CTB - 20
Technical Bulletin

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Perforated coated steel

Introduction

This Technical Bulletin provides information regarding coated steels that are supplied in the perforated condition for internal linings or external cladding applications. (Note: the term 'coated steel' is used in this Technical Bulletin to reference both metallic coated steel and prepainted metallic coated steel products).

Perforated products are often employed in applications that require increased ventilation, increased light transmission or for use in acoustic dampening systems.

BlueScope does not supply perforated steel products, but BlueScope products, including ZINCALUME® aluminium/zinc/magnesium alloy-coated steel, COLORBOND® prepainted steel and zinc-coated steel, may sometimes be used in the supply of perforated applications by third parties.

Corrosion performance

Most coated steel products used in construction applications employ 'barrier' and/or 'sacrificial' metallic coating systems for protection against corrosion. Sacrificial metallic coatings provide protection by corroding in preference to the underlying steel base in the presence of a corrosive influence. Refer to:

Corrosion Technical Bulletin CTB-06 Development of aluminium/zinc/magnesium alloy-coating for next generation ZINCALUME® steel with Activate® technology.

When coated steel is cut or drilled, the steel substrate at the newly created cut edge is exposed to the atmosphere and mild corrosive attack begins. At such locations, the adjacent metal coating is usually sufficient to protect the cut edge and provide reasonable durability.

A critical factor that contributes to determining the longevity of coated steels is the ratio of the area of exposed steel substrate (at cut edges and scratches) relative to the amount of local metal coating that is available to provide corrosion protection.

When supplied in the non-perforated form, the ratio of metal coating to the exposed steel cut edge is relatively high and as a result any corrosion at cut edges proceeds slowly. However, when a large number of perforations are introduced, the area of cut edge is increased relative to the surface area of metallic coating.

In practical terms, this results in a significant reduction in the capability of remaining metallic coating to provide long term corrosion protection to the perforated product without regular maintenance or additional corrosion protection measures being implemented.

Design considerations

Coated steels supplied in the perforated condition generally do not offer the same level of corrosion resistance as material that has not been perforated. For this reason, BlueScope does not offer warranties for product that is supplied in the perforated condition.

The following factors should be considered when using perforated coated steels to assist in maximising performance of the product.

- Perforations: Holes spaced at greater pitch (intervals) will yield better performance than holes at very small pitch. Larger holes at greater pitch can generate the same open area as small holes at narrow pitch.

- Exposure: Internal applications are at less risk of corrosion than exterior applications, however, ventilation scenarios ducting external airflow, should be considered carefully.
- Post-treatment: Products that are painted or powdercoated subsequent to perforation, may offer increased corrosion performance. However, this is often dependant on the preparation of the substrate, quality of the finish and ability of the applicator to coat the internal cut edges of the perforations.

Related BlueScope Technical Bulletins

Corrosion Technical Bulletin CTB-06 Development of aluminium/zinc/magnesium alloy-coating for next generation ZINCALUME® steel with Activate® technology.