

Australian/New Zealand Standard®

**Tolerances for flat-rolled steel
products**

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The following interests are represented on Committee MT/1:

Australian Chamber of Commerce and Industry
Australian Chamber of Manufactures
Australian Foundry Institute
Australian Institute of Steel Construction
Bureau of Steel Manufacturers of Australia
Department of Defence, Australia
Institute of Metals and Materials Australasia
Metal Trades Industry Association of Australia
Railways of Australia Committee
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Tube manufacturers

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RECONFIRMATION

OF

AS/NZS 1365:1996

Tolerances for flat-rolled steel products

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The following are represented on Technical Committee MT-001:

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New Zealand Heavy Engineering Research Association
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NOTES

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee MT/1, Iron and Steel, to supersede AS 1365—1986.

The objective of this Standard is to specify dimensional tolerances for flat-rolled steel products excluding stainless and heat-treated steels. The 1986 edition was amended in September 1992 to alter the width tolerances of untrimmed plate and floorplate.

This Standard gives an option of two classes of tolerance (A and B) for plate and strip rolled on a continuous mill, and for cold-rolled sheet and strip. These classes apply to flatness on hot-rolled product and to thickness, flatness, width and length on cold-rolled sheet and strip. The tighter Class B tolerances should only be specified in cases where the product requires stringent tolerance control.

In the preparation of this Standard cognizance was taken of the following International Standards:

ISO

3573:1986	Hot-rolled carbon steel sheet of commercial and drawing qualities
3574:1986	Cold-reduced carbon steel sheet of commercial and drawing qualities
4960:1986	Cold-reduced carbon steel strip with a carbon content over 0.25%
4995:1993	Hot-rolled steel sheet of structural quality
4996:1991	Hot-rolled steel sheet of high yield stress structural quality
4997:1991	Cold-reduced steel sheet of structural quality
5001:1993	Cold-reduced carbon steel sheet for vitreous enamelling
5951:1993	Hot-rolled steel sheet of higher yield strength with improved formability
6316:1993	Hot-rolled steel strip of structural quality
6317:1982	Hot-rolled carbon steel strip of commercial and drawing qualities
6932:1986	Cold-reduced carbon steel strip with a maximum carbon content of 0.25%
7452:1984	Hot-rolled structural steel plates—Tolerances on dimensions and shape
9034:1987	Hot-rolled structural steel wide flats—Tolerances on dimensions and shape

All of these International Standards, except ISO 7452 and ISO 9034, specify general properties in addition to dimensional tolerances, for various types of flat-rolled steel products. The Standards ISO 7452 and ISO 9034 specifically cover dimensional tolerances for hot-rolled structural steel plates and wide flats but are not applicable to thicknesses below 3 mm and 4 mm respectively.

Australian/New Zealand industry considers that there are considerable advantages in having requirements for dimensional tolerances for all types of flat-rolled steel products in the one Standard.

In this edition steepness ratio is included as an alternative method for expressing flatness and a method for measuring out-of-squareness is specified.

The terms 'normative' and 'informative' have been used in this Standard to define the application of the appendix to which they apply. A 'normative' appendix is an integral part of a Standard, whereas an 'informative' appendix is only for information and guidance.

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STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Australian/New Zealand Standard
Tolerances for flat-rolled steel products

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE This Standard specifies dimensional tolerances for flat-rolled steels (uncoated, metallic-coated or organic-coated), other than stainless, high alloy and quenched and tempered steels, as follows:

- (a) Wide slabs.
- (b) Plate and floorplate rolled on a reversing mill.
- (c) Hot-rolled plate, floorplate, sheet and strip rolled on a continuous mill.
- (d) Cold-rolled sheet and strip.

For coated products, thickness tolerances apply to the base metal only.

NOTE: Widths and thicknesses given in tables do not necessarily indicate availability in Australia or New Zealand, and enquiries in this regard should be directed to suppliers.

1.2 REFERENCED DOCUMENT The following document is referred to in this Standard:

AS

2706 Numerical values—Rounding and interpretation of limiting values

1.3 DEFINITIONS For the purpose of this Standard, the definitions below apply.

1.3.1 Cold-rolled sheet—a cold-rolled product of any width or thickness, supplied in cut lengths. Edges are either trimmed or untrimmed.

