

Achieve energy savings.

**Simplify waste management.**

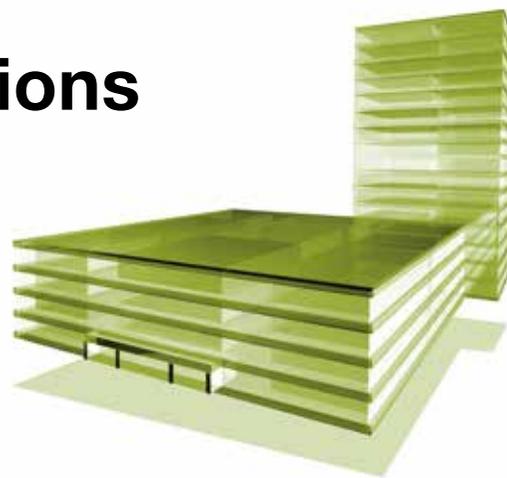
Enhance indoor environment quality.

Reduce your **environmental impact.**

Everything you need for a greener building, all in one place!

We make **green solutions**

*bright*



Inspiring Great Spaces™

**Armstrong**<sup>®</sup>  
CEILING SOLUTIONS

# Achieve energy savings

When designing an energy-efficient building, people tend to focus on everything from insulation to window placement. But, in fact, ceiling systems can also play a major role in effective energy conservation.

Here are a couple of key things to consider for your next green-building project...

Our built environment is vital in the fight against climate change as 40% of CO<sub>2</sub> emissions come from energy used in our buildings.

## DID YOU KNOW?

Up to  
**90%**  
of light back  
=  
**20%**  
Cost savings

**-40%**  
of the HVAC  
energy cost

**22°**  
stabilised room  
temperature

### LIGHT REFLECTANCE

A well designed ceiling with high light reflectance improves space illumination, allowing for fewer light fixtures, a reduced electrical light output, lower maintenance costs and a reduced cooling load.

#### Measurable savings...

- High light reflectance ceilings, such as the **ULTIMA** surface, enhance the benefits of indirect lighting by improving overall lighting uniformity, returning up to 90% of the light back into the space, compared to 75% with standard ceilings.
- A light reflectance of 90% and more delivers 20% of cost savings with indirect lighting, and can yield total building energy savings up to 11%.

### CoolZone, at the heart of your energy ambitions

**COOLZONE** incorporates BASF Micronal phase-change material into Armstrong's plain metal ceiling tiles. The phase-change material encased in the cassette stores and releases large amounts of energy, reducing cooling costs and maintaining a comfortable temperature.

A solution for your future energy ambitions, tailored for each building: classrooms, offices and meeting rooms, retail, lightweight buildings, new and existing buildings.

For more information regarding **COOLZONE**, please consult us.

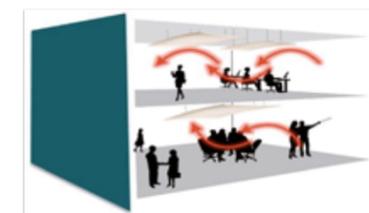
### THERMAL MASS

The thermal mass of the building's structure absorbs daytime thermal gains and then, during the night time, the heat stored in the thermal mass of the building is released back to the room. There needs to be 'contact' between the air within the room and the building's thermal mass in order for thermal transfer to occur.

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

Armstrong's **CANOPY** range offers lots of choices of material such as mineral, resin, wood and metal, available in a large range of shapes and sizes. Our island ceilings are very easy to install and dismantle, enabling easy re-location and reuse.

We have also developed a range of **AXIOM CANOPIES** which are manufactured to pre-designed sizes and packaged with all the necessary components in our factory. This provides easy on-site installation along with no wasted materials or components.



