



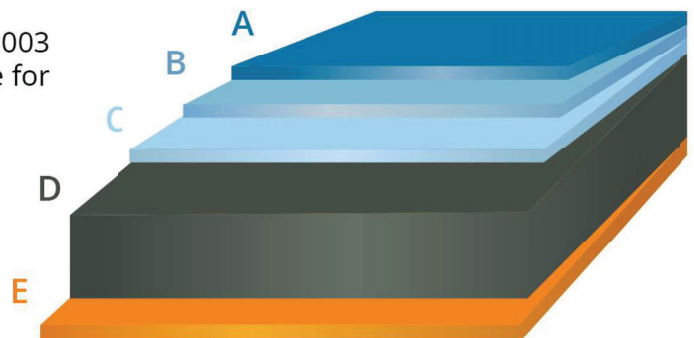
Atlas Steels Alfacade product specification

- Atlas Steels Alfacade is a 3mm or 4mm non-combustible pre-finished solid Aluminium panel tested to AS1530.1 and deemed non-combustible, the panels have also been tested and pass AS1530.3 requirements.
- Polyvinylidene flouride (PVDF) Coating system
- 20 years warranty, subject to standard terms and conditions.
- Atlas Steels Alfacade has been tested to AS 4284 and meets the weatherproofing requirements for FP1.4
- The Atlas Steels Alfacade is certified to ISO 9001:2015 & ISO 14001:2015 for designed, manufactured and coating system.

Material composition

Atlas Steels Alfacade is a 3.0mm + 4.0mm 3003 Series H22 100% solid aluminium panel, suitable for all Type A, B, & C class of construction.

- A. Protective film
- B. PVDF coating
- C. Pre-Treatment Layer
- D. 3mm or 4mm aluminium
- E. Protective wash coat to back of panel



Standard panel dimensions

| WIDTH | LENGTH | THICKNESS |
|-------------|----------------------|-----------|
| 1250 / 1575 | 2500 3200 4000 | 3mm / 4mm |

***Note - Custom width & lengths are available with minimum MOQ per width and size.*

Coating system

Atlas Steels Alfacade panels are coated with a Becker Group coating system, Beckers are a leading worldwide supplier of industrial coatings and the global market leader of coil coatings. Beckers are focused on developing sustainable coatings – their vision is to become the most sustainable industrial coatings company in the world. Beckers expertise is based on a long history dating back over 150 years, their history includes the manufacturing of high-performance coating solutions for a wide variety of applications, including an extensive range of colours

Atlas Steels Alfacade 2 or 3 coat polyvinylidene fluoride (PVDF) coating system is a pure thermoplastic fluoropolymer that is non-reactive & possesses multiple coating benefits .

PVDF coatings are especially resistant to solvents, acids & have a very low density compared to other fluoropolymers .

Atlas Steels Alfacade is able to be colour matched to any colour that the Architect, client, builder requires from any existing colour range (subject to minimum order quantities)



- Chemical resistance (ASTM D543): excellent
- Abrasion resistance (ASTM D4060) : excellent
- PVDF coating thickness: 25 - 30 micron
- Gloss 20 – 80% matt/flat gloss
- Reverse = 7 micron grey wash coat

Beckers most UV-resistant topcoat system based on a blend of polyvinylidene fluoride and acrylic resins in 70/30. Available in mid to low gloss levels. Only the most durable pigments are used to achieve the Beckry®Fluor colour range.

Material Data

Test results

| Test Standard | RESULT |
|---------------|----------------------|
| AS 1530.1 | Non - Combustible |
| AS 1530.3 | PASS |
| | Ignitability Index 0 |
| | Heat Evolved 0 |
| | Spread of Flame 0 |
| | Smoke Developed 1 |

Thermal performance

Thermal resistance from -50°C To + 80°C

| Test Standard | Thermal Resistance 1A M2.K/W | Thermal Resistance 1A M2.K/W |
|---------------|---------------------------------|---------------------------------|
| | | |

Material Data Sheet

| Physical property | VALUE |
|--|-------|
| Tensile strength – ultimate, Ft _u * (MPa) | 179 |
| Tensile strength – yield, Ft _y * (MPa) | 158 |
| Compressive strength, F _{cy} (MPa) | 131 |
| Shear strength – ultimate, F _{su} (MPa) | 83 |
| Shear strength – yield, F _{su} (MPa) | 69 |
| Bearing strength – ultimate, F _{bu} (MPa) | 276 |
| Bearing strength – yield, F _{by} (MPa) | 172 |
| Compressive MOE, E (MPa) | 70000 |
| Thermal expansion coefficient | 23 |
| Fatigue strength (MPa) | 60 |
| Modulus of resilience (Kj/M ³) | 130 |
| Embodied carbon (kg-CO ₂ /kg) | 8.1 |

Installation Details

The following list of installation considerations and details need to be taken into account prior to the start of panel installation:

- Atlas Steels Alfacade has a directional arrow on the protective film, ensure arrow direction is consistent with the installed cladding layout to prevent any variation in the finish due to light refraction/reflection.
- Different production lots may show as a minor colour variation a overall project order is recommended to ensure colour consistency across the project.
- When aluminium Z angles are installed onto galvanised top hats, an isolation tape/barrier should be used to separate dissimilar metals.
- Atlas Steels Alfacade is to be installed in a cassette fix method on Type A & B constructions, refer to the following installation drawing.
- Atlas Steels Alfacade panel is to be installed on a BCA compliant wall or wall system that meets the current NCC requirement, including variations of wall types for example, load bearing, non-load bearing, wall types that require a Fire Resistance Level (FRL)

Protective Film

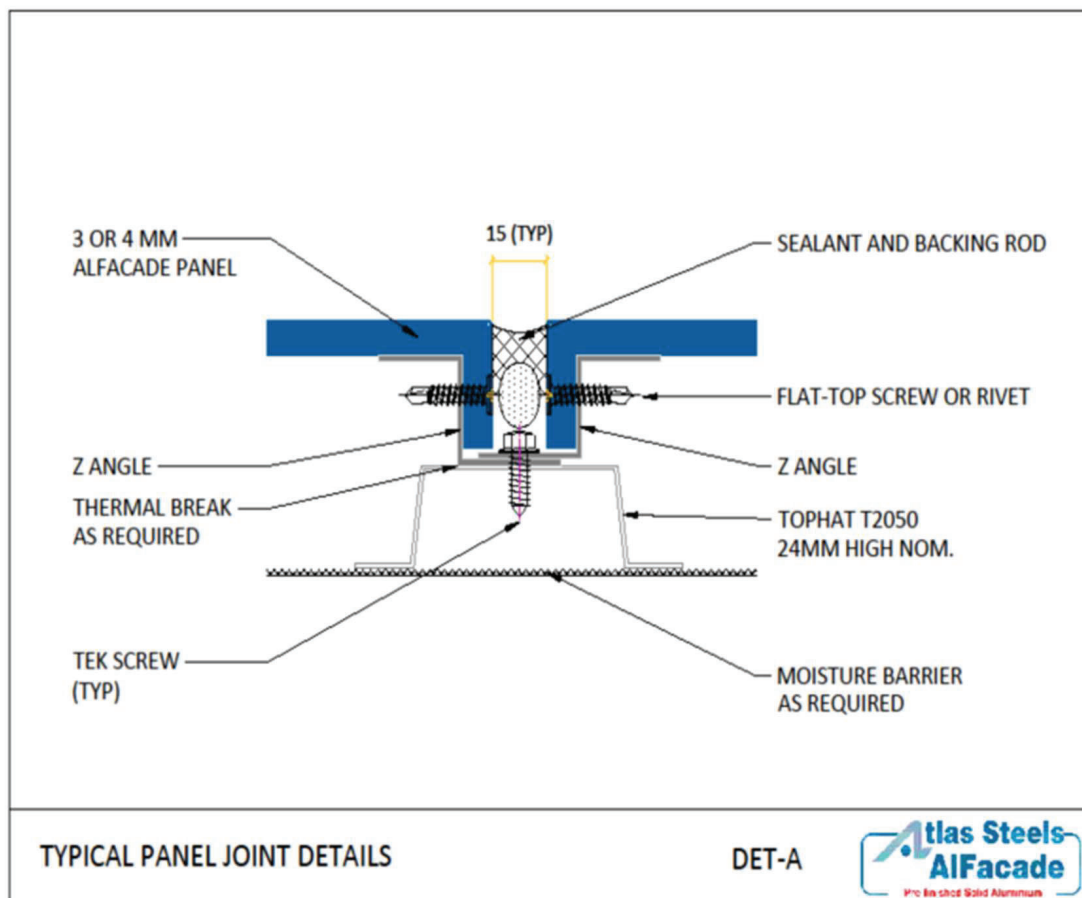
- Ensure the protective film is completely removed from within express joints before they are caulked with silicon.
- To avoid glue residue on panel surface from exposure to weathering and UV light, the protective film will need to be removed from the panels within 45 days of installation. A clear protective film is also available (MOQ may apply) which needs to be removed within 25 days of installation.
- Under no circumstance should you apply PVC tapes, polyurethane or silicone sealant. These products can penetrate the film, or the panel surface, resulting in a change in the PVDF coating gloss level.
- Do not apply any spray paint or write with permanent marker on the protective film, as the colour may penetrate the film and affect the painted panel surface.
- After removal of the protective film ensure no scratches/damage will occur to the panel surface if still working within the area.

