

# H92 RAINSCREEN CLADDING



## TO BE READ WITH PRELIMINARIES/GENERAL CONDITIONS

### TYPES OF CLADDING

Plasmet PR-400 Rainscreen System comprising of 4mm thick aluminium composite material (ACM) coil coated cassette panels mounted on the RC 20 aluminium support structure. The system is fixed to an inner leaf structural wall and other components such as insulation, membranes, brakers, etc are incorporated.

Selected system to be formally tested at from a UK testing facility, which complies with testing requirements laid out in the CWCT "Testing for Ventilated Rainscreen Facades"

### 120 RAINSCREEN CLADDING

- **Drawing reference(s):** N/A
- **Primary support structure:** *By others*
- **Rainscreen cladding system:** Plasmet PR-400 Aluminium Rainscreen System – secret fixed, back ventilated pre-finished aluminium composite material cassette panels.
- **Manufacturer and Reference:** Plasmet Limited, Barton Moss Road, Eccles, Manchester M30 7RL  
Telephone: 0161 707 3141  
Fax: 0161 788 0181  
Email: [sales@plasmet.co.uk](mailto:sales@plasmet.co.uk) Web: [www.plasmet.co.uk](http://www.plasmet.co.uk)
- **Type:** Drained and back-ventilated
- **Panel:** ACM cassette panel, individually demountable, mechanically secured at corners. Manufacture controlled by a CNC controlled quality assured process.
- **Panel Material:** 0.5mm aluminium sheet bonded to each side of a 3mm thermoplastic core.
- **Thickness:** 4mm
- **Finish:** PVDF/Duragloss 5000 (*delete as applicable*) coil-coated – 25 micron; gloss level 20 – 35% as clause 830.
- **Colours:** (*insert colour reference from manufacturers colour chart*)
- **Joint Type and Width:** Standard 20mm with no gaskets or sealant
- **Air Gap:** (*insert \_\_\_mm: N.B. minimum 25mm*)
- **Support System:** RC 20 Rainscreen support system comprising of Vertical joint support rails, together with fully adjustable wall brackets to required cladding zone (*insert zone dimensions*), holding hooks. The support framing must allow for calculated expansion movement of the whole system vertically and horizontally.
- **Support Material:** Extruded Aluminium to BS1474 in 6063/T6 grade alloy; grade 304 with Stainless Steel pins and nylon sleeving. Number and location of fasteners as per structural design.

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- **Panel Fixings:** Panel holding hooks located into side panel returns. Stainless Steel self drilling fixings along top return. Number and location of fasteners: As per structural design
- **Backing wall:** *By others*
- **Vapour Control Layer:** as section 780
- **Breather membrane:** N/A
- **Thermal Insulation:** as clause 776
- **Accessories:** n/a
- **Other requirements:** Note - Care must be taken with regards to bi-metallic corrosion between metals.

### 130 STRUCTURAL INTERNAL WALL SYSTEM *By others*

#### GENERAL REQUIREMENTS/PREPARATORY WORK

### 210 DESIGN

- Complete the detail design of the rainscreen cladding and associated features shown on the preliminary design drawings to meet the requirements of this specification
- Co-ordinate detailed design with that for all related works.

#### DESIGN PROPOSALS

- The preliminary design drawings indicate design intent but do not preclude submission with tender of reasonable alternative proposals for consideration.

#### SPECIFICATION

- Comply with the latest edition of the Centre for Window and Cladding Technology (CWCT) standard for walls with ventilated rainscreens and standard for testing of ventilated rainscreens unless specified otherwise in this section.
- Keep a copy of the CWCT standard for walls with ventilated rainscreens and standard for testing of ventilated rainscreens together with CWCT publications invoked by these documents, at the design office, workshop and on site, readily accessible for reference at all times during the course of the works.

