



Columbus Stainless

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Revision: **0**

Title: **Columbus Carbon Steel Standard Product Catalogue**

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Implementation Date: **15/04/2024**

SCOPE

This publication covers the production range of hot-rolled plates and coils. Inclusion of any item in this document is not prejudicial to price lists, selling prices or delivery lead time which should be confirmed prior to order placement, nor does such inclusion guarantee acceptance of an order. Minimum and/or multiple quantities may be required for certain combinations. Product items not included in this document may also be considered, subject to enquiry.

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1. Types Available

Multiple and dual certification options are available.

Take note: All material is supplied in the as-rolled and non-tempered condition.

Table 1: Acerinox equivalents to Columbus internal types as standard stock

Classification		Internal Types			External Types			Galvanisable YES / NO
		General	ACX	Columbus	Common or AISI	UNS	EN	
Carbon Steel	Commercial quality	CQ	C006	10802	Commercial quality	-	-	NO
	Low carbon steel ¹	MS200YS	C002 C005	10800 10801	1008	-	-	YES
	Structural steel	S355M	C001	13500	X52 PSL - 1 or L360 X42 PSL - 1 or L290 L245 or B (L245/B)	-	S355M S275M	NO
		S355MLoSi	C003	13600	S355MLoSi X52 PSL - 1 or L360 X42 PSL - 1 or L290 L245 or B (L245/B)	-	S355M S275M	YES

Note:

1. Typical yield strength of Low carbon steels are >200 MPa (1 MPa = 1 N/mm²)

Table 2: Seconds

Classification		Internal Types			External Types		
		General	ACX	Columbus	Common or AISI	UNS	EN
Carbon Steel	Seconds	B-Grade	-	-	-	-	-

Notes:

1. Flatness specifications do not apply
2. No claims will be accepted



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1.1 Chemical Compositions

Table 3 specifies the types available with general chemistry limits based on the applicable specification. limits consult the applicable specification.

Specification	Columbus Internal Type	ACX	General/ External type	Composition max limit																	
				C	Mn	Si	P	S	Cu	Ni	Cr	Mo	NbVTi	B	V	Nb	Ti	Al ³	N	CEV	CrCuMo
Commercial quality	10802	C006	CQ	0.25	1.60	0.55	0.035	0.035	0.55	0.50	0.50	0.20	-	-	-	-	-	-	-	-	-
SAEJ403	10800	C002	1008	0.10	0.50	0.04	0.03	0.035	0.35	0.25	0.40	0.06	-	-	-	-	-	-	-	-	-
	10801	C005		0.10	0.50	0.15-0.25	0.03	0.035	0.35	0.25	0.40	0.06	-	-	-	-	-	-	-	-	-
API-5L	13500 13600	C001	X52 PSL - 1	0.26	1.50 ¹	-	0.03	0.03	0.50	0.50	0.50	0.15	0.15	0.001	-	-	-	-	-	-	-
		C003	X42 PSL - 1	0.26	1.50 ¹	-	0.03	0.03	0.50	0.50	0.50	0.15	0.15	0.001	-	-	-	-	-	-	-
			L245/B ²	0.24	1.50 ¹	-	0.03	0.03	0.50	0.50	0.50	0.15	0.15	0.001	-	-	-	-	-	-	-
EN 10219-1	13500 13600	C001	S355M _{LoSi}	0.14	1.50	0.15-0.25	0.035	0.03	-	0.30	-	0.20	-	-	0.10	0.05	0.05	-	0.02	0.39	0.60
		C003	S355M	0.14	1.50	0.50	0.035	0.03	-	0.30	-	0.20	-	-	0.10	0.05	0.05	-	0.02	0.39	0.60
EN 10025-2	13500 13600	C001 C003	S355JR + AR	0.24	1.60	0.55	0.035	0.035	0.55	0.42	0.29	0.11	-	-	-	-	0.05	0.02 ³	-	-	-
			S355J2 + AR	0.22	1.60	0.55	0.025	0.025	0.55	0.42	0.29	0.11	-	-	-	-	0.05	0.02 ³	-	-	-
			S355J0 + AR	0.22	1.60	0.55	0.03	0.03	0.55	0.42	0.29	0.11	-	-	-	-	0.05	0.02 ³	-	-	-

