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I SCOPE

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V CHANGE TABLE

Revision	Paragraph	Detail of Change
6		Changed Unity to General and removed reference U- from all types throughout the document
	1.1	Removed 3CR12Ti and 3CR12LT Added 40975, 439
	1.3	Changed ACX type for 301LN Indicate difference in C between 304 and 304H Combined and removed the ASTM/ASME reference for 304L, with Cr 18.0-19.5
	1.4	Removed 3CR12Ti and 3CR12LT Added EN type 1.4000 for 410S Added a split between 304 and 304H Combined ASTM and ASME for 304L
	2	Corrected Acerinox code for HRA Show difference between 523 and 543 Removed 509
	3.1.1	Fixed tolerance specification ISO 9444-2
	3.1.1.1	Changed lengths for 8-10mm and 10-16mm thickness and added a footnote
	3.1.3.1	Removed 3CR12Ti, 3CR12LT and 304H Added 40975, 439 Combined ASTM and ASME for 304L Added gauges for 40920 Added footnote references for 4 and 5
	3.1.3.2	Fixed numbering of heading Removed 3CR12Ti and 3CR12LT Added 40975, 439 Added a split between 304 and 304H with the footnote on 304H translated to values in the table Combined ASTM and ASME for 304L Changed minimum gauge on 321 No.1 < 1400mm wide to 3mm Added footnote references for 4 Changed CS2304 to 2304 in footnote 3
	3.2.2	Added footnote 2 on the use of gauge numbers
	3.2.3.1	Removed 3CR12Ti and 3CR12LT Added 40975, 439 Added a split between 304 and 304H Combined ASTM and ASME for 304L Added footnote 1 and 2 on the allowable tolerance Added footnote 9 for 2B supplied as BA at mill option on less than 0.5mm
7	1.1	Removed 439 and 434. Added C841
	1.3	Added 301L, 1.4318. Updated Heat Resistant Aust.
	1.4	Added 40975. Removed 434, 439. Added 301L. Updated 304 and 309, 310 Added TR, Removed 6R and HRP
	2	Max Length for plate 8-10mm changed from 6200mm to 6100mm
	3.1.1.1	301L added. HRA on Heat Resistant Aust removed. Footnotes updated
	3.1.3.1	40975 added. 304, 304DDQ max plate Gauge increased. HRA 309/310
	3.1.3.2	removed.
	4 – 6	Newly added.
	7.1.1	Footnotes updated
	7.1.2	Gauge number removed for Imperial. 0.015 inch (0.381mm) removed.
	7.1.3.1	430 <1300 min gauge updated to 0.4mm. 434 removed. Duplex min 0.7mm. Footnotes updated.
	7.4 – 13.2	Newly added
	14	Updated.

Table of Contents

1. TYPES AVAILABLE

1.1. Ferritics

CLASSIFICATION	TYPE		COMPOSITIONS[1]										
	General	ACX	C	Si	Mn	P	S	N	Cr	Mo	Nb	Ni	Other
Utility Ferritics	3CR12	C211	0.03	1.0	1.5	0.040	0.030		10.5-12.5			0.3-1.0	Ti: 4x(C+N) to 0.6
	3CR12L	C220	0.03	1.0	1.5	0.040	0.015	0.03	10.5-12.5			0.3-1.0	
	410S	C420	0.08	1.0	1.0	0.040	0.015		12.0-13.5			0.6	
Standard Ferritics	40910	C800	0.03	1.0	1.0	0.040	0.015	0.03	10.5-11.7			0.5	Ti: 6x(C+N) to 0.5
	40920	C801	0.03	1.0	1.0	0.040	0.0015	0.03	10.5-11.7			0.5	Ti: 8x(C+N) to 0.5
	40975	C700	0.03	1.0	1.0	0.040	0.030	0.03	10.5-11.7			0.5-1.0	Ti: 6x(C+N) to 0.75
	430	C500	0.08	1.0	1.0	0.040	0.015		16.0-18.0			0.75	
	430DDQ	C530	0.08	1.0	1.0	0.040	0.015		16.0-18.0				Al: 0.30 max
	439Nb	C515	0.05	1.0	1.0	0.040	0.015		17.08-18.0		0.45		Ti[2]: 4x(C+N)+0.15 to 0.8
	441	C845	0.03	0.75	1.0	0.040	0.015		17.5-18.5		3xC+0.3 to 1.00		Ti: 0.1 to 0.6
	441	C841	0.03	0.75	1.0	0.040	0.015		18.0-18.5		3xC+0.3 to 1.00		Ti: 0.1 to 0.6
	434	C535	0.08	1.0	1.0	0.040	0.015		16.0-18.0	0.9-1.25			
Moly Ferritics	436	C550	0.08	1.0	1.0	0.040	0.015	0.04	16.0-18.0	0.8-1.25	7x(C+N)+0.1 to 0.8		
	444	C555	0.025	1.0	1.0	0.040	0.015	0.03	17.5-19.5	1.8-2.5		1.0	Ti[2]: 4x(C+N)+0.15 to 0.8

[1] Compositions are maximum values, unless otherwise stated. Balance is iron

[2] Stabilisation may be by use of titanium or niobium or zirconium. For ASTM A240, Ti+Nb>4(C+N)+0.20. For EN10088-2, according to the atomic mass of these elements and the content of carbon and nitrogen, the equivalence shall be the following: Nb (% by mass) ≡ Zr (% by mass) ≡ 7/4 Ti (% by mass). (i.e. when replacing titanium with niobium nearly double (1.75) the niobium is needed.)