## Case Study

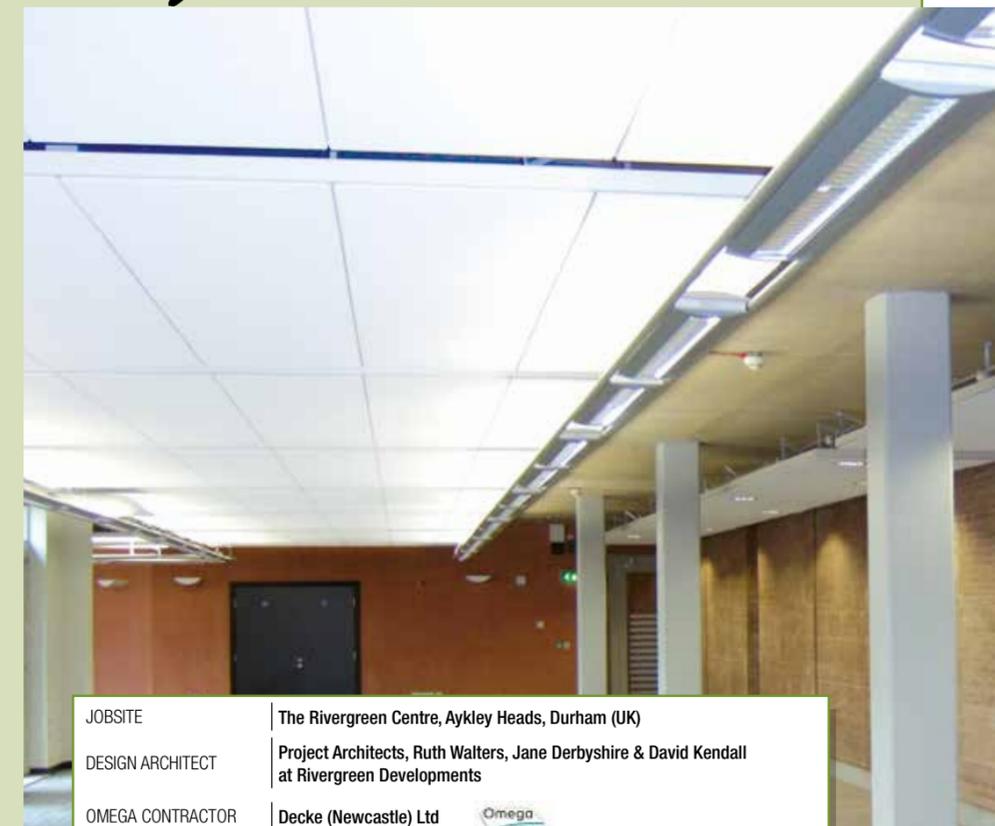
### Pulling the plug on heating and AC

#### Challenge

How to create an eco-friendly building, using the thermal mass of the concrete to control room temperatures instead of relying on air-conditioning and heating.

#### Solution

By installing Armstrong's **AXIOM C CANOPY** clouds and benefiting from their thermal mass, Armstrong were able to eliminate the use of these appliances and thus reduce energy consumption significantly. Additionally, they create a cleaner-looking environment with light-reflective properties.



JOB SITE	The Rivergreen Centre, Aykley Heads, Durham (UK)
DESIGN ARCHITECT	Project Architects, Ruth Walters, Jane Derbyshire & David Kendall at Rivergreen Developments
OMEGA CONTRACTOR	Decke (Newcastle) Ltd 
PRODUCT	AXIOM C CANOPY

# Case Study

## Simplify **waste management**

Recycling can be as good for you as it is for the environment. It reduces waste, saves money and is a smart alternative to our dwindling landfill capacity.

### END OF LIFE RECYCLING (EOL)

We are currently the only mineral-wool ceiling tile producer to offer a comprehensive post-consumer recycling scheme. We offer a collection programme for refurbishment / strip-out projects of used tiles whenever it is environmentally and economically viable to do so. **The ceiling tiles are recycled into the mix and are processed into new ceiling tiles.**



### OFF-CUT RECYCLING

As part of our post-consumer recycling programme we have developed an off-cut recycling scheme. This diverts waste generated during the installation process from landfill and this material can be fully recycled into our manufacturing process.

