Rainscreen Cladding Manual

IBSTOCK building sustainability

Rainscreen cladding just got easier...
Welcome to Ibstock

Ibstock, the UK’s largest brickmaker is one of the best known and trusted brands in the construction industry, with a reputation built on an unrivalled choice of over 500 different bricks from 21 manufacturing and distribution units across the UK. This heritage and manufacturing capability has been used to develop a range of innovative products, which in addition to bricks includes prefabricated brickwork components and external wall insulation systems as well as a diverse selection of special shaped bricks and pavers.

Ibstock has brought all this experience together in a range of novel rainscreen cladding systems that offers the specifier a virtually unlimited range of colours and sizes as well as exceptional environmental credentials. For the installer this means systems that are quicker, easier and more cost effective to install.

The company is committed to ensuring a more sustainable future through its manufacturing, its communities and its products - investing over £70 million over the last 10 years. This has lead to many industry firsts including being the first UK brick manufacturer to be awarded a ‘very good’ rating for the responsible sourcing standard, BES 6001, which now applies to all of its brickworks across the UK.

All Ibstock rainscreen cladding systems are backed by unique technical, design and site support services. This includes a team of regionally based Design Advisors who are experienced in developing practical solutions to design challenges that are quality assured to ISO 9001. Further support is provided by a comprehensive technical services department and a CAD team to help realise the most complex designs.

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Welcome to Ibstock’s Rainscreen cladding systems

Using Rainscreen Claddings

Rainscreen systems have been used for centuries in Europe and were first introduced to the UK in the 1950s. They became popular in the UK in the 1980s for the re-cladding of tower blocks but this problem-free system is now more widely used in new build. Therefore, they can be successfully used in both new and old projects. In old buildings new life is given by changing the appearance and increasing thermal efficiency. In new build, the system’s proven principles allow a low risk, effective solution.

Rainscreen cladding is not a traditional cavity construction like brick and block. The principle of rainscreen cladding is that the majority of the rain is stopped at the outer face and the small amount of rain that penetrates is taken away by the updraft in the cavity or drains out at the bottom of the cladding.

Rainscreen Technology

Any external wall must satisfy a number of criteria: it must be durable, weatherproof, fire resistant and must not transmit heat and sound. Rainscreen claddings must therefore also meet these criteria. With rainscreens, the outer leaf resists rain penetration, keeping the inner leaf relatively dry by the separation of an airspace.

The cladding is supported by a frame, normally aluminium, within the cavity and located back to the structure with brackets and primary fixings.

Rainscreen systems rely on ingress of air at the bottom of the cladding - a ventilated cavity no less than 38mm (to allow the stack effect to work) and egress of air (normally baffled to avoid rain ingress) at the top of the cladding.

The majority of the water is kept out by the cladding material. The updraft in the cavity (stack effect) takes away the small amount of water which passes through the cladding.

Any water which penetrates through the cladding is not taken away can drain down the back of the cladding and out through the bottom.

Condensation is controlled by allowing the fabric to breathe and condensation to pass into the ventilated cavity and be taken away by the updraft within the cavity.

Using the building's thermal mass, if air permeable insulation is placed in the cavity whilst the condensation is evacuated, the heat is retained with the continuous insulation not allowing any cold bridging and keeping the temperature constant within the building. This will reduce cooling and heating requirements. As the building temperature is kept static, there are also beneficial results for maintenance and longevity.

The UK experience of rainscreen cladding is very positive. The systems have been commonly used for over 40 years. The principles are well understood and there is a great deal of expertise available from professionals and contractors.

Ibstock has developed three rainscreen cladding systems under the Elementix® brand name. There are very few situations where these systems cannot be used - they are suitable for steel and concrete frame buildings, masonry and steel, or timber stud wall construction. They can be used for both new build and refurbishment of the exterior of an existing building.

Sustainability

Elementix® rainscreen cladding tiles are manufactured from naturally inert materials and are non-toxic.

