

# Professional's guide to Australian Standards for steel sheet and strip products

## Introduction

This Technical Bulletin sets out to identify standards and codes that are relevant to the manufacture of metallic coated steel and prepainted steel products intended for use in common building applications. It also addresses standards related to design, installation and performance requirements of building elements manufactured from these materials. It also aims to explain the terminology of metallic coated steel sheet and strip adopted in Australian Standards to simplify their interpretation and use.

As consumers become increasingly aware of the various performance requirements imparted to building materials, so too must manufacturers and trades be aware of the relevant codes and standards that set those performance requirements.

In Australia, the National Construction Code (NCC) in conjunction with Australian Standards, provides a nationally accepted and uniform set of technical requirements for all areas of building, from design to construction. The NCC comprises the Building Code of Australia (BCA) and the Plumbing Code of Australia (PCA). The NCC presents performance-based requirements, incorporating Australian (and International) Standards to provide building solutions with a focus on safety, health, amenity, and sustainability.

The Australian Standards called up in the NCC set out specific requirements which relate to products used by the building industry with respect to, for example, resilience, durability, strength, and installation procedures.

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

- Australian Standard AS 1397:2021 – *Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium*
- Australian/New Zealand Standard AS/NZS 2728:2013 – *Prefinished/ prepainted sheet metal products for interior/exterior building application – Performance requirements.*

In addition to material performance requirements, Australian Standards also specify requirements for the design, specification and installation of products manufactured from metallic coated and prepainted steel sheet materials.

Relevant Australian Standards, and an outline of what each cover, follow:

- Australian Standard AS 1445-2013 – *Hot-dipped zinc-coated, aluminium/zinc-coated or aluminium/zinc/magnesium-coated steel sheet – 76mm pitch corrugated.* (Covers design and tolerance requirements for corrugated steel profiles).
- Australian Standard AS 1562.1:2018 – *Design and installation of sheet roof and wall cladding – Metal.* (Covers design and installation of metal roof sheets and wall cladding).
- Australian Standard AS 2050:2018 – *Installation of roof tiles.* (Covers design and install requirements for steel roof battens for tile roofs)
- Australian/New Zealand Standard AS/NZS 2179.1:2014 – *Specifications for rainwater goods, accessories and fasteners – Metal shape or sheet rainwater goods, and metal accessories and fasteners.* (Covers design, material and performance requirements for metal rainwater goods and accessories).
- Australian/New Zealand Standard AS/NZS 2904:1995 – *Damp-proof courses and flashings.* (Covers material requirements for products installed as flashings or damp-proof course).
- Australian/New Zealand Standard AS/NZS 3500 (Set) – *Plumbing and drainage.* (Covers requirements for plumbing and drainage components).

**Table 1. Recommended AS 1397:2021 compliant products for use in building applications.**

Application	Steel building product standard (or equivalent)	Product
Roof sheeting	AS 1562.1:2018	COLORBOND® steel AM100 / ZINCALUME® steel AM125
Wall Cladding	AS 1562.1:2018	COLORBOND® steel AM100 / ZINCALUME® steel AM125
Rainwater Goods	AS/NZS 2179.1:2014	COLORBOND® steel AM100 / ZINCALUME® steel AM125
Purlins	AS/NZS 4600:2018	GALVSPAN® steel Z350 or Z450
Steel Roof Battens	AS 2050:2018	TRUECORE® steel AM150

NOTE: BlueScope recommends ZINCALUME® steel sheet be specified for roof, wall and rainwater applications if a metallic coated finish is desired and TRUECORE® steel for ALL steel building frame installations. The outdoor performance of products manufactured from COLORBOND® steel sheet or strip is equivalent, or superior, to that of ZINCALUME® steel.

## Steel sheet material standards

### Australian Standard AS 1397:2021

*Continuous hot-dip metallic coated steel sheet and strip – Coatings of zinc and zinc alloyed with aluminium and magnesium.*

All hot-dipped metallic coated sheet and strip produced by BlueScope for the Australian building industry complies with Australian Standard AS 1397:2021. The products in AS 1397:2021 include materials for a variety of building applications, examples of compliant products are shown in Table 1.

A critical aspect to comply with AS 1397:2021 is the mandatory requirement that all metallic coated steel produced to this standard, unless detrimental to the end use of the product, must be legibly and durably marked with the number of the standard, i.e. AS 1397, the base steel thickness, and the designation of the steel base and coating.

