

## CONTENTS

### Introduction

Introduction.

Key Product Feature.

Colours and finishes.

### Design

System principle: ventilated rainscreen.

Prep. Of the substrate.

Surface mounted features.

High wind loading or exceptional impact requirements.

Fire.

Ventilation.

Breather membrane.

Tape and EPDM.

Perforated closures.

Allface subframe.

### Installation

Installing Cladcolour.

Panels cutting and fixing methods.

Movement Joints.

Trims.

Window and door returns.

Sealing around openings and penetrations.

Termination at soffit line and under window cills.

### Handling and Storage

Handling and Storage.

## 10 Steps to Cladcolour system installation

Step 1. Fit Breather membrane

Step 2. Fit battens, metal channels or Allface subframe to the wall.

Step 3. Attach perforated closures.

Step 4. Fix Insulation and Cavity Barriers.

Step 5. Fix additional profiles.

Step 6. Fix panels.

Step 7. Corners, Jambs, Opening heads.

Step 8. Window details.

Step 9. Deflection zone details. (Movement joints)

Step 10. Coastal location information

## Appendix of Drawings

Drawings – Generic substrate on Allface

Drawings – Steel frame substrate on Allface

## Ancillary Information

Off site.

Health & Safety.

Maintenance.

## INTRODUCTION

### Introduction

Benx Cladcolour system is a mechanically fixed panelling façade cladding system and is suitable for installation above damp-proof course level on external sheathed light gauge steel frame and other supporting walls applications. The system is for existing, new dwellings and buildings other than dwellings, for low and high raise buildings.

The system consists of flat panels, mechanically fixed with rivets or screws to timber battens, metal profiles or Allface Brackets and supporting rails.

The appropriate support frame is fixed to a sheathed LGSF/Timber frame or masonry supporting wall.

Cladcolour system holds 3 KIWA BDA's certificate number:

- Cladcolour MP                      BAW-24-343-P-A-UK
- Cladcolour HD                      BAW-24-344-P-A-UK
- Cladcolour Safewall MP/HD      Pending approval

This demonstrates its versatility regarding the application onto variable structure types and use of building types, being commercial or dwellings. We constantly monitor our environmental performance to establish benchmarks for continuous improvement and we regularly review our environmental policy to consider stakeholder views, updates to legislation, and any changes in our environmental impacts.

The product has a reaction to fire classification of:

- A1 in accordance with BS EN 13501

This is dependant on specific finish and mechanical fixing method.

These Third-party accreditation and classification demonstrate the stringent testing regimes and standards that Benx Cladcolour system has met, following a testing path for strength and stability, behaviour to fire, weathertightness and durability. All of which ensure a high level of performance is achieved for the use of Benx Cladcolour for your project specification.



**New images Due: Note to KIWA**

## Key Product Features

- ✓ Fully tested KIWA approved, and CE marked.
- ✓ Fully ventilated system.
- ✓ Standard thicknesses are 9mm & 12mm.
- ✓ Resistant to rot, fungus, or insect attacks.
- ✓ High levels of weather resistance.
- ✓ Low maintenance, long performance life.
- ✓ Easy to install using standard tools.
- ✓ Development of panel typical and bespoke arrangements.
- ✓ A1 Classifications to BS EN 13501-1:2018
- ✓ Dimensionally stable.

## Colours and finishes

Cladcolour MP/HD are available in a wide range of solid colours, textures and special effect finishes.

Set your creativity free with our extensive range of colours and textures including almost all RAL and NCS colours available.

Consult our Sales and technical department for a detailed chart of available colours. [technicalservices@bex.co.uk](mailto:technicalservices@bex.co.uk) or **08006124662**



