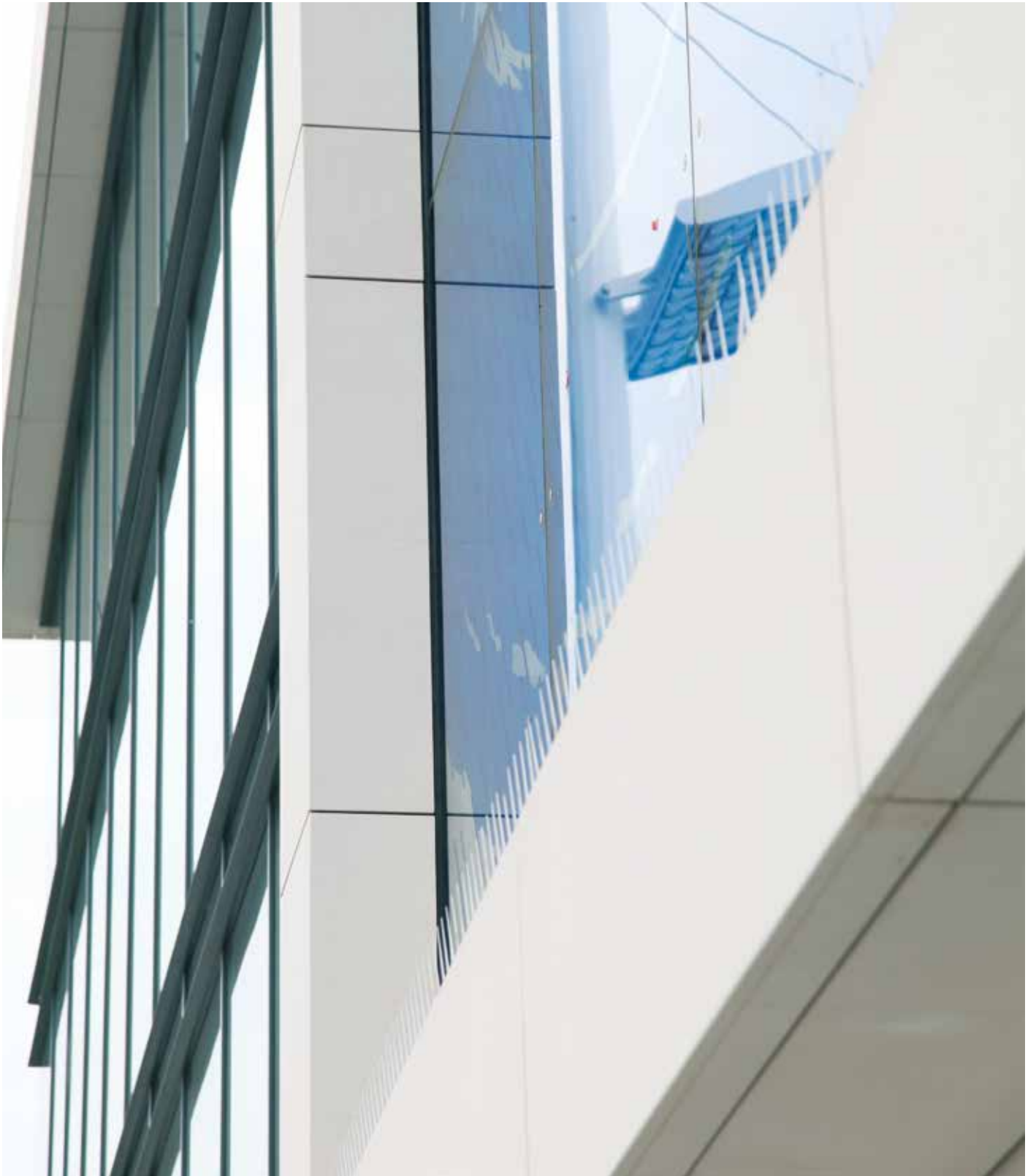




## **System overview** | Lithodecor

Innovative façade solutions



**Building:** Southampton Regional Business Centre, Southampton | **Design:** Capita Symonds

# Welcome to Lithodecor



Lithodecor lightweight façades featuring natural stone and glass offer a wide range of shapes and design options that have inspired not only architects but also their clients. The systems are ideal for new build projects as well as for the refurbishment of older buildings. Lithodecor offers individual, sophisticated solutions based on first-class product quality.

Lithodecor is a member of the DAW group of companies, Germany's largest manufacturer of architectural paints. Founded in 1895, the traditional family-owned business has been extremely successful in developing product solutions that enhance the design and maintain the value of buildings.

