

SINGAPORE STANDARD

Specification for metal roofing system



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Building and Construction Authority

Housing & Development Board

Kalzip Asia Pte Ltd

LCP Building Products Pte Ltd

M Metal Pte Ltd

SETSCO Services Pte Ltd

Singapore Institute of Architects

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Foreword

This Singapore Standard was prepared by a Working Group appointed by the Technical Committee on Architectural Works under the direction of the Building and Construction Standards Committee.

This standard resulted from the review of SS 370 Specification for metal roofing and CP 89 Code of practice for metal roofing. SS 631 replaces SS 370 and CP 89.

The roof is the most exposed, vulnerable and in some ways the most important weather-excluding element in the building. Essential to the satisfactory performance of the building as a whole is the need to resolve the technical and aesthetic problems associated with roof finishes.

Metal roofing is suitable for both flat and pitched roofs and is usually laid with insulation and waterproofing for composite roof construction.

The standard serves as a standard reference for the specification on metal roofing in the building industry. It should be noted that the performance of the metal roofing is dependent on the proper installation of the roof. It is the responsibility of the user to determine the applicability of regulations prior to its use.

In preparing this standard, reference was also made to the following publications:

AS 1397	Continuous hot-dip metallic coated steel sheet and strip – Coatings of zinc and zinc alloyed with aluminium and magnesium
ASTM A755/A755M	Standard specification for steel sheet, metallic coated by the hot-dip process and prepainted by the coil-coating process for exterior exposed building products
JIS G 3312	Prepainted hot-dip zinc-coated steel sheet and strip
JIS G 3322	Prepainted hot-dip 55% aluminium-zinc alloy-coated steel sheet and strip

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Acknowledgement is made for the use of information from the above publications.

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NOTE

- 1. Singapore Standards (SSs) and Technical References (TRs) are reviewed periodically to keep abreast of technical changes, technological developments and industry practices. The changes are documented through the issue of either amendments or revisions.*
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Specification for metal roofing system

1 Scope

This Singapore Standard specifies minimum performance requirements for unpainted and prepainted metal products intended to be fabricated for use in the building industry in exterior applications such as roofing, wall cladding, soffits and awnings. It covers the use of galvanised, zinc/aluminium, prepainted profile in steel and aluminium. It is intended to be read in conjunction with manufacturer's technical product literature.

This Singapore Standard incorporate the Code of Practice which is intended to provide guidelines, information and recommendations to the specifier and end user on the design, performance, installation, transportation and handling of metal roofing material. This Singapore Standard incorporates good practices between manufacturers and roofing contractors.

2 Normative references

The following referenced documents are indispensable for the application of this standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

AAMA 2605	Voluntary specification, performance requirements and test procedures for superior performing organic coatings on aluminium extrusions and panels
AS/NZS 2728	Prefinished/prepainted sheet metal products for interior/exterior building applications – Performance requirements
AS 3566.1	Self-drilling screws for the building and construction industries – General requirements and mechanical properties
ASTM A153	Standard specification for zinc coating (hot-dip) on iron and steel hardware
ASTM D1308-02	Standard test method for effect of household chemicals on clear and pigmented organic finishes
ASTM D2247	Standard practice for testing water resistance of coatings in 100 % relative humidity
ASTM D3363-05	Standard test method for film hardness by pencil test
ASTM F1941	Standard specification for electrodeposited coatings on mechanical fasteners, inch and metric
BS EN 485-2	Aluminium and aluminium alloys – Sheet, strip and plate – Part 2: Mechanical properties
BS EN 485-3	Aluminium and aluminium alloys – Sheet, strip and plate – Part 3: Tolerances and dimensions and form for hot-rolled products
BS EN 485-4	Aluminium and aluminium alloys – Sheet, strip and plate – Part 4: Tolerances on shape and dimensions for cold-rolled products
BS EN 573-3	Aluminium and aluminium alloys – Chemical composition and form of wrought products – Part 3: Chemical composition and form of products

