

# BS EN 10143 : 1993

## Continuously hot-dip metal coated steel sheet and strip - Tolerances on dimensions and shape

### Tolerances on dimensions and shape

#### Thickness

The tolerances on thickness are given in

- table 1 for hot-dip metal coated flat products of all low carbon steels for cold forming (e.g. as specified in EN10142) and of structural steels with minimum yield strength values  $<280 \text{ N/mm}^2$  and for grades Fe E 550G (or S 550GD) with a minimum yield strength of  $550 \text{ N/mm}^2$  in the unannealed condition;

- table 2 for hot-dip metal coated flat products of structural steels with minimum yield strength values  $\geq 280 \text{ N/mm}^2$

Thickness tolerances more severe than the special tolerances given in tables 1 and 2 may be agreed at the time of the order.

#### Width

The tolerances on width are given in

- table 3 for products with nominal widths  $>600 \text{ mm}$  (wide strip and sheet);
- table 4 for products with a nominal width  $< 600 \text{ mm}$  (slit wide strip cut lengths.)

#### Length

The tolerances on length (for sheet and cut lengths) are given in table 5.

#### Flatness

The flatness tolerances for sheet are given in

- table 6 for hot-dip metal-coated sheet of all low carbon steel for cold forming (e.g. as specified in EN 10142) and of structural steels with minimum strength values  $< 280 \text{ N/mm}^2$ ;
- table 7 for hot-dip metal-coated sheet of structural steels with minimum yield strength values  $\geq 280 \text{ N/mm}^2 \leq 360 \text{ N/mm}^2$ .

**Table 1. Tolerances on thickness for hot-dip metal-coated flat products of all low carbon steels for cold forming (e.g. as specified in EN 10142) and of structural steels with minimum yield strength values  $< 280 \text{ N/mm}^2$  (including steel grades Fe E 550G or S 550GD) - dimensions in mm**

Nominal thickness	Normal tolerances for nominal widths <sup>(1) (2)</sup>			Special tolerances (S) for nominal widths <sup>(1) (2)</sup>		
	$\leq 1200$	$>1200 \leq 1500$	$>1500$	$\leq 1200$	$>1200 \leq 1500$	$>1500$
$\leq 0.40$	$\pm 0.05$	$\pm 0.06$	—	$\pm 0.03$	$\pm 0.04$	—
$>0.40 \leq 0.60$	$\pm 0.06$	$\pm 0.07$	$\pm 0.08$	$\pm 0.04$	$\pm 0.05$	$\pm 0.06$
$>0.60 \leq 0.80$	$\pm 0.07$	$\pm 0.08$	$\pm 0.09$	$\pm 0.05$	$\pm 0.06$	$\pm 0.06$
$>0.80 \leq 1.00$	$\pm 0.08$	$\pm 0.09$	$\pm 0.10$	$\pm 0.06$	$\pm 0.07$	$\pm 0.07$
$>1.00 \leq 1.20$	$\pm 0.09$	$\pm 0.10$	$\pm 0.11$	$\pm 0.07$	$\pm 0.08$	$\pm 0.08$
$>1.20 \leq 1.60$	$\pm 0.11$	$\pm 0.12$	$\pm 0.12$	$\pm 0.08$	$\pm 0.09$	$\pm 0.09$
$>1.60 \leq 2.00$	$\pm 0.13$	$\pm 0.14$	$\pm 0.14$	$\pm 0.09$	$\pm 0.10$	$\pm 0.10$
$>2.00 \leq 2.50$	$\pm 0.15$	$\pm 0.16$	$\pm 0.16$	$\pm 0.11$	$\pm 0.12$	$\pm 0.12$
$>2.50 \leq 3.00$	$\pm 0.17$	$\pm 0.18$	$\pm 0.18$	$\pm 0.12$	$\pm 0.13$	$\pm 0.13$

(1) In the case of wide and slit wide strip, the thickness tolerances in the region of cold-rolled welds shall be increased by max. 60% over a length of 15m.

**Table 2. Tolerances on thickness for hot-dip metal coated flat products of structural steels with minimum yield strength values  $\geq 280 \text{ N/mm}^2$  (but exceeding steel grades Fe E 550G or S 550GD (see table 1) - dimensions in mm**

Nominal thickness	Normal tolerances for nominal widths <sup>(1) (2)</sup>			Special tolerances (S) for nominal widths <sup>(1) (2)</sup>		
	$\leq 1200$	$>1200 \leq 1500$	$>1500$	$\leq 1200$	$>1200 \leq 1500$	$>1500$
$\leq 0.40$	$\pm 0.06$	$\pm 0.07$	—	$\pm 0.04$	$\pm 0.05$	—
$>0.40 \leq 0.60$	$\pm 0.07$	$\pm 0.08$	$\pm 0.09$	$\pm 0.05$	$\pm 0.06$	$\pm 0.07$
$>0.60 \leq 0.80$	$\pm 0.08$	$\pm 0.09$	$\pm 0.11$	$\pm 0.06$	$\pm 0.07$	$\pm 0.07$
$>0.80 \leq 1.00$	$\pm 0.09$	$\pm 0.11$	$\pm 0.12$	$\pm 0.07$	$\pm 0.08$	$\pm 0.08$
$>1.00 \leq 1.20$	$\pm 0.11$	$\pm 0.12$	$\pm 0.13$	$\pm 0.08$	$\pm 0.09$	$\pm 0.09$
$>1.20 \leq 1.60$	$\pm 0.13$	$\pm 0.14$	$\pm 0.14$	$\pm 0.09$	$\pm 0.11$	$\pm 0.11$
$>1.60 \leq 2.00$	$\pm 0.15$	$\pm 0.15$	$\pm 0.17$	$\pm 0.11$	$\pm 0.12$	$\pm 0.12$
$>2.00 \leq 2.50$	$\pm 0.18$	$\pm 0.18$	$\pm 0.19$	$\pm 0.13$	$\pm 0.14$	$\pm 0.14$
$>2.50 \leq 3.00$	$\pm 0.20$	$\pm 0.20$	$\pm 0.21$	$\pm 0.14$	$\pm 0.15$	$\pm 0.15$

