

TOLERANCE TABLES

COLD ROLLED

1. Thickness tolerance for steel grades with specified minimum yield strength <260 MPa, e.g. DC04 EN 10131

Nominal thickness	Normal tolerances for a nominal width of:			Restricted tolerances for a nominal width of:		
	≤ 1200	> 1200 ≤ 1500	> 1500	≤ 1200	> 1200 ≤ 1500	> 1500
≥ 0.35 a 0.40	± 0.03	± 0.04	± 0.05	± 0.020	± 0.025	± 0.030
> 0.40 a 0.60	± 0.03	± 0.04	± 0.05	± 0.025	± 0.030	± 0.035
> 0.60 a 0.80	± 0.04	± 0.05	± 0.06	± 0.030	± 0.035	± 0.040
> 0.80 a 1.00	± 0.05	± 0.06	± 0.07	± 0.035	± 0.040	± 0.050
> 1.00 a 1.20	± 0.06	± 0.07	± 0.08	± 0.040	± 0.050	± 0.060
> 1.20 a 1.60	± 0.08	± 0.09	± 0.10	± 0.050	± 0.060	± 0.070
> 1.60 a 2.00	± 0.10	± 0.11	± 0.12	± 0.060	± 0.070	± 0.080
> 2.00 a 2.50	± 0.12	± 0.13	± 0.14	± 0.080	± 0.090	± 0.100
> 2.50 a 3.00	± 0.15	± 0.15	± 0.16	± 0.100	± 0.110	± 0.120

2. Thickness tolerances for steel grades with a specified minimum yield strength between 260 MPa <340 MPa, e.g. DC01 EN 10131

Nominal thickness	Normal tolerances for a nominal width of:			Restricted tolerances for a nominal width of:		
	≤ 1200	> 1200 ≤ 1500	> 1500	≤ 1200	> 1200 ≤ 1500	> 1500
≥ 0.35 a 0.40	± 0.04	± 0.05	± 0.06	± 0.025	± 0.030	± 0.035
> 0.40 a 0.60	± 0.04	± 0.05	± 0.06	± 0.030	± 0.035	± 0.040
> 0.60 a 0.80	± 0.05	± 0.06	± 0.07	± 0.035	± 0.040	± 0.050
> 0.80 a 1.00	± 0.06	± 0.07	± 0.08	± 0.040	± 0.050	± 0.060
> 1.00 a 1.20	± 0.07	± 0.08	± 0.10	± 0.050	± 0.060	± 0.070
> 1.20 a 1.60	± 0.09	± 0.11	± 0.12	± 0.060	± 0.070	± 0.080
> 1.60 a 2.00	± 0.12	± 0.13	± 0.14	± 0.070	± 0.080	± 0.100
> 2.00 a 2.50	± 0.14	± 0.15	± 0.16	± 0.100	± 0.110	± 0.120
> 2.50 a 3.00	± 0.17	± 0.18	± 0.18	± 0.120	± 0.130	± 0.140

3. Thickness tolerances for steel grades with a specified minimum yield strength between **340 MPa <420 MPa EN 10131**

Nominal thickness	Normal tolerances for a nominal width of:			Restricted tolerances for a nominal width of:		
	≤ 1200	> 1200 ≤ 1500	> 1500	≤ 1200	> 1200 ≤ 1500	> 1500
≥ 0.35 a 0.40	± 0.04	± 0.05	± 0.06	± 0.030	± 0.035	± 0.040
> 0.40 a 0.60	± 0.05	± 0.06	± 0.07	± 0.035	± 0.040	± 0.050
> 0.60 a 0.80	± 0.06	± 0.07	± 0.08	± 0.040	± 0.050	± 0.060
> 0.80 a 1.00	± 0.07	± 0.08	± 0.10	± 0.050	± 0.060	± 0.070
> 1.00 a 1.20	± 0.09	± 0.10	± 0.11	± 0.060	± 0.070	± 0.080
> 1.20 a 1.60	± 0.11	± 0.12	± 0.14	± 0.070	± 0.080	± 0.100
> 1.60 a 2.00	± 0.14	± 0.15	± 0.17	± 0.080	± 0.100	± 0.110
> 2.00 a 2.50	± 0.16	± 0.18	± 0.19	± 0.110	± 0.120	± 0.130
> 2.50 a 3.00	± 0.20	± 0.20	± 0.21	± 0.130	± 0.140	± 0.150