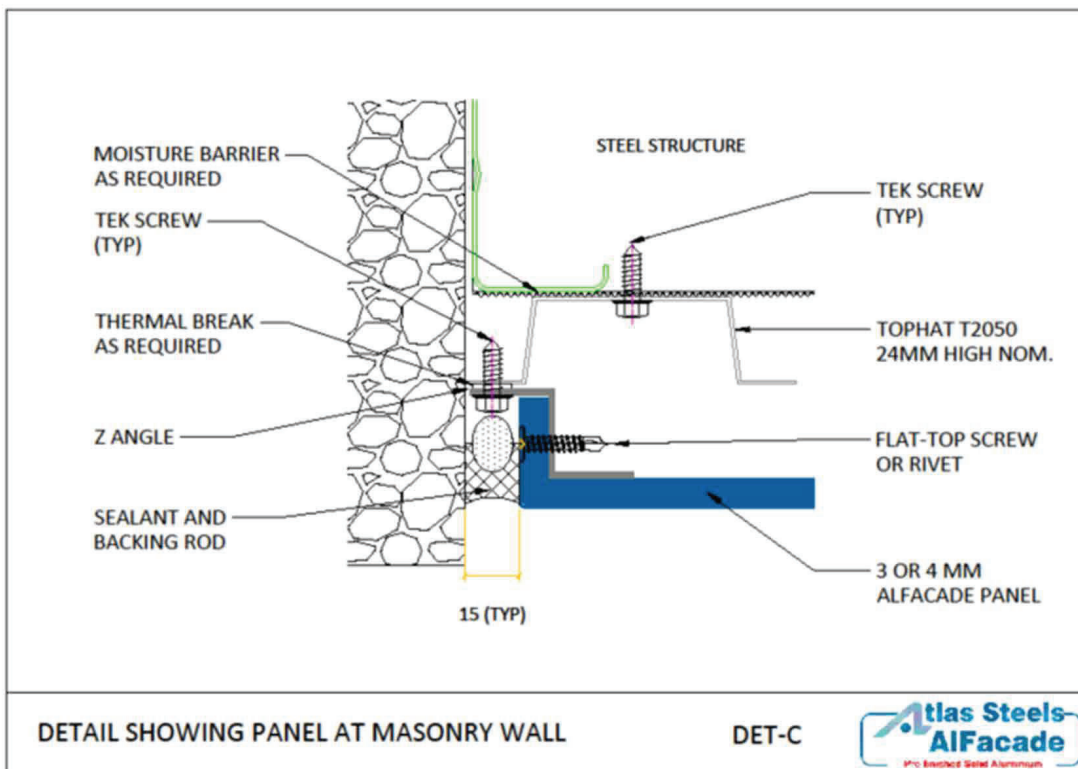
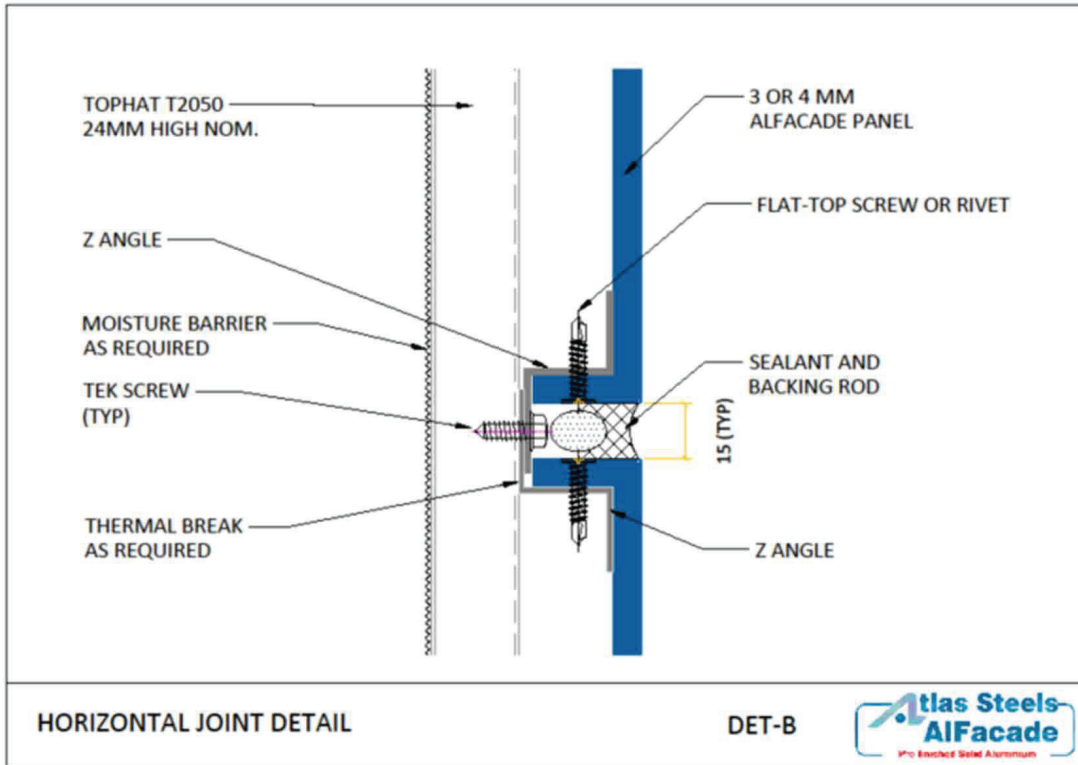
Installation Guidelines

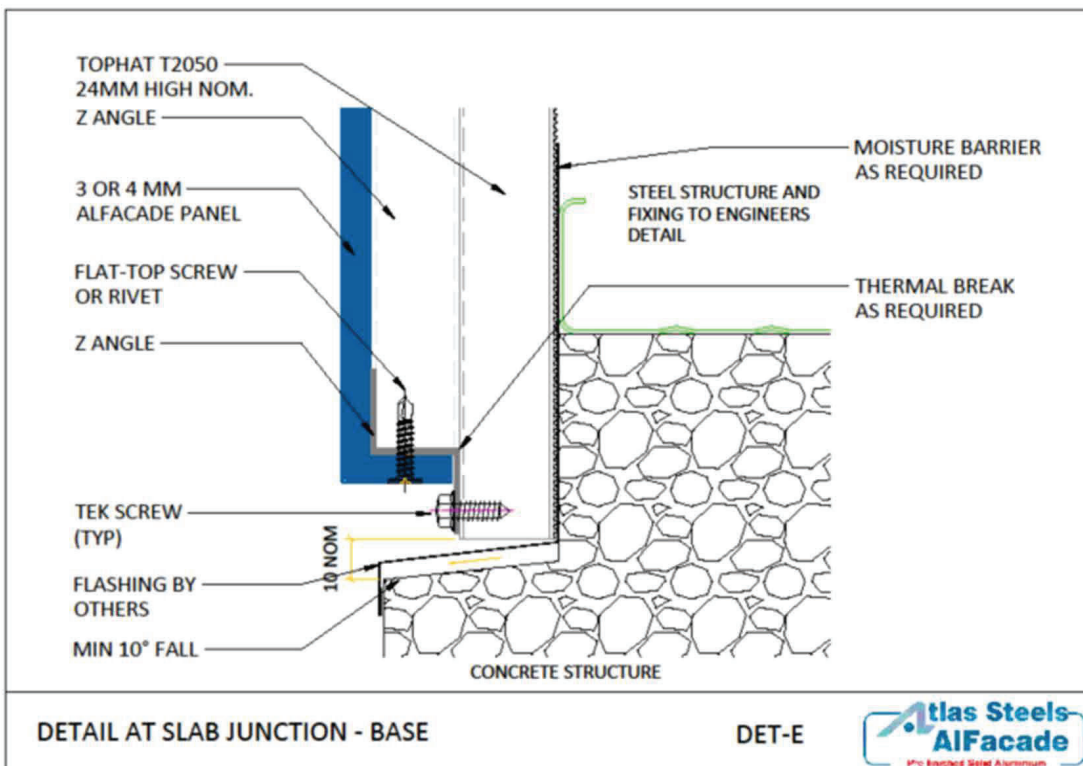
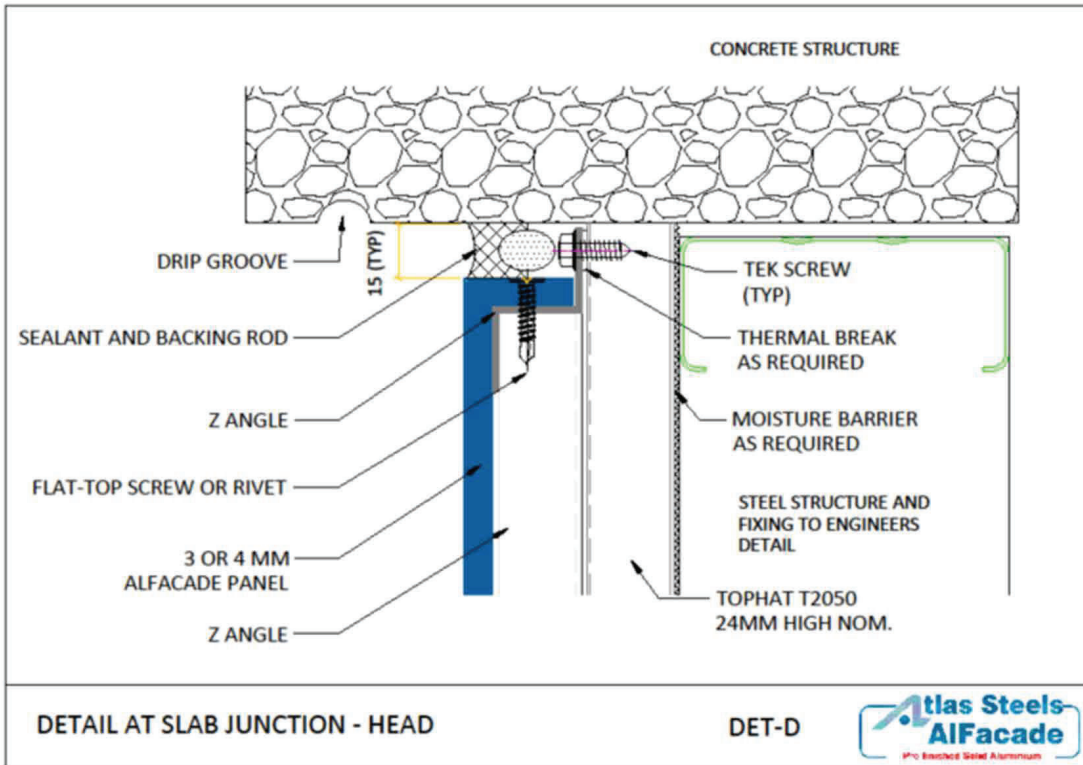
General guideline, sequence of installation is as follows:

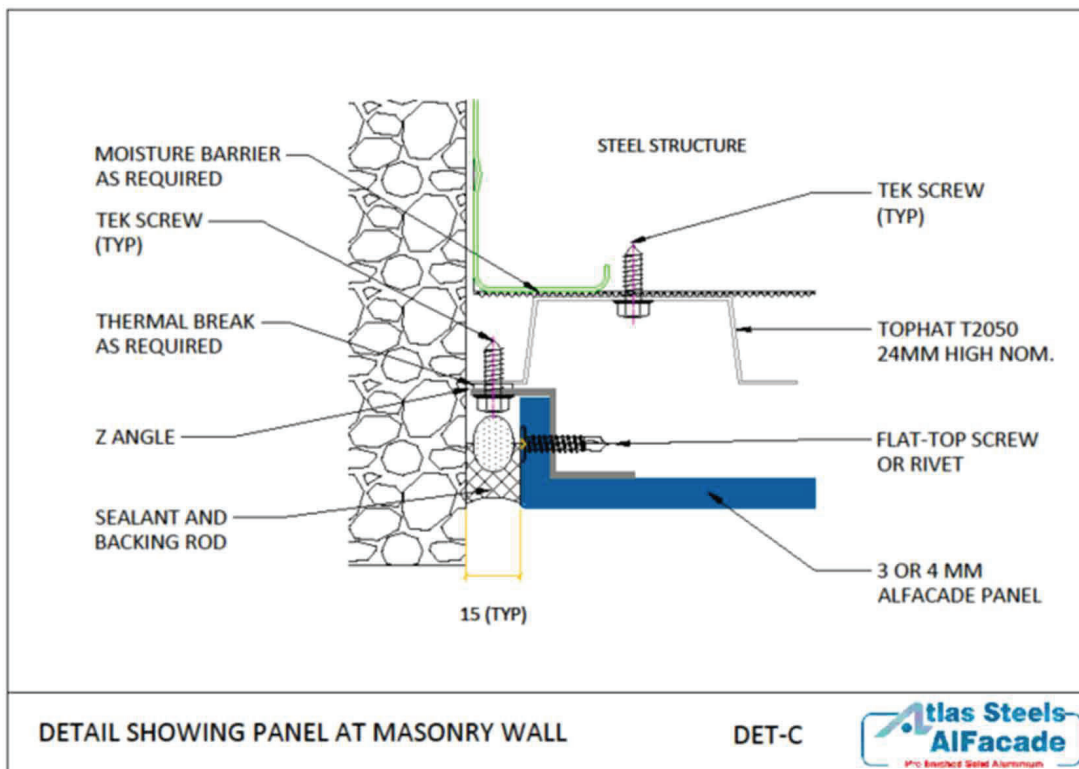
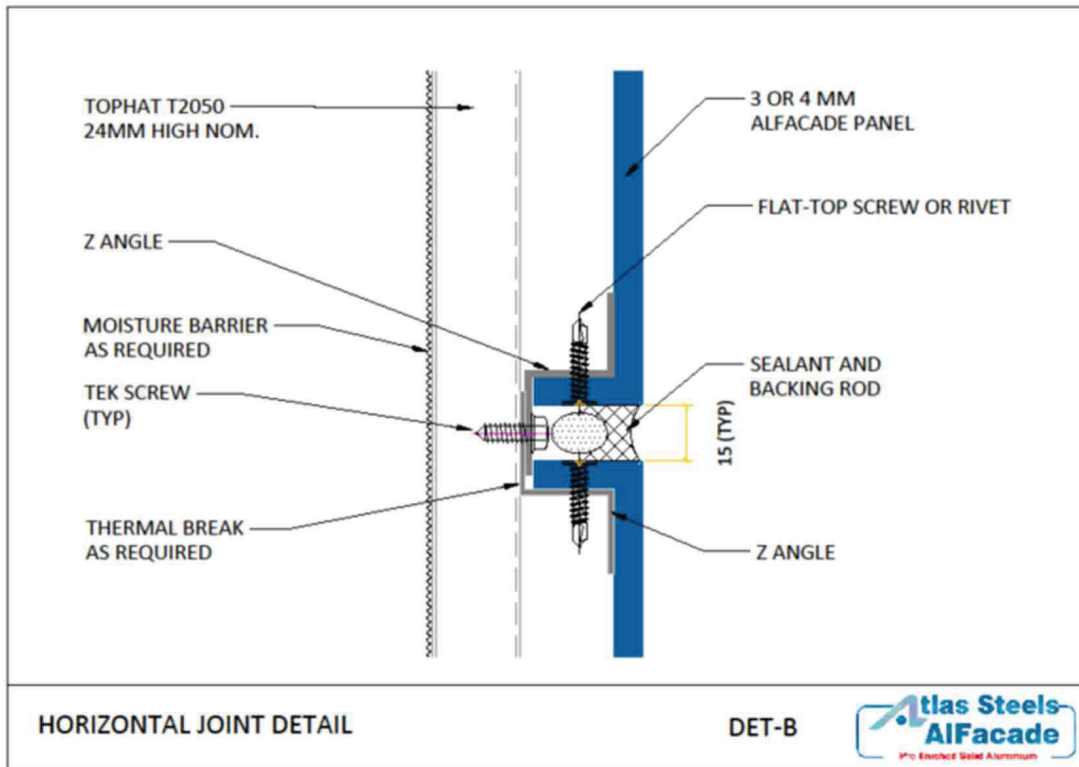
- Installation of an approved/compliant vapor permeable membrane as per manufacturers requirements.
- Installation of top hats vertically, ensuring they are levelled horizontally and vertically and fixed at appropriate center's to meet area / building wind loading requirements, with 10-12 gauge hex head class 3 screws.
- CNC fabricate and prepare Atlas Steels Alfacade for installation.
- Install Atlas Steels Alfacade panels to the top hats, then fix through the aluminium Z angles into top hats at the recommended centers for wind loading requirements.
- Caulking + backing rod applied to panel joints as per manufacturers recommendations, do not caulk panel joints if temperature is above 30°C
- Remove all the protective film from Atlas Steels Alfacade within 45 days of installation.