Subsidiaries such as alsecco, Caparol and Alpina are market leaders in their respective segments. Synergies are achieved throughout, from research to production, and have delivered many classic products and innovations.

This brochure gives you a detailed overview of Lithodecor's products and systems outlining their performance and creative design opportunities.



**LITHODECOR**  
Innovative Façade Systems



**Photograph on title page:** Earth Sciences Building, Oxford University | **Design:** Wilkinson Eyre Architects, London

# Contents



## **Philosophy**

Sophisticated, high-tech façade solutions featuring natural stone and glass. We offer individual solutions for architectural, technical and structural requirements.

→ Page 06



## **Production**

Excellent product quality assured through ultra-modern manufacturing techniques at our site in Germany, ensuring flexibility of design for clients.

→ Page 08



## **Airtec Stone**

Lightweight natural stone façades offer an extremely attractive solution for any architectural project. Ideal even for difficult substrates when refurbishing older properties.

→ Page 10



## **Airtec Glass**

Unique glass finish which is light in weight and available in a wide range of colours. Perfect when combined with Airtec Stone on the same project.

→ Page 18



## Airtec Photovoltaic

The Airtec system opens up innovative forms of solar energy generation for façades, combining technology and design.

→ Page 28



## Natural stone wall-base system

Combining function and design, this system enables a bonded composite system to be used in conjunction with the ventilated, mechanically-fixed system.

→ Page 29



## Airtec projects

A more detailed look at a small selection of our most innovative and technical projects for both Airtec Stone and Airtec Glass.

→ Page 30



## Technical support

Lithodecor offers full technical and design support from inception to installation. We are available to offer advice and assistance in choosing the right system for your project.

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# Philosophy

## **Innovative solutions for façade design**

Natural stone and glass have captured a permanent place in architecture – from classical to modern times. Lithodecor produces sophisticated, innovative, high-tech solutions featuring both these building materials. Whichever design option you choose, be assured that your architectural, technical and structural requirements in terms of individual façade solutions will be fulfilled.

Lithodecor ventilated rainscreen façade systems are based on a proven construction principle of lightweight composite materials and natural stone or glass panels. Both systems have the relevant building regulation approvals.

The common element of all Lithodecor façade systems is their sandwich construction. The combination of lightweight concrete with specially formulated adhesives, mesh inserts and glass or natural stone, gives Lithodecor products their particular technical properties with reduced weight. This means that large, storey-high natural-stone panels up to 4.7m<sup>2</sup> in size can easily be installed whilst also achieving a 66% weight reduction in comparison with classic stone façades.

The lightweight nature of the materials means that Lithodecor systems are in great demand, especially as solutions to structural problems encountered with older properties. Due to problematic, relatively unsound substrates, the architectural and energy-efficiency upgrades of buildings constructed between the 1950s and 1970s, for example, with natural stone or glass is often only possible by installing lightweight façade systems. The interplay of glass and stone with a wide range of textures and finishes offers a highly attractive solution for every architectural requirement. The combination of these systems with energy-saving external thermal insulation composite systems or solar power-generating façade modules offers further important and cost-effective solutions.

As façade materials, natural stone and glass represent high quality in terms of design and durability. Make the most of the unique design options offered by these materials – individually or combined. Please contact our Lithodecor technical team for advice on your individual project – they will be happy to help.

Telephone 01785 818998

E-Mail [technical@lithodecor.co.uk](mailto:technical@lithodecor.co.uk)

Web [www.lithodecor.co.uk](http://www.lithodecor.co.uk)





**Building:** Festuca House, East Village (formerly Olympic Village) | **Design:** Howarth Tompkins

# Made in Germany

## A high-quality, hand-finished product

We have been manufacturing Lithodecor sandwich panels at our own production facility for over 20 years. The Lithodecor facility combines state-of-the-art industrial production technology with the skilled hand-finishing of materials associated with traditional manufacturing.

Many years of expertise and experience of working with stone, together with research and continuous development of the production process, are key factors that have contributed to the excellent quality of Lithodecor's product range.

The high-grade composite panels are always uniquely and individually manufactured for each project. This customisation allows us to meet almost any requirements of designers and architects. It involves not only the provision of samples and selection of stone, but also the specification of finishes and panel sizes as well as bespoke parts.