1.2. Duplexes

CLASSIFICATION	TYPE		COMPOSITIONS[1]										
	General	ACX	C	Si	Mn	P	S	N	Cr	Mo	Ni	Cu	PRE[2]
Lean Duplexes	2001	C920	0.03	1.0	4.0-6.0	0.035	0.015	0.05-0.17	19.5-21.5	0.6	1.0-3.0	1.0 max	22
	2304	C940	0.03	1.0	2.0	0.035	0.015	0.05-0.20	22.0-24.0	0.1-0.6	3.5-5.5	0.1 to 0.6	25
Standard Duplex	2205	C900	0.03	1.0	2.0	0.035	0.015	0.14-0.20	22.0-23.0	2.5-3.5	4.5-6.5		35

[1] Compositions are maximum values, unless otherwise stated. Balance is iron

[2] PRE is Pitting Resistance Equivalent = Cr + 3.3Mo + 16N

1.3. Austenitics

CLASSIFICATION	TYPE		COMPOSITIONS[1]									
	General	ACX	C	Si	Mn	P	S	N	Cr	Mo	Ni	Others
Cr-Mn-Ni Austenitic	202	C335	0.08	0.75	6.5-8.0	0.045	0.015	0.15	15.0-17.0		3.5-5.0	Cu: 2.0 max
Cr-Ni Austenitics	301L/301LN	C115	0.03	1.00	2.0	0.045	0.015	0.07-0.20	16.5-18.0		6.0-8.0	
	1.4318	C111	0.03	1.00	2.0	0.045	0.015	0.10-0.20	16.5-18.5		6.0-8.0	
	304	C120	0.07	0.75	2.0	0.045	0.015	0.10	18.0-19.5		8.0-10.5	
	304H		0.04-0.1									
	304DQ	C160	0.07	0.75	2.0	0.045	0.015	0.10	18.0-19.5		8.5-10.5	
	304DDQ	C181	0.07	0.75	2.0	0.045	0.015	0.10	18.0-19.5		9.0-10.5	
	304L	C151	0.03	0.75	2.0	0.045	0.015	0.10	18.0-19.5		8.0-10.5	
	304LS	C152	0.03	0.75	2.0	0.045	0.005-0.015	0.10	18.0-19.5		8.0-10.5	
	304LDDQ	C200	0.03	0.75	2.0	0.045	0.015	0.10	18.0-20.0		10.0-10.5	
	304LN	C115	0.03	0.75	2.0	0.045	0.015	0.12-0.16	18.0-19.5		8.5-11.5	
	321	C315	0.08	0.75	2.0	0.045	0.015	0.10	17.0-19.0		9.0-12.0	Ti: 5x(C+N) to 0.7
Cr-Ni-Mo Austentics	316L-1.4404	C240	0.03	0.75	2.0	0.045	0.015	0.10	16.5-18.0	2.0-2.5	10.0-13.0	
	316L-1.4435	C300	0.03	0.75	2.0	0.045	0.015	0.10	17.0-18.0	2.5-3.0	12.5-13.0	
	316LN	C320	0.03	0.75	2.0	0.045	0.015	0.12-0.16	16.5-18.0	2.0-2.5	10.0-12.5	
	316Ti	C280	0.08	0.75	2.0	0.045	0.015	0.10	16.5-18.0	2.0-2.5	10.5-13.5	Ti: 5x(C+N) to 0.7
Heat Resistant Austenitics	309S-1.4833	C340	0.08	0.75	2.0	0.045	0.015	0.11	22.0-24.0		12.0-14.0	
	1.4828 (309Si)	C309	0.20	1.5-2.5	2.0	0.045	0.015	0.11	19.0-21.0		11.0-13.0	
	310S-1.4845 310H	C350	0.04-0.08	0.75	2.0	0.045	0.015	0.11	24.0-26.0		19.0-22.0	

[1] Compositions are maximum values, unless otherwise stated. Balance is iron

1.4. Equivalents

CLASSIFICATION		INTERNAL TYPES			EXTERNAL TYPES		
		General	ACX	Columbus	Common or AISI	UNS	EN
Ferritic	Utility	3CR12	C211	41211	3CR12	S41003	1.4003
		3CR12L	C220	41220	3CR12L		
		410S	C420	41011	410S	S41008	1.4000
	Standard	40910	C800	40962	409	S40910	1.4512
		40920	C801	40963	409	S40920	1.4512
		40975	C700	41262	409Ni	S40975	1.4003
		430	C500	43012	430	S43000	1.4016
		430DDQ	C530	43311	430DDQ		
		439Nb	C515	43911	439Nb	S43932	1.4510
		441	C845 C841	44101 44102	441	S43940	1.4509
	Moly	436	C550	43611	436	S43600	1.4526
		444	C555	44411	444	S44400	1.4521
		2001	C920	22112	2001	S32001	1.4482
Duplex	Lean	2304	C940	23041	2304	S32304	1.4362
		2205	C900	22051	2205	S32205 S31803	1.4462
	Standard	202	C335	20211	CS202	-	-
Austenitic	Cr-Mn-Ni	1.4318	C111	30111			1.4318
	Cr-Ni	301L/301LN	C115	30188	301LN 301L	S30153 S30103	
		304 304H	C120	30431	304 304H	S30400	1.4301
		304DQ	C160	30423	304DQ	S30400 S30403 S30400	1.4301 1.4307 1.4301
		304DDQ	C181	30428	304DDQ		
					304L 304		
		304L	C151	30412	304L	S30403 S30400 S30403 S30400	1.4307 1.4301 1.4306 1.4307 1.4301
		304LS	C152	30427	304 304LS		
		304LDDQ	C200	30442	304LDDQ		
		304LN	C130	30453	304LN 304N	S30453 S30451	1.4311
		321	C315	32113	321	S32100	1.4541 1.4878
		316L	C240	31613	316L 316	S31603 S31600	1.4404 1.4401 1.4402
	Cr-Ni-Mo	316L	C300	31628		S31603 S31600 S31653 S31651	1.4432 1.4435 1.4436
		316LN	C320	31619	316LN 316N		1.4406
		316Ti	C280	31663	316Ti	S31635	1.4571
		309S	C340	30911	309S 309 309H	S30908 S30900 S30909	1.4833
	Heat Resisting	1.4828 (309Si)	C309	30921	-	-	1.4828
		310S	C350	31085	310S 310 310H	S31008 S31000 S31009	1.4845