1.3.2 Edge camber—the deviation of an edge from a straight line forming a chord to it.

1.3.3 Edge conditions

1.3.3.1 Trimmed edge—the edge produced by the removal of material by mechanical means or gas cutting. Also referred to as sheared or slit edge.

1.3.3.2 Untrimmed edge—the edge produced by rolling between horizontal rolls, with or without vertical edging rolls. Also referred to as mill or universal edge.

1.3.4 Floorplate—a hot-rolled product 600 mm or greater in width, supplied in cut lengths or in coils, having a rolled raised pattern at regular intervals on one surface. Edges are either trimmed or untrimmed.

NOTE: Floorplate is produced by either of the following processes:

- (a) Rolling through a continuous mill to produce coils, or cut lengths from coil, having a nominal thickness equal to or greater than 2 mm.
- (b) Cutting from a parent plate, which is the product of a slab rolled through a reversing mill, and which has a nominal thickness greater than 4.50 mm.

1.3.5 Hot-rolled sheet—a hot-rolled product supplied in cut lengths produced from a coil rolled on a continuous mill. The width is equal to or greater than 600 mm and the nominal thickness less than 3 mm. Edges are either trimmed or untrimmed.

1.3.6 Longitudinal direction—the direction of greatest extension of the steel during rolling.

1.3.7 Plate—a hot-rolled product 600 mm or greater in width, supplied in cut lengths. Edges are either trimmed or untrimmed.

NOTE: Cut-lengths are produced from either of the following plate sources:

- (a) From a parent plate, which is the product of a slab rolled through a reversing mill, and which has a nominal thickness greater than 4.50 mm.
- (b) From a coil which has been rolled through a continuous mill to produce a nominal thickness equal to or greater than 3 mm.

1.3.8 Strip—a continuously rolled product of any width and thickness, supplied in coil form. Edges are either trimmed or untrimmed.

1.3.9 Transverse direction—the direction at right angles to the direction of the greatest extension of the steel during rolling.

1.3.10 Wide slab—a semi-finished rolled or continuously cast flat product having a rectangular cross-section, a thickness greater than 100 mm and a width-to-thickness ratio not less than 4:1.

1.4 MEASUREMENT OF FLATNESS To measure flatness, the product, resting under its own weight, is placed on a flat horizontal surface in such a manner that any deviation from flatness is in the centre of the product, not at the ends. Deviations from flatness are measured by allowing a straightedge to rest on at least two points on the product surface and then measuring the distance between the product and the straightedge (see Figure 1.1 (a)). Only that portion situated between two consecutive points of contact is taken into consideration. The straightedge may be placed in any direction.

Where two points of contact do not exist, the deviation may be determined by measuring the distance between the flat horizontal surface and the bottom surface of the product (see Figure 1.1 (b)).

An alternative method for expressing flatness is to calculate the steepness ratio (see Appendix A).

1.5 MEASUREMENT OF EDGE CAMBER To measure edge camber the product is laid on a flat horizontal surface and a straightedge is placed on the concave side edge. The maximum distance between the side edge and the straightedge (w_c) is then measured (see Figure 1.2). Camber is expressed as a percentage of the measured value divided by the length of sheet.

1.6 MEASUREMENT OF OUT-OF-SQUARENESS The deviation from squareness of a length cut from trimmed-edge steel strip is measured by scribing a line normal to the trimmed edge adjacent to the cut. The out-of-squareness is expressed as a percentage of the measured value of deviation from square divided by the nominal width (see Figure 1.3).

1.7 ROUNDING OF TEST RESULT VALUES For the purpose of assessing compliance with this Standard, the specified limiting values shall be interpreted in accordance with the 'rounding method' described in AS 2706, i.e. the observed or calculated value shall be rounded to the same number of figures as in the specified limiting value and then compared with the specified limiting value. For example, for specified limiting values of 2.5, 2.50, and 2.500, the observed or calculated value would be rounded respectively to the nearest 0.1, 0.01, or 0.001.