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P E T R A R C H

EXTERIOR ARCHITECTURAL WALL PANELS

TECHNICAL GUIDE



Introduction

Petrarch architectural cladding panels have been used extensively for over 30 years for internal and external applications to new construction projects and to refurbish existing buildings. Refer to British Board of Agreement Certificate No 86/1787.

Petrarch can be fixed satisfactorily in many different types of applications by means of mechanical fixings, adhesives or a combination of both.

Petrarch high quality, decorative, lightweight cladding panels are extremely durable and offer advantages over natural stone, slate, and precast concrete, including ease of handling and saving on installation and other structural costs including foundations.

Petrarch can be used in curtain walling systems either as an infill panel or a composite panel. In addition Petrarch is widely used as the facing panel to a range of ventilated rainscreen solutions, with Petrarch fixed to timber battens or an aluminium framework designed to provide a minimum ventilated cavity of 38mm behind the panels.

Ventilation must be provided at the base and top of the cladding as well as above and below interruptions such as windows and doors. The openings should be protected by perforated closures or mesh to prevent entry by birds or vermin. For building heights of up to 3 storeys the inlet and outlet gaps at the base and head of the cladding should be a minimum of 10mm continuous. The CEP Technical Applications Team will be pleased to assist with the detailing and application.

Rainscreen framing systems are designed to be anchored to the building structure at floor slab and at intermediate positions. The selection of the most appropriate fixing is dependent on the following design considerations:

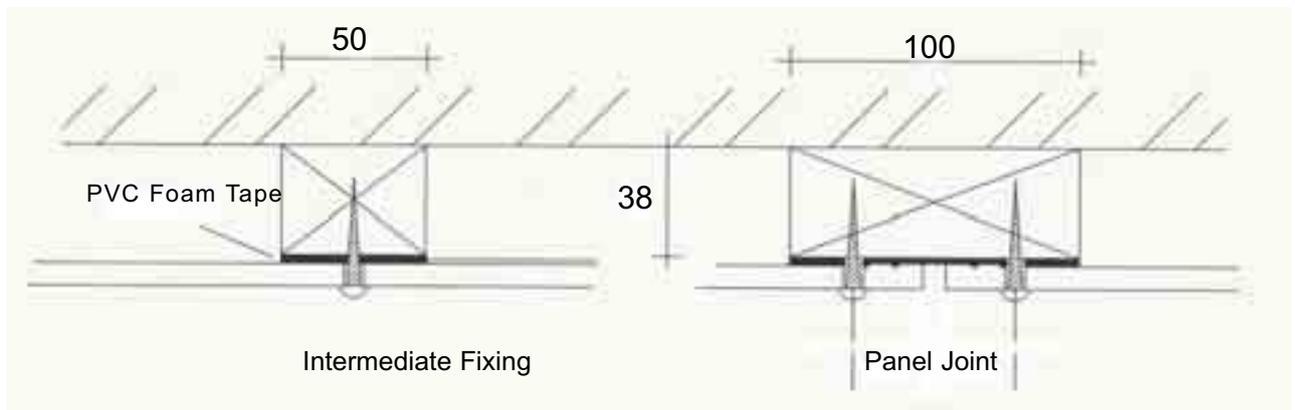
- Existing structure and condition (brick, block or reinforced concrete, timber or steel frame).
- Wind loading: This will depend on geographic region, topography, building size and shape. Determining the precise wind loading will enable the most economical fixing system to be used in relation to batten sizes and centres, sizes of fixings and panel sizes. For the relevant calculations reference should be made to BS6399: Part 2: 1997 – Loading for buildings: Part 2, Code of practise for windloads.
- Building regulations and codes of practice
- Budget

In all cases it is important that reference is made to the latest information available from the fixing component manufacturers or a suitably qualified structural engineer, and that the fixings are used strictly in accordance with their instructions.

Sub-Frame Options – For the purpose of supporting the cladding panels only.

Timber Battens - Timber batten sub-frames should be constructed in accordance with BS5268 – 2: 2002 Structural Use of Timber: Code of practice for permissible stress design, materials and workmanship. Timber must be preservative-treated in accordance with BS5268: Part 5: 1989: Code of practice for the preservative treatment of structural timber.

