

Specification for MITSUBISHI ALPOLIC NC/A1

Non-Combustible Aluminium Façade Panel as External Wall Cladding Material

1. SCOPE

The extent of the panel system work is indicated on the drawings and in these specifications. The work includes the design, supply, fabrication and installation of 4mm ALPOLIC NC aluminium facade material/ panel cladding with all necessary sub-structures, mechanical fixings, hardware and fittings to provide a complete installation, in total conformity with the requirements and intent of the drawings and specification herein.

Panel system requirements include 4mm ALPOLIC NC aluminium panels with an engineered certified fixing system including matching copings, flashings, fixing hardware, shims, furring, fasteners, gaskets and sealants, related flashing adapters, and masking (as required) for a complete watertight installation.

2. INSTALLER QUALITY ASSURANCE

The fabrication and installation shall be carried out by such a specialist who has experience in façade manufacturing and installation with ALPOLIC NC panels and be licensed to the local building authority to perform such facade construction and contracting. The specialist is to show the evidence of holding the correct State trade licence category upon tendering.

3. DESIGN CRITERIA

ALPOLIC NC cladding shall be designed and installed as a watertight cassette panel system mechanically fix and installed as individual panels as indicated by the grid layout on the architectural drawings. All sub frames, fixing and joint details shall be designed to perform to the expected structural and thermal loads and movements.

All proprietary fixings including top hats are as per manufacturer's/ distributor's specification. Each panel shall be fastened using extruded aluminium angle brackets with compatible, system engineered and approved fixing hardware. All fastening is to be concealed within the panel joints leaving the exposed panel face clean of fixings. A 12mm minimum construction joint shall be provided between all cladding panels and elements.

All construction joints shall be sealed to conceal fixings and form a watertight seal. The sealer shall be the silicone sealant Dow 791 designed for Aluminium panel joint seal application and carry a Dow 791 manufacturer's warranty for at least 10 Years. That Sealant must be a Neutral Cure, 100% silicone sealant and contain NO fillers. The Dow 791 sealant shall be applied to the manufacturer's specification and the sealant shall conform to the ASTM C920. Joints formed with the sealant will extend and compress a minimum total of 100% ($\pm 50\%$) of original joint, when tested to ASTM C719. A "Design Life" statement from the Sealant manufacture shall be provided by the contractor and this shall state a general design life to remain "fit for purpose" for a minimum of 20 years, as applied strictly in accordance to the manufacture's installation procedures (refer product TDS) and applied to acceptable substrates as determined by Dow.

Any Horizontal cladding areas shall have a fall away from the vertical façade areas with a slope of 1:15 (5 degrees approx) with the intention of avoiding water pooling. Based on a surface gloss finish of G30 (30% according to the Gardner Scale), the panel surface shall not have any imperfections such as buckles, creases, oil canning and other

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surface defects when viewed at any position but not less than at an angle of 15 degrees to the true plane of the panel, with natural lighting of incident of not less than the same angle. The composite panel cladding shall be designed to meet or exceed specified performances required for the prevailing local weather conditions.

- 3.1 Design Wind Loading : ? N/m² positive and negative. No cladding element shall sustain permanent deformation or failure under loading equivalent 1.2 times the design wind pressure specified. Deflection of any aluminium frame shall not exceed 1/150 of the clear span.
- 3.2 Expansion and Contraction. Panels shall be fabricated and installed as to provide for all expansion and contraction of the components. Changes in temperature due to climatic conditions shall not cause harmful buckling, opening of joints, undue stress on fastening and anchors, noise of any kind or other defects.
- 3.3 Flatness. With a gloss of 30% according to GARDNER Scale, the cladding surface taken individually shall not have any irregularities such as oil canning, waves, buckles and other imperfections when viewed at any position but not less than at an angle of 15 degrees to the true plane of the panel, with natural lighting of incident of not less than the same angle.
- 3.4 A thermal break must be installed at all points between any metal-on-metal contact as per Section J 0.2 NCC 2019 and must comply with non-combustibility requirements for Type A and B construction and be of a minimum R value of 0.2

4. MATERIAL AND FINISHES

4.1 ALPOLIC NC (Non-Combustible) Aluminium Cladding Panel

All cladding panels shall be 4 mm thick Mitsubishi ALPOLIC NC aluminium panel comprising of a Non-Combustible (NC) mineral filled core. The cladding panel must meet the DtS compliance of AS 1530.1 & AS 1530.3

Aluminium panel skin shall be 0.5mm thick 3105 alloy with a recycled content of the aluminium skin to be > 50% post consumer material as well as > 35% secondary production fragments.

The 0.5 mm (3105-H14) aluminium skins shall also consist of a corrosion resistant primer on the inner surfaces facing the core material to prevent possible corrosion. The reverse side shall consist of a polyester base coat or a service coating to protect against corrosive environments.

4.2.1 Principal Properties

- (a) 0.2% proof stress of aluminium skin (ASTM E8) MPa or N/mm² = 150 or greater.

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- (b) Dent (impact) test by Du-pont method steel ball weight 0.30 kg at 300 mm = No greater than 0.5 mm
- (c) Tensile strength (ASTM E8) MPa or N/mm² to be 29 for 6 mm thick panel; 49 for 4 mm thick
- (d) Delamination strength (climbing drum peel test ASTM D1781) shall be 100 mmN/mm or greater.
- (e) Panel sheet weight if 4mm shall be 8.6 kg/m².

4.3 Surface Finish

The cladding panel face shall be factory prefinished by Mitsubishi with a Lumiflon-based FEVE fluorocarbon coating applied through a "Die Coating" process with a smooth, fine coating and without directional lines for solid and metallic colours. The coating finish shall have a manufactures warranty for 20 years and delivered with the panel warranty at completion.