- **1000 m<sup>2</sup>** of ceiling = **3.8 tonnes** of waste diverted from landfill,
- **7 000 kWh** of energy saved,
- **43 tonnes** of virgin raw material saved.

### GREEN OMEGA CONTRACTORS

Armstrong Ceilings has launched a scheme to build an eco-friendly army of approved ceiling and wall system installers with expertise in recycling projects. **A Green Omega meets a range of criteria including having an environmental policy**, completing Armstrong's environmental survey and training, and enrolling in an environmental management system (EMS) such as ISO 14001.

In 1999, Armstrong Ceilings introduced the industry's first ceiling-recycling programme. To date, we have recycled over 11 million m<sup>2</sup> of old ceiling material. That's more than 61,500 tonnes of construction waste that's been diverted from landfills.

**DID YOU KNOW?**



Ceiling tiles  
**100%**  
recyclable



JOB SITE	236 Grays Inn Road, London
ARCHITECT	Tate and Hindle Ltd
MAIN CONTRACTOR	Mitie Interiors Ltd
OMEGA CONTRACTOR	Laser Essex Ltd
PRODUCT	Recycled Ceilings DUNE Premier MicroLook

*Out with the old, in with the new*

#### Challenge

How to create an inspirational yet environmentally friendly internal environment, while also providing a sustainable solution and savings on landfill costs.

#### Solution

With Armstrong's unique 'End of Life' recycling programme, 9 tonnes of old Dune ceiling tiles were recycled. The ceilings were picked up, free of charge and returned back to the manufacturing plant to be re-used. A true 'cradle to cradle' extended life cycle!

Axal ceilings, Axiom Transitions & the Bandrastrer suspension system were selected for their acoustic performance, clean aesthetics, durability, demountability as well as their ability to be recycled. The Axal tiles provided the visual sleekness of a concealed system, with the accessibility and maintenance benefits of an exposed grid system.

## Making good use of off-cut scraps

#### Challenge

How to manage a mega installation project with 120,000m<sup>2</sup> of ceilings whereby the off-cuts can be collected quickly and recycled right away in order to make new tiles for the same site.

#### Solution

Armstrong implemented an innovative Off Cut Recycling System directly on site, which enabled all the waste to be captured and collected as it was generated. What's more, Armstrong BIOGUARD PLAIN and BIOGUARD ACOUSTIC tiles provided a combination of acoustic, anti-microbial, ISO 5 clean-room solutions the hospital required.

**10 650 m<sup>2</sup>** of ceiling tiles  
**42.9 tonnes** saved from landfill  
**19.5 tonnes** of CO<sub>2</sub> was offset



JOB SITE	University Hospital, Birmingham (UK)
ARCHITECT	Building Design Partnership Ltd
MAIN CONTRACTOR	Balfour Beatty
OMEGA CONTRACTOR	Titan Ceilings Ltd 
PRODUCT	Off Cut Recycling Programme

# Case Study

## Enhance indoor environment quality

When it comes to sustainability, the environment inside the building is just as important as what's happening outside. Offer your occupants great lighting, outstanding acoustics and clean, fresh air so they can work, study, live and play in the most positive conditions possible.

### VISUAL COMFORT

A well designed ceiling with high light reflectance improves space illumination, allowing for fewer light fixtures, a reduced electrical light output, lower maintenance costs and a reduced cooling load.

- High light reflectance ceilings, such as **ULTIMA** or **PERLA**, enhance the benefits of indirect lighting by improving overall lighting uniformity, returning up to 90% of the light back into the space, compared to 75% with standard ceilings.
- Island ceilings, such as **ULTIMA** or **OPTIMA CANOPIES**, installed over a working place improve the light reflection for better comfort for the end user.

### ACOUSTICAL COMFORT

Armstrong acoustical ceilings reduce noise levels in interior spaces, allowing for an optimum balance of high-performance sound absorption and room-to-room sound attenuation to maximise / minimise speech intelligibility as appropriate. Armstrong offers the largest range of acoustical solutions, with reflective products, absorptive products (up to 1.00  $\alpha_w$  with **OP RANGE** and **OPTIMA**), and room-to-room sound attenuation performance dB range (up to 43dB for **ULTIMA dB** planks).