Vertical battens at joints should be a minimum of 100 x 38mm. Vertical intermediate battens should be a minimum of 50 x 38mm. The faces receiving the panels should be covered with a single layer of PVC foam tape, except on the panel joint where other jointing types make it unnecessary.



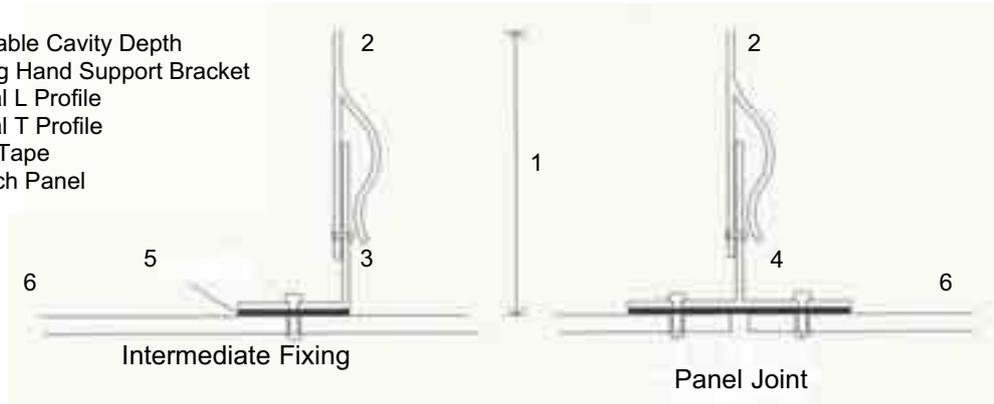
Metal Battens - Extruded aluminium “Z” and top hat sections are readily available and can be tailored to suit most requirements. These simple top hat and z section systems comprise extruded sections individually erected. The guidance given in BS58118-1: 1991 and BS58118-2 :1991 must be observed.

Adjustable Sub-Frame - For cladding applications that require the existing structure to be thermally upgraded or where more complex façades demand an adjustable aluminium framing system, varying depths of bracket can be installed. Dimensions will depend upon the depth of cavity required behind the cladding panel and the thickness of the insulation. Vertical rails are then lined and levelled and secured to the brackets to form the framing to which the Petrarch panels are to be mechanically fixed. These systems are particularly beneficial on refurbishment projects where there may be a variance in level of the existing façade. The rail face receiving the panels should be covered with a single layer of PVC foam tape, except on the panel joint where other jointing types make it unnecessary.

In certain situations as defined within the Building Regulations it may be necessary to incorporate horizontal fire barriers within the cavity at each floor level.

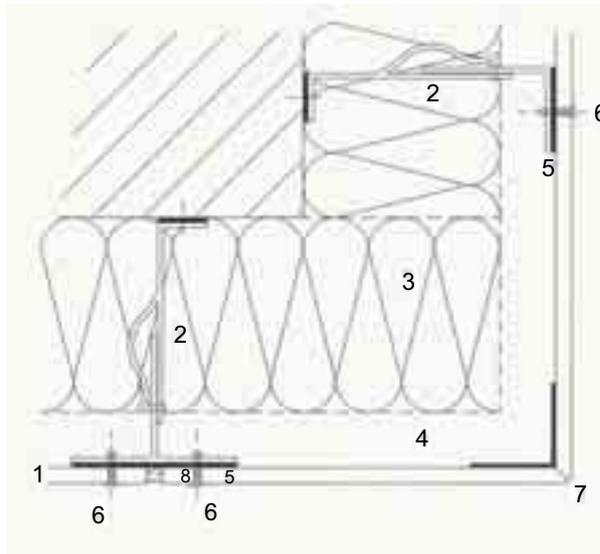
Adjustable aluminium framing (refer to CEP System 1066 Guide)

1. Adjustable Cavity Depth
2. Helping Hand Support Bracket
3. Vertical L Profile
4. Vertical T Profile
5. Foam Tape
6. Petrarch Panel