Notes:

1. Due to lower concentration of carbon. See API-5L.
2. External type L245/B also has a composition max limit of NbV < 0.06 wt.%
3. Minimum values



2. Dimensions

All material is supplied in the *as-rolled* and *non-tempered* condition.

-2.1 Gauges Available

All the chemical compositions listed in Table 3 are available in the following gauges (see Table 4).

Table 4: Standard Hot Rolled gauges in metric dimensions. Gauges not specified can be enquired.

	Form
0.5 to 1.0	Coil
3 to ≤ 55	Coil /Plates

2.2 Widths Available

All the chemical compositions listed in Table 3 are available in the following widths (see Table 5). All material is supplied with a mill edge in the untrimmed condition. Trimmed material is available upon request.

Table 5: Standard widths in metric dimensions. Widths not specified can be enquired.

Metric width (mm)	Form
1000 to ≤ 1575	All: Coil and Plates

3. Product forms

3.1 Coil form

All the chemical compositions listed in Table 3 are available in the following coil dimensions (see Table 6). Coils are available in gauges up to and including 16mm. Gauges and widths not specified are available on request.

Table 6: Coil dimensions

Form	Width (mm)	Gauge (mm)
Coil	1000 to ≤ 1575	2.5 to ≤ 16

3.2 Plate form

All the chemical compositions listed in Table 3 are available in the following plate dimensions (see Table 7). Gauges, widths and lengths not specified are available on request.

Table 7: Plate dimensions (Std = Standard).

Form	Width	All widths (see Table 5)	
	Plate length	2000 - 6000 mm	8000 mm
Plate	Gauge		
	8mm	Std	Std
	10mm	Std	Std
	12mm	Std	Std
	16mm	Std	Std
	18mm	Std	Std
	20mm	Std	-
	25mm	Std	-
	30mm	Std	-
	35mm	On Enquiry	-
	40mm	On Enquiry	-
	45mm	On Enquiry	-
	50mm	On Enquiry	-
55mm	On Enquiry	-	

Note:

1. Max plate piece mass is 5 ton



4. Delivery Conditions

4.1 Certification

Hot rolled products can be certified to the most recent, active revision of EN 10204 3.1. Other specifications can be supplied based upon agreement between the customer and Columbus. Regardless of the specification and tolerances required by the customer, all certificates are issued in terms of EN 10204 3.1.

4.2 Tolerances

Gauge tolerances as guaranteed to the API 5L, ASTM and EN tolerances. Other material tolerances are guaranteed to the ASTM and EN tolerances listed in Table 8. Any special customer requirements should be agreed upon order placement.

Table 8: Tolerances according to the specifications

Product Group	Specification	Types applicable (see Table 3)
Hot rolled coil and plates cut from coils	ASTM A568M and EN 10051	All
Plates	EN 10029 and EN 10051	All

4.3 Gauge Tolerances

4.3.1 Hot Rolled Coil and Plates Cut From Coils Gauge Tolerances

Gauge tolerances on coils and plates cut from coils according to EN 10051 specification category A and B (see Table 9 and 10). If negative tolerances are required please consult the relevant dimensional specification.