**Production site:** Netzschkau, Germany



Cutting



Calibration



CNC processing





Manufacturing composite panels



Finishing



Quality control



**Building:** Farringdon Station, London | **Design:** Atkins

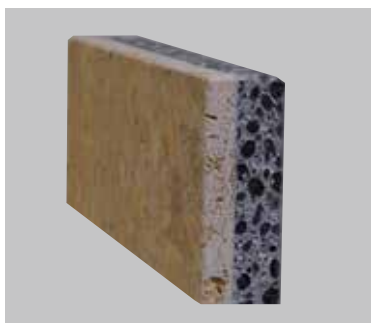


## Airtec Stone

Lightweight, large panel natural stone

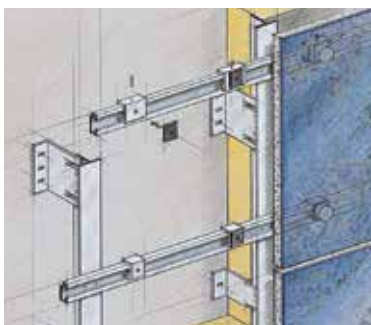


# Principles | Airtec Stone



## Construction

The production process for Lithodecor Airtec Stone panels involves laminating thin slabs of natural stone onto a carrier panel. The carrier panels, made from a specially developed lightweight concrete, are used for fixing and load transfer. Since the physical characteristics of the carrier and the laminated material are very similar, the layers are a perfect combination and protect the façade against all types of weather.



## Structural system

In a ventilated system the composite panels are fixed to a standard aluminium base frame with special aluminium clips. The load is transferred from the panel to the clips via specially developed ceramic discs that are bonded onto the carrier panel with an approved adhesive. The number of fixing points is dependent on the size and weight of the façade panels or shaped parts.



## Size

The general building inspectorate approval for Lithodecor natural stone lightweight façades covers panel sizes up to 3.8m high and individual panel areas up to 4.7m<sup>2</sup>. These sizes are impossible to produce using classic natural-stone façade systems on account of their weight and the size of the block stone prior to cutting.



## Weight

Airtec Stone represents a weight-saving of up to 66% compared with a conventional stone façade. This is a major advantage, especially when refurbishing older properties where the supporting structure has limited load-bearing capacity. Existing façades can be replaced or over-clad without making costly structural changes. This aspect is hugely beneficial for buildings originally erected in the 50s, 60s and 70s, and for vertical expansion projects.



## Bespoke parts

Due to the material properties of the composite panel, it is possible to manufacture three-dimensional shaped parts, such as corners, angles and U-sections with a monolithic appearance. This process involves mitring the composite panels, bonding them without a visible joint and securing them by mechanical means. Cantilevered panels up to 400mm in length can be attached to a mother panel.



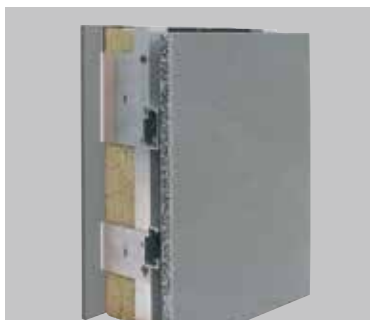
## Overhangs

Classic stone façades usually extend approximately 180–220mm beyond the existing structure. The shearing force grows disproportionately if the overhang is any greater and requires the installation of elaborate and costly stainless-steel base frames. Such projects are frequently impossible to implement with classic natural stone systems. Because of their light weight, Lithodecor composite panels make much greater moment arms possible with an optimised base frame.



## Impact resistance

The sandwich construction of natural stone, lightweight concrete, special adhesive and mesh guarantees maximum impact resistance. Tests carried out on structural elements confirm that the maximum loading requirements are met. Unlike classic stone façades the anchor bolts cannot work loose.



## Approval

Lithodecor natural-stone lightweight façades are approved by European Agrément Certification. International construction product approvals have also been obtained, including ones in the UK (CWCT). The monitored and certified production processes guarantee maximum reliability.



# System | Airtec Stone

## Lightweight large panel natural stone

Lithodecor Airtec Stone is unlike any other ventilated rainscreen façade system as it removes technical and structural constraints for designers. The composite panel consists of an 8-10mm thick top layer produced from almost any natural stone on a lightweight concrete carrier up to 19mm thick. This system is up to 66% lighter than solid natural stone panels.

A special manufacturing process provides architects with a choice of almost any natural stone suitable as a façade cladding. The combination of stone options plus a wide range of textures and finishes, ensures that a highly attractive solution is available to meet almost any architectural requirement. Large bespoke components, for example panels of storey height or shaped parts, such as reveals and corner interfaces, can easily be supplied.



Architectural classics – enhanced with high-quality granite cladding.



