TB - 7
Technical Bulletin

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Care of BlueScope coated steel products prior to installation

Introduction

The information in this Technical Bulletin provides guidance on protection for metal coated and prepainted steel products whilst in storage and awaiting installation.

Why correct storage is important

BlueScope coated steel products are manufactured to be resilient to the Australian climate in a range of building applications and service environments. When installed in applications such as roofing and wall cladding, coated steel products offer excellent corrosion resistance resulting from exposure to a regular wet and dry cycle. When such cycles are imbalanced, there is potential for adverse conditions to arise that may result in premature corrosion or discolouration of coated steel products.

Such imbalance can result during improper outdoor storage of coated steel materials where multiple layers of coated steel become wet whilst in close contact, such as when stored in coil form prior to fabrication or stored in sheet stacks of nested profiles or wrapped bundles subsequent to fabrication and prior to installation.

Rainwater and condensation are easily drawn between adjacent surfaces by capillary action or driven in by wind. Condensation can occur if the temperature of the metal is lower than the dew point of the surrounding air. In this case moisture from the warmer air will condense onto the colder metal surface.

Ingress of moisture between surfaces in intimate contact may lead to prolonged periods of wetness that can result in establishment of surface corrosion or other surface conditions that may be irreversible. Surface effects may range from temporary aesthetic concerns to blistering and corrosion that may compromise long-term durability.

The conditions required to generate corrosion within packed materials are understood as a general concept, but specific conditions under which issues may arise are very difficult to predict. Consequently, it is always recommended to take precautions with regard to storage of coated steel product where it is not intended for immediate use.

Surface Treatment for short term protection

ZINCALUME® aluminium/zinc/magnesium alloy-coated steel, TRUECORE® aluminium/zinc/magnesium alloy-coated steel and zinc-coated steel (e.g. GALVASPAN® steel, ZINCANNEAL® steel and ZINCFORM® steel), are manufactured with a surface treatment known as passivation. Passivation provides additional short term corrosion protection for periods of storage and transport and initial exposure to the external environment.

Passivation treatments provide some measure of corrosion protection to metal coated steel products within packs prior to installation and also assists with uniform weathering of metallic finishes once installed and exposed to the external environment.

ZINCALUME® steel and TRUECORE® steel have an additional thin film of resin applied to improve rollformability and provide resistance to hand/foot marking during installation.

Prepainted steel products, such as COLORBOND® steel do not have a passivation film applied to the surface of the product, but similar technologies are incorporated into the organic coating systems.

Although effective in resisting short acting corrosion influences resulting from moisture exposure, the effectiveness of surface passivation may not always be realised during conditions where product may remain wet for extended periods prior to use. This may also be the case when product is stored in a format where airflow between sheets is limited, such as may occur for coil storage and stacks of nesting sheet profiles or with packaging with restricted airflow.

Site Storage Recommendations

If not required for immediate use on the building site, storage of construction materials should be carefully considered in the context of expected storage timeframes, site activity and exposure to possible inclement weather.

Materials may be delivered to site in any number of packaging variations or configurations, each with its own unique considerations for appropriate storage.

Preferably, packs should be stored inside if possible, or under cover. If packs must be stored outside and in the open, the following considerations may assist in minimising moisture entry into packs & wrapped bundles:

General Recommendations

- Packs should be stored on a stable surface away from construction activities to minimise the chances of damaging any weather protection and to reduce the number of movements required at the job site.
- Packs should be placed on a concrete slab or other sealed surface. If the bundles are to be stored on natural ground, a plastic ground cover should be put under the pack to mitigate condensation of water from the ground into the packs.
- Packs should be raised above the ground on dunnage (timber or other suitable medium) to avoid contact with any pooling or flowing water and to allow for air circulation around the pack to promote drying. Dunnage should be placed at regular spacings along the length of the pack to avoid any sagging and preventing low points in which water may pool.
- Packs may be oriented on a slight incline to promote drainage of water off top surfaces.
- The pack should be completely covered with a loose-fitting waterproof tarp or plastic to protect from rain and overnight condensation.
  Note: Tightly wrapping packs in plastic may restrict airflow and result in packs "sweating" in humid or damp conditions.