## DESIGN

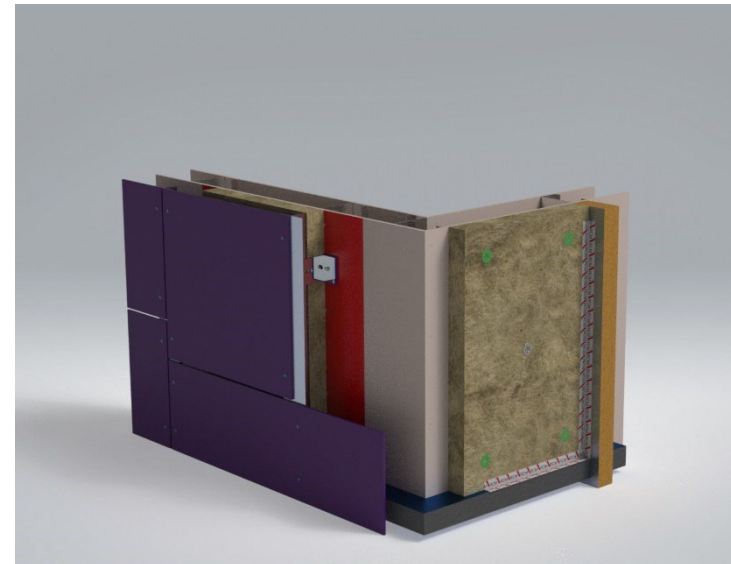
### Additional

**System principle: ventilated rainscreen.**

**Benx Cladcolour** system is installed to a ventilated cladding principle. The objective of the system is to create an air flow at the base of the system whilst creating ventilation at the top of the elevation and through horizontal joints. There are options for additional window cill and head ventilation dependant on project specific design.

The drained and ventilated cavity between the supporting wall and the back of the Cladcolour shall be a minimum width of 25mm. Any water collecting in the cavity owing to rainwater or condensation shall be removed by drainage and ventilation, with a minimum 10mm ventilation gap at the top and bottom of the system.

Windows cills and heads, can provide additional ventilation to create a full ventilation flow, or alternative air flow modelling can be used where cill or head ventilation is not appropriate. The purpose for this function is to remove moisture from within the cavity. Failure to create a sufficient flow could lead to possible problems with the overall system.



### Prep. Of the substrate

The Cladcolour system BDA's allow for the system to be fitted on LGSF STF, and masonry substrates. For use on LGSF and STA, the system will be fitted back onto a suitable sheathing boards, through to the primary studs, with a breather membrane either fixed onto the sheathing board or insulation as other third party approval such as NHBC may determine BM location. Benx have an extensive portfolio of cement boards and breather membranes available, that can be supplied by RCM, please contact sales on 0800 6124662.

## Surface Mounted Features.

When Benx Cladcolour system is subject to additional items being fixed to the building i.e., gutters canopies etc. they should be fixed through the system and into the primary structure or into the main sub structure. Alternatively, they can be fixed into additional rails installed behind the system.

Clearance holes should be allowed for when fixing these items through the system. Under no circumstances should the Benx Cladcolour system be used to carry structural loadings.

## High Wind Loading or Exceptional Impact Requirements.

When installing Benx Cladcolour system it is important to fully understand the wind loading of the structure that the product is being applied to. The support wall shall have sufficient strength to withstand all wind, dead and imposed loads applied to and from the system, including racking and any temporary loads that could be applied during installation. The strength of the supporting wall shall be verified by a suitably engineer. The project specific design shall ensure that:

- The system attachment to the supporting wall has adequate fixing pull-out and pull through capacity for the calculated wind loads,
- Thermal expansion effects of both metal rails and metal structural frame and the cladding to be supported are taken into consideration in the design and detailing.

Additional information can be found in the KIWA Certificate or consult Bend technical department for further information.

Benx Cladcolour system is a category III panel and therefore suitable for installation in a zone not likely to be damaged by normal impacts caused by people or by thrown or kicked objects. Full category definition available on request.

## Fire

Benx Cladcolour panels are classified as European Classification A1 in accordance with BS EN 13501-1: 2018.

The system classification may alter depending on mounting applications of either timber frame or aluminium rails, and when fixed with rivets or screws (please refer to fixing section for specification of fixings).

Furthermore, consideration and placement of open and closed state cavity fire barriers to close the cavity in the event of fire. In addition, closer/interface around windows must be project reviewed.

Other considerations are the type of insulation and breather membrane. We recommend that the national Building Regulations and standards are consulted, alternatively please consult with the Benx Technical Services Team.