### Australian/New Zealand Standard AS/NZS 2728:2013

*Prefinished/prepainted sheet metal products for interior/exterior building applications – Performance requirements*

AS/NZS 2728:2013 specifies the physical properties of organic films (paint systems) and performance requirements of prepainted metal sheeting for a range of exterior service environments. Having the correct material used for building products is the responsibility of the building specifier.

For recommended finishes and details of the COLORBOND® steel type to perform in various environments, please refer to the following Technical Bulletins:

[Technical Bulletin TB-1A](#) Steel Roofing Products – Selection Guide

[Technical Bulletin TB-1B](#) Steel Walling Products – Selection Guide

[Technical Bulletin TB-15](#) Selection and use of steel eave gutter, downpipe and fascia products

## Terminology

### Coating class designation

Coating class designation is a widely used terminology system which combines the coating mass of a metallic coated steel product with type of alloy coating used. The various coating class designations are defined in AS 1397:2021. The coating type describes the elemental makeup of the coating. For example, Type AM is an aluminium/zinc/magnesium alloy while Type Z is zinc. The coating mass defines the minimum mass of coating per square metre of steel sheet (total of both surfaces). For reasons of compliance with AS 1397:2021 and to ensure appropriate product selection, it is not sufficient to simply state whether the sheet should be Type AM or Type Z without specifying the coating mass, i.e. the amount of corrosion protection required. Table 2 outlines the designation of two common coating classes.

**Table 2. Designation of two common coating classes.**

Coating class designation	Coating type	Coating mass (Minimum grams of coating per square metre – total of both surfaces)
AM125	Aluminium/zinc/magnesium alloy	125
Z450	Zinc	450

## Base metal thickness

The appropriate approach to specification of coated steel is by nominating the base metal thickness (BMT), i.e. the thickness of the steel substrate of the product. BMT is specified due to the base steel being the component that provides structural load bearing capability, rigidity and other mechanical properties. In isolated instances total coated thickness (TCT) may also need to be expressed (in addition to BMT) where dimensional tolerances are critical, but for engineering purposes, TCT quoted in isolation may lead to confusion and potential structural failure and must not be used in this manner.

However, measuring the TCT can be used to indicate whether the specified BMT has been supplied if the coating class of the product is known. Table 3 provides the approximate overall thickness (approximate TCT) for a nominated BMT and coating class.

**Table 3. Approximate total coated thickness for a given base metal thickness and coating class**

ZINCALUME® steel		BMT (mm)	Zinc-coated steel	
Approximate TCT (mm)	Coating Class		Coating Class	Approximate TCT (mm)
0.39	AM125	0.35	Z275	0.39
0.46	AM125	0.42	Z275	0.46
0.54	AM125	0.50	Z275	0.54
0.59	AM125	0.55	Z275	0.59
0.64	AM125	0.60	Z450	0.67
0.645	AM150	0.60	Z600	0.69

NOTE: The service life of metallic coated steel is dependent on the type and thickness of the metallic coating, not the thickness of the steel base.

## Mechanical properties

Mechanical properties of steel products generally refer to the behavioural characteristics of steel such as its strength, flexibility/elongation or hardness. For the majority of building application specifications, the mechanical properties of steel refer only to the yield strength of the steel. Yield strength is the point to which steel can be stressed before it deforms permanently. Yield strength is expressed in megapascals (MPa), with a higher number indicating greater structural capacity.

The guaranteed minimum yield strength is expressed by a number (in MPa) following the letter 'G'. This indicates that the mechanical properties of the steel were obtained by inline heat treatment prior to hot-dip metallic coating. For example:

- G250 is a structural grade with minimum yield strength of 250MPa.
- G300 is a slightly higher strength grade ideal for roll-forming.
- G550 is a very high strength steel commonly used for roof sheets or light gauge structural sections.

## Specifications

Ideally, specifications should combine the coating class and minimum yield strength with the BMT (mm). For example:

- 0.42mm G550 AM125 for ZINCALUME® steel
- 0.60mm G300 Z450 for zinc-coated steel

## Steel building product standards

These are Australian Standards for finished goods made from steel sheet materials:

- AS 1445-2013 - *Hot-dipped zinc-coated, aluminium/ zinc-coated or aluminium/zinc/magnesium-coated steel sheet – 76mm pitch corrugated.*

- AS/NZS 2179.1:2014 - *Specifications for rainwater goods, accessories and fasteners. PART 1: Metal shape or sheet rainwater goods, and metal accessories and fasteners.*

Such standards encompass aspects of finished end-products related to design, manufacture, specification and installation. In many instances, material requirements for metallic coated steels nominated in these standards is premised upon conformance to AS 1397:2021.