The term ‘adaptable’ building is used to describe a structure that has the ability to be modified or extended at a minimum cost to suit the changing needs of the people using the structure. Thoughtful design can provide the flexibility for these needs to be met without requiring expensive and energy intensive renovations. The ease of assembly and disassembly of rainscreen panels and components means a structure can be re-shaped or extended incorporating the re-use of the rainscreen system.

The Ibstock rainscreen cladding systems also offer further sustainability benefits as the express and eco-freedom versions are manufactured in the UK. Ibstock is the only manufacturer to offer a UK manufactured system which, of course, cuts down the delivery mileage required. Elementix eco-freedom is also manufactured from 94% recycled material, adding further to its sustainability credentials.

For further information, please contact Ibstock’s nationwide network of Design Advisors on 0844 800 4576.
Terracotta rainscreen just got easier…

Elementix® express has been engineered with the installer in mind to ensure ease and speed of construction. The range of natural colours and surface finishes adds definition and detailing to a façade in an instant.
Elementix® express key features

- Quick and easy to install
- Minimal components for cost-effectiveness
- Matches Fireborn® Natural colours and Forticrete® Medici® finishes
- Damaged tiles are easily replaced
- Tested to CWCT (Centre for Window and Cladding Technology) Standard
- Manufactured in the UK
- Maintenance free
- Flexibility of tile size

Sizes

Special feature

The length can be finished to any size within the above dimensions at no extra cost as the tiles are cut after firing.
Standard colours
This is a range of five natural clay colours. They provide a selection of bold finishes which radiates the depth of colour and warmth only possible from fired ceramics.

Medici® colours
These feature all the vitality of polished stone. The high-quality aggregate used in their manufacture provides a richness and variation in colour only seen with natural stone.

Glazed colours
Real ceramic glazes ensure unmatched vibrancy and durability. Our unique expertise with glazing means that virtually any colour can be produced.

Shot-blast colours
Subtle tones and hues characterise this range of tiles. They replicate the regional colour variations found with natural stone.

Special feature
We can glaze tiles to virtually any RAL colour.
Elementix® express installation sequence

1. **Primary support brackets**
   Primary support brackets are fixed to the substrate at a maximum of 1m vertical centres (wall brackets to be isolated from the building substrate, thermally enhanced insulators are available. These sit directly behind the brackets, see standard sections).

2. **Vertical carrier rail**
   Vertical carrier rails are fixed back to the primary support brackets (rails are supplied in 2.915m lengths and cut to suit on site). The vertical rail position is dictated by the length of tile specified.

3. **Connectors**
   The connectors are then fitted into the carrier rail slots (two required per tile).

4. **Anti-rattle clips**
   Anti-rattle clips are slotted onto the top of the express tile (two required per tile).

5. **Elementix® express tile**
   The express tile is then hooked over the connectors. The tiles need to be installed from the bottom upwards to ensure there is an overlap between each tile.

**Horizontal joints**
Horizontal joints are a standard 10mm.

**Vertical joints**
Width to be determined by the specifier - 4mm is recommended.

**Green rating**
- UK-manufactured ensures minimal delivery mileages.
- High strength and durable ceramic tiles reduces damage on site and ongoing maintenance.
- Lightweight tile reduces structural load compared with traditional masonry.
- Made from abundant natural clays in factories that hold very good ratings to BES 6001, the Standard for Responsible Sourcing and BS 14001, the Environmental Management Standard.
- New composite stone options minimise the need for natural stone extraction.
- All components are fully recyclable.
- A+ BREEAM rating

