

Data sheet: A1.4

Plate Mill Product Tolerances

Hot rolled steel plate

General description

When plate is ordered to a national specification such as ASTM, EN or JIS, tolerances in accordance with that specification will apply.

This data sheet applies to ArcelorMittal South Africa's high strength quenched and tempered steels, ROQ-tuf[®] and ROQ-last[®]. It also applies to all other local specification for example Commercial Quality, Flange and Profile Cutting Plate, Hard wearing plate and analysis specifications. It is mainly based on the tables given in EN 10029 (Hot-rolled steel plate 3mm thick or above - Tolerances on dimensions and shape).

Tolerances

1. Thickness

Thickness tolerances can be supplied as:

- Class A: For minus thickness depending on the nominal thickness
- Class B: For a fixed minus tolerance of 0,3 mm
- Class C: For a fixed minus tolerance of 0 mm ("Thickness minimum")
- Class D: For symmetrical tolerances

Table 1: Thickness Tolerances

Nominal thickness t (mm)	Tolerances on the nominal thickness							
	Class A		Class B		Class C		Class D	
	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper
$4,5 \leq t < 5,0$	-0,3	0,7	-0,3	0,7	0	1,0	-0,5	0,5
$6,0 \leq t < 8,0$	-0,4	0,8	-0,3	0,9	0	1,2	-0,6	0,6
$8,0 \leq t < 15,0$	-0,5	0,9	-0,3	1,1	0	1,4	-0,7	0,7
$15,0 \leq t < 25,0$	-0,6	1,0	-0,3	1,3	0	1,6	-0,8	0,8
$25,0 \leq t < 40,0$	-0,7	1,3	-0,3	1,7	0	2,0	-1,0	1,0
$40,0 \leq t < 80,0$	-0,9	1,7	-0,3	2,3	0	2,6	-1,3	1,3
$80,0 \leq t < 100,0$	-1,1	2,1	-0,3	2,9	0	3,2	-1,6	1,6

If, at the time of ordering no class is specified, class A will apply.

Class C (thickness minimum) normally applies for Pressure Vessel Grades.

Thickness is measured at any point more than 25mm from any edge, excluding ground areas. For thicknesses tolerances applicable where the surface was repaired by grinding, refer to EN 10163-2 (Delivery requirements for surface condition of hot-rolled steel plates).

For further information, contact:

ArcelorMittal South Africa Limited, PO Box 2, Vanderbijlpark 1900. Toll free number 0800 005043

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2. Width

Width tolerances for plates with trimmed edges are given in Table 2:

Table 2: Tolerance over width and length for sheared edges

Nominal thickness t (mm)	Tolerances on the width	
	Lower	Upper
$4,5 < t < 5,0$	0	+20
$6,0 < t < 100,0$	0	+25

Width tolerances for plates with untrimmed edges shall be agreed at the time of ordering.

3. Length

Length tolerances for plates are given in Table 3:

Table 3: Tolerance over width and length for sheared edges

Nominal length l (mm)	Tolerances on the width	
	Lower	Upper
$l < 4000$	0	+20
$4000 \leq l < 6000$	0	+30
$6000 \leq l < 8000$	0	+40
$8000 \leq l < 10000$	0	+50
$10000 \leq l < 15000$	0	+75

4. Flatness

Flatness is measured as the maximum deviation from a horizontal flat surface. For wave pitches (the distance between points of contact of the plate and straight edge) 1000 mm or longer a 2000 mm straight edge is used to determine the deviation. For shorter wave pitches a 1000 mm straight edge is used.

Table 4 indicates the normal flatness tolerances for different plate thicknesses. Steel types in this table are defined as:

Type L: Products with a specified minimum yield strength ≤ 460 MPa, excluding quenched or quenched and tempered material.

Type H: Products with a specified minimum yield strength > 460 MPa, including all quenched or quenched and tempered material.

Table 4: Normal tolerances on flatness (class N)

Nominal thickness t (mm)	Steel Type L		Steel Type H	
	Measuring Length (mm)			
	1000	2000	1000	2000
$4,5 < t < 5,0$	9	14	12	17
$6,0 \leq t < 8,0$	8	12	11	15
$8,0 \leq t < 15,0$	7	11	10	14
$15,0 \leq t < 25,0$	7	10	10	13
$25,0 \leq t < 40,0$	6	9	9	12
$40,0 \leq t < 100,0$	5	8	8	12

For wave pitches between 300 mm and 1000 mm the maximum flatness deviation is 1% of the wave pitch for type L products and 1,5% for type H products, but not exceeding the values in table 4. Deviations ≤ 2 mm shall not be considered as a wave and should not be taken into account.

Flatness tolerances other than the above must be agreed at the time of enquiry and order.

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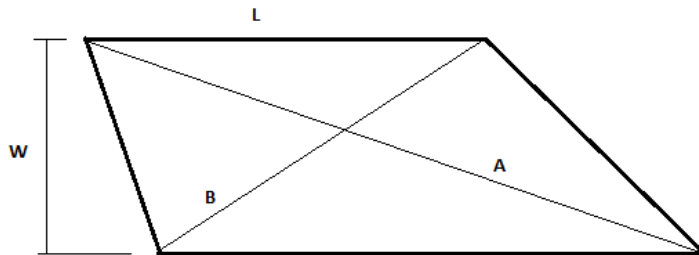
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5. Out-of-square

The out-of-squareness of a plate shall be so that:

$$L - [(A-B)/2] \geq X$$

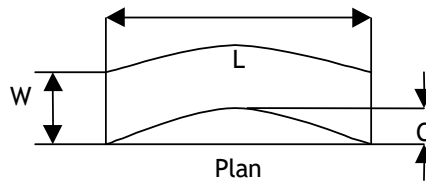
Where: A and B are the diagonals of the actual plate
L is the shortest length of the actual plate
W is the width of the actual plate
X is the ordered length of the plate



6. Camber

Camber is the deviation of a side edge of a plate from a straight line. The maximum camber of a single rolled plate is 0,25% of the length of the plate. For cut lengths the maximum camber permissible is 0,4% in any length.

W is the width
L is the length
C is the edge camber



7. Mass

The permissible variation for the average mass of batches is expressed as a percentage of the nominal mass in Table 5. The permissible over mass of a single plate is one third more than the plus tolerance in the table.

Table 5: Permissible variation in batch mass

Thickness t (mm)	Variation under (%)	Variation over (%)
$4,5 \leq t < 6,0$	4,0	8,0
$6,0 \leq t < 8,0$	4,0	6,0
$8,0 \leq t < 10,0$	3,5	5,5
$10,0 \leq t < 12,0$	3,0	5,0
$12,0 \leq t < 18,0$	2,0	4,0
$18,0 \leq t < 50,0$	1,5	3,5
$50,0 \leq t < 75,0$	1,5	3,5
$75,0 \leq t < 80,0$	1,5	2,5
$80,0 \leq t < 100,0$	1,5	2,5

The approximate mass of 1 cubic metre of steel is 7,85 ton (7 850 kg).

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