### 225 INFORMATION TO BE PROVIDED WITH TENDER: Submit to the CA the following rainscreen cladding particulars:

- Typical Plan, section and elevation drawings at suitable scales.
- Typical detailed drawings at large scales, including [\(insert any specific details which should be clarified at tender stage\)](#)

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- Technical information and certification demonstrating compliance with the specification of proposed incorporated products and finishes, including (insert product and finish types generically specified)
- Certification, reports and calculations demonstrating compliance with the specification of the proposed rainscreen cladding.
- Proposals for connections to and support from the primary support structure.
- Proposals for any primary support structure additional to that shown on preliminary design drawings.
- Schedule of builder's work, special provisions and special attendance by others.
- Examples of standard documentation from which the project quality plan will be prepared.
- Preliminary fabrications and installation method statements and programme.
- Proposals for replacing damaged or failed products.
- Areas of non-compliance with the specification.

**230 INFORMATION TO BE PROVIDED AFTER ACCEPTANCE OF TENDER:** Submit to the CA within (to be agreed) weeks of appointment the following rainscreen cladding particulars.

- A schedule of detailed drawings and dates for submission for comment.
- A schedule of loads that will be transmitted from the rainscreen cladding to the structure.
- Proposed fixing details and systems relevant to the structural design and construction with methods of adjustments and tolerances.
- A schedule of all fabrication tolerances/size tolerances.
- A detailed testing programme in compliance with the main contract master program (if required)
- A detailed fabrication and installation programme in compliance with the Main Contract master programme.
- A quality plan in compliance with CWCT 'Guide to good practice for facades', Section 6.
- Proposals to support any outstanding applications for Building Regulation consents or relaxations.

**235 INFORMATION TO BE PROVIDED BEFORE COMMENCEMENT OF RAINSCREEN CLADDING WORK:** Submit to the CA before testing or fabrication the following rainscreen cladding particulars:

- Detailed drawings to fully describe fabrication and installation.
- Detailed calculation to prove compliance with all design/performance requirements.
- Project specific fabrications, handling and installation method statements.
- Certificate for all incorporated components manufactured by others confirming their suitability for all locations in the rainscreen cladding.

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- Recommendations for spare parts for future repairs or replacements.
- Recommendations for safe dismantling and recycling or disposal of all products.

**240 PRODUCT SAMPLES:** Before commencing detailed design provide the CA with identified samples of:

- (Panel Finish)
- Obtain approval of appearance before proceeding.

**250 SAMPLE OF FIXINGS:** At an agreed stage during detailed design work provide the CA with identified samples of each type of fixing, together with manufacturers recommended torque figures.

**260 FABRICATION SAMPLES:** At an agreed stage during detailed design work provide the CA with samples of:

- (Small scale Sample of folded Tray)
- Obtain approval of appearance before proceeding

### DESIGN/PERFORMANCE REQUIREMENTS

#### 310 GENERALLY

- Comply with CWCT as 'Standard for walls with ventilated rainscreens' Section 2 Performance Criteria unless specified or agreed otherwise.
- Project performance requirements specified in this subsection are to be read in conjunction with CWCT performance criteria.

**335 INTEGRITY OF VENTILATED RAINSCREEN CLAD WALLS:** Determine size(s) and thickness(s) of panels, the size(s), number and spacing of fixings, configuration and location of secondary support systems and incorporation of other accessories and fittings to ensure the cladding system, primary support structure and other elements forming the rainscreen wall will resist all factored dead, imposed and design live loads, and accommodate all deflections and movements without damage.

- Calculate wind loads on rainscreen walls appropriate to location, exposure, height, building shape and size in accordance with BS 6399-2, taking full account of existing and known future adjacent structures.
- Impact load(s) in accordance with BS 8200:
- Location and category: (To be determined by Contractor)
- Temporary imposed Loads: (To be confirmed by structural Engineer)

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**350 DEFLECTION UNDER WIND LOAD:** At positive and negative applications of the design wind pressure the maximum normal deflection for the listed components must not exceed:

- Individual rainscreen panels  $L/90$  of the span measured between the points of attachment of the panel - this being defined as the folded perimeter edges of the panel. The panel face (or pan) can deflect to a calculated safe dimension based upon the mechanical properties of the material, and always ensuring that no residual deformation occurs.
- Framing members –  $L/200$  of the span of the member measured between points of attachment to the building, or 20mm, whichever is the lesser.