Note: cavity depth to be determined once dimensional survey completed

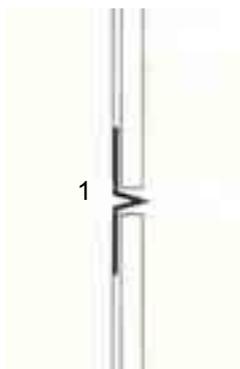
Mechanical Face Fix Factory Bonded Corner and Joint



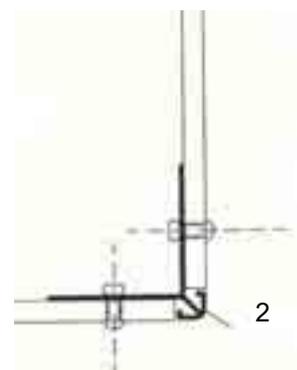
1. 7mm Petrarch Panel
2. Adjustable aluminium sub-frame
3. Insulation
4. Ventilated cavity
5. 1.5mm x 50mm Foam tape
6. Face fixing using colour collated rivets
7. Factory bonded corner with birds beak mitre
8. Silicon sealant joint (or open)

CEP supply a range of PVC and Aluminium profiles to compliment the installation, with options on horizontal and vertical joints, corner profiles and cavity closures. These include birds beak horizontal profiles and aluminium corner profiles. For the full range of standard accessories contact CEP Technical Applications Team.

1. Birds beak horizontal joint profile



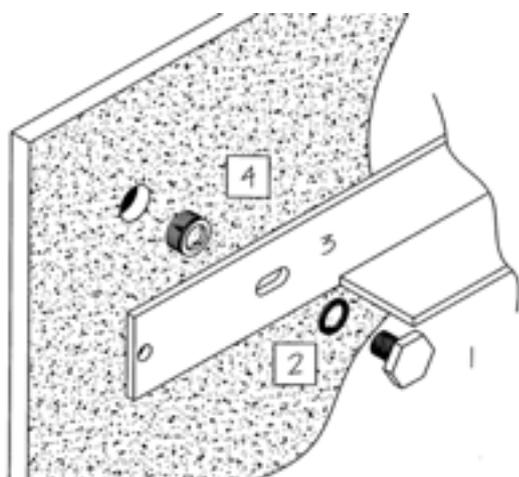
2. Aluminium external corner profile



Curtain Wall – Proprietary curtain wall systems are designed and fabricated to form the total wall. There are a wide range of curtain wall systems available, most of which can be adapted to carry Petrarch panels within their aluminium framework. The CEP Technical Applications Team will be pleased to assist with detailing and application.

Petrarch Fixing Options

Mechanical Secret Fixing - These systems rely on attaching aluminium brackets or bracing angles to the back of the panels by means of threaded, expanding board anchors inserted into blind holes drilled into the back of the panel.



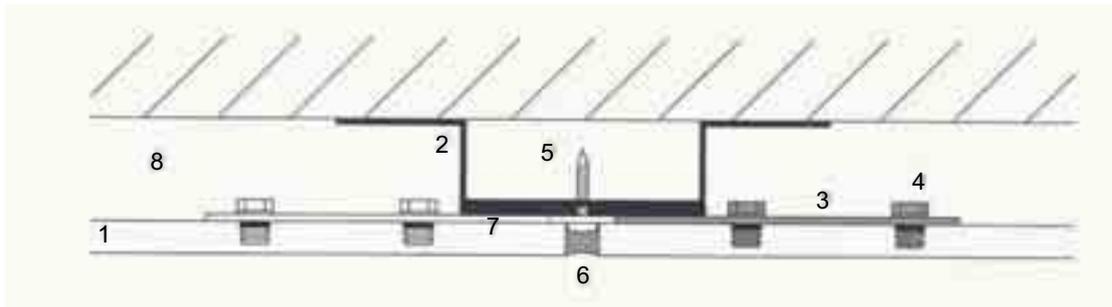
1. M6 x 14mm Hexagonal Head Stainless Steel Set Screw
2. Stainless Steel Washer
3. 50 x 38 6mm Aluminium Bracing Angle
4. Board Anchor

The board anchors are 7.5mm long, which dictates that these fixing systems can only be used with Petrarch 10mm. The load carrying capacity of the expanding board anchors very much depends upon the precision of fabrication. It is therefore recommended that the drilling of holes and attachment of brackets is **not** carried out on site. Experience has shown that these operations should be carried out under factory controlled conditions to achieve the best results. The use of brackets or bracing angles depends upon the aesthetic and structural design criteria.

