

# BUILDERS GUIDE TO AUSTRALIAN STEEL SHEET AND STRIP STANDARDS

## TECHNICAL BULLETIN TB-14

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This issue supersedes all previous issues

With growing consumer awareness of products and their potential performance, it is becoming increasingly important that manufacturers and tradesmen adhere to those Australian standards which relate to the products they use and their installation.

Australian standards are compiled by committees of interested scientific, industrial and government groups under the direction of Standards Australia. Copies of published standards are available from their state offices.

This technical bulletin sets out to explain the terminology of metallic-coated steel sheet and strip adopted in the standards in order to simplify their interpretation and use.

There are two standards for the base steel sheet materials used in building trades:

- AS 1397:2001 for zinc-coated and aluminium/zinc alloy-coated steel sheet and,
- AS 2728 for prepainted steel sheet.

Australian standards also cover other aspects of the trade with specifications for products manufactured from steel sheet materials and their installation. These are:

- AS 2179 for metal rainwater goods.
- AS 2180 for selection and installation of metal rainwater goods.
- AS 1445 for corrugated steel sheet, and
- AS 1562 for design and installation of metal roofing.

### STEEL SHEET MATERIAL STANDARDS

AUSTRALIAN STANDARD 1397:2001 "STEEL SHEET AND STRIP - HOT-DIPPED ZINC-COATED OR ALUMINIUM/ZINC-COATED"

All hot-dipped metallic-coated sheet and strip produced by BlueScope Steel complies with Australian Standard 1397:2001. The products in this Standard include materials for a variety of building applications. These include:

#### ROOF CLADDING

- ZINCALUME® AZ150
- Zinc-coated Z450 (see note)

#### WALL CLADDING

- ZINCALUME® AZ150
- Zinc-coated Z275 (see note)

#### RAINWATER ITEMS

- ZINCALUME® AZ150
- Zinc-coated Z275 (see note)

**Note:** It is important to note that the introduction and development of ZINCALUME® zinc/aluminium alloy-coated steel sheet and strip has given a much improved life to the above products. Consequently, BlueScope Steel Limited recommends ZINCALUME® steel sheet be specified for these applications if a metallic-coated finish is desired. Exterior products manufactured from COLORBOND® prepainted steel sheet or strip, besides being decorated in one of a number of colours, have a superior outdoor performance. For recommended finishes for various environments, refer to Technical Bulletin TB-1a "Steel roofing products selection guide" and/or TB-1b "Steel walling products - selection guide". Using the correct product in manufacturing building products is the responsibility of the manufacturer or specifier.

### COATING CLASS

This term refers to the coating type, Z or AZ (Zinc or Aluminium/Zinc) and the minimum mass (weight) of coating per square metre of steel sheet. Typical coatings are Z275 and AZ150. these designations signify:

- for Z275  
Z = Zinc
- and 275 = 275 grams minimum of zinc per square metre, the total on both sides.
- for AZ150  
AZ = Aluminium/Zinc
- and 150 = 150 grams minimum of aluminium/zinc alloy per square metre, the total on both sides.

### MECHANICAL PROPERTIES

The guaranteed minimum yield strength is specified by a number following the letter "G". This indicates the mechanical properties of the steel were obtained by inline heat treatment prior to hot-dip coating. Yield strength is the point to which steel can be stressed before it deforms permanently. Yield strength is expressed in megapascals (MPa) and the higher the number, the greater the structural strength.

For example: G250 is a structural grade with a minimum yield strength of 250 megapascals, G300 is a slightly higher strength grade ideal for roll-forming G550 is a very high strength steel.

## SUMMARY

Ideally, specifications should state:

1. the base steel thickness, eg, 0.60 mm
2. the minimum yield strength, eg, G300
3. the coating class, eg, AZ150.

For example:

- 0.60 mm AZ150 for ZINCALUME® zinc/aluminium alloy-coated steel,
- 0.60 mm G300 Z450 zinc-coated steel.

## IMPORTANT

It is not sufficient to simply state whether the sheet should be zinc-coated or ZINCALUME® steel without being specific as to the coating mass, ie, the protection required.

REMEMBER, THE SERVICE LIFE OF METALLIC-COATED STEEL IS DEPENDENT ON THE THICKNESS OF THE COATING AND NOT THE THICKNESS OF THE STEEL BASE.

The base thickness of some building materials is described as “BMT” - base metal thickness. Product thickness has been, in isolated instances, nominated as “TCT” or Total Coated thickness. This can be misleading and should not be used in specifications.

However, a measure of TCT can be used to indicate whether the specific base thickness has been supplied.

The following table provides the approximate overall thickness (approximate TCT) for a nominated base thickness.