4. Thickness tolerance for steel grades with specified minimum yield strength **420 MPa EN 10131**

Nominal thickness	Normal tolerances for a nominal width of:			Restricted tolerances for a nominal width of:		
	≤ 1200	> 1200 ≤ 1500	> 1500	≤ 1200	> 1200 ≤ 1500	> 1500
≥ 0.35 a 0.40	± 0.05	± 0.06	± 0.07	± 0.035	± 0.040	± 0.050
> 0.40 a 0.60	± 0.05	± 0.07	± 0.08	± 0.040	± 0.050	± 0.060
> 0.60 a 0.80	± 0.06	± 0.08	± 0.10	± 0.050	± 0.060	± 0.070
> 0.80 a 1.00	± 0.08	± 0.10	± 0.11	± 0.060	± 0.070	± 0.080
> 1.00 a 1.20	± 0.10	± 0.11	± 0.13	± 0.070	± 0.080	± 0.100
> 1.20 a 1.60	± 0.13	± 0.14	± 0.16	± 0.080	± 0.100	± 0.110
> 1.60 a 2.00	± 0.16	± 0.17	± 0.19	± 0.100	± 0.110	± 0.130
> 2.00 a 2.50	± 0.19	± 0.20	± 0.22	± 0.130	± 0.140	± 0.160
> 2.50 a 3.00	± 0.22	± 0.23	± 0.24	± 0.160	± 0.170	± 0.180

5. Width tolerance for sheets and wide strips **EN 10131**

Type of tolerance	Nominal length		
	≤ 1200	1200 a ≤ 1500	>1500
Normal	- 0 + 4	- 0 + 5	- 0 + 6
Restricted	- 0 + 2	- 0 + 2	- 0 + 3

6. Tolerance on width of wide strip cut to length with width less than **600 mm EN 10131**

Type of tolerance	Nominal thickness	Nominal width			
		< 125	≥ 125 a < 250	≥ 250 a < 400	≥ 400 a < 600
Normal	< 0.6	- 0 + 0.4	- 0 + 0.5	- 0 + 0.7	- 0 + 1.0
	≥ 0.6 a < 1.0	- 0 + 0.5	- 0 + 0.6	- 0 + 0.9	- 0 + 1.2
	≥ 1.0 a < 2.0	- 0 + 0.6	- 0 + 0.8	- 0 + 1.1	- 0 + 1.4
	≥ 2.0 a < 3.0	- 0 + 0.7	- 0 + 1.0	- 0 + 1.3	- 0 + 1.6
Restricted	< 0.6	- 0 + 0.2	- 0 + 0.2	- 0 + 0.3	- 0 + 0.5
	≥ 0.6 a < 1.0	- 0 + 0.2	- 0 + 0.3	- 0 + 0.4	- 0 + 0.6
	≥ 1.0 a < 2.0	- 0 + 0.3	- 0 + 0.4	- 0 + 0.5	- 0 + 0.7
	≥ 2.0 a < 3.0	- 0 + 0.4	- 0 + 0.5	- 0 + 0.6	- 0 + 0.8

7. Length tolerance for plates **EN 10131**

Type of tolerance	Nominal length	
	< 2000	≥ 2000
Normal	- 0 + 6	- 0 + 0,3% of the length
Restricted	- 0 + 3	- 0 + 0,15% of the length