2. FINISHES AVAILABLE

Columbus	Acerinox	ASTM/ ASME	EN	Description
Unground	595	-	-	Slabs with no grinding.
Ground	596	-	-	Slabs with grinding.
HR	599	-	1U	Hot rolled (not heat treated, not descaled). Suitable for products which are to be further worked (e.g. re-rolling).
HRA	504	-	1C	Hot rolled and heat treated (not descaled). Suitable for industrial heat resisting and materials handling applications.
No. 1	501	No. 1	1D	Hot rolled, heat treated and descaled. Suitable when smoothness and uniformity of finish are not important.
2D	512	No. 2D	2D	Cold rolled, heat treated and pickled. Dull, smooth finish. Suitable for forming applications.
2B	522	No. 2B	2B	Cold rolled, heat treated and pickled. Bright and smoother finish than 2D (obtained by skin passing or tension levelling).
2E	524	No. 2B	2E	Cold rolled, heat treated and mechanically descaled, may be followed by pickling. Rough and dull finish.
No. 3[2]	531	No. 3	2G	A linearly textured polished finish, one or both sides, typically using 120 grit polishing belts, with a transverse Ra <1.5μm.
No. 4[2]	543 523	No. 4	2G	A linearly textured polished finish, one or both sides, typically using 180 to 240 grit polishing belts, with a transverse Ra <1μm.
SB[2]	551	No. 6	2J	ScotchBrite finish, one or both sides, with a transverse Ra <0.5μm.
SSB[2]	553	-	-	Superior ScotchBrite finish, one or both sides, with a transverse Ra <0.25μm.
BA	571	Bright Annealed Finish	2R	Cold rolled, bright annealed finish, retained by final annealing in a controlled atmosphere furnace (may be skin passed). Smooth, bright, reflective finish.
BE	510	-	-	Columbus 2B cold rolled, but final anneal in a controlled atmosphere furnace.
TR	572 / 573	TR	2H	Finish obtained by Cold Rolled, annealed pickled and Temper Rolled.

Notes

1. *Each type is available in one or more, but not necessarily all of the finishes listed above.*
2. *Material is polished on one or both sides. When polished on both sides, the superior finish will be on top. Where polyethylene (PE) coating is specified, this will only be applied to the superior surface.*

3. SIZES AVAILABLE

3.1. Hot Rolled Products

3.1.1. Hot Rolled Dimensions (Standard Dimensions)

Width			Length		Length		Length		Length		Length	
(mm)	(in.)		(mm)	(in.)	(mm)	(in.)	(mm)	(in.)	(mm)	(in.)	(mm)	(in.)
1 000			2 000				3 000		6 000		8 000	
1 220	48				2 440	96	3 050	120	6 096	240	7 315	288
1 250					2 500		3 000		6 000		8 000	
1 500							3 000		6 000		8 000	
1 524	60						3 050	120	6 096	240	7 315	288

Notes:

1. *Other widths and length may be available on request and may be subject to minimum order quantities.*
2. *Width, length and flatness tolerances are normally to ASTM A480M, ISO 18286 and ISO 9444-2.*
3. *Plates longer than 6096mm may be plasma cut at mill's option.*

3.1.1.1. Maximum Plate Lengths

GAUGE (MM)		LENGTH (MM)	
min	max	Maximum	Exceptions
3	<8	6700	
8	10	8000[2]	Duplexes: maximum length is 6100mm
>10	16	8000[2]	Duplexes & ferritics: maximum length is 6100mm
>16	63	8000	

Notes:

1. *Plates lengths greater than the above may be available on enquiry.*
2. *Maximum length is 6100mm for shear cut edges*

3.1.2. Hot Rolled Gauges

Metric Gauges			Imperial Gauges		
(mm)	Equivalent (in.)		(in.)	(in.)	Equivalent (mm)
3	0.118		1/8	0.1250	3.18
3.5	0.138				
4	0.157				
4.5	0.177				
5	0.197		3/16	0.1875	4.76
6	0.236		1/4	0.2500	6.35
8	0.315		5/16	0.3125	7.94
10	0.394		3/8	0.3750	9.53
12	0.472		7/16	0.4375	11.11
14	0.551		1/2	0.5000	12.70
15	0.591				
16	0.630		5/8	0.6250	15.88
18	0.709				
20	0.787		3/4	0.7500	19.05
22	0.866		7/8	0.8750	22.23
25	0.984		1	1.0000	25.40
28	1.102		1 1/8	1.1250	28.58
30	1.181				
32	1.260		1 1/4	1.2500	31.75
35	1.378				
40	1.575		1 1/2	1.5000	38.10
45	1.772		1 3/4	1.750	44.45
50	1.969		2	2.000	50.80
55	2.165		2 1/4	2.250	57.15
60	2.362				
65	2.559		2 1/2	2.500	63.50

Notes:

1. Other gauges are available on request and may be subject to minimum order quantities.

3.1.3 Hot Rolled Gauge Ranges

3.1.3.1 Hot Rolled Coil

GENERAL TYPE		Width < 1 400mm			Width > 1 400mm		
		HR	HRA	No. 1	HR	HRA	No. 1
Ferritics	3CR12[4]	-	3 to 6	3 to 6	-	3 to 6	3 to 6
	3CR12L[4]	-	3 to 6	3 to 6	-	3 to 6	3 to 6
	410S	-	-	3 to 6	-	-	3 to 6
	40910[5]	3 to 6	-	3 to 6	3 to 6	-	3 to 6
	40920[5]	3 to 6	-	3 to 6	3 to 6	-	3 to 6
	40975		3 to 6	3 to 6	-	3 to 6	3 to 6
	430	3 to 6	-	3 to 6	3 to 6	-	3 to 6
	430DDQ	-	-	3 to 6	-	-	3 to 6
	439Nb	-	-	3 to 6	-	-	3 to 6
	441	-	-	3 to 6	-	-	3 to 6
	436	-	-	3 to 6	-	-	3 to 6
	444	-	-	3 to 6	-	-	3 to 6
Duplex	2001	-	-	4 to 6	-	-	4 to 6
	2304	-	-	4 to 6	-	-	4 to 6
	2205	-	-	4 to 6	-	-	4 to 6
Austenitics	202	3 to 16	-	3 to 8	3 to 16	-	3 to 8
	301LN/301L	3 to 16	-	3 to 8	3 to 16	-	3 to 8
	304	3 to 16	-	3 to 8	3 to 16	-	3 to 8
	304DQ	3 to 16	-	3 to 8	3 to 16	-	3 to 8
	304DDQ	3 to 16	-	3 to 8	3 to 16	-	3 to 8
	304L	3 to 16	-	3 to 8	3 to 16	-	3 to 8
	304LS	3 to 16	-	3 to 8	3 to 16	-	3 to 8
	304LDDQ	3 to 16	-	3 to 8	3 to 18	-	3 to 8
	304LN	3 to 16	-	3 to 8	3 to 16	-	3 to 8
	321	3 to 16	-	3 to 8	3 to 16	-	3 to 8
	316L-1.4404	3 to 16	-	3 to 8	3.5 to 16	-	3.5 to 8
	316L-1.4435	3 to 16	-	3 to 8	3.5 to 16	-	3.5 to 8
	316LN	3 to 16	-	3 to 8	3.5 to 16	-	3.5 to 8
	316Ti	3 to 16	-	3 to 8	3.5 to 16	-	3.5 to 8
	309S-1.4833	3 to 16		3 to 8	3.5 to 16		3.5 to 8
	309S Si-1.4828	3 to 16		3 to 8	3.5 to 16		3.5 to 8
	310S-1.4845	3 to 16		3 to 8	3.5 to 16		3.5 to 8

Notes:

1. *Maximum gauge for trimmed coil is 8mm.*
2. *Negative tolerances are not available on minimum gauges.*
3. *Positive tolerances are not available on maximum gauges.*
4. *On 3CR12 and 3CR12L, 8mm HRA is available with certification to Chemistry only 40910 and 40920 in 3mm No. 1 only certifiable to ASTM A240, not EN 10088-2.*
5. *>8mm Material is available with certification to Chemistry only.*

3.1.3.2 Hot Rolled Plate

GENERAL TYPE		Width < 1 400mm			Width > 1 400mm		
		HR	HRA	No. 1	HR	HRA	No. 1
Ferritics	3CR12	-	3 to 30	3 to 30	-	3 to 30	3 to 30
	3CR12L	-	3 to 30	3 to 30	-	3 to 30	3 to 30
	410S	-	-	3 to 20	-	-	3 to 20
	40910[1]	-	-	3 to 16	-	-	3 to 16
	40920[1]	-	-	3 to 16	-	-	3 to 16
	40975		3 to 30	3 to 30		3 to 30	3 to 30
	430	-	-	3 to 12	-	-	3 to 12
	430DDQ	-	-	3 to 12	-	-	3 to 12
	439	-	-	3 to 12	-	-	3 to 12
	441	-	-	3 to 12	-	-	3 to 12
	436	-	-	3 to 12	-	-	3 to 12
	444	-	-	3 to 12	-	-	3 to 12
	2001	-	-	4 to 40	-	-	4 to 40
Duplex	2304	-	-	4 to 50	-	-	4 to 50
	2205	-	-	4 to 40	-	-	4 to 40
	202	-	-	3 to 40	-	-	3 to 40
Austenitics	301LN	-	-	3 to 40	-	-	3 to 40
	304	-	-	3 to 63.5	-	-	3 to 63.5
	304H	-	-	8-63.5	-	-	8 to 63.5
	304DQ	-	-	3 to 63.5	-	-	3 to 63.5
	304DDQ	-	-	3 to 63.5	-	-	3 to 63.5
	304L	-	-	3 to 63.5	-	-	3 to 63.5
	304LS	-	-	3 to 63.5	-	-	3 to 63.5
	304LDDQ	-	-	3 to 63.5	-	-	3 to 63.5
	304LN	-	-	3 to 63.5	-	-	3 to 63.5
	321	-	-	3 to 63.5	-	-	3 to 63.5
	316L-1.4404	-	-	3 to 63.5	-	-	3.5 to 63.5
	316L-1.4435	-	-	3 to 63.5	-	-	3.5 to 63.5
	316LN	-	-	3 to 63.5	-	-	3.5 to 63.5
	316Ti	-	-	3 to 63.5	-	-	3.5 to 63.5
	309S-1.4833	-		3 to 50	-		3.5 to 50
	309S Si-1.4828	-		3 to 50	-		3.5 to 50
	310S-1.4845	-		3 to 50	-		3.5 to 50

Notes:

1. 40910 in 3mm No. 1 only certifiable to ASTM A240, not EN 10088-2.

3.2 Tolerances

Material can be ordered to the tolerances listed below:

- ASTM A480/ASTM A480M
- ASME SA480/ASME SA480M
- EN 18286
- ISO 9444-2
- EN 10051
- EN 10029

Material tolerances are only guaranteed to the EN and ASTM tolerances listed above. Any special customer requirements should be agreed upon order placement.

All gauge measurements are taken at least 25mm from the edge on trimmed material. On untrimmed material, the gauge measurement method should be confirmed upon order placement.

4. Pack Masses

4.1.1 Coil Mass

Delivery tolerances are ± 10% on order mass.

4.1.1.1 Minimum Coil Mass

The minimum pack mass is 3 500kg.