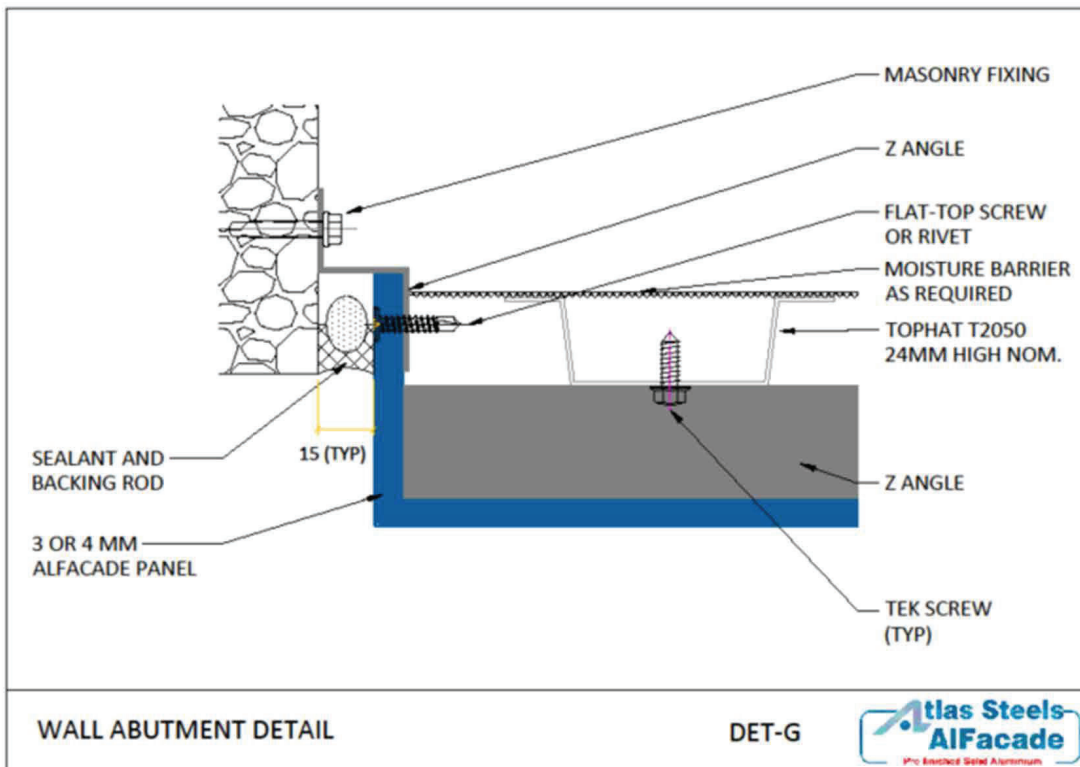
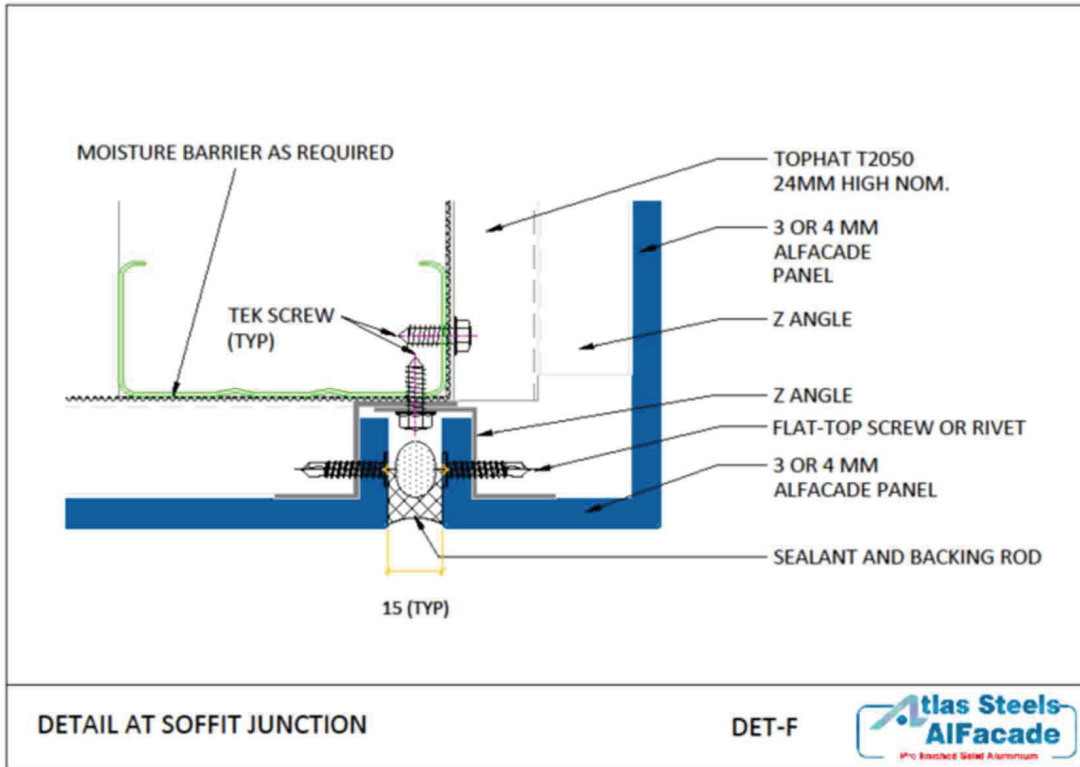
Installation Drawings

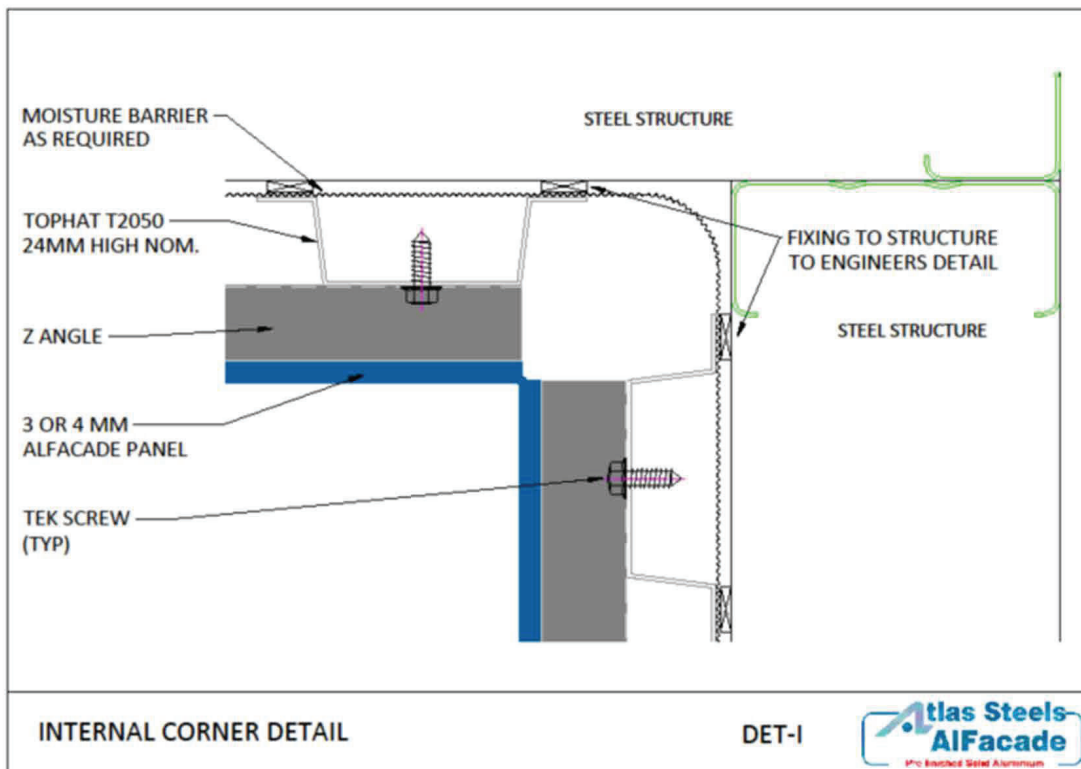
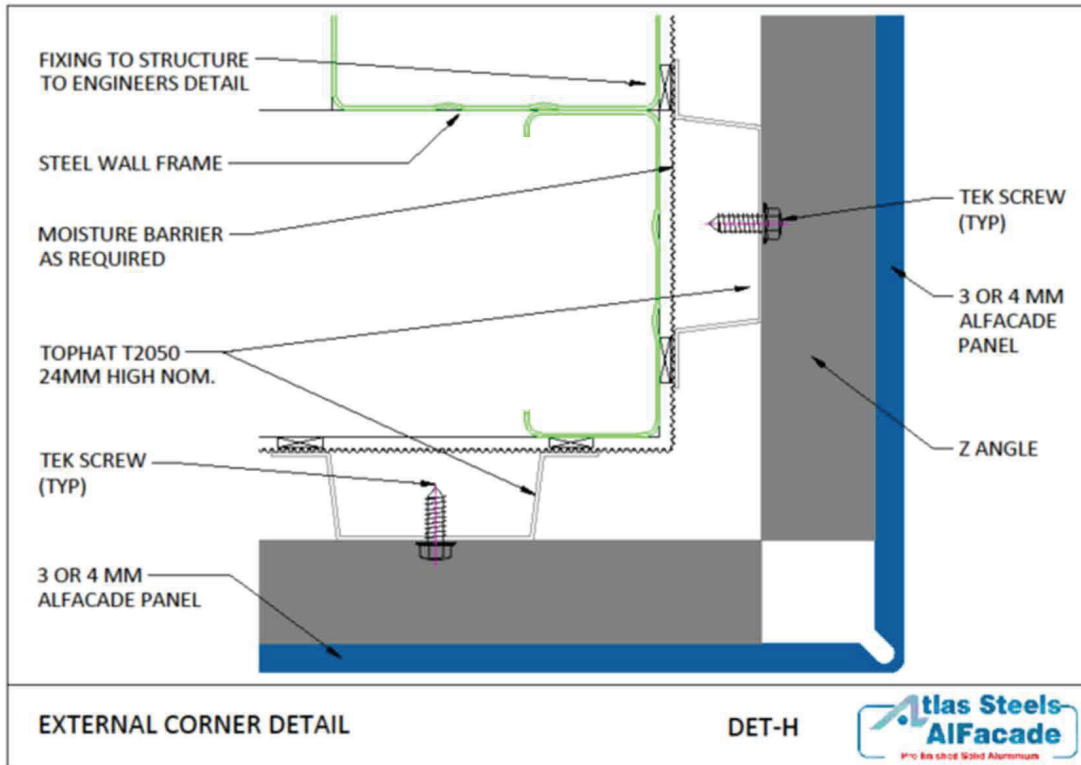