Specification of the base steel sheet Australian Standard in conjunction with the steel building product Australian Standard will ensure the correct material is used and that the finished product is made to specified quality Australian Standards.

## Installation standards

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These Australian Standards ensure that building products are incorporated into a building in an appropriate manner. Australian Standards that reference building products made from metallic coated and prepainted steel sheets include:

1. AS 1562.1:2018 – *Design and installation of sheet roof and wall cladding – Metal*
2. AS 2050:2018 – *Installation of roof tiles* (for the selection and installation of metal roofing battens under roof tiles)
3. AS/NZS 2904:1995 – *Damp-proof courses and flashings* (for the selection and installation of flashings)
4. AS/NZS 3500 (Set) – *Plumbing and drainage*
  - a. AS/NZS 3500.3:2018 *'Plumbing and drainage – PART 3: Stormwater drainage'*
  - b. AS/NZS 3500.5:2012 *'Plumbing and drainage – Housing installations'*

## How to specify for best product performance

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In addition to information contained within the National Construction Code and Australian Standards, it is essential to consult manufacturer's literature with regard to appropriate use of materials for expected applications and service environments in addition to other information that may be relevant with regard to maintenance or design considerations.

Prior to product specification of BlueScope products, it is recommended to consult:

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

which includes information and advice on material selection, common design considerations, storage of material on site, handling of material, installation, selection of fasteners, cutting and avoidance of swarf damage, compatibility of accessories (including flashings and sealants) and maintenance procedures to contribute to long product life.

In addition to the information contained in Technical Bulletin TB-13, specifications should consider the following:

- Minimum coating class shall be as specified in Table 1.
- All metallic-coated steel sheet and strip used for roofing, walling and rainwater goods shall be formed from ZINCALUME® steel complying with AS 1397:2021 and branded accordingly.
- All prepainted steel sheet and strip used for roofing, walling and rainwater goods shall be formed from COLORBOND® steel complying with AS/NZS 2728:2013 with a substrate complying with AS 1397:2021.
- Rainwater products shall be COLORBOND® steel or ZINCALUME® steel and shall comply with AS/NZS 2179.1:2014 (or equivalent) and AS/NZS 3500.3:2018.
- If a corrugated profile has been chosen, the finished product shall comply with AS 1445-2013.
- End-product profiles are typically offered in select combinations of base steel grade and base metal thickness.
- All accessories shall be of similar material and durability to the finished product(s).

## Conforming vs. complying

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The terms conforming/conformance and complying/compliance in reference to Australian Standards and the National Construction Code are often used interchangeably, but in fact have two very distinct applications in relation to manufactured products and their application in construction.

When the properties of a material or the process of its manufacture of are subject to requirements of one or more Australian Standards, then a product that meets all requirements is said to be a 'conforming product'.

When the implementation of a product in construction is subject requirements of an Australian Standard or the National Construction Code, then a product that is used or specified correctly it is considered to be compliant.

By this logic, if a material meeting the requirements of relevant standards is specified or installed in a manner contrary to the requirements of the National Construction Code, then it is possible for a conforming product to be used in a non-compliant manner.

Advice regarding product conformance of materials for construction should be sought from the manufacturer or distributor of the products. Issues pertaining to compliant installation will be subject to independent certification.

## Conclusion

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It is in the best interest of the specifier and end-user of hot-dipped metallic coated steel products to demand products that conform with relevant Australian Standards and are implemented in compliance with the National Construction Code.

By combining the appropriate base steel strength, thickness and type of coating, associated materials and installation practice, the greatest potential value and product performance are often met at no extra cost.

## Referenced Australian Standards

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AS 1397:2021 – *Continuous hot-dip metallic coated steel sheet and strip – Coatings of zinc and zinc alloyed with aluminium and magnesium*

AS/NZS 2728:2013 – *Prefinished/ prepainted sheet metal products for interior/exterior building application – Performance requirements*

AS 1445-2013 – *Hot-dipped zinc-coated, aluminium/zinc-coated or aluminium/zinc/magnesium-coated steel sheet – 76mm pitch corrugated*

AS 1562.1:2018 – *Design and installation of sheet roof and wall cladding – Metal*

AS 2050:2018 – *Installation of roof tiles*

AS/NZS 2179.1:2014 – *Specifications for rainwater goods, accessories and fasteners – Metal shape or sheet rainwater goods, and metal accessories and fasteners*

AS/NZS 2904:1995 – *Damp-proof courses and flashings*

AS/NZS 3500 (Set) – *Plumbing and drainage*

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