## Ventilation

To make sure that you obtain the best performance from our product and to avoid interstitial condensation we recommend a minimum airflow at the backside of the panels should be 100% free of obstructions with no less than 200 cm<sup>2</sup> of vertical/cross airflow (Min 20mm System depth) behind panels. Minimum air flow at base and top of walls is required to have at least 60% unobstructed ventilation if using ventilated profiles, allowing 500mm<sup>2</sup> /m minimum. The minimum ventilated cavity depth (= air gap) normally depends on the joint between the panels.

For note:

- CWCT-standard, parts 1 + 3: Table 3.3 The minimum width of open joints is 6 mm to 10mm maximum. The air gap shall be 25 mm wide for sealed / closed joints and 50 mm wide for open joints.
- NHBC-standard 2020, section 6.9.18 (rainscreen cladding): The minimum width of joints is 10 mm unless specified otherwise, while the air gap must be 38 mm for baffled and 50mm open joints, respectively.

## Breather Membrane

Allows the transfer of moisture vapour, restricts the transfer of water, and may act as an air barrier. Cladcolour panels are not weathertight and should be backed by a suitable breather membrane acting as a vapour permeable protection. Where required, a wall breather membrane is laid in accordance with the manufacturer recommendations, with minimum laps in accordance with their specification to ensure water can drain away from the building. For membranes fixed back to a sheathing board, the timber battens or metal rail supports are vertically fixed over the breather membrane at maximum 600 mm centres.

Breather membrane typical location is on top of the sheathing board behind the external insulation slabs, however in some cases when NHBC insurance is required the membrane is placed on the external face of the insulation slabs, consult the main designer or contractor about this requirement. The wall breather membrane should be UV durable to BS EN 13859-2, used in conjunction with sheathing on framed applications. RCM membrane range is available.

The membrane must be fixed behind the battens, top hats, or brackets (except NHBC). Installed to RCM manufacturers recommendations.

## Tape and EPDM

To make sure that you obtain the best performance of built-up wall, all jointed layers influence the overall performance in: Water leakage and air permeability and to avoid this, the use of tapes is required.

The use of tape is required in different layers of the build-up:

- To seal the sheathing boards, follow Benx jointing recommendations,
- To seal and protect the breather membrane, follow Benx breather membranes recommendations for rainscreen systems.

Interfaces: Water leakage around windows/openings and sheathing edges needs careful consideration. EPDM, tapes, gaskets must be designed to keep water out of vulnerable areas of the built-up wall.

## Perforated closures

Perforated profiles are available in various widths and bespoke to prevent insects entering through the cavity ventilation gap used at base, top and window openings of cladding and allow ventilation. All ventilation openings around the periphery of a cladding system should be suitably protected with a ventilation protection mesh or a perforated sheet or similar.

A minimum ventilation gap (see ventilation) must be provided between Benx Cladcolour system's panels and the substrate wall or the external face of insulation slabs, a perforated closure is installed at the base, top, above and below window frame and openings on the top and bottom of the sub-frame.

## Battens & Top Hats

The subframe for Cladcolour can comprise of Timber batten, aluminium top hat or Z section profile, with typically a minimum 25mm or 38mm deep vertical cavity depths to allow for a free-flowing air. The cavity between the breather membrane and the inner face of panel must be maintained throughout the facade.

If timber battens are to be used, then a minimum 38mm x 50mm preservative treated battens must be used as vertical supports set typically at 600mm centres. Battens to be pressure treated grade 'B' timber (project specification to be clarified prior to final design)

Any of the chosen support batten or metal profiles, must have sufficient surface face width to accommodate the fixing pattern, maintaining minimum edge distance of panel, as well as accommodating the joint width which can vary project to project.

For Cladcolour the vertical support frame is traditionally set out at a maximum 600 mm centres, ensuring the specified fixings are fully embedded into the wall substrate. A maximum 300mm centres are used to fix Cladcolour to the chosen subframe, or to suit project specific design loads.

If top hat rails or Z sections rails are to be used, the gauge width and depth will be determined by the required loads for individual projects. Vertical metal supports for Cladcolour are traditionally set out at a maximum 600 mm centres, ensuring the specified fixings are fully embedded into the wall substrate. A maximum of 300mm centres are used to fix the Cladcolour to the chosen frame and to suit project specific design loads.