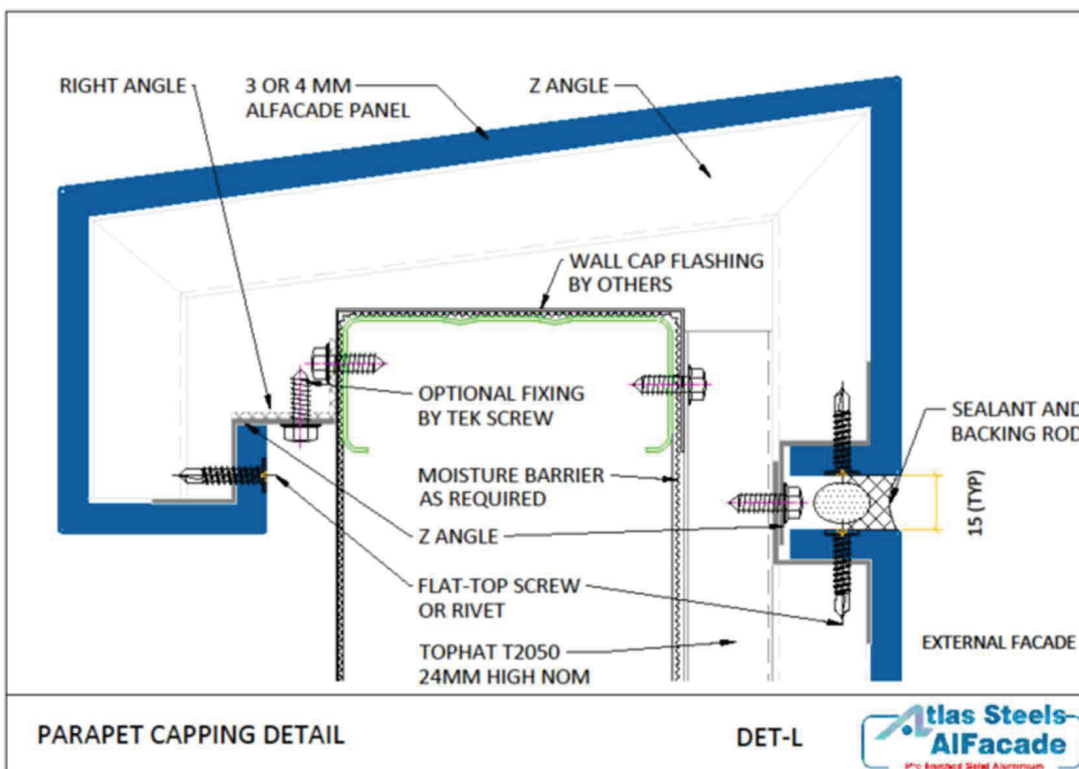
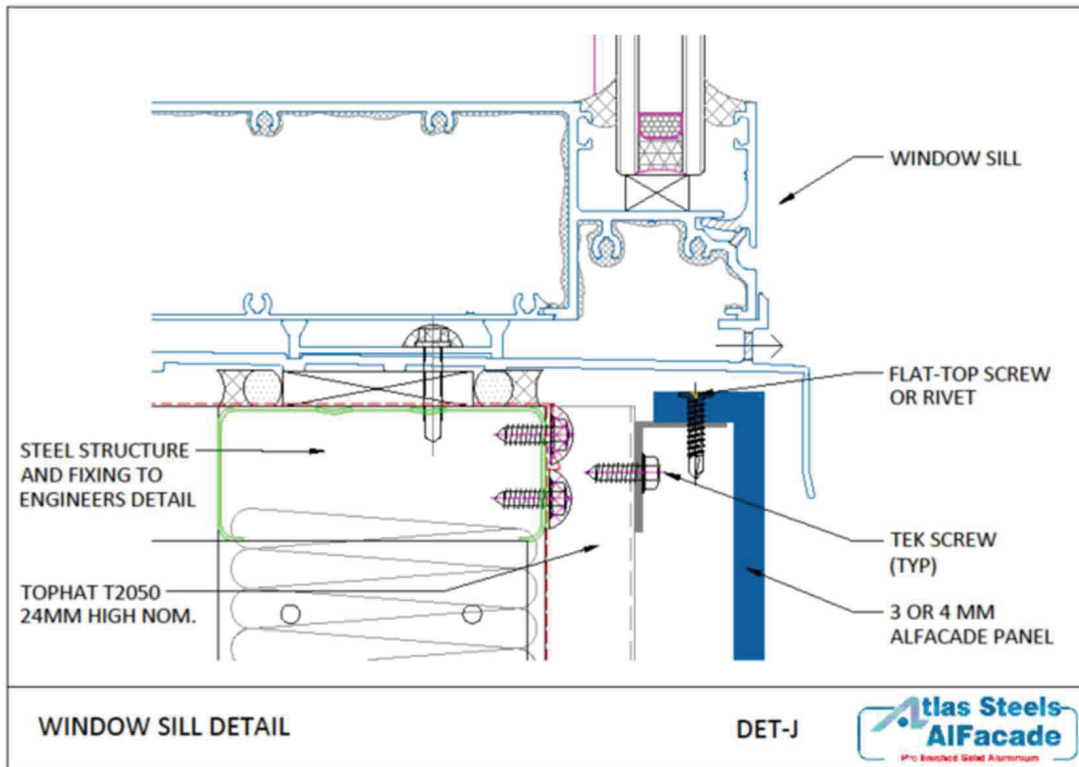


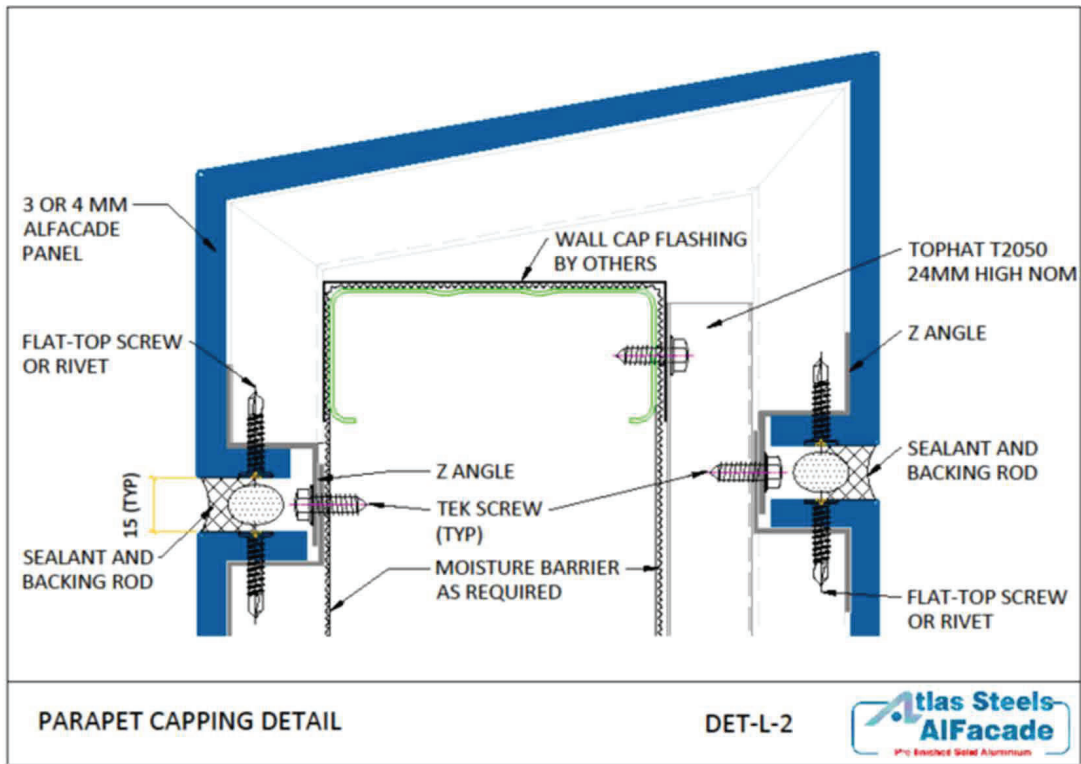












Atlas Steels Alfacade 3.0mm panel wind pressure table

**Material AS/NZS
Properties 1664 3003
H22**

| | | | |
|------------------|-----------|---------------------------------------|--|
| E | 70000 MPa | <-- Compressive modulus of elasticity | <-- AS/NZS 1664.1 Table 3.4 (A) for Alloy 3003 Group |
| G | 26250 MPa | <-- Shear modulus of elasticity | <-- AS/NZS 1664.1 Clause 3.4.8.3 |
| t | 3.00 mm | <-- Plate thickness | |
| F _{tu} | 159 MPa | <-- Tensile ultimate strength | <-- Mill Certificate |
| F _{ty} | 144 MPa | <-- Tensile yield strength | <-- Mill Certificate |
| F _{cy} | 124 MPa | <-- Compressive yield strength | <-- Extrapolated from Table 3.3 (A) AS/NZS 1664.1 3003-H16 |
| f _y | 0.95 | <-- Yield capacity factor | <-- AS/NZS 1664.1 Clause 3.4.2 & 3.4.3 |
| f _u | 0.85 | <-- Ultimate capacity factor | <-- AS/NZS 1664.1 Clause 3.4.2 & 3.4.3 |
| k _t | 1.0 | <-- Coefficient for tension members | <-- AS/NZS 1664.1 Table 3.4 (B) |
| f _{F L} | 135 MPa | <-- Limit state bending stress. | <-- AS/NZS 1664.1 Clause 3.4.2 & 3.4.3 |