**370 APPEARANCE AND FIT:** Design rainscreen wall:

- To ensure position and alignment of all parts and features as shown on the reference drawings listed in Type(s) of rainscreen cladding clause(s).
- To accommodate deviations in the primary support structure.
- Maximum permitted component and installation tolerances:
  1. Permitted deviation of overall panel width +2.00mm –2.00mm
  2. Permitted deviation in panel length +2.00mm –2.00mm
  3. Maximum permitted deviation in length of two opposite sides of +2.00mm –2.00mm
  4. Squareness of panels: When the longest of two adjacent sides of the panel is taken as the base line, the deviation of the shorter side measured from a perpendicular to the baseline at any point along the baseline not to exceed +2.00mm –2.00mm
  5. Flatness: Deviation under a 1.0m straight edge placed anywhere on a flat surface not to exceed 2.00mm
  6. Alignment of joints between adjacent panels: deviation of panel corner from protected lines of edges of adjacent panels not to exceed 2.00mm
  7. Alignment of faces to adjacent panels: Deviation of panel edge under a 1.0m straight edge placed across adjacent panel not to exceed 2.00mm

**380 GENERAL MOVEMENT:** The rainscreen cladding must accommodate anticipated building movements as follows: [\(To be inserted by clients Engineer\)](#)

**390 AIR PERMEABILITY GENERALLY:** To comply with CWCT Standard as laid down in Document: (Guide to good Practice for Walls with ventilated Rainscreens)

**420 WATER PENETRATION:** onto internal surfaces or into cavities not designed to be wetted must not occur when the rainscreen wall is subjected to a test pressure.

**430 THERMAL PROPERTIES:** Method for calculating the thermal transmittance (U-value) of the rainscreen wall: (elevations to meet elemental method of Part L of the building Regulations).

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- Average U-value of rainscreen wall: [\(insert here\)](#).

**440 CONDENSATION:** The psychometric conditions under which condensation must not form within or on the interior surface of the rainscreen wall or any surface of the wall that is on the warm side of any insulation are:

- Outdoor notional psychometric conditions as BS6229, table 6:

	Winter	Summer
Temperature:	-5C	18C
Relative humidity:	90%	65%
Vapour Pressure:	0.362 kPa	1.341 kPa
Duration:	60 Days	60 Days

- Indoor notional psychometric conditions:  
Temperature: ( See Services Engineers Specification) C  
Relative humidity: (See Services Engineers Specification) %  
Vapour Pressure: (Data available in BS6229, table 7) kPa  
Calculated amount of winter interstitial condensation must not exceed (0.5kg/m<sup>2</sup> for non fibrous and closed cell insulates, 0.35kg/m<sup>2</sup> for fibrous insulates) kg/m. Calculated annual net retention must not exceed 5% of winter condensation.

**450 VAPOUR CONTROL LAYER:** Determine the interstitial condensation risk of the rainscreen wall using the method described in BS 5250 Appendix D. If necessary, provide a suitable vapour control layer to ensure that damage and nuisance from interstitial condensation does not occur.

**460 SOUND TRANSMITTANCE BETWEEN INTERIOR AND EXTERIOR OF RAINSCREEN CLAD WALL:** Minimum sound reduction indices (R) to BS EN ISO 140-3:

**465 SOUND TRANSMITTANCE BETWEEN ADJOINING FLOORS ABUTTING RAINSCREEN CLAD WALL:** Minimum sound reduction indices (R) to BS EN ISO 140-3:

**470 SOUND TRANSMITTANCE BETWEEN ADJOINING ROOMS ABUTTING RAINSCREEN CLAD WALL:** Minimum sound reduction indices (R) to BS EN ISO 140-3

**480 FIRE RESISTANCE OF BACKING WALL:** To BS 476-21 and not less than (0)

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**485 INTERNAL SURFACE SPREAD OF FLAME OF BACKING WALL:** To BS 476-7 Class 0

**490 CAVITY FIRE BARRIERS:** To BS 476-20 and must resist the passage of flame and smoke for not less than (1hr)

### PRODUCTS

#### 710 ALUMINIUM ALLOY FRAMING SECTIONS

- To BS 1474, alloy 6063 and suitable for the specified finish.
- Structural members to comply with BS 8118.