4.1.1.2 Typical Coil Mass

The typical coil masses (Tons) for all standard widths are as follows:

Coil split in parts

Width (mm)	Coil	2 Parts	3 Parts	4 Parts
	17	8.5	5.6	4.2
1000	16-20	7-10	5-7	3.5-5
	21	10.5	6.9	5.2
1219	20-24	9-12	6-8	4.5-6
	21	10.5	7	5.3
1250	21-25	10-13	6-9	4.5-6
	25	12.7	8.5	6.3
1500	24-28	10.5-14.5	7.5-9.5	5.5-7
	26	13	8.6	6.5
1524	25-29	12-15	7.5-9.5	5.5-7

4.1.2 Plate Mass

4.1.2.1 Minimum Plate Pack Mass

Plate will be supplied with a minimum Pack Mass of 2 000kg.

4.1.2.2 Maximum Plate Pack Mass

The maximum Pack Mass depends on the skid carrying capacity, which is dependant on the gauge and case length.

Gauge (mm)	**Skid Length (mm)**			
	≤ 2 800	**> 2 800 to ≤ 4 000**	**> 4 000 to ≤ 6 200**	**>6 200mm**
2.5 to 3	4 000kg	3 500kg	3 000kg	-
>3 to 60	4 000kg	4 000kg	3 000kg	5 000kg
>60	5 000kg	5 000kg	5 000kg	5 000kg

4.2 Slit Coils

Slit coils are available up to a maximum gauge of 6mm. The minimum slit width is as follows:

Gauge Range (mm)	Minimum Slit Width (mm)
3	25
>3 to 5	35
>5 to 6	45

Maximum slit width is 500mm and can be packed eye to sky. Above 500mm will be handled as coil and packed as eye to wall.

4.3 End Use

Hot rolled products are produced to suit the customers' end use as far as possible. It is essential therefore when ordering that the end use is stated. Customers are encouraged to consult with Columbus Stainless' Technical Customer Services Department to obtain the material which best suits their purpose. Should no end use be supplied, any claims relating to the material will be handled accordingly.

5. Inner Diameter of Coils

Untrimmed Black Hot Band

762 ± 10mm or 610 ± 10mm at Mill's option.

All Other Coils

610 ± 10mm

6. Outer Diameter of Coils

Untrimmed Coils

Maximum of 2 100mm

Trimmed Coils

Maximum of 1 900mm

7. Paper Interleaving

Hot rolled products are not paper interleaved.

8. Certification

Hot rolled products can be certified to the following specifications:

- ASTM A240/A240M
- ASME SECT IIA, ED 01, ADD 02:SA240M
- EN 10088-2
- EN 10088-4
- EN 10028-7

9. Specification

Regardless of the specification and tolerances required by the customer, all certificates are issued in terms of EN 10204. The following certificates are available:

EN 10204	Description	Conditions of Issue
3.1	Internal Independent Inspection	Issued unless otherwise specified
3.2	External Independent Inspection	On request to TüV Accreditation
2.2	Test Report	Analysis only

10. Certification to AD 2000 W2 (TüV)

Certain approved steel types manufactured to EN 10028-7 (No. 1 finish only) are certified to AD 2000 W2 & AD 2000 W10 (TüV certification), with the approval of TüV Rheinland. The certificate stating the approved types can be downloaded from the downloads page on www.columbusstainless.co.za.

For gauges thicker than 30mm, as covered under 3.1 + AD 2000 W2/W10, 3.2 Certification (external TüV approval) are available on request.

11. Certification to Pressure Equipment Directive (PED/97/23)

Certification to PED/97/23 is available on all Columbus material produced to EN 10028-7 up to a maximum thickness of 63.5mm.

12. Certification to Construction Product Regulation / CE mark (EN 10088-4)

CE mark certification to EN 10088-4 is available on material up to the maximum gauges specified in the scope of certification, as approved by TüV, which can be downloaded from the downloads page on www.columbusstainless.co.za.

13. Surface Condition

Coil material is guaranteed with at least 97% of surface as prime. Untrimmed coils may be available on enquiry, with 97% of the surface guaranteed as prime after trimming to final width by the customer. On Plate material, surface reclamation is done in accordance with EN10163/2. Note, Columbus do not perform weld repair on plate material.

14. Coil Supplied for Cutting to Plate

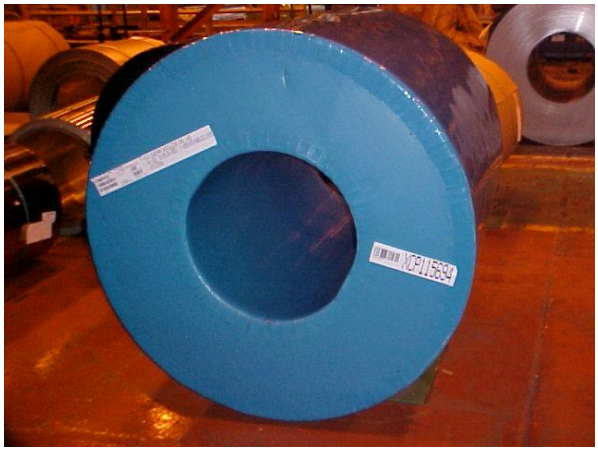
Coil purchased for the purpose of cutting to plate is supplied on the understanding that it is the converter's responsibility to ensure that the facilities utilised are capable of producing material that conforms to the specification to which it is processed.

14.1 Packing

Full packing details can be obtained from controlled document number PAC-INS-032, available on request. However, some generalised packing methods are given below.

No. 1 Coil

Packing is suitable for rail/road/sea transport. Coil axis is horizontal. Coil has no wooden base, unless shipped in containers. The coil is labelled with two bar code labels, one on either side of the coil.



Black Hot Band Coil

Packing is suitable for rail/road/sea transport. Coil axis is horizontal. Coil is without packing material. Strapping is with a suitable steel strapping. The coil is labelled with two bar code labels, one on either side of the coil.

