Armstrong's Canopy range:

- Offers a choice of material: mineral, wood and metal.
- Available in a large range of shapes and sizes.
- Are very easy to install and dismantle, enabling easy relocation and reuse.

### Armstrong's Axiom Canopy range:


- Manufactured to pre-designed sizes and packaged with all the necessary components in our factory.
- Easy on-site installation along with no wasted materials or components.










# Rating tool performance tables

Everything you need for  
a green building all in one place

Certificates and resources can be downloaded on [www.knaufarmstrong.com](http://www.knaufarmstrong.com).  
Look for the Green icon  for Sustainable Ceiling Solutions.

			
Cradle to Cradle Certified™	Environmental Product Declaration	Recycled Content (%)	Light Reflectance (%)

ACOUSTICS				INDOOR AIR QUALITY		
						
Absorption		Attenuation <sup>(2)</sup>		ISO	VOC	Formaldehyde
$\alpha_w$	Class	NRC	D <sub>nfw</sub> (dB)			

LEED Credit	MRc4 BD&C MRc5 ID7&7	MRc1 BD&C MRc4 ID&C	MRc3 BD&C MRc4 ID&C	EQc6	< ----- EQc9 ----- >	-	EQc2	-
BREEAM Credit	-	Mat 02	Mat 06	Hea 01	< ----- Hea 05 ----- >	-	Hea 02	Hea 02
WELL Credit	25 / 26 / 97	25 / 26 / 97	-	53 / 55 / 56 57 / 59 / 62	< ----- 78 / 79 / 80 / 81 / 86 / 89 ----- >	-	1	1

MINERAL										
ULTIMA <sup>+</sup>	✓	✓	33 - 37	87	0.65(H) - 0.75(H)	C	0.65 - 0.75	33 - 40	ISO 5	A+ E1
ULTIMA <sup>+</sup> dB	✓	✓	36 - 43	87	0.60(H)	C	0.55 - 0.65	41 - 43	ISO 5	A+ E1
ULTIMA <sup>+</sup> OP	✓	✓	17 - 20	87	1.00	A	0.95	25	ISO 5	A+ E1
PERLA	✓	✓	23 - 37	86	0.65(H)	C	0.70	35	ISO 5	A+ E1
PERLA dB	✓	✓	64	86	0.50(H) - 0.60(H)	C - D	0.50 - 0.65	41 - 43	ISO 5	A+ E1
PERLA OP 0.95	✓	✓	16 - 79	85	0.95	A	0.90	25 - 27	ISO 5	A+ E1
PERLA OP 1.00	✓	✓	20	85	1.00	A	0.95	25	ISO 5	A+ E1
METAL										
METAL Perforated <sup>(1)</sup>	✓		≤ 30	65 - 83	0.15 - 1.00	A - E	0.10 - 0.90	13 - 41		A+ E1
METAL Unperforated	✓		≤ 30	85	0.10(L)	NC	0.10	44	ISO 3 / ISO 5 <sup>(3)</sup>	A+ E1
MESH Solutions	✓		≤ 30	≤ 85						A+ E1
SUSPENSION SYSTEM										
PRELUDE	✓		25							A+ E1
DGS	✓		25							A+ E1


(1) Values for Rg 0501 / Rg 0701 / Rd 1522 acoustic performance will vary with acoustic infill (no infill, acoustic fleece, B15, OP19).  
(2) Valid for Q-Clip (ISO 3) and R-Clip F (ISO 5).

(3) Some values will be Dncw. Although superseded by Dnfw, Dncw test results continue to be valid.  
\* Can be easily recycled and processed into new products.





# Environmental certificates

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## Cradle to Cradle Certified™



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Cradle to Cradle Certified™ products are recognised in LEED® and WELL Building Standard

## LEED®, BREEAM, HQE, DGNB and WELL

Download our credit summaries to help you to research, select and document which Armstrong Ceiling Systems best meet the environmental criteria for your project.

## Environmental Product Declarations



Project teams aim to assess the environmental impacts at the building level to provide flexibility when specifying construction products. Taken together, construction products make a highly significant contribution to the overall life cycle impacts of a building.

Environmental Product Declarations (EPD) are independently verified and registered documents that communicate transparent and comparable information about the life-cycle environmental impact of products.

Armstrong Ceiling Solutions EPDs have been third party certified by IBU (Institut Bauen und Umwelt e.V. (IBU) as conforming to the requirements of ISO 14025.

## Manufacturing accreditations

Our European tile & grid manufacturing plants have attained:

- **ISO 14001** environmental management system accreditation
- **ISO 9001:2000** for quality assurance

## CE declaration of performance



The CE marking indicates that a construction product is in conformity with its declared performance and that it has been assessed accordingly to a harmonised European standard.

## Test reports

Armstrong offers a wide variety of test reports to meet the following performance requirements:

- Sound absorption
- Sound attenuation
- Sound reduction

### Advisory note

All photographic and design elements supplied in this brochure do not necessarily reflect any recommendation by any of the companies named in this brochure as to the proper use or recommended methods of installation of suspended ceilings and are supplied only as informative material. For technical reasons in printing, differences may appear between colours printed in this brochure and the actual product. The choice of colours should always be made from a sample of the product. All statements and technical information contained in this brochure, or any publication of the companies named in this brochure, relating to Armstrong ceilings are based on results obtained under laboratory test conditions. It is the responsibility of the user to verify with the seller of the products in writing that such statements and information are appropriate to the specific use intended. Sales of the products and liability of the selling companies are in accordance with the terms and conditions of sale of the selling company. All product specifications are subject to modification without prior notice.





For more information visit  
**[www.knaufarmstrong.com](http://www.knaufarmstrong.com)**