Mitred corner



**Building:** Ruskin College, Oxford | **Design:** Penoyre and Prasad

#### Airtec Stone – system features

<b>System</b>	Ventilated rainscreen façade system with natural stone-faced panels on a light-weight concrete carrier.
<b>Properties</b>	The flexible substructure is weather-resistant and frost-resistant and compensates for any unevenness in the substrate.
<b>Fixing</b>	Invisible fixing to aluminium substructure.
<b>Finishes/Appearance</b>	Types of stone: limestone and sandstone, slate, granite, gabbro (polished, cut). All other types of stone and finish on request.
<b>Sizes</b>	Panel size up to 4.7 m <sup>2</sup>
<b>Approval</b>	Z-33.2-632
<b>Reaction to fire</b>	Fire-resistant, construction materials class B1.
<b>Impact resistance</b>	Meets the CWCT technical note 76 and BS 8200 up to category B for impact.

# Projects | Airtec Stone



## **Farringdon Station, London**

Both Airtec systems were specified by Atkins for the major redevelopment of Farringdon Station as part of the north-south Thameslink Programme. Airtec Stone and Glass panels were used on the interior façade as well as the exterior of the building. See also page 32.



## **Information, Communication & Media Centre, University of Potsdam**

A combination façade with stone and glass elements fixed to a standard frame considerably reduced the work associated with planning and installation. The Airtec systems also met the client's request for a façade with large patchwork elements. See also page 36.



## **Westfield Stratford City Shopping Centre, East London**

Airtec Stone has been installed on the recently opened, largest urban shopping centre in Europe - Westfield Stratford City. This natural stone system was specified by Westfield's own architects for use on part of the store façades on the external shopping malls.



## **Ruskin College, Oxford**

Airtec Stone provides a striking and modern contrast to the existing listed building, set in a 19th-century landscape at Ruskin College, Oxford. The £7.2 million new extension to the college's listed Rookery building now accommodates both teaching and learning spaces through significant refurbishment and alteration.



#### **Wigan Joint Services Centre, Wigan**

Airtec Stone was specified for a new multi-million pound project in Wigan, officially known as the Joint Services Centre (JSC). This state-of-the-art Centre incorporates a stunning new central library and swimming pool, whilst also creating a unique public service hub that has revitalised the town's civic heart.



#### **Stone over-cladding, Dresden**

Airtec Stone was able to realise the architect's vision by creating an "overcoat" including a substantial overhang to the existing façade. Only achievable due to Airtec Stone's lightweight nature.



#### **Terminal Building, Portsmouth International Port**

The architects were looking for a highly durable material for this project that also gave a natural variation to its finish. Working closely with the Port, the architect identified Airtec Stone as it could provide all these qualities plus the added benefit of being considerably lighter than solid stone.



#### **Southampton Regional Business Centre, Southampton**

Natural Portland stone was used to great effect along with glazing – with little load applied to the façade. The lightweight Airtec Stone elements together with glazing creates a compact, monolithic surface.





**Building:** Earth Sciences Building, Oxford University, Oxford | **Design:** Wilkinson Eyre Architects, London





## Airtec Glass

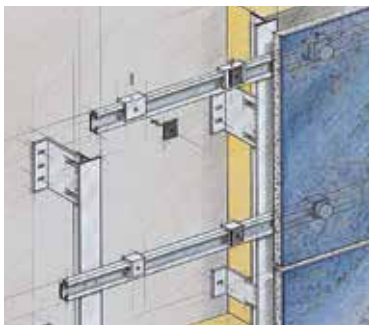
Lightweight with outstanding properties

# Principles | Airtec Glass



## Construction

The manufacture of Lithodecor Airtec Glass involves slim glass panels laminated to a specially developed lightweight concrete carrier. The carrier panels are used for fixing and load transfer.



## Structural system

In a ventilated system the composite panels are fixed to a standard aluminium base frame with special aluminium clips. The load is transferred from the panel to the clips via specially developed ceramic discs bonded into the base panel with an approved adhesive. The number of fixing points is dependent on the size and weight of the façade panels or shaped parts.



## Size

The general building-inspectorate approval for the Lithodecor lightweight glass façade covers panel sizes up to 3.80m high and individual panel areas of up to 4.7m<sup>2</sup>. Panels can be manufactured with openings, drilled holes, notches etc.



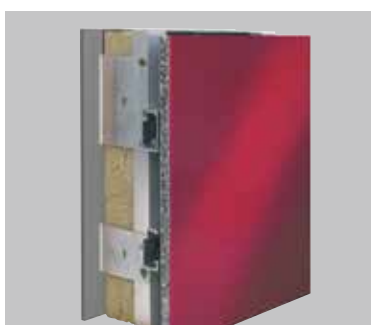
## Design

The Airtec Glass system ensures even large glass panels can be attached with invisible fixings. The almost unlimited choice of colour, printing and finish cater for almost any design preference.