Hot Rolled Plate

Packing is suitable for rail/road/sea transport. Hot rolled plate is packed on a wooden pallet and in the case of export orders, an unembossed polypropylene corex sheet is placed between the wooden pallet and the material. The case is labelled with two bar code labels, one on either side of the case.

14.2 Marking

HR and HRA Coils

Coils are stencilled on the outer wrap with gauge, type and MPO (coil) number. If required, labels with order information such as customer's name, destination, type, width, gross and net mass, case no., etc. will be placed on each coil. Detailed requirements must be noted on order placement.

No. 1 Coil and Plate

Plate is continuously line marked on the top and coil is marked on the inner and outer wrap with a sticker with MPO (coil) number, type, gauge, dimensions, finish and specification, unless otherwise specified. If required, labels with order information such as Customer's name, destination, type, width, gross and net mass, case no. etc, will be placed on the packaging of each coil. Detailed requirements must be noted on order placement.

15. Cold Rolled Products

15.1 Cold Rolled Dimensions

Width			Length		Length		Length		Length	
(mm)	(in.)		(mm)	(in.)	(mm)	(in.)	(mm)	(in.)	(mm)	(in.)
1 000			2 000				3 000			
1 220	48				2 440	96	3 050	120	6 096	240
1 250					2 500		3 000		6 000	
1 500							3 000		6 000	
1 524	60						3 050	120	6 096	240

Notes:

1. *Non-standard sizes may be available on enquiry.*
2. *Width, length and flatness tolerances are normally to ASTM A480M and EN ISO 9445.*

15.2 Cold Rolled Gauges

Metric Gauges			Imperial Gauges	
(mm)	Equivalent (in.)		Equivalent (in.)	Equivalent (mm)
0.4	0.0157			
0.5	0.0197		0.018	0.452
0.6	0.0236		0.024	0.597
0.7	0.0276		0.029	0.739
0.8	0.0315		0.032	0.818
0.9	0.0354		0.036	0.902
1.0	0.0394		0.040	1.028
1.2	0.0472		0.048	1.219
1.5	0.0591		0.060	1.511
1.6	0.0630		0.067	1.702
1.8	0.0709		0.075	1.905
2.0	0.0787		0.090	2.286
2.5	0.0984		0.105	2.667
3.0	0.1181		0.120	3.048
3.5	0.1378		0.135	3.429
4.0	0.1575		0.150	3.813
4.5	0.1772		0.165	4.191
5.0	0.1969		0.187	4.760
5.5	0.2165			
6.0	0.2362			

Notes:

1. *Only Metric Gauges are standard.*
2. *Decimal thickness, and not gauge number, should be specified when ordering as recommended in ASTM A480, to prevent any confusion with the various gauge number scales in use.*

15.2.1 Cold Rolled Gauge Ranges

15.2.1.1 Cold Rolled Coil and Sheet

UNITY TYPE		Width < 1 300mm			Width > 1 300mm	
		2D/2B/2E	BA/BE	Polished	2D/2B/2E	Polished
Ferritics	3CR12	0.5 to 3.5	-	-	0.7 to 3.5	-
	3CR12L	0.5 to 3.5	-	-	0.7 to 3.5	-
	410S	0.5 to 3.5	-	-	0.7 to 3.5	-
	40910	0.4 to 3	-	-	0.7 to 3	-
	40920	0.4 to 3	-	-	0.7 to 3	-
	430	0.4 to 3.0	0.4 to 1.6	0.4 to 3	0.7 to 3.0	0.7 to 3.0
	430DDQ	0.4 to 3	0.4 to 1.6	0.4 to 3	0.7 to 3	0.7 to 3
	439	0.4 to 3	-	0.4 to 3	0.7 to 3	0.7 to 3
	441	0.4 to 3	0.4 to 1.6	0.4 to 3	0.7 to 3	0.7 to 3
	436	0.4 to 3	0.4 to 1.6	0.4 to 3	0.7 to 3	0.7 to 3
	444	0.4 to 3	0.4 to 1.6	0.4 to 3	0.7 to 3	0.7 to 3
Duplex	2001	0.7 to 3	-	-	0.7 to 3	-
	2304	0.7 to 3	-	-	0.7 to 3	-
	2205	0.7 to 3	-		0.7 to 3	-
Austenitics	202	0.4 to 6	-	0.4 to 3	0.7 to 6	0.7 to 3
	301LN	0.5 to 6	0.6 to 1.6	0.6 to 3	1 to 6	-
	304	0.4 to 6	0.4 to 1.6	0.4 to 3	0.5 to 6	0.5 to 3
	304H	0.4 to 6	0.4 to 1.6	0.4 to 3	0.5 to 6	0.5 to 3
	304DQ	0.4 to 6	0.4 to 1.6	0.4 to 3	0.5 to 6	0.5 to 3
	304DDQ	0.4 to 6	0.4 to 1.6	0.4 to 3	0.5 to 6	0.5 to 3
	304L	0.4 to 6	0.4 to 1.6	0.4 to 3	0.5 to 6	0.5 to 3
	304LS	0.4 to 6	-	-	0.5 to 6	-
	304LDDQ	0.4 to 6	0.4 to 1.6	0.4 to 3	0.5 to 6	0.5 to 3
	304LN	0.6 to 6	0.6 to 1.6	-	1 to 6	1 to 3
	321	0.4 to 6	-	-	0.7 to 6	-
	316L-1.4404	0.4 to 6	0.4 to 1.6	0.4 to 3	0.7 to 6	0.7 to 3
	316L-1.4435	0.4 to 6	-	0.4 to 3	0.7 to 6	-
	316LN	1 to 6	-	-	1.5 to 6	-
	316Ti	0.4 to 6	-	-	0.7 to 6	-
	309S-1.4833	0.4 to 6	0.4 to 1.6	-	0.7 to 6	-
	309S Si-1.4828	0.4 to 6	0.4 to 1.6	-	0.7 to 6	-
	310S-1.4845	0.4 to 6	0.4 to 1.6	-	0.7 to 6	-

