

Guide to good practice – steel roofing and photovoltaic panels

INTRODUCTION

When installing photovoltaic (PV) panels to roofing made from COLORBOND® prepainted steel or ZINCALUME® aluminium/zinc/magnesium alloy coated steel, the following installation and maintenance practices will assist in maintaining the water tightness, functionality and durability of the roof.

This Technical Bulletin relates to the installation of framed PV panels mounted above steel roofing as shown in *Figure 1*.

Figure 1: An example of a framed PV panel mounted above a steel roof



PV INSTALLATION CONSIDERATIONS

When installing PV panels it is important to consider the following:

Clearance between PV panels and the roof

PV panels installed on a COLORBOND® steel or ZINCALUME® steel roof, shield the roof from the sun and prevent beneficial washing from rainfall. Areas on the roof directly beneath the PV panels are considered to be unwashed and may be subject to accelerated corrosion due to an accumulation of dirt, salt and other airborne contaminants which may retain moisture for extended periods due to condensation or high humidity. Refer to [Corrosion Technical Bulletin CTB-8 Building Applications](#). The provision of adequate clearance between PV panels and roofing made from COLORBOND® steel or ZINCALUME® steel will help to:

- Facilitate self-cleaning and limit the build up of leaves and other debris.
- Provide sufficient access for the cleaning, inspection and maintenance of the roofing material, including removal of any accumulated contaminants, and fasteners beneath the PV panels.
- Allow air movement to quickly dry areas beneath the PV panels. This may also be beneficial to the performance of the PV panels as electrical output is usually temperature dependant.

Compatibility of materials with roofing made from COLORBOND® steel or ZINCALUME® steel

- Dissimilar metals, such as stainless steel, lead, brass, copper and copper containing alloys (such as MONEL®) should not be used in direct contact, or contact that could create electrical connection, with roofing made from COLORBOND® steel or ZINCALUME® steel. This also includes conductive seals, washers and gaskets. Refer to [Corrosion Technical Bulletin CTB-12 Dissimilar metals](#).
- Avoid PV panels, or any introduced flashings, which utilise materials such as copper and lead as these materials have the potential to create water run-off onto roofing made from COLORBOND® steel or ZINCALUME® steel resulting in bi-metallic corrosion. Refer to [Technical Bulletin TB-8 Flashing Materials for COLORBOND® steel and ZINCALUME® steel sheet](#).
- Ensure any sealant in contact with roofing made from COLORBOND® steel or ZINCALUME® steel is 'neutral cure' silicone. Avoid acetic acid based sealants. Refer to [Technical Bulletin TB-9 Sealants for exterior finishes](#).
- Timber used in direct contact with roofing made from COLORBOND® steel or ZINCALUME® steel that has the potential to become damp (as a result of exposure to rainfall, cleaning water or high humidity) can result in accelerated corrosion of the roofing. Furthermore, treated timber has the potential to leach and drip corrosive substances onto the roof. Use of timber on the top surface of the roof should therefore be avoided. Refer to [Corrosion Technical Bulletin CTB-13 Contact with timber](#).

Avoiding potential damage to the COLORBOND® steel or ZINCALUME® steel roof

Foot traffic can dent, scuff or scratch the roof sheeting. Please refer to the roofing manufacturer for recommendations relevant to the roof sheeting profile to avoid damage from foot traffic.

- Dents may need to be rectified to avoid water ponding, which is more likely on low pitched roofs. Ponded water exposes COLORBOND® steel and ZINCALUME® steel to an extended period of wetness which may increase the potential for corrosion or water ingress.
- Scuffing, which is more likely on steeper pitched roofs, is typically an aesthetic issue that is unlikely to have any detrimental effect on the performance of roofing made from COLORBOND® steel or ZINCALUME® steel.
- For information regarding scratches please refer to [Technical Bulletin TB-2 Overpainting and Restoration of Exterior BlueScope Steel Products](#)

Sunscreens

Sunscreens containing semi-conducting metal oxides such as titanium dioxide (TiO₂) and zinc oxide (ZnO) can accelerate the degradation of organic materials, including paint systems. To protect the surface of roofing made from COLORBOND® steel, it is recommended that titanium dioxide (TiO₂) and zinc oxide (ZnO) containing sunscreens **DO NOT** contact the COLORBOND® steel surface. Refer to [Technical Bulletin TB-13](#) *General Guide to Good Practices in the use of Steel Roofing and Walling Products*.