Flat plate, simply supported (4 sides) maximum principal Stress at mid span due to wind pressure, W_{uls}

$$\sigma_{max} = \frac{\beta q b^2}{t^2} \quad (1)$$

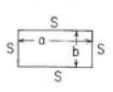
| W_{uls} | Panel width 'b' | Panel Length 'a' | | | | | | | |
|-----------|-----------------|------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | | 900.0 mm | 1200.0 mm | 1500.0 mm | 1800.0 mm | 2100.0 mm | 2400.0 mm | 2700.0 mm | 3000.0 mm |
| 1.0 kPa | 600 mm | 19.4 MPa | 24.4 MPa | 26.5 MPa | 28.5 MPa | 29.1 MPa | 29.6 MPa | 29.8 MPa | 29.9 MPa |
| | 900 mm | 25.9 MPa | 38.4 MPa | 48.2 MPa | 54.9 MPa | 58.0 MPa | 61.1 MPa | 64.2 MPa | 65.0 MPa |
| | 1200 mm | 68.2 MPa | 46.0 MPa | 63.3 MPa | 77.6 MPa | 88.9 MPa | 97.6 MPa | 101.8 MPa | 105.9 MPa |
| | 1500 mm | 133.8 MPa | 98.9 MPa | 71.9 MPa | 94.1 MPa | 113.3 MPa | 129.3 MPa | Stiffener R'd | Stiffener R'd |
| 1.5 kPa | 600 mm | 29.1 MPa | 36.6 MPa | 39.7 MPa | 42.8 MPa | 43.6 MPa | 44.5 MPa | 44.7 MPa | 44.9 MPa |
| | 900 mm | 38.8 MPa | 57.5 MPa | 72.3 MPa | 82.4 MPa | 87.0 MPa | 91.7 MPa | 96.3 MPa | 97.5 MPa |
| | 1200 mm | 102.3 MPa | 69.0 MPa | 94.9 MPa | 116.4 MPa | 133.4 MPa | Stiffener R'd | Stiffener R'd | Stiffener R'd |
| | 1500 mm | Stiffener R'd | Stiffener R'd | 107.8 MPa | Stiffener R'd | Stiffener R'd | Stiffener R'd | Stiffener R'd | Stiffener R'd |
| 2.0 kPa | 600 mm | 38.8 MPa | 48.8 MPa | 52.9 MPa | 57.1 MPa | 58.2 MPa | 59.3 MPa | 59.5 MPa | 59.8 MPa |
| | 900 mm | 51.7 MPa | 76.7 MPa | 96.3 MPa | 109.8 MPa | 116.0 MPa | 122.3 MPa | 128.4 MPa | 97.5 MPa |
| | 1200 mm | Stiffener R'd | 92.0 MPa | 126.5 MPa | Stiffener R'd | Stiffener R'd | Stiffener R'd | Stiffener R'd | Stiffener R'd |
| | 1500 mm | Stiffener R'd | Stiffener R'd | Stiffener R'd | Stiffener R'd | Stiffener R'd | Stiffener R'd | Stiffener R'd | Stiffener R'd |
| 2.5 kPa | 600 mm | 48.5 MPa | 61.0 MPa | 66.2 MPa | 71.3 MPa | 72.7 MPa | 74.1 MPa | 74.4 MPa | 74.8 MPa |
| | 900 mm | 64.7 MPa | 95.9 MPa | 120.4 MPa | Stiffener R'd | Stiffener R'd | Stiffener R'd | Stiffener R'd | Stiffener R'd |
| | 1200 mm | Stiffener R'd | 115.0 MPa | Stiffener R'd | Stiffener R'd | Stiffener R'd | Stiffener R'd | Stiffener R'd | Stiffener R'd |
| | 1500 mm | Stiffener R'd | Stiffener R'd | Stiffener R'd | Stiffener R'd | Stiffener R'd | Stiffener R'd | Stiffener R'd | Stiffener R'd |

Notes:

- (1) Roark's Formulas for Stress and Strain Table 11.4, Chapter 11, Page 502
- (2) Plate principal stress near fixings, equi-spaced @ 300mm maximum centres, due to negative wind pressure can be calculated by multiplying Table Stress by 1.3
Stress at fixing shall be less than specified AS/NZS 1664.1 limit state bending stress, provided above.
Where stress at fixings non-compliant, fixing spacing need to be reduced. In such case, consult manufacturer.

TABLE 11.4 Formulas for flat plates with straight boundaries and constant thickness

NOTATION: The notation for Table 11.2 applies with the following modifications: a and b refer to plate dimensions, and when used as subscripts for stress, they refer to the stresses in directions parallel to the sides a and b, respectively. σ is a bending stress which is positive when tensile on the bottom and compressive on the top if loadings are considered vertically downward. R is the reaction force per unit length normal to the plate surface exerted by the boundary support on the edge of the plate. r_c is the equivalent radius of contact for a load concentrated on a very small area and is given by $r_c = \sqrt{1.6r_s^2 + l^2} - 0.675l$ if $r_s < 0.5l$ and $r_c = r_s$ if $r_s \geq 0.5l$

| Case no., shape, and supports | Case no., loading | Formulas and tabulated specific values | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|--------|--------|--------|--------|----------|--------|----------|---------|----------|-------|----------|---------|--------|--------|--------|----------|--------|--------|--------|--------|--------|--------|----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1. Rectangular plate; all edges simply supported  | 1a. Uniform over entire plate | (At center) $\sigma_{max} = \sigma_b = \frac{\beta q b^2}{t^2}$ and $\gamma_{max} = \frac{-2q b^4}{E t^3}$ (At center of long sides) $R_{max} = \gamma q b$ <table border="1"> <tr> <th>a/b</th> <td>1.0</td> <td>1.2</td> <td>1.4</td> <td>1.6</td> <td>1.8</td> <td>2.0</td> <td>3.0</td> <td>4.0</td> <td>5.0</td> <td>∞</td> </tr> <tr> <th>β</th> <td>0.2874</td> <td>0.3762</td> <td>0.4530</td> <td>0.5172</td> <td>0.5688</td> <td>0.6102</td> <td>0.7134</td> <td>0.7410</td> <td>0.7476</td> <td>0.7500</td> </tr> <tr> <th>γ</th> <td>0.0444</td> <td>0.0616</td> <td>0.0770</td> <td>0.0906</td> <td>0.1017</td> <td>0.1110</td> <td>0.1335</td> <td>0.1400</td> <td>0.1417</td> <td>0.1421</td> </tr> <tr> <th>γ</th> <td>0.420</td> <td>0.455</td> <td>0.478</td> <td>0.491</td> <td>0.499</td> <td>0.503</td> <td>0.505</td> <td>0.502</td> <td>0.501</td> <td>0.500</td> </tr> </table> (Ref. 21 for $\nu = 0.3$) | a/b | 1.0 | 1.2 | 1.4 | 1.6 | 1.8 | 2.0 | 3.0 | 4.0 | 5.0 | ∞ | β | 0.2874 | 0.3762 | 0.4530 | 0.5172 | 0.5688 | 0.6102 | 0.7134 | 0.7410 | 0.7476 | 0.7500 | γ | 0.0444 | 0.0616 | 0.0770 | 0.0906 | 0.1017 | 0.1110 | 0.1335 | 0.1400 | 0.1417 | 0.1421 | γ | 0.420 | 0.455 | 0.478 | 0.491 | 0.499 | 0.503 | 0.505 | 0.502 | 0.501 | 0.500 |
| | a/b | 1.0 | 1.2 | 1.4 | 1.6 | 1.8 | 2.0 | 3.0 | 4.0 | 5.0 | ∞ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| β | 0.2874 | 0.3762 | 0.4530 | 0.5172 | 0.5688 | 0.6102 | 0.7134 | 0.7410 | 0.7476 | 0.7500 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| γ | 0.0444 | 0.0616 | 0.0770 | 0.0906 | 0.1017 | 0.1110 | 0.1335 | 0.1400 | 0.1417 | 0.1421 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| γ | 0.420 | 0.455 | 0.478 | 0.491 | 0.499 | 0.503 | 0.505 | 0.502 | 0.501 | 0.500 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1b. Uniform over small concentric circle of radius r_c (note definition of r_c) | (At center) $\sigma_{max} = \frac{3W}{2\pi t^2} \left[(1 + \nu) \ln \frac{2b}{\pi r_c} + \beta \right]$ $\gamma_{max} = \frac{-2W b^2}{E t^3}$ <table border="1"> <tr> <th>a/b</th> <td>1.0</td> <td>1.2</td> <td>1.4</td> <td>1.6</td> <td>1.8</td> <td>2.0</td> <td>∞</td> </tr> <tr> <th>β</th> <td>0.435</td> <td>0.650</td> <td>0.789</td> <td>0.875</td> <td>0.927</td> <td>0.958</td> <td>1.000</td> </tr> <tr> <th>α</th> <td>0.1267</td> <td>0.1478</td> <td>0.1621</td> <td>0.1715</td> <td>0.1770</td> <td>0.1805</td> <td>0.1851</td> </tr> </table> (Ref. 21 for $\nu = 0.3$) | a/b | 1.0 | 1.2 | 1.4 | 1.6 | 1.8 | 2.0 | ∞ | β | 0.435 | 0.650 | 0.789 | 0.875 | 0.927 | 0.958 | 1.000 | α | 0.1267 | 0.1478 | 0.1621 | 0.1715 | 0.1770 | 0.1805 | 0.1851 | | | | | | | | | | | | | | | | | | | | | |
| a/b | 1.0 | 1.2 | 1.4 | 1.6 | 1.8 | 2.0 | ∞ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| β | 0.435 | 0.650 | 0.789 | 0.875 | 0.927 | 0.958 | 1.000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| α | 0.1267 | 0.1478 | 0.1621 | 0.1715 | 0.1770 | 0.1805 | 0.1851 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