Notes:

1. *Gauges other than the ones quoted may be available on enquiry and may be subject to minimum order quantities.*
2. *Gauges less than 0.4mm are only available in the local market.*
3. *Minimum gauge on 2E finish is 0.8mm.*
4. *Roofing quality 3CR12 is available in 0.6mm and 925mm wide, suitable for roofing, cladding, etc.*
5. *For the 2B heat resisting austenitics in gauges of 1.6mm and less and widths of 1 250mm and less, finish may be supplied as BE at Mill's option.*
6. *Heat resisting grades not available as BA finish, only 2D, 2B and BE.*

15.3 Tolerances

Material can be ordered to the tolerances listed below:

- ASTM A480/ASTM A480M
- ASME SA480/ASME SA480M
- ISO 9445

Material tolerances are only guaranteed to the ISO and ASTM tolerances listed above. Any special customer requirements should be agreed upon order placement.

All gauge measurements are taken at least 25mm from the edge on trimmed material. On untrimmed material, the gauge measurement method should be confirmed upon order placement.

15.4 Pack Masses

15.4.1 Coil Mass

15.4.1.1 Minimum Coil Mass

Gauge	Local	Export
≤1.6mm	2 000kg	4 000kg
>1.6mm	4 000kg	4 000kg

15.4.1.2 Maximum & typical Coil Mass

The typical coil masses (Tons) for all standard widths are as follows:

	Coil split in parts			
Width (mm)	Coil	2 Parts	3 Parts	4 Parts
	17	8.5	5.6	4.2
1000	16-20	7-10	5-7	3.5-5
	21	10.5	6.9	5.2
1219	20-24	9-12	6-8	4.5-6
	21	10.5	7	5.3
1250	21-25	10-13	6-9	4.5-6
	25	12.7	8.5	6.3
1500	24-28	10.5-14.5	7.5-9.5	5.5-7
	26	13	8.6	6.5
1524	25-29	12-15	7.5-9.5	5.5-7

The maximum coil masses for all standard widths are as follows:

Gauges ≤ 0.7mm	10 000kg without PE coating 7 000kg with PE coating
Gauges >0.7mm, width of 1 000mm	18 900kg
Gauges >0.7mm, width of 1 220mm	23 000kg
Gauges >0.7mm, width of 1 250mm	23 400kg
Gauges >0.7mm, width of 1 500mm	28 200kg
Gauges >0.7mm, width of 1 524mm	28 500kg

15.4.2 Sheet Mass

15.4.2.1 Minimum Sheet Pack Mass

Sheet will be supplied with a minimum Pack Mass of 1 500kg.

15.4.2.2 Maximum Sheet Pack Mass

The maximum Pack Mass depends on the skid carrying capacity, which is dependant on the gauge and case length.

Gauge (mm)	Skid Length (mm)			
	≤ 2 400	**>2 400 to ≤2 800**	**>2 800 to ≤4 000**	**>4 000 to ≤7 100**
0.3 to <0.9	2 500kg	2 000kg	2 000kg	1 000kg
0.9	3 000kg	3 000kg	2 500kg	1 000kg
>0.9 to <1.5	3 000kg	3 000kg	2 500kg	1 500kg
1.5 to <2.0	3 500kg	3 500kg	3 000kg	2 000kg
2.0	3 500kg	3 500kg	3 000kg	2 500kg
>2.0 to <3.1	4 000kg	4 000kg	3 500kg	2 500kg
3.1 to <3.8	4 000kg	4 000kg	4 000kg	2 500kg
3.8 to <4.0	4 000kg	4 000kg	4 000kg	3 000kg
≥4.0	4 000kg	4 000kg	4 000kg	3 300kg

15.5 Slit Coils

Slit coils are available up to a maximum gauge of 6mm. The minimum slit width is as follows:

Gauge Range (mm)	Minimum Slit Width (mm)
≤0.5	10
>0.5 to 3.0	25
>3.0 to 5.0	35
>5.0	45

15.6 Coil Quality

Note that trimmed coils are guaranteed with 97% of the surface as prime. Untrimmed coils may be available on enquiry, with 97% of the surface guaranteed as prime after trimming to final width by the customer.

Seconds Quality

As part of the normal stainless steel production process, there is some inevitable generation of Seconds quality material. Seconds conform to the ASTM or EN requirements for steel type, gauge, width, finish and mechanical properties. In addition, the coil must be capable of further processing by the customer. Typically, this would mean that the steel has surface defects which can either be polished out, or that the defect is relatively isolated and that prime material can be obtained by cutting out the defects. Typical defects that would cause material to be seconds would be skin laminations, stains (or streaks and related defects), scratches, roll marks, indentations, dents, residual scale, etc. Seconds can be untrimmed.

Fourths Quality

Fourths is coil or sheet of Prime or Seconds surface quality with a maximum mass of 1 500kg. Fourths do not necessarily conform to the ASTM or EN mechanical property requirements. Fourths may include coil ends (which may thus not be properly skin passed or polished). In addition to typical Seconds defects, Fourths can also have edge damage and portions with folds. Coils are supplied with no inner core and thus the inner diameter may be somewhat oval. Fourths can be untrimmed.

15.7 End Use

Cold rolled products are produced to suit customers' end use as far as possible. It is essential therefore when ordering that the end use is stated. Customers are encouraged to consult with Columbus Stainless' Technical Customer Services Department to obtain the material which best suits their purpose. Should no end use be supplied any claims relating to the material will be handled accordingly.

15.8 Inner Diameter of Coils

All coils will have an internal diameter of 610mm (24”). However, 508mm (20”) coils may be available on enquiry.

