

Selection guide for zinc-coated steel purlin products

Introduction

This Technical Bulletin provides the appropriate purlin coating class for use in a range of common building applications. It provides guidance and information regarding factors which must be considered to ensure maximum service life of zinc-coated steel purlin products.

Products

The products produced for purlin manufacture are:

- GALVSPAN® G450 zinc-coated steel
- GALVSPAN® G500 zinc-coated steel
- GALVSPAN® G550 zinc-coated steel

Coating classes available are Z350 (standard coating class) and Z450 (optional coating class). Coating class recommendations for a range of building applications are detailed in Table 1.

GALVSPAN® steel is manufactured in accordance with Australian Standard AS 1397-2011: *Continuous hot-dip metallic coated steel sheet and strip – Coatings of zinc and zinc alloyed with aluminium and magnesium*. For more information on GALVSPAN® steel refer to the appropriate product data sheet.

General

As with all metallic coated steel products, the corrosion performance of GALVSPAN® steel is dependent on the interaction of a number of factors. These include the coating class and the environmental factors to which the surface may be exposed.

The extensive range of climatic conditions in Australia (the tropical north, alpine regions in the south-east, heavy surf characteristics of much of the coastline and desert regions of the interior) need to be considered when specifying purlins. In addition to these environmental conditions, building design (particularly exposure of purlins to the external environment) and internal activities within the building must also be considered.

Factors influencing purlin performance

Table 2 'Guide to Atmospheric Exposure Conditions' is provided to assist in establishing the type of exposure conditions that may be encountered in the various environments listed in Table 1. The descriptions covered in this Technical Bulletin are not an exhaustive list and cannot cover all possibilities, therefore any quoted distances from a source are a GUIDE ONLY. If further information is required, please contact Steel Direct.

Table 1. Coating Class recommendations for typical building applications

Building application	Environment description	Coating class
Enclosed buildings	Non-aggressive, internal environments	Z350
Open sided rural buildings	Non-aggressive, rural environments. (Refer to “Unwashed Areas” section of this Technical Bulletin).	Z350
Enclosed Industrial Buildings	Non-aggressive environments	Z350 Refer Note (iii)
Carports and awnings	Environment can vary from non- aggressive to aggressive.	Z350 Refer Note (iv)
Other open sided buildings and industrial awnings	Aggressive environments; also those subject to ingress and build-up of airborne corrosive contaminants or high levels of condensation.	Z450 Refer Note (v)
Intensive animal farming, feed lots and similar activities	Extremely aggressive environment.	Z450 Refer Note (v)
Storage of cement, fertilisers, mineral concentrates and other aggressive industrial products	Very aggressive environments.	Z450 Refer Note (v)

Note:

- The above examples cover a general range of building applications. Due to the variety of factors which can affect service life and product performance where more detailed recommendations or information on specific applications are required, these should be referred back to Steel Direct.
- This table should be considered in conjunction with Table 2.
- Consideration must be given to the nature of activities performed within the building. Where potentially corrosive by-products are produced, further consultation with Steel Direct is recommended.
- Where the environment is considered to be non-aggressive, Z350 will give an appropriate service life provided routine maintenance is conducted as recommended by BlueScope. Where the purlin environment is considered to be mildly aggressive, BlueScope recommend that purlins with an increased coating mass (Z450) be used. Should the environment be regarded as extremely aggressive, BlueScope recommend that the purlins be further post painted with an appropriate high build coating system, as recommended by a reputable paint supplier (see [Technical Bulletin TB-2 Overpainting and Restoration of Exterior BlueScope Products](#)).
- It is important that you consult Steel Direct for advice in regard to design of buildings in extremely aggressive environments considering the use of GALVSPAN® G450 Z450 steel, to ensure maximum service life.

Table 2. Guide to atmospheric exposure conditions

Exposure condition		Corrosive influence	Distance from corrosive influence
Aggressive (close distances to surf, industrial pollution and fumes)	Rough, active surf	Salt laden, moist air	500m – 1000m
	Industrial emission	Fallout	300m – 750m
	Fossil fuel combustion	Acid laden air	300m – 750m
Non-aggressive (outer urban, semi-rural areas, well removed from shoreline and industrial pollution)	Rough, active surf	Salt laden, moist air	>1000m
	Calm, still water	Salt laden, moist air	>300m
	Industrial emission	Fallout	>750m
	Fossil fuel combustion	Acid laden air	>750m

Note:

- Contact Steel Direct for exposure classifications which do not meet the above criteria.
- For distances less than the minimum shown, please consult Steel Direct.

BlueScope maintain a central register of product performance in various environmental conditions and advice should be sought from BlueScope where doubt may exist as to the proper application of the appropriate GALVSPAN® steel coating class. This is particularly so where the proposed structure is used to house activities that are potentially corrosive in nature or generate corrosive emissions. This includes but is not limited to the storage or use of acids and chemicals, fossil-fuel combustion and other process by-products (including heat & moisture). In addition, the concentration and nature of nearby industrial activity in some localities, and the direction, intensity and nature of prevailing winds can also exert an influence.

There are a number of specific factors which must be considered:

Regional influences

Current field experience has indicated that certain regions in Australia are more susceptible to problems such as excessive salt and industrial fallout and excessive humidity. These influences can have a detrimental effect on

purlin life which must be taken into consideration when designing building structures. Individual areas should be assessed for local field performance prior to final specification. Please contact Steel Direct for advice.

Unwashed areas of buildings

All surfaces of a building structure where natural rainfall cannot reach are subject to the buildup of dust, marine salts, industrial fallout or specific local environment contaminants. In open sided buildings this can include the wind-borne deposits from local industrial or agricultural activities.

Accelerated corrosion can occur when these contaminants combine with condensation resulting in a corrosive electrolyte that over a period of time can contribute to corrosion of zinc-coated steel purlins and cladding.

To ensure maximum service life under such conditions these areas should be subject to a regular maintenance programme. Where practical, washing down of the internal surfaces at regular intervals should be conducted. The frequency of washing is dependent on the local environmental conditions. Washing may be conducted by means of high-pressure water jets, nylon brush cleaning with suitable household detergent solution followed by rinsing and drying.

Where consideration is being given to initial design, which may incorporate unwashed areas and where such cleaning methods may not be appropriate in respect of building function (for example operations, contents etc.) please contact Steel Direct for advice.

Accumulation of condensation or fallout on purlins

In applications where there is high levels of condensation or dust within the building it is recommended where possible that purlins be specified with a down turned bottom lip. This will aid with drainage of moisture from the bottom flange and help to reduce accumulation of dust or debris and assist with maintenance to remove buildup inside the bottom flange.

Related BlueScope Technical Bulletins

[Technical Bulletin TB-2](#) Overpainting and restoration of exterior BlueScope coated steel products

Referenced Australian Standards

AS 1397:2011 - *Continuous hot-dip metallic coated steel sheet and strip – Coatings of zinc and zinc alloyed with aluminium and magnesium*

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To ensure you have the most current information

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