## Maximum stability

The sandwich composition of these materials ensures maximum stability during transportation, installation and use. The residual load capacity achieved as a result of the composite structure, offers maximum protection against risks such as sections falling off the façade as a result of damage, e.g. external influence.



## Approval

Lithodecor glass façades have passed all the necessary durability and fire protection tests and are approved for use in the UK and Germany plus many other countries. The monitored and certified manufacturing processes guarantee maximum safety.

# System | Airtec Glass

## Lightweight with outstanding properties

The Airtec Glass system combines the unique qualities of glass with the innovative technology of a ventilated rainscreen façade. The extremely resistant composite panels, which can be up to 32mm thick, consist of toughened safety glass bonded to a lightweight concrete carrier. A wide range of colours and different types of glass can be applied to this carrier panel.

The composite panels, up to 4.7m<sup>2</sup> in size, are hooked onto the frame with an invisible clip design and with each element able to be adjusted both vertically and horizontally for perfect alignment.

In addition, sections of glass and stone can be combined in the same plane which is especially useful when installing the system on older properties with problematic substrates. This option to combine different finishes and materials is not available with classic systems. Whether transparent, tinted or enamelled, screen printed or plain - anything is possible!



Opaque white glass



Combining stone and glass



**Building:** Marks & Spencer, Warrington | **Design:** Darnton EGS Architects

#### Airtec Glass – system features

<b>System</b>	Ventilated rainscreen façade system with glass panels on a lightweight concrete carrier
<b>Properties</b>	The flexible substructure is weather- and frost-resistant and compensates for any unevenness in the substrate
<b>Fixing</b>	Invisible fixing to aluminium substructure
<b>Finishes/Appearance</b>	Enamelling or screen print
<b>Sizes</b>	Panel size up to 4.7 m²
<b>Approval</b>	Z-33.2-1033
<b>Reaction to fire</b>	Fire-resistant, construction materials class B1.
<b>Impact resistance</b>	Meets the CWCT technical note 76 and BS 8200 up to category B for impact.



# Projects | Airtec Glass



## **Indecon Court, London**

Attractive combination of different façade sections with Airtec Glass elements of storey height. Modern housing design combining different materials for the façade.



## **Marks & Spencer, Warrington**

Sophisticated appearance of a flagship store for Marks & Spencer. Extremely large, invisibly fixed glass elements create a prestigious façade.



## **Oxford University**

The façade's structural glazing look was fixed to a lightweight wall offering optimum energy efficiency. In comparison with a conventional façade system, Airtec Glass was able to deliver rapid installation together with low construction costs. See also page 34.



## **Headquarters of FC Bayern Munich, Munich**

Large spandrel units with invisibly fixed large-size glass elements on the façade of the headquarters of Bayern Munich FC. The combination with post-and-rail façades demanded an optimised solution for the base frame.



#### **Itzehoe Clinical Centre**

A winning combination of various sizes of glass panels with traditional, smaller ceramic tiles. The durable and high-quality façade solution achieves its sophisticated appearance with invisible fixings.



#### **MCR Medical Centre, Rhaderfehn**

Concrete stairwells are integrated with invisibly fixed Airtec Glass elements and a post-and-rail façade providing a striking finish. A very attractive result featuring opaque and translucent sections of glass.



