

SELECTION GUIDE FOR GALVANIZED STEEL PURLIN PRODUCTS

TECHNICAL BULLETIN TB-17

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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 galvanized steel purlin products.

PRODUCTS

The products produced for purlin manufacture are:

- GALVSPAN® G450
- GALVSPAN® G500
- GALVSPAN® G550

The grade G450 indicates a minimum yield strength of 450MPa in accordance with Australian Standard AS1397.

These products are available with two different coating classes Z350 and Z450. Coating class is the specified coating type and the minimum mass of coating on both sides of the sheet. This is measured by the triple spot test as detailed in Australian Standard AS1397. Z350 is a zinc coating with a minimum coating of 350g/m² on both sides. Coating class recommendations for a range of building applications are detailed in Table 1.

Table 1: Coating Class recommendations for typical building applications.

Note: This table should be considered in conjunction with Table 2

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 1
Carports and awnings	Environment can vary from non-aggressive to aggressive.	Z350 Refer Note 2 Z450
Other open sided buildings, industrial awnings and municipal water storage reservoirs	Aggressive environments; also those subject to ingress and build-up of airborne corrosive contaminants or high levels of condensation.	Z450
Intensive animal farming, feed lots and similar activities	Extremely aggressive environment.	Z450 Refer Note 3
Storage of cement, fertilisers, mineral concentrates and other aggressive industrial products	Very aggressive environments.	Z450 Refer Note 3

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 your local BlueScope Steel Limited State Sales Office.

- 1 Consideration must be given to the nature of activities performed within the building. Where potentially corrosive by-products are produced, further consultation with your BlueScope Steel State Sales Office is recommended.
- 2 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 Steel. Where the purlin environment is considered to be mildly aggressive, BlueScope Steel recommend that purlins with an increased coating mass (Z450) be used. Should the environment be regarded as extremely aggressive, BlueScope Steel recommend that the purlins be further post painted with an appropriate high build coating system.
- 3 It is important that you consult your local BlueScope Steel State Sales Office for advice in regard to design of buildings in extremely aggressive environments considering the use of GALVSPAN® G450 Z450, to ensure maximum service life.

GENERAL

As with all metallic-coated steel products, the corrosion performance of GALVSPAN® steel is dependant on the interaction of a number of factors. These include the type and amount of metallic coating and both general and micro-environments to which the surface may be exposed.

In Australia, environmental conditions range from the relatively non-aggressive conditions of the dry outback through urban-coastal to the more aggressive conditions of the humid tropics in the far-north. **As a consequence the appropriate product choice is of paramount importance.**

The advice contained in this technical bulletin is based upon many years of experience with metallic-coated products under both test and field conditions.

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.

It is clearly not possible in such a brief summary to cover all possibilities in detail, therefore any quoted distances from a source can only be indicative and are provided for guidance only.

BlueScope Steel maintain a central register of product performance in various environmental conditions and advice should be sought from BlueScope Steel 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 intended for the storage of acids and chemicals and where fossil-fuel combustion and other process by-products (*including heat & moisture*) are conducive to the development of aggressive environments. In addition, the concentration and nature of industrial activity in some localities and the direction, intensity and nature of prevailing winds can also exert an influence.

Within the above conditions there are a number of additional 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 your local BlueScope Steel State Sales Office for advice.

Unwashed Areas of Buildings

All surfaces within a building structure where natural rainfall cannot reach are subject to the build up 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 of the building product can occur when these contaminants combine with night-time condensation which results in a corrosive electrolyte. Over a period of time this electrolyte can contribute significantly to corrosion of galvanized purlins and cladding.

To ensure maximum service life under such conditions these areas should be subject to a regular maintenance programme. This programme should include, where practical, washing down of the internal surfaces at regular intervals. The frequency of washing is dependant on the local environmental conditions. It should however, be sufficient to prevent the accumulation of aggressive contaminants. Washing may generally be achieved by means of high-pressure water jets, nylon brush cleaning with suitable non-ionic 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 (*eg. operations, contents etc*) please contact your BlueScope Steel State Sales Office for advice.

Table 2: Guide to atmospheric exposure conditions

EXPOSURE CONDITION	CORROSIVE ELEMENT	DISTANCE FROM CORROSIVE ELEMENT
AGGRESSIVE (close distance to surf, industrial pollution and fumes) Rough active surf Industrial emission Fossil fuel combustion	Salt laden, moist air Fallout Acid laden air	* From 500 up to 1000 metres * From 300 up to 750 metres * From 300 up to 750 metres
NON - AGGRESSIVE (outer urban, semi-rural, and rural areas, well removed from shoreline and industrial pollution) Rough active surf Calm, still water Industrial emission Fossil fuel combustion	Salt laden, moist air Salt laden, moist air Fallout Acid laden air	More than 1000 metres More than 300 metres More than 750 metres More than 750 metres

Note: Contact your BlueScope Steel State Sales Office for exposure classifications which do not meet the above criteria.
 * For distances less than the minimum shown, please consult your BlueScope Steel State Sales Office.

The information and advice contained in this Bulletin is of a general nature only, and has not been prepared with your specific needs in mind. You should always obtain specialist advice to ensure that the materials, approach and techniques referred to in this Bulletin meet your specific requirements.

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