### INDOOR AIR QUALITY

Increasing attention is being given to the quality of the indoor environment and the presence of Volatile Organic Compounds (VOCs) within it. In this respect, Armstrong offers a wide selection of ceiling systems with safe and low emissions.

In certain areas, 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: **BIOGUARD**, **PARAFON HYGIEN**, **CLEAN ROOM FL**, **PERLA OP**.

#### Anti-microbial

Armstrong ceilings do not favour the development of fungi/mould or yeast and the product can be used in any general area. The **BIOGUARD** products have additional components which prevent the build-up of virulent strains of bacteria, moulds and yeasts.

#### Cleanable

The frequency and method of cleaning of a ceiling varies from one application to another. All products can be cleaned with a dry cloth or vacuum cleaner.

$\alpha_w \leq 1.00$

acoustical absorption Class A



Up to

43 dB

ISO 5

We spend on average 90% of our time in buildings. The right balance of **acoustic and visual comfort** together with **good air quality** improves workplace productivity and learning outcomes.

**DID YOU KNOW?**



JOB SITE	Kinnarps Showroom (FR)
ARCHITECT	Kinnarps
PRODUCT	OPTIMA CURVED CANOPY concave and convex, AXIOM C CANOPY with 600 x 600 mm OPTIMA TILES

## Creating an ergonomic space for improved well-being

### Challenge

How to create an ergonomic space that can improve occupant well-being in a 100 m<sup>2</sup> showroom. A key requirement of this project was to maintain the untreated finish of the soffits whilst using striking ceiling elements to combine design, acoustic performance and enhanced lighting conditions.

### Solution

Thanks to Armstrong's Island Ceiling range, the ceilings could be targeted into specific areas without 'whitening' the entire space. They also help to manage the room's indirect acoustics and provide perfect surfaces for indirect lighting.

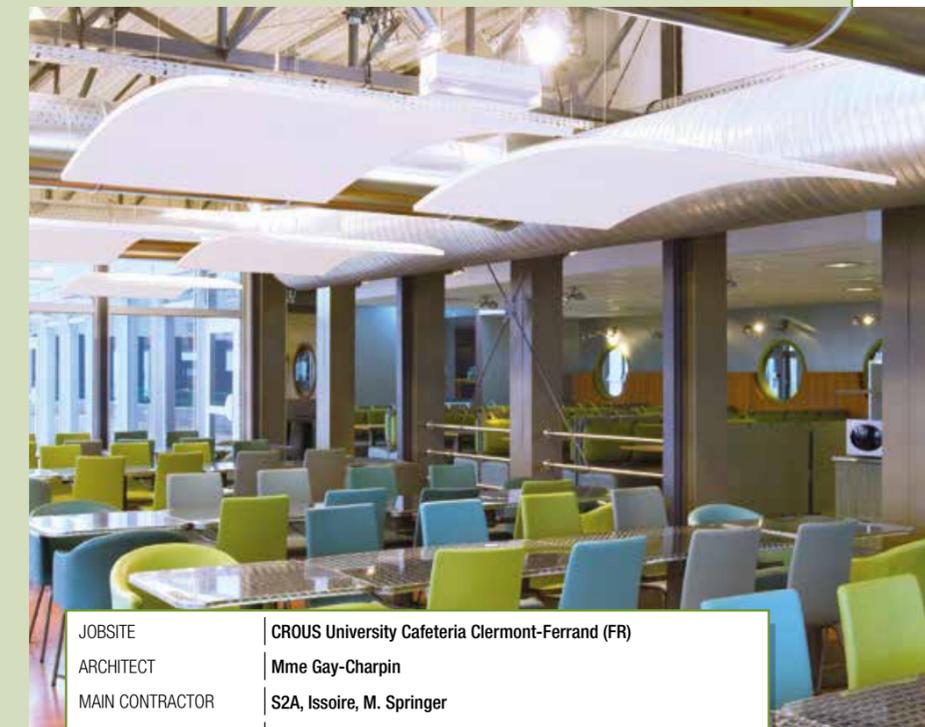
## A quieter place to dine

### Challenge

How to reduce excess reverberation and noise build up in a loud canteen. With its 3.50 metre high ceiling and rough concrete finish, conversations were difficult and students were stressed.