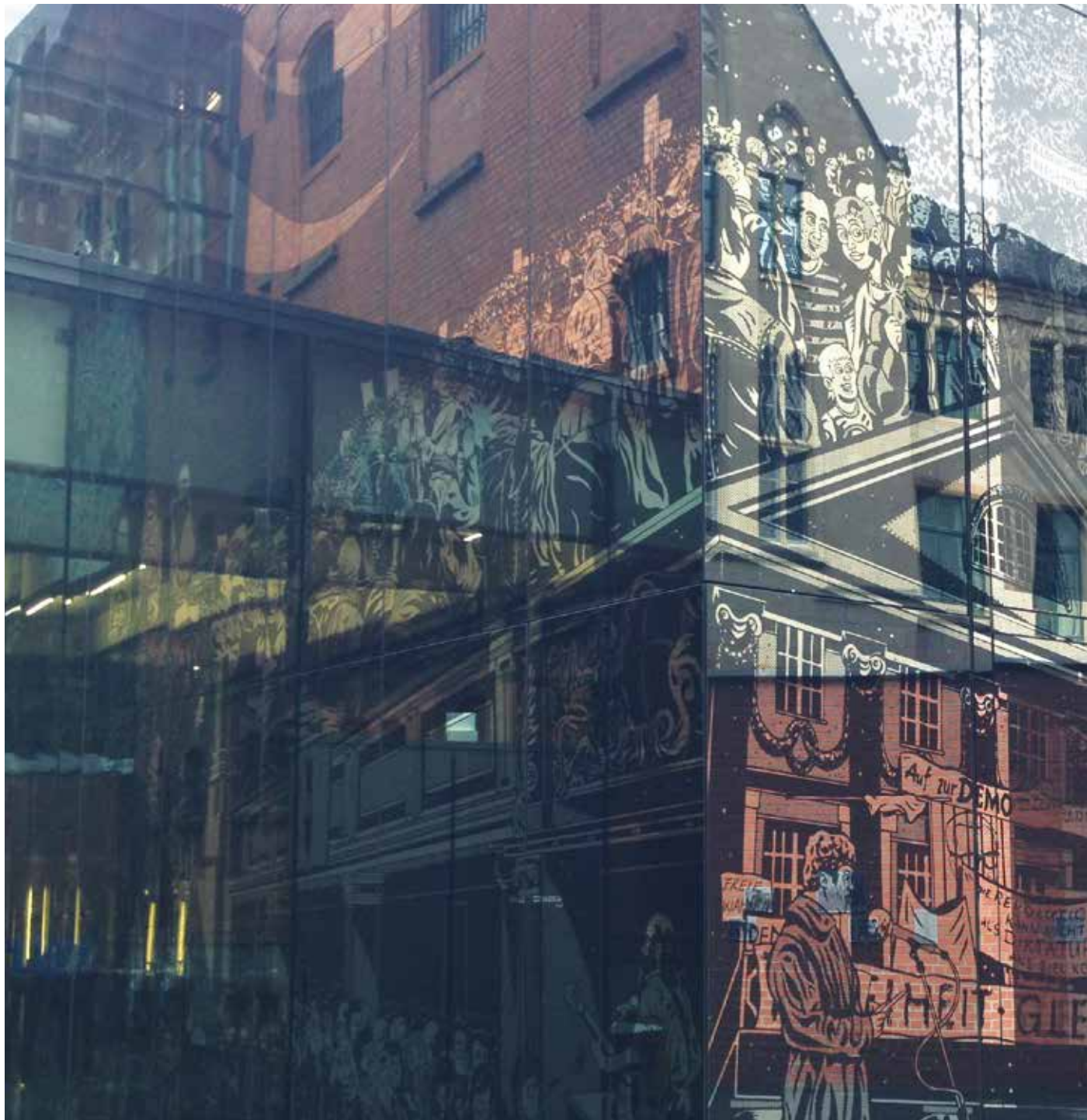
#### **Hansa Baugenossenschaft eG, Bikkamp**

The combination of an ETIC system with glass elements highlights individual areas. The solution for the interfaces presented a challenge that we were able to meet with Airtec Glass.



#### **Cartoon frieze for memorial – Erfurt**

Digital printing and chromium plating were used to apply every detail of the high-resolution motifs to the thermally toughened safety glass panels. The storey-high individual elements and their installation was straightforward as part of the Airtec Glass system.



**Building:** Memorial, Erfurt | **Design:** Freybeuter Graphics Studio, Potsdam and cartoonist Simon Schwartz





## System variants

Façade systems with design opportunities

# System | Airtec Photovoltaic

## New architectural design options

Airtec Photovoltaic offers innovative forms of solar energy generation for façades. The carrier is a lightweight façade panel with an integrated photovoltaic module of variable shape and design. The analogue construction principle allows the photovoltaic elements to be combined with other Airtec systems using the same base frame; consequently photovoltaic units can be used for specific areas.

The potential use of Airtec Photovoltaic modules is enormous, since the façade accounts for the majority of the surface area of urban buildings. The vertical arrangement of these areas allows approximately 80% of solar radiation to be used efficiently. The interplay of design and technology is extremely varied, since Airtec Photovoltaic offers not only the standard sizes available on the market, but also individual, project-specific sizes. The modules also fulfil additional functions associated with the external envelope, such as providing a water-tight and air-tight barrier or sun protection.

Integrated in the building, these solar components make a lasting contribution to reducing the energy-related running cost and CO<sub>2</sub> generation. The legal requirements of EnEV 2009, the ordinance on the saving of energy, are complied with. Furthermore, system operators benefit from statutory support schemes, such as feed-in tariffs or tax relief.



