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Introduction

Thank you for choosing the Flexi Rail solar panel mounting system. Flexi Rail is made from industrial strength Aluminium to give it superior strength and the range of components gives you the ultimate flexibility in sizing and locating your solar array.

Flexi Rail is packed with features to help make your solar system installation quick and simple. With fittings that can be secured to the rail at any point and features built into the clamps that add extra security and stability, Flexi Rail has been engineered for convenience.

Flexi Rail has been designed specifically for Australian roofs and weather conditions. The structure has been certified not only to the Australian/New Zealand Standard for Wind Actions (AS/NZ 1170.2), but also to the Australian Standards for Timber, Aluminium and Residential Timber buildings (AS 1720.1, AS1664.2, AS1684.3 & AS1684.4).

The Flexi Rail system should contain the necessary components for mounting a solar PV system to a rooftop. Flexi Rail should only be installed by a qualified installer. The following instructions assume a proficient level of competence and understanding of solar array installations.

**WARNING:** indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury. This symbol is not used for hazards relating to property damage unless there is also a risk of personal injury to this level.

**CAUTION:** indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to draw attention to unsafe practices that may cause damage to property.
Installer’s Responsibilities

1. Complying with all applicable local or national building codes.

2. Complying with all workplace health and safety issues.

3. Ensuring that Flexi Rail and other products are appropriate for the particular installation and the installation environment.

4. Establishing that site location is suitable for the engineered rating of the system (as per engineer’s certification available on request) including height from the ground, location on roof and local topography etc.

5. Installing Flexi Rail as per engineer’s recommended minimum/maximum spacings and layout drawings (see figs #17,#18,#22,#23,#24 and #25).

6. Making sure that the roof, its rafters, connections, and other structural support members can support the panels and mounting system under building live load conditions and that they are not damaged thus weakening their strength. Taking into account possible snow or earthquake variables, if in doubt contact an engineer or building specialist.

7. Maintaining the waterproof integrity of the roof, including selection of appropriate flashings or sealants.

8. Ensuring safe installation of all electrical and mechanical aspects of the PV array with attention to no live current entering rail system or roof in any way.

INSTALLATION OF THIS PRODUCT IS TO BE PERFORMED ONLY BY PROFESSIONALLY TRAINED INSTALLERS. Any attempt by an unqualified person to install this product could result in death or serious injury.
## Maximum Roof Fixing Spacing
Both Non-Cyclonic and Cyclonic

![Map of Australia with regions labeled A to D](image)

Source: AS NZS 1170.2-2002 Structural design actions - Wind actions

<table>
<thead>
<tr>
<th>Roof Type</th>
<th>Fixing Into</th>
<th>Fixing Type</th>
<th>Non-Cyclonic Max Centres (Regions A and B)</th>
<th>Cyclonic Max Centres (Regions C and D)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tin</td>
<td>Battens</td>
<td>TIN Roof Fixing Kits and Roof Pucks</td>
<td>650mm</td>
<td>325mm</td>
</tr>
<tr>
<td>Tile</td>
<td>Rafters</td>
<td>TILE Roof Fixing Kits (Roof Hooks and Fixings)</td>
<td>1200mm (middle clamp centrally located)</td>
<td>N/A consult an engineer</td>
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# Flexi Rail Components