These criteria also determine the gauge of metals used in both the bracketry and the sub-structure as well as defining the framing centres. Guidance and advice on these matters is available from our Technical Applications Team.

The simplest design would, dependent upon panel sizes, have either full width bracing angles notched flat at each end or simple brackets, fitted at the factory. These extend beyond the panel and are fixed to the sub-frame by means of screws through the expansion gap. These screw fixings must be into minimum 3mm gauge aluminium rails and care taken not to tighten and strip the threads of the self-tapping screws. When fixing to the system 1066 adjustable sub frame, the fixing of the brackets to the subframe is by means of rivets and not self-tapping screws. The rivets are fixed within the 10mm wide expansion joint using an extension nose piece fitted to a standard gun. Both fixings are subsequently hidden by an approved solvent-free joint sealant, providing a completely hidden fixing.

Secret Fix Vertical Joint on Aluminium Battens.

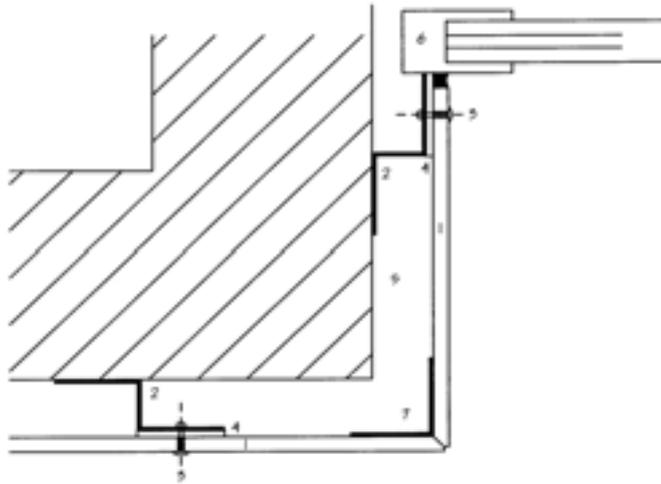


1. 10mm Petrarch Panel
2. Aluminium top-hat sized in accordance with structural engineer's calculations
3. 125mm x 25mm x 3mm Flat aluminium brackets
4. Brackets factory fitted to rear of panel with M6 stainless steel set screws into board anchors
5. No 10 x 25 Stainless steel pan-head self tapping screw
6. 10mm Silicone sealant joint covering screw head
7. 1.5mm x 100mm Foam tape
8. Ventilated cavity

An alternative design uses factory applied aluminium brackets which hook onto a sub-frame, and are then levelled and fixed. This system provides alternatives to the mastic joint including an open joint.

Mechanical Face Fixing – Rivets can be used as a means of face fixing panels onto an aluminium sub-frame, and Torx Screws can be used in a similar way when fixing to a timber subframe.

Corner Detail to Window Reveal on Simple Aluminium Sub Frame



1. 7mm Petrarch panel
2. Aluminium sub-frame sized in accordance with structural engineer's calculations
3. Stainless steel rivets
4. Foam tape
5. Fully ventilated cavity
6. Window by others
7. Factory bonded corner with birds beak mitre

The panels can be pre-drilled and if required counter bored so that the head of the rivet or torx screw is at the same plane as the panel face. Both Torx screws and rivet heads can be colour coated to a similar colour to that of the Petrarch thus providing a cost-effective discreet attachment method.

Rivets must be applied using a stand off head on the rivet gun to allow the rivet to set but leaving 0.3mm clearance for panels to move. Similarly torx screws should not be screwed further than the surface of the panel and must not be over tightened. This ensures that panels sit flat on the sub frame and provides allowance for thermal movement of the panel and the framing system. The centre point of the drill hole in the sub frame must coincide with the centre point of the drill hole in the Petrarch panels. Drill with a centering piece. The fixings should be put in place starting from the middle of the panel outwards.