Solar energy generation for the façade

## Airtec Photovoltaic – System features

<b>System</b>	Ventilated rainscreen facade with photovoltaic panels.
<b>Properties</b>	The flexible substructure is weather-resistant and frost-resistant and compensates for any unevenness in the substrate.
<b>Fixing</b>	Invisible fixing to aluminium substructure.
<b>Finishes/Appearance</b>	Charcoal-coloured cells, almost invisible “pinstripes” and wires.
<b>Sample sizes</b>	1300 x 1100mm, 1000 x 1000mm, 1000 x 800mm, 1200 x 800mm, 1200 x 600mm – other sizes on request.

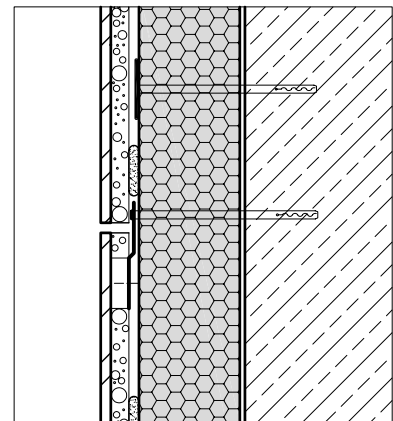


# Natural-stone wall-base system

## Creative yet functional

In inner cities and other built-up areas rainscreen façade systems are often uneconomical on account of the load-bearing considerations and the resultant system build-up. In such cases a bonded composite system is used as a variant for ventilated, mechanically-fixed systems so that sophisticated designs featuring natural stone can also be implemented.

The bonded system offers clear benefits when combined with an ETIC system, especially for specific façade sections, such as wall bases or entrance areas. This involves fully bonding natural-stone composite panels to the thermal insulation and mechanically fixing them in place to prevent tilting. Specialist solutions incorporating shaped parts can easily be integrated in the wall-base system.



**Building:** Venet House, Neu-Ulm

**Design:** Nething General Planners, Architects, Engineers, Neu-Ulm



Natural-stone wall-base systems are available in all the usual varieties of stone.



**Building:** Acton Gardens, London | **Design:** HTA Architects





## Airtec projects

Detailed project overviews

# Project | Airtec Stone and Airtec Glass

## Farringdon Station, London

Airtec ventilated rainscreen cladding was specified by Atkins for the major redevelopment of Farringdon Station as part of the north-south Thameslink Programme. Both Airtec Stone and Airtec Glass were utilised on the project due to their compatibility, with both systems being used on the interior façades as well.

Farringdon Station was the terminus of the world's first underground railway. The historic station is being given a massive upgrade to preserve its heritage and provide space for the Thameslink and Crossrail services that will make it one of London's busiest transport hubs, with 140 trains an hour at peak times. From 2018, Farringdon will be the only station where Thameslink, Crossrail and Underground services meet, giving passengers the choice to travel north-south, east-west and around London.

This part of Farringdon Station was required to be designed to create a feeling of light and space and the use of Airtec Stone and Glass has achieved that to great effect. It was also important that the two finishes could be combined seamlessly which the Airtec system provides and that the same system could be used for exterior and interior use.

In total 2600m<sup>2</sup> of Airtec stone panels, up to 3m in size, were installed on the project; the finish being a beige-coloured Jura Limestone. For safety and security reasons the lower panels around the base of the exterior façade were filled with the upper joints being left open, which was an important feature for the exterior of the station.

400m<sup>2</sup> of Airtec Glass panels, in white glass were installed, again with panels up to 3m in height. The panels form part of the exterior fascia of the station whilst also being used extensively through the ticket hall area and extending down the stairs onto the platform areas too.







# Project | Airtec Glass

## Earth Sciences Building, Oxford University

Lithodecor's Airtec Glass system was specified by Wilkinson Eyre Architects for the new Earth Sciences Building at Oxford University. This prestigious project has provided this department not only with a world-class teaching environment but also with excellent research facilities. The Airtec Glass system creates a building façade that is not only striking in appearance but satisfies structural and architectural demands.

Colin McAuley, Project Manager, RBDML, commented, "This is a very significant project for the university in the development of its science area and the architectural design of the building needed to reflect that. The Airtec Glass system has enabled the design to be realised and the team at Lithodecor gave their technical support throughout the installation."

The new building is the flagship for the university's redevelopment of its science area and provides laboratory and office space for around 400 students and staff. The purpose-built centre will enable the department to maintain its international reputation as a centre for research excellence as well as signalling to the wider public the interests and concerns of the users. The most striking element of the building is a "narrative" wall which will act as a shop front for the ideas and activities of the department.