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**Tile Size** | **Total System Weight** | **Tile Weight** | **Durability** | **Transverse Strength** | **Water Absorption** | **Tolerance**
--- | --- | --- | --- | --- | --- | ---
400mm x 150mm | 67Kg/m² | 3.8Kg | Frost Resistant | Category E to BS 8200 | < 8% | ±1mm
450mm x 150mm | 67Kg/m² | 4.0Kg | Frost Resistant | Category E to BS 8200 | < 8% | ±1mm
500mm x 150mm | 67Kg/m² | 4.5Kg | Frost Resistant | Category E to BS 8200 | < 8% | ±1mm
400mm x 225mm | 67Kg/m² | 5.4Kg | Frost Resistant | Category E to BS 8200 | < 8% | ±1mm
450mm x 225mm | 67Kg/m² | 5.9Kg | Frost Resistant | Category E to BS 8200 | < 8% | ±1mm
500mm x 225mm | 67Kg/m² | 6.3Kg | Frost Resistant | Category E to BS 8200 | < 8% | ±1mm

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**Suitable substrates**
Elementix® express can be fixed back to:
- Steel frame
- Concrete frame
- Brickwork
- Lightweight steel framing
- Timber frame
- Dense concrete block (min 1450kg/m³)
- Existing masonry

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**Easy to fit**
Technical specifications

A non-loadbearing external cladding tested to CWCT standards, fixed back to and providing weather protection to an inner leaf, drained and back ventilated, suitable for both new build and refurbishment projects.

Components
- Elementix® express Natural Clay Tiles or Concrete Tiles
- Elementix® express Vertical Carrier Rail
- Elementix® express Connector
- Elementix® express Anti Rattle Clip

Installation Generally
Typically aluminium Elementix® express vertical carrier rails are fixed to the primary supporting structure with brackets, the bracket size and spacing are dependant on site wind loading and panel layout. Elementix® express connectors are fitted to the vertical carrier rails, the Elementix® express tiles can then be fitted quickly without the use of tools. Anti rattle clips are then fitted to the top of each tile. A range of fittings and accessories are available for reveals, soffits, returns etc and more information on these is available from Ibstock Brick Limited.

Primary Support Structure
(deplete as necessary) Steel frame / concrete frame / brickwork / dense concrete blockwork (minimum 1450 kglm²) / lightweight steel framing / timber frame / existing masonry.

Rainscreen Cladding System
Manufacturer: Ibstock Brick Limited, Leicester Road, Ibstock Leicestershire, LE67 6HS. Tel: 01530 261599 Fax: 01530 257457.

Reference: Ibstock Elementix® express Rainscreen Cladding System

Type: Drained and back ventilated

Rainscreen Panel
Manufacturer: Ibstock Brick Limited

Product Reference: Ibstock Elementix® express Rainscreen Cladding

Material: Clay, 140 and 215mm high, 400mm, 450mm and 500mm long. Other lengths up to 500mm long are available.

Thickness: 35mm

Finish/Colour: Natural Red / Natural Cream / Natural Blue / Natural Brown / Natural Grey / Stone and Glazed

Fasteners: Aluminium Elementix® express connectors

Number and location of fasteners: 2 no. Elementix® express connectors per tile, located in the hook at the back of the tile and into the slots in the vertical carrier rail. Connectors provide restraint to each tile. 2 no. Elementix® express Anti Rattle Clips per tile placed approx 1/7 inboard of the edge of the tile.

Joint Type: Horizontal joint: Labyrinth joint. Vertical joint: Open joint.

Joint Widths: 2-10mm vertically to suit project requirements and 10mm horizontally.

Air Gap
Minimum 38mm

Secondary Support System
Manufacturer: Nvelope Rainscreen Systems Limited, Unit 10 Blenheim Court, Brownfields, Welwyn Garden City. AL7 1AD Tel: 01707 333343. Fax: 01707 333343.

Product Reference: Nvelope NV Brackets

Material: Aluminium wall brackets joined to Elementix® express vertical carrier rail with stainless steel fasteners.

Fasteners: Consult Nvelope Rainscreen Systems Limited.

Number and Location: Bracket layout to suit site wind loading and substrate, consult Nvelope Rainscreen Systems Limited.

Backing Wall

Vapour Control Layer: As clause 785

Thermal Insulation: As clause 776

Breather Membrane: As clause 785

Accessories:

Incorporated Components:

Other Requirements:

776 Thermal Insulation

- Manufacturer: 
- Product Reference: 

Thickness: Not less than.....