Maintaining the watertightness of the existing roof made from COLORBOND® steel or ZINCALUME® steel

- The installation of PV panels should allow free drainage of moisture from all surfaces and avoid the ponding of water.
- Any penetrations through the roof should be placed in such a manner so as to minimise the risk of water ingress. Penetrations through the roofing sheet should be properly sealed using appropriate flashings and sleeves, and/or neutral-cure silicone sealants. Refer to [Technical Bulletin TB-8](#) *Flashing materials for COLORBOND® steel and ZINCALUME® steel sheet*, and relevant industry standards.
- Avoid valley fixing or valley holes for electrical cables.
- PV fasteners and brackets should be installed away from sheet side laps as they may distort the profile and interfere with the specifically designed anti-capillary laps, leading to the ingress of water.

Rainwater collection

If rainwater from the roof is collected for domestic use, check with the supplier of the PV system to ensure that it does not interfere with the required water quality.

Fasteners and brackets

Fasteners and brackets used in the installation of the PV panel should have a service life comparable with the expected performance of the roofing made from COLORBOND® steel or ZINCALUME® steel and be appropriate for the PV panels. This includes the replacement of any corroded roofing fasteners that will be located beneath the new PV panels. Refer to fastener manufacturer recommendations.

Swarf

During the installation of the PV panels or ancillary items, daily removal of swarf should be conducted. Refer to [Technical Bulletin TB-5](#) *Swarf staining of steel profiles*.

Electrical cables

Electrical cables should not sit directly upon the roof as this may lead to the accumulation of dirt, salt and other airborne contaminants. Alternatively, affix cables to the PV panel support structure.

Earthing

Ensure appropriate earthing of the PV system. Stray currents to the roof made from COLORBOND® steel or ZINCALUME® steel may accelerate corrosion. Refer to Australian and New Zealand Standard AS/NZS 5033:2012 *Installation and safety requirements for photovoltaic (PV) arrays*.

Safety

- For both the installation of PV panels and ongoing maintenance, BlueScope Steel recommends working safely in accordance with relevant State legislation.

- Precautions should be taken to ensure that any worker or equipment does not come in contact with overhead power lines or other electrical items.
- The surface of roofs can be slippery when wet, hence working on a wet roof is not recommended.

MAINTENANCE

As unwashed areas have an increased risk of corrosion compared to washed areas, regular cleaning is recommended. Generally, unwashed areas should be cleaned with fresh, potable water, at least every 3 months for coastal or industrial areas and at least every 6 months in other applications. This may coincide with any periodic or scheduled PV panel cleaning. Further guidance for maintaining unwashed areas is contained in [Technical Bulletin TB-4](#) *Maintenance of COLORBOND® steel and ZINCALUME® steel*.

Maintenance should also include an inspection of the condition of the roofing fasteners, as well as the surface condition of roofing made from COLORBOND® steel or ZINCALUME® steel. This will allow a review of the washing frequency, whether any fasteners require replacement and if remedial work is required to the roof sheeting.

The recommendations above regarding potential damage to the COLORBOND® steel or ZINCALUME® steel roof also apply to maintenance work conducted on the roof.

Other maintenance considerations include (but are not limited to):

- ensuring that any washing does not flood the eaves of the building, which could cause damage to ceilings.
- adhering to relevant State/Territory/Municipality water restrictions.
- ensuring that runoff from any washing does not contaminate rainwater collected in tanks or local water courses.

NOTE:

For further details and guidelines about installing PV systems refer to the website of the Clean Energy Council: <http://www.cleanenergycouncil.org.au/>

RELATED TECHNICAL BULLETINS:

[Technical Bulletin TB-2](#)

Overpainting and Restoration of Exterior BlueScope Steel products

[Technical Bulletin TB-4](#)

Maintenance of COLORBOND® steel and ZINCALUME® steel

[Technical Bulletin TB-5](#)

Swarf Staining of Steel Profiles

[Technical Bulletin TB-8](#)

Flashing Materials for COLORBOND® steel and ZINCALUME® steel sheet

[Technical Bulletin TB-9](#)

Sealants for exterior finishes

[Technical Bulletin TB-13](#)

Guide to Good Practices in the use of Steel Roofing and Walling Products

[Corrosion Technical Bulletin CTB-8](#)

Building Applications

[Corrosion Technical Bulletin CTB-12](#)

Dissimilar Metals

[Corrosion Technical Bulletin CTB-13](#)

Contact with Timber

REFERENCED AUSTRALIAN STANDARDS

- **AS/NZS 5033:2012** *Installation and safety requirements for photovoltaic (PV) arrays*

NOTE:

All Australian and Australian/New Zealand Standards should be read to incorporate any and all amendments to the most recently published version.

If you have any questions regarding this Bulletin, please contact BlueScope Steel Direct on 1800 800 789.

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