The building has been designed around a strong sustainability ethos, exceeding targets set by the local planning department for its embodied energy, which stipulates a minimum of 20% recycled materials in buildings of this type. The building also uses ground source heat pumps providing around 43% of the building energy needs and there is also a recycled rainwater system in place.





# Project | Airtec Stone and Airtec Glass

## **Information, Communication and Media Centre, University of Potsdam**

Staab Architects were required to design the new Information, Communication and Media Centre at the University of Potsdam near Berlin. The architect's vision was to create a seamless transition of glass and stone for the exterior façade of the building to create a distinguished and striking finish which would provide a clearly visible focal point for the university campus.

The exacting requirements were to create a façade of natural stone and glass with a smooth surface to create a "patchwork" finish. It was also important that the finish was seamless so invisible fixings were going to be an essential criteria when choosing the individual system, as was the need for panels up to 2.9 metres in height.

Identifying the individual ventilated rainscreen system offering both a glass and a natural stone finish was a challenge for Staab Architects as finding compatible systems which give the same finished depth to the cladding as well as using the same installation, was proving difficult. Lithodecor's Airtec system was identified as being the perfect solution to this technical and design issue.

The architects required a sample façade to ensure that the Airtec Glass and Airtec Stone systems could be combined successfully and create the desired finish. It was also important for the architects and client to assess the installation and view the invisible fixings and check that the stone and glass would successfully be installed in "plane". The architects were delighted with the test and the system was then fully specified for the project.

The new centre at the University of Potsdam houses over a million books and is open plan in its layout incorporating bright airy reading areas. From the upper levels there are fantastic views across the campus with daylight being an important feature flooding areas with light and atmosphere.







# Project | Airtec Stone

## Southside Shopping Centre, Wandsworth, London

Southside is an award-winning, retail-led regeneration scheme that has breathed new life into what was once one of Europe's largest indoor shopping centres. The ongoing project involved the phased extension, remodelling and refurbishment of a distressed 1970s asset in Wandsworth town centre, South London

Airtec Stone was specified by Leslie Jones Architecture for the external façades and structure to the development. In total 1200m<sup>2</sup> of Airtec panels were installed in Crème Royal, giving a clean light finish to the shopping centre.

Led by Leslie Jones Architecture, there was a partnership approach to the brief which has sustained a long-term vision for a vibrant lifestyle offer anchored by major UK retailers and leisure operators.

The improvements to the site include a multi-storey car park, wider malls, a restaurant offer and new retail units with double-height frontage. The dynamic interior combines both natural and feature lighting and characterises the step change in the fortune of the centre. Under foot the high-quality theme continues with the use of limestone.

Southside demonstrates how progressive asset management initiatives set within the context of an agreed master plan is able to transform the fortunes of a failing retail centre.





# Technical support | Airtec systems

Lithodecor offers full technical and design support from inception to installation. We are available to offer advice and assistance in choosing the right system for your project.

Throughout every stage of the construction process we can make visits to the project site, if required, thus ensuring all elements of the Airtec system are correctly installed in accordance with guidelines.

As part of our service, our website contains all the relevant technical information you might require for your project specification.

- Detail drawings in both dwg and pdf format
- Data sheets
- Approval certificates

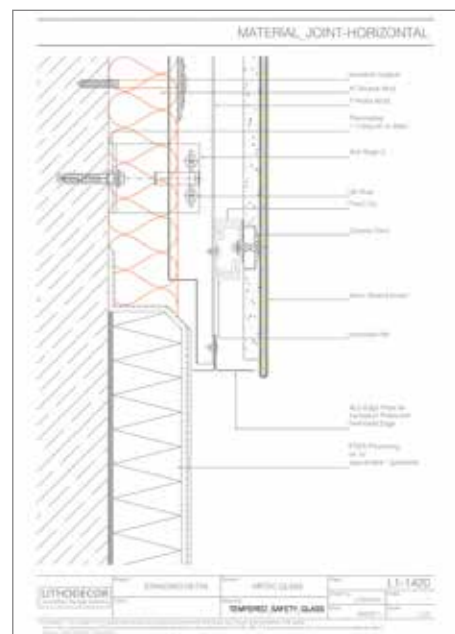
The website also provides details of system build-ups, the range of finishes available plus detailed project information covering a wide range of applications and sectors.

We also have a RIBA-accredited CPD entitled "Lightweight Natural Stone and Glass Ventilated Rainscreen Facades and the Requirements of Modern Architecture". Visit our website at [www.lithodecor.co.uk](http://www.lithodecor.co.uk) to book your seminar.



Please contact our Lithodecor technical team for advice on your individual project.

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