Fixing: Attached to the outer face or supported within the backing wall so as not to bulge, sag, delaminate or detach during installation or in situ during the life of the rainscreen cladding.

REFER TO INSULATION MANUFACTURER FOR APPLICATION ADVICE. 780 VAPOUR CONTROL LAYER

Material:
- Minimum vapour resistance:
- Manufacturer:
- Product reference:

Continuity: No breaks and with minimum of joints.

Penetrations and abutments: Seal to vapour control layer. If necessary, prime substrates to achieve full bond.

Sheet laps: Not less than 150mm, seal with tape. Prime substrates as necessary to achieve full bond.

Sheet tape: Double sided sealant with vapour resistivity not less than vapour control sheet.

- Size (width and thickness):

Sheet repairs and punctures: Seal with lapped patch of vapour control membrane and continuous band of sealant tape along edges.

REFER TO VAPOUR CONTROL LAYER MANUFACTURER FOR APPLICATION ADVICE.

785 Breather Membrane

Material:

Manufacturer:

- Product reference:

Continuity: No breaks. Minimise joints.

Penetrations and abutments: Attach to breather membrane with tape. Achieve full bond.

- Laps: not less than 150mm, bond with tape. Achieve full bond.

Tape: As recommended by breather membrane manufacturer.

Repairs: Lapped patch of breather membrane material secured with continuous band of tape on edges.

Junctions at flashings, sills, gutters etc. Overlap and allow free drainage to exterior.

REFER TO BREATHER Membrane MANUFACTURER FOR APPLICATION ADVICE.

985 Damage

Repairs: Damaged or broken tiles can be easily replaced by carefully lifting the tile to be replaced along with the two tiles above it, care should be taken to ensure these do not fall out. WEAR PERSONAL PROTECTIVE EQUIPMENT. Damage to the vertical supporting rails may require removal of a section of tiles to remediate. Unbroken tiles can be re-used.

995 Maintenance

Elementix® express Rainscreen Cladding requires little or no maintenance. Refer to Ibstock Brick Limited for guidance on specific tiles if required.

Recycling

Elementix® express Rainscreen cladding tiles are manufactured in the UK from naturally inert materials and are not prone to off-gassing of volatile materials. Clay products are non-toxic. Despite the potential longevity of fired clay products, they are sometimes demolished well before the end of their useful life.

The following are possible uses for recycled clay building materials:

- Reclamation and re-use.
- Filling and stabilising material for infrastructure works.
- Aggregates for in-situ and precast concrete and mortars.

The majority of the aluminium used in Nvelope extrusions is from recycled sources.

‘Adaptable building’ is used to describe a structure that has the ability to be modified or extended at minimum cost to suit the changing needs of the people using the structure. Thoughtful design can provide the flexibility for these needs to be met without requiring expensive and energy intensive renovations. The ease of assembly and disassembly of Elementix® express panels and components means a structure can be re-shaped or extended incorporating the re-use of the Elementix® express system.
Elementix® express technical specifications

Base detail

- Elementix® express Tile Module to suit Project
- Elementix® express Vertical Carrier Rail
- PVC Anti-Rattle Clip
- Elementix® express Tile Connector
- 150 or 225mm Tile Module
- 140 or 215mm
- Framing Rivet

Moisture repellent insulation (Rockwool / Kingspan Rainscreen or similar) fixed with anchors to suit insulation thickness

Close to NV bracket

Wall bracket anchors can vary subject to substrate composition

Wall Brackets to be isolated from the building substrate (i.e. Dissimilar Material) For thermally enhanced isolation use Uvelope Insulators

Ventilation Profile to suit construction depth, (additional support for vent profile required for large cavities)

Horizontal joint detail

- Elementix® express Tile Module to suit Project
- Elementix® express Vertical Carrier Rail
- PVC Anti-Rattle Clip
- Elementix® express Tile Connector
- 150 or 225mm Tile Module
- 140 or 215mm
- Framing Rivet