502 Formulas for Stress and Strain

Atlas Steels Alfacade 4.0mm panel wind pressure table

Material AS/NZS Properties 1664 3003 H22

| | | | |
|------------------|-----------|---------------------------------------|--|
| E | 70000 MPa | <-- Compressive modulus of elasticity | <-- AS/NZS 1664.1 Table 3.4 (A) for Alloy 3003 Group |
| G | 26250 MPa | <-- Shear modulus of elasticity | <-- AS/NZS 1664.1 Clause 3.4.8.3 |
| t | 4.00 mm | <-- Plate thickness | |
| F _{tu} | 159 MPa | <-- Tensile ultimate strength | <-- Mill Certificate |
| F _{ty} | 144 MPa | <-- Tensile yield strength | <-- Mill Certificate |
| F _{cy} | 124 MPa | <-- Compressive yield strength | <-- Extrapolated from Table 3.3 (A) AS/NZS 1664.1 3003-H16 |
| f _y | 0.95 | <-- Yield capacity factor | <-- AS/NZS 1664.1 Clause 3.4.2 & 3.4.3 |
| f _u | 0.85 | <-- Ultimate capacity factor | <-- AS/NZS 1664.1 Clause 3.4.2 & 3.4.3 |
| k _t | 1.0 | <-- Coefficient for tension members | <-- AS/NZS 1664.1 Table 3.4 (B) |
| f _{F L} | 135 MPa | <-- Limit state bending stress. | <-- AS/NZS 1664.1 Clause 3.4.2 & 3.4.3 |

Flat plate, simply supported (4 sides) maximum principal Stress at mid span due to wind pressure, W_{uls}

$$\sigma_{max} = \frac{\beta q b^2}{t^2} \quad (1)$$

| W_{uls} | Panel width 'b' | Panel Length 'a' | | | | | | | |
|-----------|-----------------|------------------|---------------|-----------|-----------|---------------|---------------|---------------|---------------|
| | | 900.0 mm | 1200.0 mm | 1500.0 mm | 1800.0 mm | 2100.0 mm | 2400.0 mm | 2700.0 mm | 3000.0 mm |
| 1.0 kPa | 600 mm | 10.9 MPa | 13.7 MPa | 14.9 MPa | 16.1 MPa | 16.4 MPa | 16.7 MPa | 16.7 MPa | 16.8 MPa |
| | 900 mm | 14.5 MPa | 21.6 MPa | 27.1 MPa | 30.9 MPa | 32.6 MPa | 34.4 MPa | 36.1 MPa | 36.6 MPa |
| | 1200 mm | 38.4 MPa | 25.9 MPa | 35.6 MPa | 43.7 MPa | 50.0 MPa | 54.9 MPa | 57.2 MPa | 59.6 MPa |
| | 1500 mm | 75.3 MPa | 55.6 MPa | 40.4 MPa | 52.9 MPa | 63.7 MPa | 72.7 MPa | 80.0 MPa | 85.8 MPa |
| 1.5 kPa | 600 mm | 16.4 MPa | 20.6 MPa | 22.3 MPa | 24.1 MPa | 24.5 MPa | 25.0 MPa | 25.1 MPa | 25.2 MPa |
| | 900 mm | 21.8 MPa | 32.4 MPa | 40.6 MPa | 46.3 MPa | 48.9 MPa | 51.6 MPa | 54.2 MPa | 54.9 MPa |
| | 1200 mm | 57.5 MPa | 38.8 MPa | 53.4 MPa | 65.5 MPa | 75.0 MPa | 82.4 MPa | 85.9 MPa | 89.3 MPa |
| | 1500 mm | 112.9 MPa | 83.4 MPa | 60.6 MPa | 79.4 MPa | 95.6 MPa | 109.1 MPa | 120.0 MPa | 128.7 MPa |
| 2.0 kPa | 600 mm | 21.8 MPa | 27.5 MPa | 29.8 MPa | 32.1 MPa | 32.7 MPa | 33.3 MPa | 33.5 MPa | 33.6 MPa |
| | 900 mm | 29.1 MPa | 43.1 MPa | 54.2 MPa | 61.8 MPa | 65.2 MPa | 68.8 MPa | 72.2 MPa | 74.9 MPa |
| | 1200 mm | 76.7 MPa | 51.7 MPa | 71.2 MPa | 87.3 MPa | 100.1 MPa | 109.8 MPa | 114.5 MPa | 119.1 MPa |
| | 1500 mm | Stiffener R'd | 111.2 MPa | 80.8 MPa | 105.8 MPa | 127.4 MPa | Stiffener R'd | Stiffener R'd | Stiffener R'd |
| 2.5 kPa | 600 mm | 27.3 MPa | 34.3 MPa | 37.2 MPa | 40.1 MPa | 40.9 MPa | 41.7 MPa | 41.9 MPa | 42.1 MPa |
| | 900 mm | 36.4 MPa | 53.9 MPa | 67.7 MPa | 77.2 MPa | 81.5 MPa | 86.0 MPa | 90.3 MPa | 91.4 MPa |
| | 1200 mm | 95.9 MPa | 64.7 MPa | 89.0 MPa | 109.1 MPa | 125.1 MPa | Stiffener R'd | Stiffener R'd | Stiffener R'd |
| | 1500 mm | Stiffener R'd | Stiffener R'd | 101.0 MPa | 132.3 MPa | Stiffener R'd | Stiffener R'd | Stiffener R'd | Stiffener R'd |

Notes:

- Roark's Formulas for Stress and Strain Table 11.4, Chapter 11, Page 502
- Plate principal stress near fixings, equi-spaced @ 300mm maximum centres, due to negative wind pressure can be calculated by multiplying Table Stress by 1.3
Stress at fixing shall be less than specified AS/NZS 1664.1 limit state bending stress, provided above.
Where stress at fixings non-compliant, fixing spacing need to be reduced. In such case, consult manufacturer.