**8. Flatness tolerances for specified minimum yield strength steel grades
<260 MPa EN 10131**

		Maximum wave height for nominal thickness		
Type of tolerance	Nominal width	< 0,7	≤ 0,7 a < 1,2	≥ 1,2
Normal	< 600	7	6	5
	≥ 600 a < 1200	10	8	7
	≥ 1200 a < 1500	12	10	8
	≥ 1500	17	15	13
Restricted	< 600	4	3	2
	≥ 600 a < 1200	5	4	3
	≥ 1200 a < 1500	6	5	4
	≥ 1500	8	7	6
	< 1500	The height of the corrugation of edges longer than 200 mm must be less than 1% of their length.		
	≥ 1500	The height of the corrugation of edges longer than 200 mm must be less than 1,5% of their length. For edge corrugations longer than 200 mm, the maximum height shall not exceed 2 mm.		

**9. Flatness tolerances for specified yield strength steel grades
260 MPa ≤ 360 MPa EN 10131**

		Maximum wave height for nominal thickness		
Type of tolerance	Nominal width	< 0,7	≤ 0,7 a < 1,2	≥ 1,2
Normal	≥600 < 1200	13	10	8
	≥ 1200 a < 1500	15	13	11
	≥ 1500	20	19	17
Restricted	≥600 < 1200	8	6	5
	≥ 1200 a < 1500	9	8	6
	≥ 1500	12	10	9

**10. Characteristics of cold-rolled steels for deep-drawing according to
EN 10130**

		Maximum wave height for nominal thickness		
Type of tolerance	Nominal width	< 0,7	≤ 0,7 a < 1,2	≥ 1,2
Normal	< 600	7	6	5
	≥ 600 a < 1200	10	8	7
	≥ 1200 a < 1500	12	10	8
	≥ 1500	17	15	13
Restricted	< 600	4	3	2
	≥ 600 a < 1200	5	4	3
	≥ 1200 a < 1500	6	5	4
	≥ 1500	8	7	6
	< 1500	The height of the corrugation of edges longer than 200 mm must be less than 1% of their length.		
	≥ 1500	The height of the corrugation of edges longer than 200 mm must be less than 1,5% of their length. For edge corrugations longer than 200 mm, the maximum height shall not exceed 2 mm.		

Grade	Number	Chemical composition % by mass max.				
		C Máx %	P Máx %	S Máx %	Mn Máx %	Ti Máx %
DC01	10330	0,12	0,045	0,045	0,60	-
DC03	10347	0,10	0,035	0,035	0,45	-
DC04	10338	0,08	0,030	0,030	0,40	-
DC05	10312	0,06	0,025	0,025	0,35	-
DC06	10873	0,02	0,020	0,020	0,25	0,3
DC07	10898	0,01	0,020	0,020	0,20	0,2

**11. Mechanical properties for cross-section specimens according to
EN 10268**

Grade	Number	Conventional yield strength at 0,2%	Conventional yield strength increase after heating	Tensile strength	Elongation	Plastic deformation ratio	Plastic deformation ratio	Plastic deformation hardening exponent
		Rp02 Trans. MPa	BH2 Min Trans MPa	Rm Trans. MPa	A80 Min Trans. %	r Máx trans	r Máx trans	R Min trans
HC180Y	1.0922	180 a 230		330 a 400	35		1,7	0,19
HC180B	1.0395	180 a 230	35	290 a 360	34		1,6	0,17
HC220Y	1.0925	220 a 270		340 a 420	33		1,6	0,18
HC220I	1.0346	220 a 270		300 a 380	34	1,4		0,18
HC220B	1.0396	220 a 270	35	320 a 400	32		1,5	0,16
HC260Y	1.0928	260 a 320		380 a 440	31		1,4	0,17
HC260I	1.0349	260 a 310		320 a 400	32	1,4		0,17
HC260B	1.0400	260 a 320	35	360 a 440	29			
HC260LA	1.0480	260 a 330		350 a 430	26			
HC300I	1.0447	300 a 350		340 a 440	30	1,4		0,16
HC300B	1.0444	300 a 360	35	390 a 480	26			
HC300LA	1.0489	300 a 380		380 a 480	23			
HC340LA	1.0548	340 a 420		410 a 510	21			
HC380LA	1.0550	380 a 480		440 a 580	19			
HC420LA	1.0556	420 a 520		470 a 600	17			
HC460LA	1.0574	460 a 580		510 a 660	13			
HC500LA	1.0573	500 a 620		550 a 710	12			