The paint process shall be a factory applied three-coat system, consisting of a primer, topcoat and clear coat with a minimum thickness of 28 micron. The paint surface is to meet the following standards;

- (a) A minimum Pencil Hardness of "H" (ASTM D3363-92a).
- (b) Salt Spray ASTM D-B117-90- 4,000 hrs - 100%
- (c) Colour retention (ASTM D 2244-93) shall achieve a maximum rating of 5 units after 4,000 hours.
- (d) Gloss retention (ASTM D 523-89) shall be a minimum of 70% after 4,000 hours.
- (e) Chalk resistance (ASTM D 4214-89) maximum rating of 8 units after 4,000 hours.

The finished surface shall be protected with a factory-applied self-adhesive peel-off protective film, tested to withstand at least 6 months exposure to local weather conditions without losing the original peel-off characteristic or causing stains or other damages.

4.4 Colour/ Gloss

The surface shall consist of Lumiflon "Fluoro-Polymer" FEVE based fluoro-carbon with finishes of ?. Colours and gloss level on the surface finish shall be subject to the architect's final request/ selections and as detailed in the exterior colour schedule.

4.5 Fire Testing

TEST	DESCRIPTION	RESULT
AS 1530.1	Combustibility test for materials	Non-combustible
AS 1530.3	Simultaneous determination of: Ignitability, flame propagation, heat release and smoke release	Ignitability: 0 Flame propagation: 0 Heat release: 0 Smoke release: 0-2

5. FIXINGS

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- 5.1 Panels and system shall be installed using fasteners, including concealed screws, nuts, bolts and others for those connecting aluminium to aluminium or aluminium to steel shall be of non-magnetic stainless steel.
- 5.2 Blind rivets used for fastening aluminium to sub-frame shall be of aluminium alloy with stainless steel mandrel.
- 5.3 All fixing anchors, brackets and similar attachments used in the erections, shall be of aluminium, non-magnetic stainless steel, zinc coated steel, or hot dip zinc galvanised steel.
- 5.4 Where two surfaces of dissimilar materials come into contact, the surfaces shall be insulated with a layer of PVC or Polyethylene tape.

6. FABRICATION

- 6.1 A set of shop drawings are to be submitted to the architect before fabrication seeking approval and outlining the intended design for the facade to comply with the relevant Australian Standards.
- 6.2 All cladding panels shall be factory-fabricated and assembled in compliance with the manufacturer's technical data sheets/ manual and such works shall be performed under experienced factory supervision and control.
- 6.3 All panels shall be machined to specifications, tools and equipment recommended and approved by the Mitsubishi sheet manufacturer. After folding into cassettes, an extruded aluminium profile shall be fixed to the minimum 25mm deep return bend using \varnothing 5mm blind rivets.
- 6.4 Rivets shall be properly positioned not less than 10mm from the edge of the ALPOLIC NC panel.
- 6.5 Fabricated corners of the ALPOLIC NC panels shall be as per manufacturer's technical manual.
- 6.6 Panels shall be designed and manufactured to withstand the specified wind load. If reinforcement stiffeners are required, they are to be applied in strict conformance to the manufacturer's specification. The ends of the stiffener shall be mechanically joined to the panel sub-frame and any chemical bonding process shall meet the manufacturer's fabrication specification.
- 6.7 Panels shall be erected in accordance with an approved set of shop drawings.
- 6.8 Finished panels shall be stored and transported to site in vertical position, face-to-face resp. back-to-back, with adequate protection to prevent scratches and dents.
- 6.9 The factory applied protective peel-off foil shall only be removed after the panels have been installed on site.

7. INSTALLATION

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- 7.1 Panels shall be stored on site in vertical position, face-to face resp. back-to back-, with adequate protection to prevent scratches and dents.
- 7.2 Do not install component parts that are observed to be defective, including warped, bowed, dented, scratched, and broken members.
- 7.3 Do not cut, trim, weld, or braze component parts during erection in a manner which would damage the finish, decrease strength, or result in visual imperfection or a failure in performance. Return component parts which require alteration to shop for re-fabrication, if possible, or for replacement with new parts.
- 7.4 Fixing of the cladding structure to the building structure shall be by approved methods in strict accordance to the specification and approved shop and/or erection drawing.
- 7.5 All component parts shall be installed level, true to line with uniform joints and reveals. Maximum deviation for vertical member: 3mm max. in a 5.200m run and 5mm max. in 11.00m run. Maximum deviation for horizontal members: 3mm max. in 8.500m run. Maximum offset from true alignment between the abutting members shall not exceed 1.0mm. The tolerance of the width of the joints between two panels shall be maximum ± 2 mm.
- 7.6 Cladding panels shall be left protected by the factory applied peel-off film for max. 6 months. Under no circumstances shall the peel-off film on individual panels be partially removed and left exposed to weathering.
- 7.7 Before handing over of the completed cladding, all peel-off film shall be removed. Panels which were exposed to weathering without peel-off film shall be cleaned in accordance with manufacturer's recommendation.

8. **HAND OVER/COMPLETION**

8.1 **Final Inspection & Certification**

The façade installer is to submit their façade design and installation to gain approved/ certification by a professional engineer registered in the applicable state to ensure that the facade is engineered to comply with the appropriate Australian Standards including but not limited to AS1170.2 (wind loading standard).

8.2 **Manufacturers Warranty**

A Mitsubishi Manufacturer's Warranty shall be issued for 20 years, including the full costs of replacement / re-installation by the manufacturer if a warranty problem is to occur. This warranty is to be issued by the ACM manufacturer and not the ACM material reseller or distributor.

END OF DOCUMENT