<table>
<thead>
<tr>
<th>Item 1 - Rail Extrusion</th>
<th>Item 2 - End Clamp Assembly</th>
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</thead>
<tbody>
<tr>
<td><img src="image" alt="Rail Extrusion" /></td>
<td><img src="image" alt="End Clamp Assembly" /></td>
</tr>
<tr>
<td>2600 or 3420 long</td>
<td>2A-End clamp</td>
</tr>
<tr>
<td></td>
<td>2B-End clamp bolt</td>
</tr>
<tr>
<td></td>
<td>(socket head screw)</td>
</tr>
<tr>
<td></td>
<td>2C-End clamp snapnut</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item 3 - Mid Clamp Assembly</th>
<th>Item 4 - L-Foot Assembly</th>
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</thead>
<tbody>
<tr>
<td><img src="image" alt="Mid Clamp Assembly" /></td>
<td><img src="image" alt="L-Foot Assembly" /></td>
</tr>
<tr>
<td>3A-Mid clamp</td>
<td>4A-L-foot</td>
</tr>
<tr>
<td>3B-Mid clamp bolt</td>
<td>4B-#14 Tek screw</td>
</tr>
<tr>
<td>(socket head screw)</td>
<td>x 75mm</td>
</tr>
<tr>
<td>3C-Mid clamp snapnut</td>
<td>4C-L-Foot snapnut</td>
</tr>
<tr>
<td></td>
<td>&amp; threaded rod</td>
</tr>
<tr>
<td></td>
<td>4D-M8 flat washer</td>
</tr>
<tr>
<td></td>
<td>4E-M8 spring washer</td>
</tr>
<tr>
<td></td>
<td>4F-M8 hex nut</td>
</tr>
<tr>
<td></td>
<td>4G-EPDM large flat washer</td>
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</table>

<table>
<thead>
<tr>
<th>Item 5 - Rail Joiner Assembly</th>
<th>Item 6 - Roof Puck (for corrugated roofs)</th>
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</thead>
<tbody>
<tr>
<td><img src="image" alt="Rail Joiner Assembly" /></td>
<td><img src="image" alt="EPDM Strip" /></td>
</tr>
<tr>
<td>5A-Rail joiner &amp; threaded rod</td>
<td>EPDM strip top and bottom</td>
</tr>
<tr>
<td>5B-Flat serrated Aluminium washer</td>
<td></td>
</tr>
<tr>
<td>5C-M8 flat washer</td>
<td></td>
</tr>
<tr>
<td>5D-M8 spring washer</td>
<td></td>
</tr>
<tr>
<td>5E-M8 hex nut</td>
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<table>
<thead>
<tr>
<th>Item 7 - Roof Tile Hook Assembly</th>
<th>Item 8 - Cable Cover</th>
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<tr>
<td><img src="image" alt="Roof Tile Hook Assembly" /></td>
<td><img src="image" alt="Cable Cover" /></td>
</tr>
<tr>
<td>7A-Roof tile hook</td>
<td>1000mm</td>
</tr>
<tr>
<td>7B-M8 hex nut</td>
<td></td>
</tr>
<tr>
<td>7C-M8 spring washer</td>
<td></td>
</tr>
<tr>
<td>7D-M8 flat washer</td>
<td></td>
</tr>
<tr>
<td>7E-#14 Tek screw x 55mm</td>
<td></td>
</tr>
<tr>
<td>7F-M8 J-bolt</td>
<td></td>
</tr>
<tr>
<td>7G-M8 L-bolt</td>
<td></td>
</tr>
</tbody>
</table>
Roof Fixing Kits

Tin Roof Fixing Kits
L-Foot and Roof Puck Installation

Set up one roof puck (Item 6) and L-foot (Item 4) in position (Fig #3) and run a string line or chalk line square across the roof line to the last roof puck or a marker (Fig #4) and then mark the correct spacing according to engineer’s layout drawing or max spacing allowable for the wind zone requirement of your installation (Fig 6 & 7). Cyclonic zones require additional interface kits.

Fig #1
Item 4 - L-Foot Assembly

Fig #2
Item 6 - Roof Puck

Fig #3

Fig #4
Chalk Line

Fig #5
Chalk Line
1. Locate and screw in all intermediate roof pucks and L-feet (Item 4A) with Tek screws (Item 4B) as per engineer’s layout drawings or max spacing allowed along the string or chalk line (Fig #5).

2. If the setup is a “retrofit” over existing Tek screws you will need to unscrew existing self drilling metal type screws and replace with the higher rated Timber type Tek Screws provided (Item 4B).

3. If the setup is on a new roof, pre drill the holes with a pilot drill of approximately 5mm making sure that all swarf is swept up off the roof surface and gutters. A roof puck used as a locator helps stop the drill from skipping around. All screws need to be at a minimum located into fixed roof battens.