Top Hats or Z sections can be galvanised steel, Aluminium or stainless steel for coastal environments.

The use of both products is restricted in some cases. KIWA Certificate TBC.

## Allface

General design considerations BAW-19-117-S-A-UK. The system shall be secured to the supporting wall with fixings installed through the spacer support rails/system that form the cavity between the sheathing board of the supporting wall and the carrier board, via the Allface smart fixing system F1.10 in accordance with Allface design recommendations.



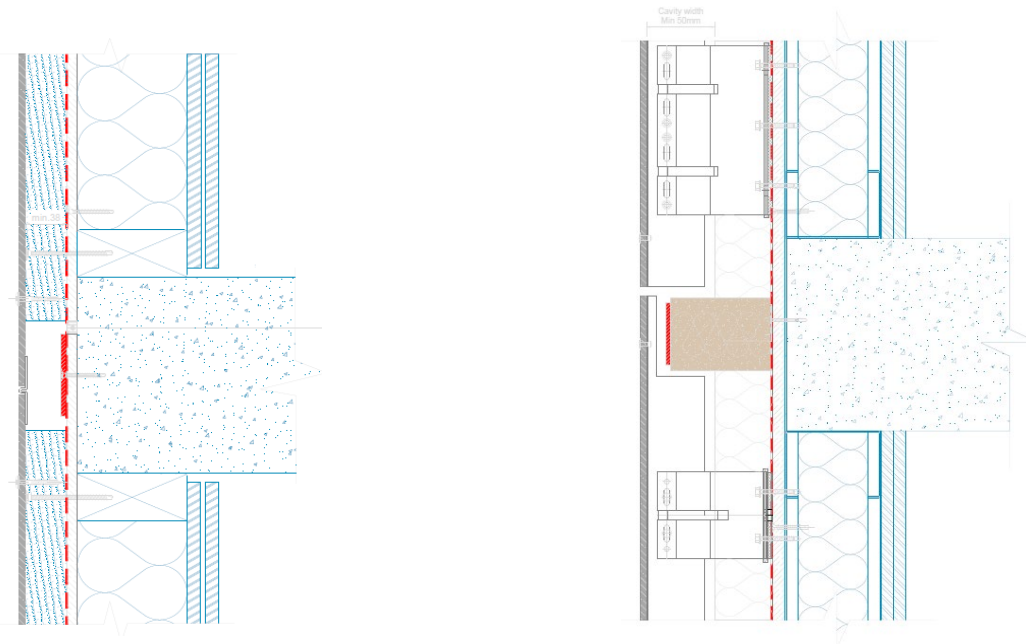
If the Allface system is specified, a range of L and T shaped aluminium rails that must be used as vertical supports fitted at a maximum 600 mm centres widths, A maximum of 800mm is allowed between the helping hands in a vertically fixed plane, Ensuring the specified rails are fixed onto the aluminium brackets with fixed and sliding points to suit project specific design loads, creating a minimum cavity between the sheathing board of the supporting wall or the insulation and the back of the panels of 50mm. for open joints.

Horizontal adjustment can be achieved using the rail fixing leg or altering the helping hand basket size to accommodate fluctuations in the substrate alignment.

Helping hand bracket sizes may vary from 50mm to 294mm

## Product Details

Example details shown below. A more comprehensive set of product and system detail can can be provided by Benx Technical service department on 0800 612 4662



## INSTALLATION

### Installing Benx Cladcolour System

**Benx Cladcolour** system should be installed in compliance with National Building Regulations. For use on new residential and non-residential high-rise buildings up to and over 18m in height in the UK.

There are several different ways to install **Cladcolour** system however, the overall principle is the same. fix the Panels onto the preservative-treated vertical or horizontal support batten/rails that are spaced with a maximum of 600mm centres across the building elevation. A minimum of a 25mm clear cavity is required behind the panel with closed joints or 50mm with fully open joints. At the base and head (and typically window and door heads and sills) a minimum 10mm continuous opening should be left.