### Solution

Armstrong proposed a fast, clean and simple solution to address these challenges. This included OPTIMA CURVED CANOPIES over the more acoustically challenged areas – approximately 30% of the ceiling – ensuring extra sound absorption.



JOB SITE	CROUS University Cafeteria Clermont-Ferrand (FR)
ARCHITECT	Mme Gay-Charpin
MAIN CONTRACTOR	S2A, Issoire, M. Springer
PRODUCT	OPTIMA CURVED CANOPY

# Reduce your environmental impact

Whatever your ceiling project, Armstrong helps you reduce your environmental impact with responsible solutions, from product design and raw material selection to manufacturing and logistics.

## ENVIRONMENTAL PRODUCT DECLARATIONS (EPD)

### What's so good about an EPD?

An EPD is a thoroughly objective, fact-based study conducted by a third party. Most importantly, this study takes into account the entire lifecycle of the product, from its earliest stages of development all the way up to its end of life.

It offers a summary of performance attributes, aesthetics, and environmental preferences to help you choose the right product for each project.

Now, we have Environmental Product Declarations for most of the product families, including a view of the total ceiling system.

Armstrong EPD's conform to the requirements of ISO 14025.

### EPD environmental impact areas...

#### • Global Warming Potential

Also known as 'carbon footprint', this takes into consideration greenhouse gas emissions, or other emissions that contribute to climate change.

#### • Primary Embodied Energy

Amount of energy from renewable and non-renewable sources used in the raw material procurement for a product, and the amount of energy required to manufacture it into a new product.

#### • Ozone Depletion

Thinning of the earth's stratospheric ozone layer.

#### • Acidification Potential

Pollutants or emissions that turn into acids and harm buildings, plants, animals, aquatic life, and human health.

#### • Eutrophication Potential

When materials contribute to increased quantity of nutrients that leach into water or soil and shift the biological balance.

#### • Water Consumption

Total amount of water required to produce a product.

#### • Smog/Photochemical Oxidant Creation Potential

When emission of chemicals cause smog or air pollution.

An Environmental Product Declaration (EPD) is a standardised and Life Cycle Analysis (LCA) based tool to communicate the environmental performance of a product or system, and is applicable worldwide.

**DID YOU KNOW?**



PRODUCTS

### Mineral Ceilings

- High recycled content (up to 82%)
- 100% recyclable
- High light reflectance and acoustical performance
- 15 years guarantee
- Multiple manufacturing locations for reduced transportation emissions

### Metal Ceilings

- 30% recycled content
- Well established 3rd-party recycling programme
- 15 years guarantee
- High light reflectance and acoustical performance
- Cleanable and durable
- Multiple manufacturing locations for reduced transportation emissions
- Design flexibility for waste minimisation and performance optimisation

### Wood Range

- Constructed using high class MDF, coated with clear UV enhanced lacquer, without the use of any solvents
- Good light reflectance and acoustical performance
- Natural product without allergic ingredients

### Suspension Systems

- All Armstrong suspension systems contain 25% recycled content, with the highest percentage of post consumer content in the industry (23%)
- Rotary stitched for additional strength and stability
- Recyclable
- Patented Peakform for extra strength & stability
- Multiple manufacturing locations for reduced transportation emissions

## SUSTAINABLE PRODUCTS AND DESIGN

### Raw Material

Raw materials for our ceilings are renewable and abundant in nature – Biosoluble mineral wool (the wools used in our products meet the classification "exempt" as defined by EC directive 97/69/EC 1997), perlite, natural starch, recycled paper, recycled tiles and clay. None of our ceiling products contain asbestos.