4. Use the rectangular EPDM washer (Item 4G) supplied with the L-feet either above or below the roof puck as a secondary waterproofing barrier.

**Maximum L-Foot Spacing for Both Non-Cyclonic and Cyclonic Drawings**

![Fig #6: Max L-Foot Spacing in Cyclonic Zone](image)

![Fig #7: Max L-Foot Spacing in Non-Cyclonic Zone](image)

325mm max

650mm max
Tile Roof Fixing Kits
Tile Hook, Tile Hook Fixings and Snapnuts

Lift tiles and locate Certified Tile Hooks onto rafters as per instructions below. A minimum of 6 Tile Hooks per 3 or 4 panel rail kit must be attached. See Fig #12 and #13 on page 11 for layouts.
**Roof Tile Hook Installation Instructions**

1. Locate rafter positions and lift tile(s) and place safely off to one side.

2. Position tile bracket strap in the lowest trough of the tile directly above the rafter position.

3. Move the tile bracket sideways to align holes in Tile hook so that the J-Bolt and L-bolt can be placed either side of the rafter. When in position screw in with the Tek screw provided to hold the bracket in place whilst fitting the J-bolt and L-bolt.

4. Cut very small slits in the sarking if present either side of the rafter where the J-bolt and L-bolt are to be placed.

5. Thread the L-bolt through the slit in the sarking and turn it so that the short leg faces perpendicular to the rafter and is hooked under the rafter by threading it back up through the slotted hole in the roof tile hook. When in position loosely, tighten up with the flat & spring washers and hex nut. See Fig #10 and #11).

6. Use a similar action to locate the J-bolt beside the rafter making sure that the J-bolt locates between the rafter and the stop-end of the L-bolt and can’t slide off. Firmly tighten both bolts once roof tile hook is in a straight line with other hooks.

7. Use a driver to tighten the L and J-bolt nuts to a min of 8 to 9 Nm.

8. After fitting remaining roof tile hooks at no greater than 1200mm centres align all hooks before starting resealing process.

9. Reseal small slits in sarking with suitable tape or sealant.

10. Position the removed tile back into place. It may be necessary to remove the lower return lip near the strap of the tile hook if it does not allow the tile back into a sealable situation. If necessary use sealant to make sure that no water can penetrate back under the tile.
Maximum Tile Hook Spacing for Both Non-Cyclonic and Cyclonic Drawings

Fig #12

Fig #13
Rail and Clamp Setup

Rail Setup Instructions

1. Measure the panel width being used and allow for each panel width plus 20mm for each mid clamp and a min of 35mm for each end clamp (this allows 10 mm of rail overhang past each end clamp in total). The more overhang the less chance of any installation errors (note some very wide panels may not fit without using extra rail and joiners).

2. Trim rail if necessary or leave extra overhang in place. See Fig #16, #17, #18 and #19 with reference to maximum allowable spacing based on installation wind zone and location. If in doubt in any way contact us regarding fitting layout or consult your engineer.

3. After setting up all L-feet to max certified spacing in Fig #16, #17, #18 and #19 rest rail along L-feet with the serrated side closest to the serrated side of the L-feet.

4. Undo the hex nuts and washers off the snapnut assemblies provided with the L-feet.

5. Locate all L-foot bolts (threaded rod and snap nuts only) into the rail in line with the L-feet holes (fig #14).

6. Carefully rotate the rail 90 degrees into the L-feet holes and loosely attach the flat and spring washers and the hex nut to the end of the snapnut bolts.

7. Move along the rails and make sure all bolts are through the L-feet and correctly affixed with all washers and nuts loosely attached.

8. Move to the centre of the rail and adjust height of rails and check that the two rails are perpendicular and squared off at each end.

9. Re-adjust any L-feet that are out of line then. When they are in the final position move along and tighten all nuts firmly to 8-9Nm.