Please note that timber battens are not supplied as part of our portfolio, however do form part of our assessed BDA and are used on low to medium rise applications.

Benx offer an alternative range of A1 Non-combustible support frames, these include appropriate metal top hats or Z profiles with a minimum cavity depth 25mm. This is typically used for low to medium rise applications and can be fixed back to both masonry and framed buildings.

Allface system of brackets and rails can be used for low, medium and high-rise applications and can be fixed back to both masonry and framed buildings, although our **Cladcolour Safewall BDA** system is only approved onto LSF applications. Please refer to previous Allface paragraphs.

### Panels cutting and fixing methods.

Cutting – **Cladcolour** panels can be cut, drilled and screwed. There are a number of different cutting methods to choose from depending on the quantity of material to be cut.

RCM offers a complete fabrication service for **Cladcolour** system with a fully integrated optimisation & fabrication service that allows our customers to order both sheathing and façade boards cut to size. This will minimise waste, provide CNC quality accurate cutting and improve environmental impact., please contact our sales department for details **0800 612 4662**

Cutting and drilling by others should be carried out in a dry and well-ventilated area with all cuts being wiped to remove dust with a clean, dry cloth.

Handsaw: We recommend the use of a hardened point saw which should only be used for small quantities and only on **Cladcolour MP**.

Electric jigsaw: When cutting **Cladcolour MP** panels with an electric jigsaw, it is our advice that you turn the board over to ensure a clean finish on the front side of the board.

A hand-held circular saw with blades suitable for cutting medium to high density cement based products is more appropriate for cutting large quantities.

For cutting the product in any volume, we recommend the use of an RCM polycrystalline diamond Dart Blade to avoid excessive wear on other blades.

A test cut is always recommended. When cutting or drilling **Cladcolour** always wear appropriate PPE and use dust extract.

**Screwing/Riveting** - When fixing to the support structure it is our recommendation to follow the **Cladcolour** fixing detail sheet guide and product specification sheet.

Rivets and Screws suitable for the installation of the **Cladcolour** panels are available from RCM and can be supplied. Please contact RCM on 0800 612 4662.

## **Movement joints**

When using Allface helping hand brackets and support rails, horizontal movement joints should be incorporated in line with the Allface design. Movement joints are incorporated by leaving a minimum 10mm gap through the system (including support frame).

## **Trims.**

**Benx Cladcolour** system trims, mechanically fixed at maximum 300mm centres. Follow the typical details.

The cavity zone between the sheathing board and the **Cladcolour** may require a closure trim at the outer edges as part of the overall project design. The base and head of the cavity should be terminated with a ventilation trim.

## **Window and door returns.**

Jamb return – Jamb returns are created by using sections of the **Cladcolour** boards, cut to the depth of the return and finished using beads and trims when required, see the typical detail sets. The return panel is fixed back to metal 'L' angles as per the mentioned details. Head Return must typically be completed using a ventilation profile to ensure correct ventilation to prevent any deterioration. For any all-other support frames, the head return should be detailed and constructed in

the same manner as the jamb return. An EPDM should be installed bridging from the sheathing board the face of the support frame to allow any standing water to escape back into the cavity and exit at the base.

## **Sealing around openings and penetrations.**

When abutting termination points such as window / door frames, or when the system is penetrated, the abutment junction must be closed of using of using a polyurethane sealant applied and finished on site. Depending on size and depth of joint, a backer rod may be required.

## **Termination at soffit line and under window cills.**

**Benx Cladcolour** system should be terminated a minimum of 10mm below soffit / parapet lines and underside of window cills to allow through flow ventilation. The cavity in these zones should be capped with either insect mesh or purpose made ventilation trim.

Where a closed head or cill is more appropriate, air flow modelling must be carried out to demonstrate that sufficient air flow is being achieved that negates ventilation above head and cill.

## Handling and Storage

**Benx Cladcolour** system boards and panels should be stored undercover and off the ground on the pallets on which it is supplied. Additional outer wrap packaging for protection during transportation should be removed to release any trapped moisture and then the pack re-covered with an opaque tarpaulin.

It is important to ensure that the reverse side of the panels is kept dry during storage and installation. The protective interleaving should always be put back in place when re stacking. The panels should be protected from staining from mud or other site wet trades.