ZINC-COATED STEEL		Base thickness ◀ mm ▶	ZINCALUME® Steel	
Approx TCT mm	Coating class		Coating class	Approx TCT mm
0.39	Z275	0.35	AZ150	0.40
0.46	Z275	0.42	AZ150	0.47
0.54	Z275	0.50	AZ150	0.55
0.59	Z275	0.55	AZ150	0.60
0.67	Z450	0.60	AZ150	0.65
0.69	Z600	0.60	AZ200	0.66

Australian Standard 2728 “Prepainted and Organic Film/Metal Laminate Products for interior/Exterior Applications in Buildings”

This standard divides environments into categories in which prepainted products must perform and the paint properties to achieve a satisfactory performance. Details of the COLORBOND® steel type to perform in the various types of environments are given in Technical Bulletin TB-1a and TB-1b.

## PRODUCT STANDARDS

These are standards for finished goods made from steel sheet materials:

- AS 1445 for corrugated steel sheet, and
- AS 2179 for metal rainwater goods.

Specification of the base steel sheet standard and the product standard will ensure the correct material is used and that the finished product is made to specified quality standards.

## INSTALLATION STANDARDS

These standards ensure a correctly manufactured steel sheet building product is fixed to a building in a specified manner. The standards are:

- AS 1562 for design and installation of metal roofing, and
- AS 2180 for selection and installation of metal rainwater goods.

## COATING TYPES AND THEIR COMPATIBILITY WITH OTHER METALS

Two basic coating types are generally in use in building and allied industries – zinc (galvanised steel) and zinc/aluminium alloy (ZINCALUME® steel). BlueScope Steel recommends that for all conditions involving atmospheric exposure, ie, roofing and walling, accessories and rainwater items, ZINCALUME® steel will provide the better long term performance.

Both coatings are affected adversely by run off from or contact with copper. Uncoated lead must not be used with ZINCALUME® steel products.

Further information on acceptability of direct contact between various materials is given in Australian Standard 2180.

Although compatible with respect to physical contact, zinc coatings should not be used for rainwater goods and tanks where water from ZINCALUME® steel roof runs onto them (refer Technical Bulletin TB-15 “Recommended Steel Gutter Systems”)

## HOW TO SPECIFY FOR BEST PRODUCT PERFORMANCE

### A. CORRUGATED ROOFING/WALL CLADDING

Where shown, corrugated roofing and wall cladding shall be custom length ZINCALUME® steel or COLORBOND® steel (profile name) roll-formed from strip complying with Australian Standard 1397:2001 and branded accordingly (refer Technical Bulletin TB-1a or TB-1b for recommended finish to suit environment). The finished product shall comply with Australian Standard 1445.

All roofing accessories shall be of similar material to the roof. Minimum coating class shall be AZ150.



Fixing shall be to manufacturer's recommendations. Sealants shall be as specified. Refer Technical Bulletin TB-9 "*Sealants for Exterior Finishes*".

During the fixing period swarf should be removed from the roof and guttering daily (refer Technical Bulletin TB-5 "*Swarf Staining of Steel Roofing and Walling Profiles*").

Copper or uncoated lead shall not be used for flashing (refer Technical Bulletin TB-8 "Flashing Materials for ZINCALUME® and COLORBOND® Steel Sheet").

Discharge from copper pipes shall not flow onto roof.

#### **B. OTHER PROFILES – ROOFING WALL CLADDING**

Where shown, roofing and wall cladding shall be custom length ZINCALUME® steel or COLORBOND® steel (profile name) roll-formed from material complying with Australian Standard 1397:2001 and branded accordingly (refer TB-1a or TB-1b for selection).

Minimum coating class shall be AZ150.

All roofing accessories shall be of similar material to the roof.

Fixing shall be to manufacturer's recommendations.

Sealants shall be as specified.

Swarf shall be removed from the roof and guttering daily.

Copper or uncoated lead shall not be used for flashing.

Discharge from copper pipes shall not flow onto roof.

#### **C. RAINWATER GOODS**

Where shown, eaves, guttering/spouting, ridge capping, box or valley gutters and downpipes shall be formed from ZINCALUME® steel complying with Australian Standard 1397:2001. The finished product shall comply with Australian Standard 2179 and Australian Standard 2180. Base steel grade and thickness will depend on profile. Coating mass shall be AZ150 (refer to TB-1a or TB-1b for material finish in various environments).

Accessories shall be of similar material to the gutter/spouting. Downpipes shall be ZINCALUME® or COLORBOND® steel. Installation shall be to normal trade practice.

Sealants shall be as specified.

#### **CONCLUSION**

It is in the best interest of the specifier and end-user of hot-dipped metallic-coated steel products to demand compliance with relevant Australian Standards. It should be noted that products do not necessarily have to comply with a standard unless compliance is claimed by statement, literature or branding, or if the specification or order call for it.

By combining the correct thickness of coating, base strength, associated materials and installation practice, the greatest potential value and performance are realised often at no extra cost.

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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