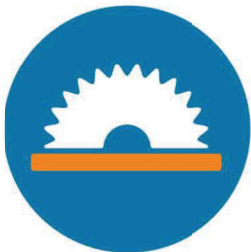
TABLE 11.4 Formulas for flat plates with straight boundaries and constant thickness

NOTATION: The notation for Table 11.2 applies with the following modifications: a and b refer to plate dimensions, and when used as subscripts for stress, they refer to the stresses in directions parallel to the sides a and b , respectively. σ is a bending stress which is positive when tensile on the bottom and compressive on the top if loadings are considered vertically downward. R is the reaction force per unit length normal to the plate surface exerted by the boundary support on the edge of the plate. r_c is the equivalent radius of contact for a load concentrated on a very small area and is given by $r_c = \sqrt{1.6r_s^2 + t^2} - 0.675t$ if $r_s < 0.5t$ and $r_c = r_s$ if $r_s \geq 0.5t$

| Case no., shape, and supports | Case no., loading | Formulas and tabulated specific values | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|---|--------|--------|--------|--------|----------|--------|----------|---------|----------|-------|----------|---------|--------|--------|--------|----------|--------|--------|--------|--------|--------|--------|----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1. Rectangular plate; all edges simply supported | 1a. Uniform over entire plate | $(\text{At center}) \sigma_{max} = \sigma_b = \frac{\beta q b^2}{t^2}$ and $\gamma_{max} = \frac{-2q b^4}{E t^3}$ $(\text{At center of long sides}) R_{max} = 7q b$ <table border="1"> <tr> <th>a/b</th> <td>1.0</td> <td>1.2</td> <td>1.4</td> <td>1.6</td> <td>1.8</td> <td>2.0</td> <td>3.0</td> <td>4.0</td> <td>5.0</td> <td>∞</td> </tr> <tr> <th>β</th> <td>0.2874</td> <td>0.3762</td> <td>0.4530</td> <td>0.5172</td> <td>0.5688</td> <td>0.6102</td> <td>0.7134</td> <td>0.7410</td> <td>0.7476</td> <td>0.7500</td> </tr> <tr> <th>γ</th> <td>0.0444</td> <td>0.0616</td> <td>0.0770</td> <td>0.0906</td> <td>0.1017</td> <td>0.1110</td> <td>0.1335</td> <td>0.1400</td> <td>0.1417</td> <td>0.1421</td> </tr> <tr> <th>γ</th> <td>0.420</td> <td>0.455</td> <td>0.478</td> <td>0.491</td> <td>0.499</td> <td>0.503</td> <td>0.505</td> <td>0.502</td> <td>0.501</td> <td>0.500</td> </tr> </table> <p>(Ref. 21 for $\nu = 0.3$)</p> | a/b | 1.0 | 1.2 | 1.4 | 1.6 | 1.8 | 2.0 | 3.0 | 4.0 | 5.0 | ∞ | β | 0.2874 | 0.3762 | 0.4530 | 0.5172 | 0.5688 | 0.6102 | 0.7134 | 0.7410 | 0.7476 | 0.7500 | γ | 0.0444 | 0.0616 | 0.0770 | 0.0906 | 0.1017 | 0.1110 | 0.1335 | 0.1400 | 0.1417 | 0.1421 | γ | 0.420 | 0.455 | 0.478 | 0.491 | 0.499 | 0.503 | 0.505 | 0.502 | 0.501 | 0.500 |
| | a/b | 1.0 | 1.2 | 1.4 | 1.6 | 1.8 | 2.0 | 3.0 | 4.0 | 5.0 | ∞ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| β | 0.2874 | 0.3762 | 0.4530 | 0.5172 | 0.5688 | 0.6102 | 0.7134 | 0.7410 | 0.7476 | 0.7500 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| γ | 0.0444 | 0.0616 | 0.0770 | 0.0906 | 0.1017 | 0.1110 | 0.1335 | 0.1400 | 0.1417 | 0.1421 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| γ | 0.420 | 0.455 | 0.478 | 0.491 | 0.499 | 0.503 | 0.505 | 0.502 | 0.501 | 0.500 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1b. Uniform over small concentric circle of radius r_c (note definition of r_c) | $(\text{At center}) \sigma_{max} = \frac{3W}{2\pi t^2} \left[(1 + \nu) \ln \frac{2b}{\pi r_c} + \beta \right]$ $\gamma_{max} = \frac{-2W b^2}{E t^3}$ <table border="1"> <tr> <th>a/b</th> <td>1.0</td> <td>1.2</td> <td>1.4</td> <td>1.6</td> <td>1.8</td> <td>2.0</td> <td>∞</td> </tr> <tr> <th>β</th> <td>0.435</td> <td>0.650</td> <td>0.789</td> <td>0.875</td> <td>0.927</td> <td>0.958</td> <td>1.000</td> </tr> <tr> <th>α</th> <td>0.1267</td> <td>0.1478</td> <td>0.1621</td> <td>0.1715</td> <td>0.1770</td> <td>0.1805</td> <td>0.1851</td> </tr> </table> <p>(Ref. 21 for $\nu = 0.3$)</p> | a/b | 1.0 | 1.2 | 1.4 | 1.6 | 1.8 | 2.0 | ∞ | β | 0.435 | 0.650 | 0.789 | 0.875 | 0.927 | 0.958 | 1.000 | α | 0.1267 | 0.1478 | 0.1621 | 0.1715 | 0.1770 | 0.1805 | 0.1851 | | | | | | | | | | | | | | | | | | | | | |
| a/b | 1.0 | 1.2 | 1.4 | 1.6 | 1.8 | 2.0 | ∞ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| β | 0.435 | 0.650 | 0.789 | 0.875 | 0.927 | 0.958 | 1.000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| α | 0.1267 | 0.1478 | 0.1621 | 0.1715 | 0.1770 | 0.1805 | 0.1851 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

502 Formulas for Stress and Strain

Atlas Steels Alfacade Fabrication details



Cutting

Atlas Steels Alfacade can be cut using various types of saw with an appropriate type aluminium blade used in your circular saw, wall saw or jigsaw, consult with your supplier for best suited option. A cutting coolant system is recommended when processing.

Tool

(CNC) 4.76mm single flute upsiral cutter

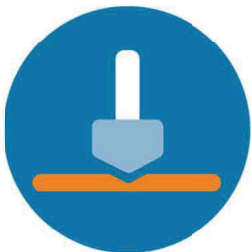
Feed

1,500mm/minute

Spindle

21,000mm/minute

angle entry when cutting panel is recommended. Cutting fluid required.



Grooving

The preferred V-Groove-routing method of Atlas Steels Alfacade is to be done via CNC machine to maintain consistency, of routed depth, by leaving 0.7-1.0mm of material at the base of the route. A cutter coolant system is recommended when processing.

Tool

(CNC) 4.76mm single flute upsiral cutter

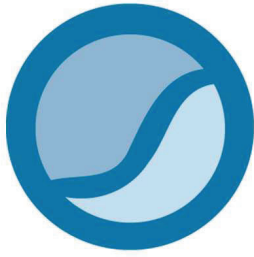
Feed

1,500mm/minute

Spindle

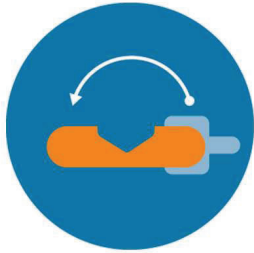
21,000mm/minute

NOTE: angle entry when routing panel is recommended. Cutting fluid required.



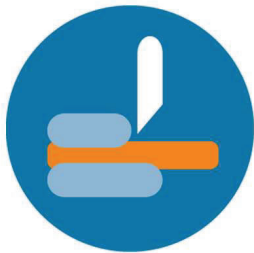
Radius/Profile cutting

The use of CNC machine, jigsaws and waterjet cutters are recommended for any curved profile cutting. A cutter coolant system is recommended when processing.



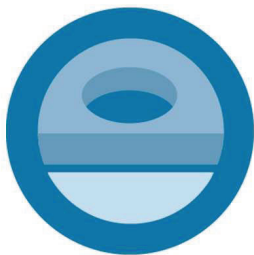
Folding

To fold the Atlas Steels Alfacade once routed, the use of pan break or a break press machine is recommended, especially for large format panels.



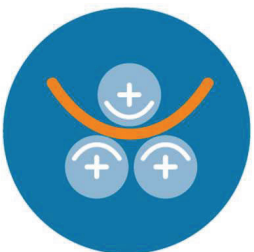
Shearing

Atlas Steels Alfacade panels can be guillotined face up for quick size processing of panels. Ensure the panel is protected from any potential damage during this process.



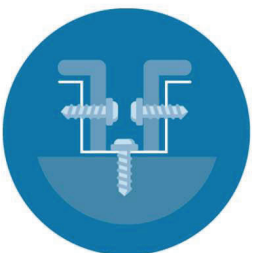
Perforating

Atlas Steels Alfacade can be punched/perforated by turret punch machines, always punch the panels face up to the tooling, as a general rule 3.0mm minimum spacing between punched holes is required.



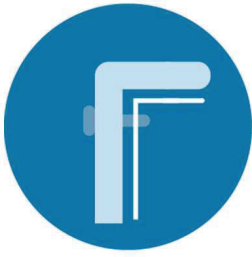
Roll Bending

Mandrill roller systems can be used to produce curved/radius in Atlas Steels Alfacade panels. Ensure roller sets are cleaned thoroughly before processing so not to damage the painted surface.



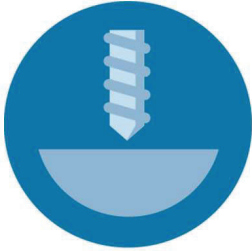
Screwing

When screw fixing Atlas Steels Alfacade the use of stainless, class 3 or 4 SDS steel screws are recommended. A facade washer can also be implemented to protect painted surface, thermal expansion/contraction also needs to be allowed for.



Riveting

When rivet fixing Atlas Steels Alfacade the use of stainless, or aluminium blind or solid rivets can be used. Protect painted surface from any possible damage, thermal expansion/contraction also needs to be allowed for.



Drilling

The use of high-speed steel (HSS) drills are recommended for any drilling required on Atlas Steels Alfacade, always drill from the panel face so not to bur the painted surface.



Bending

Atlas Steels Alfacade 3.0mm and 4.0mm panels can be folded by break press machines without having to be V routed, minor fracturing of the paint may occur which is acceptable under the Atlas Steels Alfacade warranty.