EN Specifications Guide – Stainless Steel Hot Rolled Plate

The old BS1449 & BS1501 standards have been replaced by EN Standards:

Standard	Scope
EN10088-2	Replaces BS1449-Part 2: 1983
EN10028-7	Replaces BS1501-Part3: 1990
EN10095	Covers Heat Resisting Grades
EN10259 **Now: ISO 9445**	Tolerances for COLD Rolled material
EN10029 **Now: ISO 18286**	Tolerances for Quarto Hot Rolled Plate
EN10051 **Now: ISO 9445 / 9444**	Tolerances for Coil Produced (CPP) Hot Rolled Plate

It is useful to highlight where the new EN standards differ from the old BS standards:

- Mechanical Properties have been changed
- Tensile strengths are higher and a maximum is stipulated
- Chemical Compositions vary slightly with Nickel contents being slightly lower
- 304S15, 304S16 & 304S31 have all been replaced by 1.4301
- EN 10088-2 states that Class A thickness tolerances shall normally be produced
- EN 10028-7 states that the normal thickness tolerance is Class B
- Surface Finish Standards extended and some changed

Material Certification

Where multi-certification is required, a combination of EN10088-2, EN10028-7, EN10029 or 10051 will appear together with the appropriate ASTM Standards.

Tolerances

- For Cold Rolled Plate please refer to the datasheet on cold rolled
- Note that there are two sets of tolerances tables – One set for Quarto Plate to EN10029 and one set for CPP plate to EN10051
- For CPP there are 3 categories of tolerances according to the grade where:
  - B = Ferritic & Martensitic Grades
  - C = Austenitic Grades without Mo
  - D = Austenitic Grades with Mo

Flatness – Quarto Plate

Thickness mm	Tolerance in mm over given length in mm	
	1000	**2000**
3 to 4.9	9	14
5 to 7.9	8	12
8 to 14.9	7	11
15 to 24.9	7	10
25 to 39	6	9
40 to 250	5	8

Flatness – CPP

Width	Tolerance* for given category		
	B	**C**	**D****
Up to 1200	18	23	**
1200 to 1500	23	30	**
Over 1500	28	38	**

For CPP there are 3 categories of tolerances according to the grade where:

- *B = Ferritic & Martensitic Grades*
- *C = Austenitic Grades without Mo*
- *D = Austenitic Grades with Mo*

**These flatness tolerances only apply for thicknesses up to 25mm*

***To be agreed at time of enquiry & order*

Length – Quarto Plate

Length (mm)	Tolerance in mm	
Under 4000	– 0	+ 10
4000 to 5999	– 0	+ 30
6000 to 7999	– 0	+ 40

Length – CPP

Length (mm)	Tolerance in mm	
Under 2000	– 0	+ 20
2000 to 7999	– 0	0.05 x Length

Width – Quarto Plate

Width (mm)	Tolerance in mm	
600 to 1999	– 0	+ 20
2000 to 2999	– 0	+ 25
3000 and over	– 0	+ 30

Width – CPP

Length	Plus tolerance in mm (- 0)	
	Mill edges	Trimmed
Up to 1200	+ 20	+ 3
1201 to 1500	+ 20	+ 5
Over 1500	+ 20	+ 6

Finishes according to BS EN 10088-2 / 10028-7

BS EN Finish	Old BS Finish	Description
Hot Rolled		
1C	**0**	Hot rolled, heat treated, not descaled
1E	**1**	Hot rolled, heat treated, mechanically descaled
1D	**1**	Hot rolled, heat treated, pickled
1U	**-**	Hot rolled, not heat treated, not descaled

Thickness – Quarto Plate

Thickness mm	Tolerance in mm		Max variation in mm within a plate for given width in mm	
	Minus	Plus	1000/1250/1500	2000
3 to 4.9	0.3	0.9	0.8	0.9
5 to 7.9	0.3	1.2	0.9	0.9
8 to 14.9	0.3	1.4	0.9	1.0
15 to 24.9	0.3	1.6	1.0	1.1
25 to 39.9	0.3	1.9	1.1	1.2
40 to 79.9	0.3	2.5	1.2	1.3
80 to 149	0.3	2.9	1.3	1.4
150 to 250	0.3	3.3	1.4	1.5

Thickness – CPP These figures must be increased for stainless steel by 15% for Ferritic & Martensitic, 30% for Austentic and 40% for Moly Grades

Thickness (mm)	Tolerance in mm (plus or minus) for given width in mm			
	Up to 1200	1201 to 1500	1501 to 1800	Over 1800
Up to 2.0	0.17	0.19	0.21	-
2.01 to 2.5	0.18	0.21	0.23	0.25
2.51 to 3.0	0.20	0.22	0.24	0.26
3.01 to 4.0	0.22	0.24	0.26	0.27
4.01 to 5.0	0.24	0.26	0.28	0.29
5.01 to 6.0	0.26	0.28	0.29	0.31
6.01 to 8.0	0.29	0.30	0.31	0.35
8.01 to 10.0	0.32	0.33	0.34	0.40
10.01 to 12.50	0.35	0.36	0.37	0.43
12.51 to 15.0	0.37	0.38	0.40	0.46
15.01 to 25.0	0.40	0.42	0.45	0.50

Comparative Grades

AUSTENITIC				FERRITIC/MARTENSITIC	
BS 1449-2	EN 10088-2	BS 1449-2	EN 10088-2	BS 1449-2	EN 10088-2
284S16	-	316S13	**1.4432**	403S17	**1.4000**
301S21	**1.4310**	316S31	**1.4401**	405S17	**1.4002**
304S11	**1.4307**	316S33	**1.4436**	409S19	**1.4512**
304S15	**1.4301**	317S12	**1.4438**	430S17	**1.4016**
304S16	**1.4301**	317S16	-	434S17	**1.4016**
304S31	**1.4301**	320S31	**1.4571**	410S31	**1.4006**
305S19	**1.4303**	320S33	-	420S45	**1.4028**
315S16	-	321S31	**1.4541**		
316S11	**1.4404**	347S31	**1.4550**		
N.B. The grades stated are the nearest comparisons and not direct equivalents					

Main Grade Differences

Grade	Carbon (%)		Chrome (%)		Nickel (%)		UTS (N/mm²)	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
304S15	-	0.06	17.5	19.0	8.0	11.0	500	-
304S16	-	0.06	17.5	19.0	9.0	11.0	500	-
304S31	-	0.07	17.0	19.0	8.0	11.0	490	690
1.4301	**-**	**0.07**	**17.0**	**19.5**	**8.0**	**10.5**	**540***	**750***
304S11	-	0.03	17.0	19.0	9.0	12.0	480	-
1.4307	**-**	**0.03**	**17.5**	**19.5**	**8.0**	**10.0**	**520***	**670***
316S31	-	0.07	16.5	18.5	10.5	13.5	510	-
1.4401	**-**	**0.07**	**16.5**	**18.5**	**10.0**	**13.0**	**530***	**680***
316S11	-	0.03	16.5	18.5	11.0	14.0	490	-
1.4404	**-**	**0.03**	**16.5**	**18.5**	**10.0**	**13.0**	**530***	**680***
**** Tensile properties stated apply to steels in the solution annealed condition.***								