The fixed point fixing nearest the centre of the panel is used for uniform distribution and halving of the expansion and shrinkage movements.

Concealed Face Fixing - This method can be used for both 7mm and 10mm thick panels with direct fixing through the panels into a timber sub-frame. For details contact CEP Technical Applications Team.

Fixing Centres – Typical fixing centres for applications up to three storeys would require the vertical sub-frame rails to be installed at maximum 600mm centres. The Petrarch can then be fixed into both perimeter and intermediate support rails at maximum 600mm centres.

All edge fixings to be minimum 25mm and maximum 50mm from the panel edge and minimum 50mm from corners. The fixed point hole nearest the centre of each panel should be drilled to size, all other holes should be drilled 2mm larger than the fixing shank to allow for thermal movement of the panel.

Face fixed panels should be installed with a minimum joint of 6mm, mechanical secret fixing requires a minimum 10mm joint.

Adhesives - Savings in the number of mechanical fixings can be achieved by the use of adhesives in conjunction with some of the fixings illustrated in this section.

For information on the possible reduction of mechanical fixings by incorporating adhesives, contact the CEP Technical Applications Team.

As an alternative to the normal mechanical fixing systems, Petrarch has increasingly been specified as part of the **SikaTack® Panel Secret Fix Adhesive System**. This specialist rainscreen system has been successfully employed throughout Europe for the last 25 Years.

SikaTack® structural adhesives are supplied and guaranteed by Sika and therefore all performance, supply, system design and guarantee issues relating to this fixing system must be actioned direct with Sika Limited, Watchmead, Welwyn Garden City, Hertfordshire. AL7 1BQ. Fax: 01707 329129, Tel: 01707 394444, Email: sales@uksika.com

Note: It is particularly important to ensure that the adhesive manufacturer's instructions and recommendations are strictly followed. The adhesive manufacturer's advice should be sought before work commences, and the SikaTack site bonding system must only be fixed by Sika approved fixing contractors

Technical Data

Petrarch panels have an indefinite life, the durability depending upon the supporting structure and condition of use. They are highly resistant to the effects of natural exposure, climatic extremes and atmospheric pollution including exposure to industrial and saline atmospheres cause no structural deterioration. This has been confirmed by accelerated tests in a weatherometer, and natural exposure on buildings for more than 30 years. In all these tests the properties of Petrarch are substantially unchanged except for a subtle change in colour shade.

Nominal Size	7mm	10mm
Standard Panel Sizes	2400 x 1200mm 3000 x 1200mm	
Factory Cutting Tolerances	± 2.0mm	
Nominal Weight	15.7kg/m ²	22kg/m ²
Impact Resistance	2.0J	3.5J
Fire Performance	Class 'O'	
Thermal Movement	22 x 10 ⁻⁶ mm/mm°C	
Thickness Tolerance	± 1.0mm	
Moisture Absorption (24 hour)	0.2% by weight	
Compressive Strength	137 MN/m ²	
Modulus of Elasticity	11.0 x 10 ³ MN/m ²	
Flexural Strength	30 MN/m ²	
Surface Hardness	Barcol 50	

Due to the nature of its homogeneous reinforcement Petrarch will not delaminate and is immune to insect and vermin attack.

Most graffiti, paint or other marking substances can be easily removed from Petrarch panels with a standard finish. Petrarch matt or honed finishes much more closely resemble some natural stones and are more absorbent and therefore more difficult to clean. For vulnerable areas Petrarch matt or honed panels can be supplied with an anti graffiti coating.

Colourfastness - There will be a slight colour change of the Petrarch cladding due to prolonged exposure to the weather. Experience has shown that this is not progressive and does not affect the performance of the cladding. Refer to British Board of Agrément Certificate No. 86/1787.