**711 ALUMINIUM ALLOY SHEET:** To BS EN515 BS EN 573 in an alloy, temper and thickness suitable for the application and specified finish.

**715 MILD STEEL FRAMING SECTIONS/REINFORCEMENT:** To the relevant parts of BS 7668, BS EN 10029, BS EN 10113, BS EN 10137, BSEN 10155 and BS EN 10210, in a thickness suitable for the application, and for galvanizing or other protective coating.

**717 MILD STEEL SHEET:** To the relevant parts of BS 1449-1, BS EN 10048, BS EN 10051, BS EN 10111, BS EN 10131, BS EN 10139, BS EN 10140, BS EN 10149, BS EN 10209, and BS EN 10268 in a grade and thickness suitable for the application, and suitable for galvanizing or other protective coating.

**720 STAINLESS STEEL SHEET:** To the relevant parts of BS EN 10029, BS EN 10048, BS EN 10051, BS EN 10095, BS EN 10258, BS EN 10259 and BS EN 10088-2, austenitic, grade 1.4301 (304) generally, grade 1.4401 (316) when used externally or in severely corrosive environments, and in a thickness suitable for the application.

#### 730 MECHANICAL FIXINGS

- Stainless steel to BS EN ISO 3506 grade A2 generally, grade A4 when used in severely corrosive environments or
- Mild Steel to BS 4190 and suitable for galvanizing or other protective coating, or
- Aluminium complying with BS 1474 and BS EN 755.

**731 ADHESIVES:** must not be degradable by moisture or water vapour

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### 735 **FIXINGS AND FASTENERS** must be:

- Of Dimensions not less than recommended by their manufacturers.
- Capable of adequate three dimensional adjustment to accommodate primary support structure and rainscreen cladding fabrication/installation tolerances

### 760 **GASKETS**

- None cellular rubber to BS 4255-1
- Cellular rubber to ASTM-C509
- Resistant to oxidation, ozone and UV degradation.

### 770 **GENERAL SEALANTS:** must be stable and compatible with all contact products and finishes and be selected in accordance with BS 6213 from: Silicone to BS 5889 One Part polysulfide to BS 5215 Two Part polysulfide to BS 4254 One or Two Part polyurethane.

### 776 **THERMAL INSULATION:**

- Material: (Insert choice of material)
  - Manufacturer and reference: (Insert)
  - Thickness: (Insert \_\_\_\_mm exact thickness determined by thermal analysis of complete wall build up)
- Keep as dry as possible during installation.

### 785 **BREATHER MEMBRANE:**

- Material: Spun bond polypropylene membrane
- Lay membrane over insulation as work proceeds ensuring continuity.
- Overlap joints not less than 150mm and seal with tape recommended by the membrane manufacturer, to prevent water reaching the insulation.
- Fully seal at penetrations using taping methods recommended by the membrane manufacturer.
- Before covering check for tears and punctures. Carefully repair using a patch of breather membrane with 150mm laps sealed with tape.
- Ensure that bottom edges overlap flashings, sills, etc. to allow free drainage to the exterior.

## FINISHES

### 810 **PROTECTIVE COATING OF MILD STEEL FRAMING SECTIONS/REINFORCEMENT:**

- Hot dip galvanized to BS EN ISO 1461, or
- Treated with appropriate equivalent coating to BS EN ISO 12944 and BS EN ISO 14713.



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**820 PROTECTIVE COATING OF MILD STEEL MECHANICAL FIXINGS:** All surfaces must be:

- Hot dip galvanized to BS EN ISO 1461, or
- Sheradized to BS 4921, class 1 coating thickness and passivated, or
- Zinc plated to BS 1706, coating classification Fe/Zn 12 and chromate conversion class 2C or 2D.