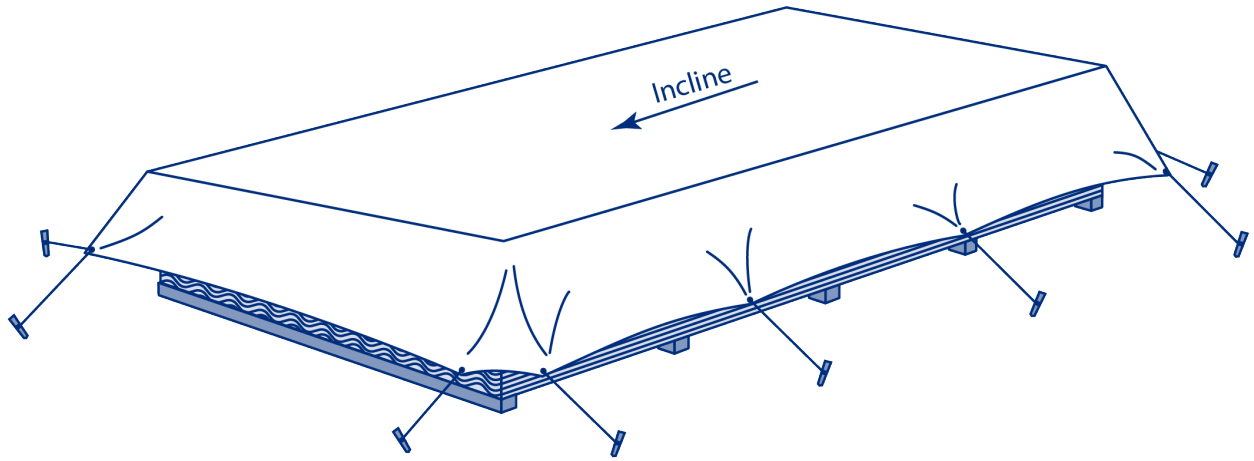

Figure 1 *Recommended storage example.*

Nested Stacks

Occurs predominantly in the context of metal roof sheets or wall cladding profiles that nest closely together. Packs of this type should be well protected from rainfall and condensation (as outlined above) as moisture can be drawn in between nested sheets via capillary mechanisms. It may not be apparent from observing the stacks that moisture is present between sheets.

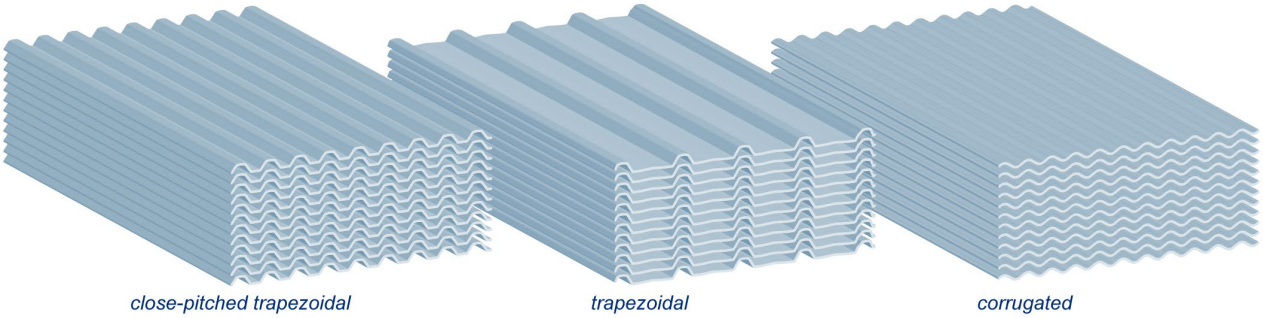

Figure 2 *Examples of common nested sheet profiles.*

Non-Nested Stacks

Items that do not nest closely together are often stacked offset or “top & tail”. In these circumstances, natural air spaces within the stack help avoid moisture being drawn in by capillary action but can still hold substantial amounts of water within the stack from rainfall or other moisture sources. Whilst the recommendation is to store product under cover, due to the long lengths that these profiles are often supplied in, this may not always be practical. To reduce the potential of standing water within the stack during exposed storage, packs of this type should be stored on a slight incline to help water drain from one end of the stack.

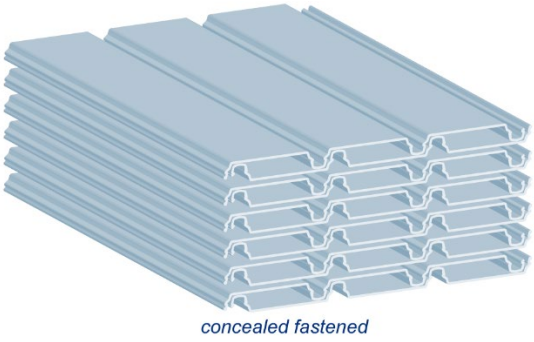

Figure 3 *Example of non-nested sheet profile.*

Bundled Items

Non-stacking items are often supplied to site in bundles, that may be either strapped or wrapped in plastic (or both). Bundles that are strapped only should be considered as per ‘Nested Stacks’ if they contain elements packed with flat abutting surfaces. Bundles containing elements that are curved may be considered as ‘Non-Nested Stacks’.