**12. Chemical composition of the casting analysis according to
EN 10268**

Grade	Number	Chemical composition of the casting analysis							
		C Máx %	Yes Máx %	Mn Máx %	P Máx %	S Máx %	Al Mín %	Ti Máx %	Nb Máx %
HC180Y	1.0922	0,01	0,3	0,7	0,06	0,025	0,01	0,12	0,09
HC180B	1.0395	0,06	0,5	0,7	0,06	0,030	0,015		
HC220Y	1.0925	0,01	0,3	0,9	0,08	0,025	0,01	0,12	0,09
HC220I	1.0346	0,07	0,5	0,6	0,05	0,025	0,015	0,05	
HC220B	1.0396	0,08	0,5	0,7	0,085	0,030	0,015		
HC260Y	1.0928	0,01	0,3	1,6	0,1	0,025	0,01	0,12	0,09
HC260I	1.0349	0,07	0,5	1,2	0,05	0,025	0,015	0,05	
HC260B	1.0400	0,1	0,5	1,0	0,1	0,030	0,015		
HC260LA	1.0480	0,1	0,5	1,0	0,030	0,025	0,015	0,15	0,09
HC300I	1.0447	0,08	0,5	0,7	0,08	0,025	0,015	0,05	
HC300B	1.0444	0,1	0,5	1,0	0,12	0,030	0,015		
HC300LA	1.0489	0,12	0,5	1,4	0,030	0,025	0,015	0,15	0,09
HC340LA	1.0548	0,12	0,5	1,5	0,030	0,025	0,015	0,15	0,09
HC380LA	1.0550	0,12	0,5	1,6	0,030	0,025	0,015	0,15	0,09
HC420LA	1.0556	0,14	0,5	1,6	0,030	0,025	0,015	0,15	0,09
HC460LA	1.0574	0,14	0,6	1,8	0,030	0,025	0,015	0,15	0,09
HC500LA	1.0573	0,14	0,6	1,8	0,030	0,025	0,015	0,15	0,09

13. Mechanical characteristics of zinc electrolytically coated low carbon steel flat products according to **EN 10152**

Grade	Number	Symbol for type of coating	Re	Rm	A80	r ₉₀	η ₉₀
			MPa	MPa	%min	min	min
DC01	1.0330	+ZE	<280	270 a 410	28	-	-
DC03	1.0347	+ZE	<240	270 a 370	34	1,3	-
DC04	1.0338	+ZE	<220	270 - 350	37	1,6	0,170
DC05	1.0312	+ZE	<200	270 a 330	39	1,9	0,190
DC06	1.0873	+ZE	<180	270 a 350	41	2,1	0,210
DC07	1.0898	+ZE	<160	250 a 310	43	2,5	0,220

14. Chemical composition of electrolytically zinc-coated low carbon steel flat products according to **EN 10152**

Grade	Number	Chemical composition of the casting analysis % max by mass				
		MPa	MPa	%min	min	min
DC01+ZE	1.0330	0,12	0,045	0,045	0,60	-
DC03+ZE	1.0347	0,10	0,035	0,035	0,45	-
DC04+ZE	1.0338	0,08	0,030	0,030	0,40	-
DC05+ZE	1.0312	0,06	0,025	0,025	0,35	-
DC06+ZE	1.0873	0,02	0,020	0,020	0,25	0,3
DC07+ZE	1.0898	0,01	0,020	0,020	0,20	0,2