Care should be always taken when handling Benx Cladcolour panels flat, as they may be susceptible to breakage. While the board is stored on the flat, it should be fully supported along its full length on purpose designed pallets. Manual handling is best carried out with the boards carried on their sides after being turned on to its side before being lifted off the stack, and then ideally carried by 2 handlers (panel size dependant) to provide support along the length of the Benx Cladcolour panels. Benx Cladcolour panels should not be slid or dragged across another surface as it could damage the finished surface. Please refer to the RCM Benx Cladcolour handling and storage labels on each pallet.



## 10 steps to Cladcolour system installation

- Step 1. Fit Breather membrane
- Step 2. Fit battens, metal channels or Allface subframe to the wall.
- Step 3. Attach perforated closures.
- Step 4. Fix Insulation and Cavity Barriers.
- Step 5. Fix additional profiles.
- Step 6. Fix panels.
- Step 7. Corners, Jambs, Opening heads.
- Step 8. Window details.
- Step 9. Deflection zone details. (Movement joints)
- Step 10. Coastal location information

### Step 1- Fit breather membrane.

Where required a breather membrane should be fixed to the outer face of the sheathing board, unless NHBC insurance standards required that will be fixed on the external side of the insulation slabs, with an overlap between the layers of membrane as required by the manufacturer. Care should be taken to ensure that the membrane is lapped to drain any water away to the outside of the building.

See Benx breather membranes for rainscreen systems document for further advise.

Breather Membranes can be supplied by RCM, please contact sales on 0800 6124662.

### Step 2- Fit battens metal channels or Allface subframe to the wall.

#### Timber Battens

Timber battens - position and fixing of the vertical battens or cross battening as specified. Battens should be spaced with a maximum of 600mm centres apart and fixed at a max of 300mm centres vertically or to suit the project design loads.

Batten sizes of typically 38mm x 50mm, may need to be doubled up on a panel joint, the support batten must have sufficient surface face width to accommodate both fixings in from minimum edge distance of panel, as well as accommodate the joint width.

Preservative-treated in accordance with BS EN 351-1: 2007, with timber batten in accordance with BS 5534: 2014. Guidance on recommended wood preservation is also given in NHBC Standards 2019, Chapter 3.3

The wall battens should be shimmed or packed to create plumb and line and level surface. Irregularities in the installation of the framing and sheathing will be visible in the finished application. Consult fixing manufacturing in relation to background.

#### Metal Profiles or Top Hat

If using metal top hats or Z section profiles, position and fix in the vertical plain. Metal profiles should be spaced with a maximum of 600mm centres apart and secured to primary supports. And then fixed at a max of 300mm centres vertically or to suit the project design loads.

Standard top hat sizes, depth 25mm, landing zone 65mm, rail base support 60mm. The wall top hats should be plumb and line and level surface. Irregularities in the installation of the framing and sheathing will be visible in the finished application. Consult fixing manufacturing in relation to background. If metal profiles are being used, please refer to manufacturer's recommendations.

Allface support frame: helping hands and rails.

- install F1 brackets over correct isolation pads to reduce the level of thermal bridging through the brackets
- mechanically fix the brackets with JT 3-3 screws with supplementary 16mm washer through the slotted holes back to the supporting framework
- temporary fit a vertical support rail to allow alignment of brackets and tighten screws
- install insulation and fire breaks accordingly
- install vertical rails (T or L profiles) into the brackets using a laser or level, plumb the rails for vertical alignment and secure to the brackets using JT 4-4 screws.

### **Step 3- Attach perforated closures.(Ventilation)**

The closures should be screwed to both the top and bottom of the Rails. They are designed to allow for air flow through the system whilst preventing access for birds, rodents, and large insects. Perforated closures should also be attached to each door, cill and window head, to prevent animal or insect access whilst maintaining ventilation flow.

Unvented Heads and cills details will be subject to final project design and specification. The layout, location, and size of Subframe and Panels must be considered, it is advisable a cavity ventilation assessment is undertaken by the principal designer before final design is agreed, to prove no detrimental impact of the façade structure.