### High-Recycled Content

A significant proportion of our ceiling tiles are produced using recycled raw materials, including slag mineral wool, other recycled mineral wools, recycled paper and recycled ceiling tiles. These recycled contents are now indicated on all Armstrong's published literature in accordance with EN ISO 14021:2001.



# Achieving the most **respected** certifications worldwide

Being a leader in sustainability and safety means complying with the strictest standards and certifications both domestically and across the globe. That's exactly what we've been doing and we'll continue to do so.

## **LEED (LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN)**



The US Green Building Council's mission is the global adoption of sustainable buildings within a generation. Their Leadership Energy and Environmental Design (LEED) building certification is a framework for improving the environmental footprint in building design, construction and operation.

## **IBU (GERMAN INSTITUTE OF CONSTRUCTION AND ENVIRONMENT)**

Armstrong collaborates with German certification and standards groups for sustainable building, such as the IBU (Germany's Institute of Construction and Environment) and is a member of WETEC. The Wet-felt Technical Committee for Construction, WETEC, provides a service to European based manufacturers of wet-felted products by providing a forum for the development and maintenance of technical, quality and safety standards and guidelines. An Environmental Product Declaration for WETEC wet-felt mineral fibre products will be published in 2012.

## **MANUFACTURING ACCREDITATIONS**



Armstrong's stringent environmental and safety standards ensure quality and consistency in our manufacturing processes. In Europe, our tile and grid manufacturing plants are accredited to ISO 14001 (environmental management), ISO 9001:2000 (quality assurance). Our mineral plants have an Occupational Health and Safety Management system in place to match ISO 18001 standards.

## **BRE ENVIRONMENTAL PROFILES**



At Armstrong, we're proud to be a recognised pioneer in green practices, with successful methods to produce environmentally preferable products, prevent pollution and reduce waste. We're the only UK mineral ceiling manufacturer with a BRE Ecopoint profile – an external certification of our compliance with ISO 14041 and ISO 21930 standards. Our Ecopoint score in 2007 was 0.10, a significant improvement on 2004, and we're working on lowering it even further.

## **GREEN BUILDING COUNCIL FOUNDER AND MEMBER**



Armstrong was a founding member of the USA and Indian Green Building Councils and plays an active role in the Green Building Councils in the UK, Netherlands, Canada, China, Australia, Spain, Germany, Poland and Serbia. In 2007, our corporate headquarters in Lancaster, PA, achieved the LEED-EB (Existing Building) Platinum rating, the highest and most demanding certification.

## **LIFETIME GUARANTEE**



The result of continuous product line development and improvement allows us to offer a new Lifetime guarantee for our Dune Supreme, Dune dB and Dune Max product ranges.

## **FDES (FRANCE'S ENVIRONMENT AND HEALTH DECLARATION)**

Armstrong is participating in European Union efforts to establish a standardised method for profiling the environmental impact of products. In France, the FDES (Fiche Déclaration Environnementale et Sanitaire) is expected to mirror other European initiatives. Information generated through FDES is utilised in France's **HQE** (Haute Qualité Environnementale) project accreditation scheme. The product profiles for our mineral and metal tile facilities are based on FDES methodology.

## **M1 (EMISSION CLASS FOR BUILDING MATERIAL)**

The Finnish Emission Classification of Building Materials aims to enhance the development and use of low-emitting building materials so that material emissions do not increase the requirement for ventilation. The classification presents emission requirements for the materials used in ordinary work spaces with respect to good indoor air quality. M1 stands for low emissions. Armstrong has achieved this classification for the majority of its range of mineral tiles.

## **15 YEAR GUARANTEE**



Most of our products are cleanable and our hygiene tiles have an antifungicide treatment. The durability of our products means less damage and fewer replacements required, resulting in a lower impact on the environment. All our 95% and 99% RH products are guaranteed for 15 years.



# Want **to learn more** ?

Find out more at  
[www.armstrongceilings.eu](http://www.armstrongceilings.eu)



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