10. Double check all fixings including Tek Screws are tightened firmly.
Joiner Instructions

1. When a rail joiner is being used to connect multiple rail lengths, position and slide the joiner into the rail opening on the serrated side, keeping the middle bolt as close to the join as possible.

2. Secure with large flat aluminium washers, spring washers and hex nuts. Tighten firmly when straight and fully aligned to 8-9Nm.

3. If the joiner is located near where an L-foot should be then the joiner bolt can be used to affix the L-foot in place of the snapnut bolt provided with the L-foot.
3 Panel System

1. Measure the centre of the rail and measure half a panel distance either side and mark both rails on both sides (this can be done on the ground in advance). If preferred also measure and mark 20mm (mid clamp width) then a full panel width to show locations of panels on both sides of middle panel.

2. If joining to another rail for greater lengths see earlier joiner instructions in Fig #15.

3. Adjust the thread of mid clamps (item 3) out as far as practical on the snapnut and thread into rail as per Fig #20 after positioning outside of where the middle panel is to be located then start lifting first panel into place.

4. If preferred locate the spare M8 socket screws or pins supplied into any suitable holes on the underside of your panels to act as a temporary locater so that they do not slide off the rails when locating the panels.

5. Move panels into correct position and start clamp down process. Lightly tighten mid clamps off after sliding panel to the exact middle location. Place surrounding panels and fit end clamps at outer extremities (see fig #17 and clamp down process in more detail on the following page).
6. After checking central locations and that all panels are aligned, tighten all clamps firmly making sure nothing foreign is fouling them and they are all aligned and even, paying attention that the end clamp’s location and proximity to the end of the rail is no less than 10mm. Double check all clamps to make sure system is locked, solid and safe.

7. Take extra care to temporarily secure panels if fitting in windy or difficult conditions. Always use responsible OH&S practices. Do not use rails and clamps as a part of your safety system.
4 Panel System

1. Measure to the centre of the rail and mark the rail at the centre + 10mm to both sides (half of mid clamp width). Then measure out one full panel width. Use these marks to locate the first panel either side of the centre and if preferred mark 20mm for each mid clamp then the remaining panel widths etc.

2. Fit all panels as per 3 panel clamp down process mentioned earlier taking care to finish off with the end clamps no closer than 10mm from the end of the rail and tighten all clamps to 8-9Nm.

Fig #18: Typical 4 Panel Layout (non-cyclonic zones)

Fig #19: Typical 4 Panel Layout (cyclonic zones)
Clamp Down Process

General notes regarding clamps/snapnut location into rail.

1. Adjust bolts so that they are only half way threaded into the snapnut on the end or mid clamps.

2. Turn snapnut so that the lower lug matches to the thicker ridge in the extrusion, keep bracket out of the way by pushing with your finger on the socket screw head whilst holding the bracket up. If unsure of which direction the snapnut goes into the rail, slide one into the end of the extrusion and note its position.

3. Locate the snapnut/bracket assembly into the rail on a forward angle and tilt backwards and upwards so that the snap nut jumps the smallest keeper pip.

4. Slide up to the panel or other fixing and after checking it is in the correct location tighten finger tight until all panels or fixings are in place.

5. After aligning all panels tighten from the outside inward to approx 8 to 9 Nm.
Cable Cover Installation

Cable covers keep wires hidden within rails and protect from vermin attack.

1. After fitting and wiring up the panels check the lengths of any covers required and cut to suit if necessary.

2. Inspect which way the cable cover goes into the rail before attempting to install (fits one way only). The ‘U’ edge of the cable cover fits into the bottom of the rail opening (fig #21).

3. Locate cable covers (Item 8) into the rail by feeding in the flat/small thin lug side into the rail opening then levelling out the cable cover flat with rail surface before snapping cover in with your fingers starting at one end and by applying pressure along the cover approximately every 200mm.

4. If resistance appears too great spray detergent and water on sliding face and make sure cover is level with rail face before attempting to snap in.

5. Whilst snapping into position, take care not to pinch any wires lying in the rail opening.

6. If cover needs to be taken out later use a Screwdriver as a lever in one end but only if it does not come into contact with any wires.