### **Step 4. Fix Insulation and Cavity Barriers.**

It is important to ensure a tight fit between slabs, trimming must be accurate to achieve close butted joints and continuity of insulation. Some brands have face side orientation for the slabs, and another don't, be aware when this occurs.

The slabs should be close butted at all vertical and horizontal joints, and at corners. the horizontal joints of the slabs should be staggered, in accordance with good practice, in some cases arrangement can be the opposite, the vertical joints should be staggered but the most common arrangement is the first.

Mineral wool insulation slab is the most common material used, over and under 18m height, however and for buildings under 18m height and depending on the system, another insulation materials could be considered, ask for advice to Benx technical department,

### **Cavity barriers**

We need to distinguish between two types of cavity barriers:

-For external fire spread prevention, surrounding the openings, at slab on every floor level, and in a stud wall or partition, always following building regulations approved document B.

-For pressure equalization, cavity barriers should be provided at the junction of the external wall and roof space, and as close as possible to an external corner (generally within 300mm)

Interface with rainscreen insulation must be close butted at all vertical and horizontal joints.

Cavity barriers are a key area of building safety and therefore project specific advice should always be undertaken to ensure the appropriate barriers are being used.

### **Rainscreen Insulation Fixings**

Insulation fixings should have a minimum head diameter of 70mm, a typical fixing pattern has a minimum of three fixings per square meter with one metal fixing at the centre of the slab for fire regulations requirement.





## Step 10. Coastal location information

When installing **Benx Cladcolour** system in coastal areas we recommend special attention to wind load calculations, substructure calculations and fixings to reduce the chances of corrosion or movement. Consult Benx Technical Services for recommendations on stainless steel fixings.

Full sized drawings can be found in the appendix.

## Appendix of drawings

### Drawings – Generic substrate on Allface NHBC compliance

### Drawings – Steel frame substrate on Allface

## Ancillary Information

### Off Site

Over the last number of years, there has been a significant uptake in methods of offsite construction driven by the market demand, the current skills shortage, and changes in environmental regulations. Precast concrete, light gauge steel, engineered timber and volumetric modular are now established approaches to manufacture and delivery.

The increased trend towards offsite manufacturing, particularly in the residential sector, has meant that it is now necessary to call upon these methods of construction to increase output and keep up with demand. Benx Cladcolour system across a facade can provide significant benefits to both the project design and its construction timeline. Complex elements such as soffits, lintels, and arches, which require skilled onsite labour, can

instead be manufactured offsite under controlled and consistent conditions.

We are working with partners in precast concrete, light gauge steel, engineered timber and volumetric modular, developing successful solutions on offsite.

Consult our Sales and technical department for further information. [technicalservices@bex.co.uk](mailto:technicalservices@bex.co.uk) or **08006124662**

### Health and Safety

When processing Benx Cladcolour system dust can be released which can cause irritation to airways and eyes. Long term exposure to any dust can be harmful to health.



Wear face protection    Wear hand protection    Wear eye protection

### Maintenance

With normal UK weather conditions, Benx Cladcolour system does not require a great deal of maintenance to maintain its strength, properties, and function. Environmental impacts may, however, influence the visual appearance. It is, however, best practice to complete an annual inspection of the façade to ensure the integrity of the ventilation gaps, fixings and joints, and action any required maintenance to prolong overall life expectancy.

For coastal locations with generally more aggressive salt laden moist air and wind driven sand more frequent inspections and general maintenance may be required with particular attention to corners, around doors, and windows and façade corner details especially when they face the direction of prevailing winds.

## Cleaning

In normal conditions, cleaning will not be required as rain will periodically wash away dust, environmental dirt ect. In cases where cleaning is required, the face of the panels should be cleaned once per year use a mild, pH-neutral detergent together with lukewarm water. Afterwards, lightly power wash up to a maximum pressure of 80 bar, the surface with clean water.

To maintain appearance and finish, do not to use;

- alkaline or aggressive cleaning agents,
- solvents,
- agents containing abrasives,
- scrubbing tools.

Remove algae and fungi with a 5% of hydrogen peroxide ( $H_2O_2$ ) to eliminate spores.