(1) In the case of wide and slit wide strip, the thickness tolerances in the region of cold-rolled welds shall be increased by max. 60% over a length of 15m. (2) For zinc coatings Z 450 and Z600 the thickness tolerances shall be increased by 0.02 mm.



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The flatness tolerances shall be agreed at the time of ordering for sheet of steel with specified higher minimum yield strength values (e.g. Fe E 550G or S 550GD) and for sheet with zinc coating masses Z 450 and Z600.

**Out of squareness**

Unless otherwise agreed the out-of-squareness *u* shall not exceed 1% of the actual width of the sheet.

**Edge camber**

Unless otherwise agreed the edge camber *q* shall not exceed 6mm over a length of 2 m. For lengths less than 2m, the edge camber shall not exceed 0.3% of

the actual length.

For slit wide strip of widths less than 600 mm a special edge camber tolerance (CS) of 2 mm maximum on a 2 m length may be specified. This special tolerance is not applicable to slit wide strip of steels with a specified minimum yield strength value  $\geq 280\text{N/mm}^2$ .

**Superimposition of dimensions**

By agreement at the time of ordering, the tolerance on out-of-squareness and edge camber may be replaced by the requirement that a perfect rectangle formed by the ordered width and length dimensions can be superimposed onto the sheets delivered.

**Table 3. Tolerances on width for hot-dip metal coated flat products with nominal widths > 600 mm (wide strip and sheet) - dimensions in mm**

Nominal width	Normal tolerances		Special tolerances (S)	
	Lower	Upper	Lower	Upper
$\geq 600 \leq 1200$	0	+5	0	+2
$> 1200 \leq 1500$	0	+6	0	+2
$> 1500$	0	+7	0	+3

**Table 4. Tolerances on length (for sheet and cut lengths) - dimensions in mm**

Nominal width	Normal tolerances		Special tolerances (S)	
	Lower	Upper	Lower	Upper
$< 2000$	0	6	0	3
$\geq 2000$	0	$0.003 \times l$	0	$0.0015 \times l$

**Table 5. Tolerances on width for hot-dip metal-coated flat products with nominal widths <600 mm (slit wide strip and cut lengths) - dimensions in mm**

Tolerance Class	Nominal thickness	Nominal Width							
		$< 125$		$\geq 125 < 250$		$\geq 250 < 400$		$\geq 400 < 600$	
		Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper
Normal	$< 0.6$	0	+0.4	0	+0.5	0	+0.7	0	+1.0
	$\geq 0.6 < 1.0$	0	+0.5	0	+0.6	0	+0.9	0	+1.2
	$\geq 1.0 < 2.0$	0	+0.6	0	+0.8	0	+1.1	0	+1.4
	$\geq 2.0 \leq 3.0$	0	+0.7	0	+1.0	0	+1.3	0	+1.6
Special (S)	$< 0.6$	0	+0.2	0	+0.2	0	+0.3	0	+0.5
	$\geq 0.6 < 1.0$	0	+0.2	0	+0.3	0	+0.4	0	+0.6
	$\geq 1.0 < 2.0$	0	+0.3	0	+0.4	0	+0.5	0	+0.7
	$\geq 2.0 \leq 3.0$	0	+0.4	0	+0.5	0	+0.6	0	+0.8



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**Table 6. Flatness tolerances for hot-dip metal-coated sheet of low carbon steels for cold forming (e.g. as specified in EN10142) and of structural steels with minimum yield strength values < 280 N/mm<sup>2</sup> - dimensions in mm**

Tolerance class	Nominal width	Nominal thickness		
		<0.7	≥0.7<1.2	≥1.2
Normal	≥600<1200	12	10	8
	≥1200<1500	15	12	10
	≥1500	19	17	15
Special (FS)	≥600<1200	5	4	3
	≥1200<1500	6	5	4
	≥1500	8	7	6

**Table 7. Flatness tolerances for hot-dip metal-coated sheet of structural steels with minimum yield strength values ≥ 280 <360 N/mm<sup>2</sup> - dimensions in mm**

Tolerance class	Nominal width	Nominal thickness		
		<0.7	≥0.7<1.2	≥1.2
Normal	≥600<1200	15	13	10
	≥1200<1500	18	15	13
	≥1500	22	20	19
Special (FS)	≥600<1200	8	6	5
	≥1200<1500	9	8	6
	≥1500	12	10	9