Fig #21: Item 8 - Cable Cover
Warranty

Warranty of Materials

RFI warrants the Flexi Rail products shall be free from defects in material and workmanship for a period of ten (10) years from the date of supply from RFI.

Environmental Care and Maintenance

The Flexi Rail products supplied are the result of extensive research and development and designed to resist corrosion, rusting and staining, but as with all metals exposed to external elements, the occurrence of such corrosion, rusting and staining is determined by the environment in which the Flexi Rail products are installed and the level of care and maintenance applied to the Flexi Rail products after installation.

Proper care and maintenance will limit the impact of corrosion, rusting and staining but not necessarily eliminate their impact over time. The Flexi Rail products will need to be washed down with a soft bristled brush using warm water and mild detergent. The Flexi Rail products should then be rinsed well with fresh water and any detergent residue is to be removed. Strong detergents and abrasive cleaners should never be used to clean the products as they may scratch or damage the surface finish.

Depending on how harsh the environment elements are, the maintenance period will vary. Refer to the recommended maintenance period table below.

Recommended Maintenance Period Table

<table>
<thead>
<tr>
<th>Environment</th>
<th>Recommended Maximum Maintenance Interval</th>
<th>Recommended Maximum Maintenance Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mill Finish Aluminium</td>
<td>Other Products</td>
</tr>
<tr>
<td>Mild</td>
<td>three months</td>
<td>six months</td>
</tr>
<tr>
<td>Moderate</td>
<td>one month</td>
<td>three months</td>
</tr>
<tr>
<td>Tropical/Severe</td>
<td>one week</td>
<td>one month</td>
</tr>
</tbody>
</table>
Environmental Definitions

Mild – Being rural, away from the coast and remote from industry and urban activity.

Moderate – Being mainly urban, inland and away from heavy industry.

Tropical – Being coastal/marine, subject to salt deposition and within 15km of the Eastern coast or 10km of the Western coast of Australia.

Dissimilar Metals

RFI does not warrant against the impact of galvanic reactions which can occur when dissimilar metals like stainless steel, zinc and aluminium come into contact with one another. Such reactions may be minimized with the application of a barrier paste at time of installation.

Certification and Standards

RFI warrants Flexi Rail products have been designed to meet Australian Standards for Solar Panels up to 20Kg in weight each and with maximum dimensions of 1.0m x 1.7m if installed as per the 3 and 4 panel cyclonic and non-cyclonic layout drawings in the Flexi Rail™ Installation Manual. This system can be installed in cyclonic areas according to maximum wind gusts detailed in Table 1.1 of AS1684.3 Residential Timber framed Construction (Areas C1,C2 & C3) and Non Cyclonic areas in accordance with Table 1.1 of AS1684.4 (Areas N1,N2,N3 &N4).

The following Australian Standards also apply:

- AS/NZS 1170 Structural Design Actions Parts 0 to 2 inclusive
- AS 1664.2 Aluminium Structures-Allowable Stress Design
- AS1684.3 Residential Timber Framed Construction-Cyclonic Areas
- AS1684.4 Residential Timber Framed Construction-Non Cyclonic Areas
- AS 1720.1 Timber Structures-Design Methods
Warranty Exclusions and Limitations

The warranties provided herein do not cover damage, malfunctions or service failures caused by:

1. Failure to follow RFI's installation, operation or maintenance instructions.

2. Installation of the Flexi Rail products in an environment for which they were not designed.

3. Repair, modifications, or movement of product from its initial installation.

4. Abuse, misuse, or acts of neglect.

5. Fire, flood, pest damage, accidental breakage, actions of third parties and other events or accidents outside of RFI's reasonable control and not arising under normal operating conditions.

6. Breakage of Solar Panels when mounted in the Flexi Rail mounting system. Due care should be taken to ensure the Flexi Rail products are used with structurally sound and certified solar panel types in accordance with solar panel manufacturers recommendations. If in doubt please contact the solar panel supplier for this information.