### FABRICATION AND INSTALLATION

**910 GENERALLY:**

- Fabricate and install rainscreen cladding in accordance with this specification and final detail drawings.
- Fabricators and installers must employ competent rainscreen cladding operatives. Records of their experience are to be provided to the CA on request.
- Select and align all products to ensure uniformity of appearance.
- Joints must only occur at positions indicated on final detail drawings.
- Isolate dissimilar metals to prevent electrolytic corrosion.
- Machine cut and drill all products to facilitate identification during assembly, handling, storage and installation. Do not mark surfaces visible in the complete installation

**911 METALWORK:** As section Z11, unless specified otherwise in this section.

**922 FIXINGS/ADHESIVES APPLICATION:** As section Z20, unless specified otherwise in this section.

**925 SEALANT APPLICATION:** As section Z22, unless specified otherwise in this section.

**930 ASSEMBLY:**

- Carry out as much assembly as possible in the workshop.
- Joints, other than movement joints and designed open joints, must be rigidly secured, reinforced where necessary and fixed with hairline abutments.
- Take precautions to prevent displacement of components in assembled units. Obtain approval for any reassembly on site.

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### 935 INSPECTION:

- All fabrications and assembled units must be carefully inspected for match with approved samples and for compliance with this specification and the final detailed drawings before dispatch to site.
- Give adequate notice of inspection arrangements to enable the CA and/or other affected parties to be present.

### 940 PROTECTION:

- All fabrications and assembled units must be protected against damage, corrosion and disfigurement during handling, installation and subsequent site operations.
- Protective coverings must be applied before dispatch to site and must not be detrimental to rainscreen cladding products, finishes or installation procedures.

### 945 HANDLING AND STORAGE:

- Do not deliver to site any rainscreen cladding products and units which can not be installed immediately or unloaded into a suitable well protected storage area.
- Store products and units on level bearers clear of the ground and separate with resilient spacers.

### 950 SUITABILITY OF STRUCTURE:

- Not less than (8) weeks before commencement of rainscreen cladding installation carry out a geometric survey of the supporting structure, checking line, level and fixing points. Report immediately to the CA if structure will not allow the required accuracy or security of erection.
- Coordinate geometric survey for rainscreen cladding with any other survey(s) for adjacent cladding.
- Set out erection datum points, lines and levels for a complete elevation at a time unless otherwise agreed with the CA.

**960 PRELIMINARY RAINSCREEN CLADDING INSTALLATION:** Complete a preliminary area of rainscreen cladding as set out below for inspection and approval of appearance by the CA.

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### 970 RAINSCREEN CLADDING INSTALLATION

- Set out straight, parallel and truly aligned
- Tighten all mechanical fixings to manufacturer's recommended torque figures. Do not over tighten fixings intended to permit differential movement.
- Remove protective coverings only where necessary to facilitate installation and from surfaces which will be inaccessible on completion.

975 On Site Welding: is not permitted

980 **INTERFACES:** ensure that flashings, closures, etc. (Specified in another section) are located correctly and neatly overlap the rainscreen cladding to form a weather tight junction.

### 985 DAMAGE

- Do not repair rainscreen cladding without approval. Such approval will not be given where products and units are badly damaged or where the proposed repair will impair performance or appearance.
- Repairs may require additional site testing at the discretion of the CA.
- Schedule repairs or record on drawings for inclusion in the maintenance manual.

990 **CLEANING:** At Practical Completion or when otherwise agreed with the CA remove any protective coverings and thoroughly clean rainscreen cladding areas. Cleaning agents for the purpose must be approved by the rainscreen cladding manufacturer and incorporated products manufacturers.

995 **MAINTENANCE:** Prepare a maintenance manual in accordance with CWCT 'Guide to good practice for facades', Section 10. Unless otherwise instructed or agreed the manual must be completed and handed over to the CA at Practical Completion.