For bundles that are supplied wrapped in plastic, (irrespective of their shape) moisture entrapment between elements is less critical than “sweating” of the pack due to moisture being unable to escape the plastic wrapping. Sweating may occur even in the absence of rainfall and may be induced through exposure to periods of damp or humid conditions. Removal of plastic wraps or cutting to allow the pack to more effectively “breathe” may reduce the incidence of sweating.

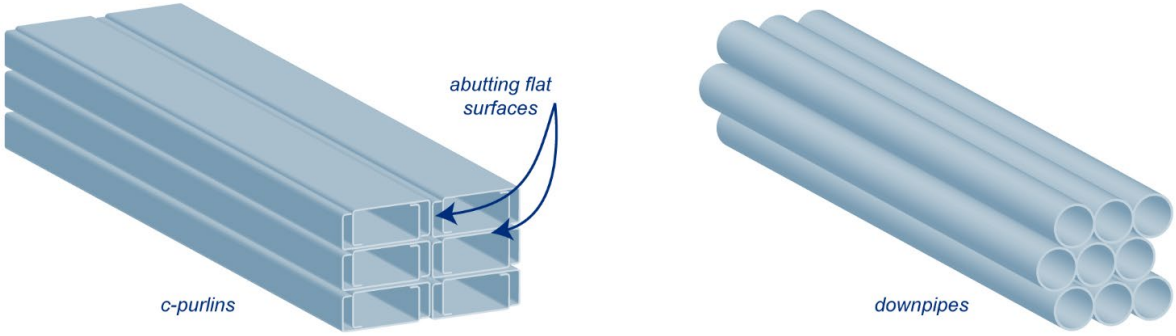

Figure 4 *Examples of items commonly supplied as wrapped/strapped bundles.*

Wet Packs

It is not possible or practical in all instances to ensure that packs remain dry during storage or during the transport and delivery phases of product supply. In the event that product becomes wet whilst in pack form either during transport or storage, there are actions that may be taken to reduce the potential for occurrence of issues related to prolonged storage of wet packs.

Solutions for drying of sheet materials will vary according to site conditions and available space. The important consideration is to find a safe and practical temporary storage solution that allows air circulation across all surfaces that became wet during pack storage.

If packs become wet, it is important to take preventative actions as soon as is practical. If rainfall is the cause of moisture, it is not necessary to wait until rainfall has ceased for actions to be effective. Additional rainfall on individual items should not pose any concern.

Nested Stacks

The most effective means of preventing issues resulting from wet storage in most circumstances is to separate individual elements from the stack. Ideally sheets should be laid individually and raised off the ground for maximum drying efficiency. If space does not allow, nested sheets can be separated and stored on-edge with air gap in between sheets. This orientation will allow for both drainage of moisture from the surface and for circulation of air between sheets.

Once materials have dried, they may be re-stacked if desired and protected against further weather exposure as per "*Site Storage Recommendations"*.

Non-Nested Stacks

For profiles that are supplied in this format, no intervention is typically required unless wrapped in plastic (see "*Bundled Items*"). Ensure packs are placed on a slight incline to allow for natural drainage from one end of the pack. If concern should arise, sheets of this type may also be addressed as per the recommendations for nested stacks.

Bundled Items

For bundled packs that have sweated or have experienced water entry, remove the plastic wrapping to allow for the bundle to "breathe". Bundles may need to be strapped or otherwise constrained prior to removing plastic wrapping if the wrapping doubles as strapping.

Separating the individual elements to allow for faster drying is recommended, but may not be necessary depending on the shape of the elements and the density with which they are bundled. As a general guide, elements with flat surfaces abutting should be separated, whereas angular objects or those with curved surfaces may not require separation.

Once elements are dried, continued storage should be managed as per "*Site Storage Recommendations*"

Related BlueScope Technical Bulletins

Technical Bulletin TB-2 Overpainting and restoration of exterior BlueScope coated steel products

Technical Bulletin TB-4 Maintenance of exterior BlueScope coated steel products

Technical Bulletin TB-10 Cut edge and bend protection of next generation ZINCALUME® steel and COLORBOND® steel

Technical Bulletin TB-13 General guide to good practice in the use of exterior BlueScope coated steel products

Technical Bulletin TB-18 Guide to good practice – Processing and application of BlueScope coated steel products