Moisture repellent insulation (Rockwool / Kingspan Rainscreen or similar) fixed with anchors to suit insulation thickness

Wall Brackets to be isolated from the building substrate (i.e. Dissimilar Material) For thermally enhanced isolation use Uvelope Insulators

Wall bracket anchors can vary subject to substrate composition

Line of Building Substrate
Elementix® express technical specifications

Parapet detail

Vertical joint detail
Elementix® express technical specifications

Elementix® express Tile. Module to suit project

Elementix® express Vertical Carrier Rail

Elementix® express Tile Connector

Framing Rivet

35 60 Varies

Line of Building Substrate

Vertical movement joint detail

Bonded external return
Elementix® express technical specifications

Wall brackets to be isolated from the building substrate (i.e. Dissimilar Material) For thermally enhanced insulation use Nvelope Insulators

Moisture repellent insulation (Rockwool / Kingspan Rainscreen or similar) fixed with anchors to suit insulation thickness

Wall bracket anchors can vary subject to substrate composition

Nvelope NV bracket

Framing Rivet

Elementix® express Vertical Carrier Rail

Elementix® express Tile. Module to suit project

Trim external return

Internal return

Elementix® express Tile Connector

35  60  Varies

Trim external return

Tile Module to suit Project

Elementix® express Tile. Module to suit project

Nvelope NV bracket

Elements® express Tile Module to suit project

Elementix® express Tile Connector

Framing Rivet

Elementix® express Vertical Carrier Rail

Moisture repellent insulation (Rockwool / Kingspan Rainscreen or similar) fixed with anchors to suit insulation thickness

Wall bracket anchors can vary subject to substrate composition

Elementix® express Tile Connector

PPC Corner Rail

Tile Module To Suit Project

Elements® express Tile. Module to suit project
Elementix® express technical specifications

Window cill detail

Elementix® express Vertical Carrier Rail

150 or 225 Tile Module

Elementix® express Tile Connector

Framing Rivet

PVC Anti-Rattle Clip

Elementix® express Tile. Module to suit project

Moisture repellant insulation (Rockwool / Kingspan Rainscreen or similar) fixed with anchors to suit insulation thickness

Wall Brackets to be isolated from the building substrate (i.e. Dissimilar Material) For thermally enhanced isolation use Envelope Insulators

Wall bracket anchors can vary subject to substrate composition

Envelope NV bracket

Line of Building Substrate

Window cill detail with trim

PPC Jamb Closer

Envelope NV bracket

Framing Rivet

Elementix® express Vertical Carrier Rail

Elementix® express Tile. Module to suit project

Wall Brackets to be isolated from the building substrate (i.e. Dissimilar Material) For thermally enhanced isolation use Envelope Insulators

Wall bracket anchors can vary subject to substrate composition
Elementix® express technical specifications

- Elementix® express Tile, Module to suit project
- Elementix® express Vertical Carrier Rail
- PVC Anti-Rattle Clip

- Moisture repellent insulation (Rockwool / Kingspan Rainscreen or similar) fixed with anchors to suit insulation thickness
- Nvelop NV bracket
- Wall bracket anchors can vary subject to substrate composition
- Wall Brackets to be isolated from the building substrate (i.e. Dissimilar Material) For thermally enhanced isolation use Nvelope Insulators
- Bonded return
- Nvelope NV bracket
- Framing Rivet
- Elementix® express Vertical Carrier Rail

Wall bracket anchors can vary subject to substrate composition

Wall Brackets to be isolated from the building substrate (i.e. Dissimilar Material) For thermally enhanced isolation use Nvelope Insulators

Window head detail

Window jamb detail with tile

Ventilation profile to suit construction depth

Window detail to suit project requirements
In the next issue of DESIGN

1982 - 2012

Celebrating 30 YEARS of the Ibstock Design Magazine

We’re celebrating three decades of innovation, inspiration and dedication

From the UK’s largest brick manufacturer

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