BS EN 1396	Aluminium and aluminium alloys – Coil coated sheet and strip for general applications – Specifications
BS EN 10088-1	Stainless steels – Part 1: List of stainless steels
BS EN 10088-2	Stainless steels – Part 2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purposes
BS EN 10088-3	Stainless steels – Part 3: Technical delivery conditions for semi-finished products, bars, rods, wire, sections and bright products of corrosion resisting steels for general purposes
BS EN 10088-4	Stainless steels – Part 4: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for construction purposes
BS EN 10088-5	Stainless steels – Part 5: Technical delivery conditions for bars, rods, wire, sections and bright products of corrosion resisting steels for construction purposes
BS EN 10169	Continuously organic coated (coil coated) steel flat products. Technical delivery conditions
BS EN 12056-3	Gravity drainage systems inside buildings – Roof drainage, layout and calculation
BS EN 13523-2	Coil coated metals. Test methods. Gloss
BS EN 13523-5	Coil coated metals. Test methods. Resistance to rapid deformation (impact test)
BS EN 13523-7	Coil coated metals. Test methods. Resistance to cracking on bending (T-bend test)
BS EN 13523-8	Coil coated metals. Test methods. Resistance to salt spray (fog)
BS EN 13523-10	Coil coated metals. Test methods. Resistance to fluorescent UV radiation and water condensation
BS EN 13523-12	Coil coated metals. Test methods. Resistance to scratching
BS EN ISO 2409	Paints and varnishes – Cross-cut test
ISO 2812-1	Paints and varnishes – Determination of resistance to liquids – Part 1: Immersion in liquids other than water
ISO 2812-2	Paints and varnishes – Determination of resistance to liquids – Part 2: Water immersion method
ISO 2812-3	Paints and varnishes – Determination of resistance to liquids – Part 3: Method using an absorbent medium
ISO 2812-4	Paints and varnishes – Determination of resistance to liquids – Part 4: Spotting methods
ISO 2812-5	Paints and varnishes – Determination of resistance to liquids – Part 5: Temperature-gradient oven method
ISO 4998	Continuous hot-dip zinc-coated and zinc-iron alloy-coated carbon steel sheet of structural quality

ISO 6272-1	Paints and varnishes – Rapid-deformation (impact resistance) tests – Part 1: Falling-weight test, large-area indenter
ISO 6272-2	Paints and varnishes – Rapid-deformation (impact resistance) tests – Part 2: Falling-weight test, small-area indenter
ISO 9364	Continuous hot-dip 55% aluminium/zinc alloy-coated steel sheet of commercial, drawing and structural qualities
ECCA-T1	Coating thickness
ECCA-T2	Specular gloss
ECCA-T3	Colour difference
ECCA-T4	Pencil hardness
ECCA-T5	Resistance to rapid deformation
ECCA-T7	Resistance to cracking on bending
ECCA-T8	Resistance to salt spray fog
ECCA-T10	Resistance to UV light
ECCA-T12	Scratch resistance
EN 13523-1	Coil coated metals – Test methods – Part 1: Film thickness
EN 13523-3	Coil coated metals – Test methods – Part 3: Colour difference – Instrumental comparison
EN 13523-4	Coil coated metals – Test methods – Part 4: Pencil hardness
JIS G 4305	Cold-rolled stainless-steel plate, sheet and strip (Amendment 1)
SS 5-B1	Methods of test for paints, varnishes and related materials – Part B1: Determination of film thickness
SS 5-E1	Methods of test for paints, varnishes and related materials – Part E1: Measurement of specular gloss of non-metallic paint films at 20°,60° and 85°
SS 5-E3	Methods of test for paints, varnishes and related materials – Part E3: Visual comparison of the colour of paints
SS 5-F2	Methods of test for paints, varnishes and related materials – Part F2 : Scratch test
SS 5-G6	Methods of test for paints, varnishes and related materials – Part G6: Resistance to humidity under condensation conditions
SS 5-G9	Methods of test for paints, varnishes and related materials – Part G9: Artificial weathering and exposure to artificial radiation – Exposure to filtered xenon-arc radiation

SS 5-G10 Methods of test for paints, varnishes and related materials – Part G10 : Corrosion tests in artificial atmospheres – Salt spray tests

SS 5-H2 Methods of test for paints, varnishes and related materials – Part H2: Designation of degree of blistering