Frost resistance – freeze thaw testing has shown no changes occurred after 250 cycles of temperature changes between -40°C and 50°C. It is important in all external applications, particularly those in areas with abnormally wide extremes of temperature, that proper provision is made for the expansion and movement of Petrarch panels.

Surface finish – The manufacturing process produces some random open texture and pitting in the surface finish which is similar to that appearing in natural stone. Petrarch is also available with a matt or honed finish which involves the removal of the resin rich surface from the standard product and can expose further surface fissures and voids whilst producing a more natural stone-like appearance.

Like natural stone, these features are not detrimental to product performance, as proven by extensive testing and application over 30 years. Refer to British Board of Agrément Certificate No. 86/1787.

Coatings – Petrarch panels can be supplied with a range of factory applied coatings. These coatings can be used to provide exceptional anti graffiti properties or simply to seal and enrich the stone like panel surface. For further information on coating options and pigmented lacquer finishes, please contact CEP Technical Applications Team who will be pleased to assist with any specific requirements.

Sitework and Maintenance

Generally, Petrarch panels will be delivered to site cut, drilled and incorporating any fabricated features according to the requirements and design of the cladding system. Petrarch is normally delivered to the site on timber pallets, interleaved with embossed straw paper and wrapped in plastic sheet.

Panels should always be carried on edge and care taken not to damage the surface or corners. Petrarch should never be lifted flat unless supported on a timber pallet. If mechanical lifting equipment is used, the panels should always be properly protected to avoid scuffing from ropes or chains and a “spreader bar” the width of the pallet should be used.

The pallets should be stored flat, clear of the ground and under cover and dry, not more than two pallets high. Note: The straw paper must be kept dry as wet paper may stain the panel face.

Workmanship - When cutting and drilling Petrarch on site, all electrically powered equipment should be operated in accordance with the manufacturers’ instructions and operate on a 110 volt supply. When cutting and drilling Petrarch panels a respiratory mask and eye protection should be worn. Equipment should be to the relevant British Standard.

Cutting - Site cutting is best carried out with an electrically operated circular saw, the sheets should be clamped, face side uppermost, to a flat surface and a guide rail used to ensure true

and straight cutting. For large amounts of site cutting a diamond tipped blade will often prove to be more economical than the abrasive cutting disc. **Note: Petrarch Riven, features the directional surface of the original slate master. When cutting Petrarch Riven, the direction should always be taken into account.**

Drilling - Normal site drilling can be carried out using a hand held electric drill fitted with a masonry bit. Drilling speeds in the range of 900-1200 rev/min will be found to be most suitable. The drill size should be 2mm larger than the fixing shank diameter.

To enable drilling and countersinking to be carried out in one operation, special countersinking tools can be obtained from CEP Claddings. These tools will give an accurate countersinking. The depth of countersinking is important both to the success of subsequent hole filling and the load carrying capacity of the screws.

Edge Polishing - Despite the fact that Petrarch is homogeneous and through coloured, after cutting darker coloured panels, the edge will appear to be lighter than the face of the panel. An exposed edge (for example at a corner detail) can be polished using a wet and dry abrasive pad with water. This will remove saw marks and restore the edge to the main body colour.

Cleaning - Petrarch standard finish is non-absorbent and will not, in normal circumstances, pick up atmospheric dirt. Nevertheless, during manufacture, fabrication, fixing or subsequently during building alterations, dirt and dust can contaminate the surface. The following lists the most common contaminants and the recommended course of action for cleaning:

Dust and Dirt - Is best removed just prior to fixing the panel. This should be done using a sponge or brush with hot soapy water and a final wash down with clean water. Hole filling should never be done until the panel has been thoroughly cleaned and dried. If dust is allowed to collect on the surface, it may be retained by the texture and will subsequently require more vigorous cleaning.

Sealant materials – Only use CEP approved solvent free sealant and mask the panels prior to the application. Should sealant be deposited on the surface use topcleaner universal, if necessary, using a nylon brush, wash down with hot soapy water and finally rinse with clean water.

In no circumstances should paint strippers or abrasive cleaners be used as these can permanently stain or mark the Petrarch.

For the removal of stains and marks other than indicated, please contact the CEP Technical Applications Team for information.

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