15.9 Paper Interleaving and Polyethelene (PE) Coating

PE coating (formerly PVC coating) is not available on coils with a gauge of less than 0.5mm. Slit coil products will be neither paper interleaved nor PE coated.

The following PE coatings are available and should be specified upon order placement:

Coating	Description	Thickness (Microns)
LNC	Novacel Fibre laser Protective Film (Grey)	100
LPF	Polifilm Fibre laser Protective Film (Dark Grey)	100
PVC	PE Black / White Laser Protective Film suitable for CO_2 Lasers.	70/80
PEB	PE Blue Translucent Protective Film	60
PLD	Low Density ,Low Glue PE Protective Film (Transparent)	30
~	No Coating	

Interleaving Paper

All 2B, 2D, polished and BA finish products will be paper interleaved unless otherwise agreed. 409,412, 439 and 441 is usually supplied for tube or coil fed press applications, it is not paper interleaved unless otherwise agreed.

Slits are usually supplied without paper interleaving unless otherwise agreed.

16. Certification

Cold rolled products can be certified to the following specifications:

- ASTM A240/A240M
- ASME SECT IIA, ED 01, ADD 02:SA240M
- EN 10088-2
- EN 10088-4
- EN 10028-7

Other specifications can be supplied based upon agreement between customer and Columbus.

17. Specification

Regardless of the specification and tolerances required by the customer, all certificates are issued in terms of EN 10204. The following certificate is available:

EN 10204	Description	Conditions of Issue
3.1	Internal Independent Inspection	Issued unless otherwise specified
3.2	External Independent Inspection	On request to TüV Accreditation
2.2	Test Report	Analysis only

18. Certification to AD Merkblatt W2 (TüV)

Certain approved steel types manufactured to EN 10028-7 are available for certification to AD 2000 W2 and AD 2000 W10 (TüV certification), with the approval of TüV Rheinland. The certificate stating the approved types can be downloaded from the downloads page on www.columbusstainless.co.za.

19. Certification to Pressure Equipment Directive (PED/97/23)

Certification to PED/97/23 is available on all Columbus material produced to EN 10028-7.

20. Certification to Construction Product Regulation / CE Mark (EN 10088-4)

CE mark certification to EN 10088-4 is available on material up to the maximum gauges specified in the scope of certification, as approved by TüV, which can be downloaded from the downloads page on www.columbusstainless.co.za.

21. Coil Supplied for Cutting to Sheet or Slitting

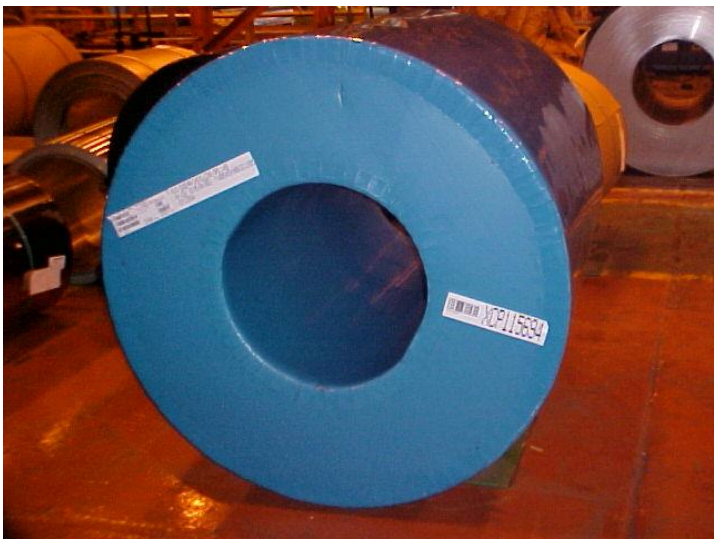
Coil purchased for the purpose of cutting to sheet or slitting is supplied on the understanding that it is the converter's responsibility to ensure that the facilities utilised are capable of producing material that conforms to the specification to which it is processed.

21.1 Packing

Full packing details can be obtained from controlled document number PAC-INS-032, available on request. However, some generalised packing methods are given below.

21.2 Cold Rolled Coil

Packing is suitable for rail/road/sea transport. Coil may have inner cores in gauges of 0.8mm and less. Coil axis is horizontal. Coil has no wooden base, unless shipped in containers. The coil is labelled with bar code labels, on either side of the coil.



21.3 Fourths Cold Rolled Coil

Coil axis is horizontal. Coil has no wooden base. The coil is labelled with bar code labels, on either side of the coil.

21.4 Cold Rolled Sheet

Packing is suitable for rail/road/sea transport. The case is labelled with bar code labels, on either side of the case.

21.5 Slit Coil

The slit is placed onto an eye to the sky wooden pallet with blue low density polyethylene plastic sheet between the slit and the wooden pallet. Two bar code labels are stapled to the wooden pallet. The slit is labelled with bar code labels.

21.6 Marking

All cold rolled coils and normal sheet will be continuously line marked on the top surface, unless otherwise specified. For BA, BE and polished material, coil will be marked with a sticker at the beginning and end, while for sheets the top sheet will be marked. Coil and sheet will be marked with MPO (coil) number, type, gauge, dimensions, finish and specification, unless otherwise specified.

22. Slab Supplied for Rolling or Forging

Types

Austenitic and ferritic types are available for re-rolling to ASTM A240, viz. 304, 304L, 310S, 316, 316L, 321 and 430. Other types may be available on enquiry.

Austenitic types are available for forging to ASTM A182, viz. F304, F304L, F316, F316L, F310S and F321. Other types may be available on enquiry.

Widths

The standard nominal slab widths are 1 030, 1 250, 1 280, 1 540 and 1 575mm
Other widths may be available on enquiry.

Lengths

Slab lengths are available between 4 100mm and 12 000mm, with a tolerance of ±50mm.

Thicknesses

Slabs are only available in thicknesses of 200mm with a tolerance of ±5mm.