Table 9: Gauge tolerances on coil and plates cut from coil

Category A: SAE1008 and Commercial Quality									
Nominal Gauge (mm)	Mill's Best (mm)	Normal (mm)						Positive (mm)	
		Width ≤ 1200		1200mm < Width ≤ 1500mm		Width > 1500mm		-	+
		-	+	-	+	-	+		
≥ 2.5 to 3.0	0.29	0.20	0.09	0.22	0.07	0.24	0.05	0.00	0.29
>3.0 to 3.5	0.31	0.22	0.09	0.24	0.07	0.26	0.05	0.00	0.31
>3.5 to 4.0	0.33	0.22	0.11	0.24	0.09	0.26	0.07	0.00	0.33
>4.0 to 4.5	0.35	0.24	0.11	0.26	0.09	0.26	0.09	0.00	0.35
>4.5 to 5.0	0.36	0.24	0.12	0.26	0.10	0.26	0.10	0.00	0.36
>5.0 to 6.0	0.4	0.26	0.14	0.28	0.12	0.28	0.12	0.00	0.40
>6.0 to 8.0	0.48	0.29	0.19	0.30	0.18	0.30	0.18	0.00	0.48
>8.0 to 10.0	0.55	0.32	0.23	0.33	0.22	0.33	0.22	0.00	0.55
>10.0 to 12.0	0.63	0.35	0.28	0.36	0.27	0.36	0.27	0.00	0.63
>12.0 to 12.5	0.7	0.35	0.35	0.36	0.34	0.36	0.34	0.00	0.70
>12.5 to 14.0	0.7	0.37	0.33	0.38	0.32	0.38	0.32	0.00	0.70
>14.0 to 15.0	0.74	0.37	0.37	0.38	0.36	0.38	0.36	0.00	0.74
>15.0 to 16.0	0.78	0.40	0.38	0.42	0.36	0.42	0.36	0.00	0.78

Note:

1. Tolerance can be split in any way within the mill's best range

Table 10: Gauge tolerances on coil and plates cut from coil

Category B: S355M									
Nominal Gauge (mm)	Mill's Best (mm)	Normal (mm)						Positive (mm)	
		Width ≤ 1200		1200mm < Width ≤ 1500mm		Width > 1500mm		-	+
		-	+	-	+	-	+		
≥ 2.5 to 3.0	0.29	0.23	0.06	0.25	0.04	0.28	0.01	0.00	0.29
>3.0 to 3.5	0.31	0.25	0.06	0.28	0.03	0.30	0.01	0.00	0.31
>3.5 to 4.0	0.33	0.25	0.08	0.28	0.05	0.30	0.03	0.00	0.33
>4.0 to 4.5	0.35	0.28	0.07	0.30	0.05	0.32	0.03	0.00	0.35
>4.5 to 5.0	0.36	0.28	0.08	0.30	0.06	0.32	0.04	0.00	0.36
>5.0 to 6.0	0.40	0.30	0.10	0.32	0.08	0.33	0.07	0.00	0.40
>6.0 to 8.0	0.48	0.33	0.15	0.35	0.13	0.36	0.12	0.00	0.48
>8.0 to 10.0	0.55	0.37	0.18	0.38	0.17	0.39	0.16	0.00	0.55
>10.0 to 12.0	0.63	0.40	0.23	0.41	0.22	0.43	0.20	0.00	0.63
>12.0 to 12.5	0.70	0.40	0.30	0.41	0.29	0.43	0.27	0.00	0.70
>12.5 to 14.0	0.70	0.43	0.27	0.44	0.26	0.46	0.24	0.00	0.70
>14.0 to 15.0	0.74	0.43	0.31	0.44	0.30	0.46	0.28	0.00	0.74
>15.0 to 16.0	0.78	0.46	0.32	0.48	0.30	0.52	0.26	0.00	0.78

Note:

1. Tolerance can be split in any way within the mill's best range



4.3.2 Hot Rolled Plate Gauge Tolerances

Gauge tolerances on plates according to EN 10029 specification Class B (see Table 11). Other classes may be available on request as per EN 10029. If negative tolerances are required please consult the relevant dimensional specification.

Table 11: Gauge tolerances for plates

Nominal Gauge (mm)	Mill's Best (mm)	Class B	
		Lower	Upper
>16 to 18	0.85	-0.3	+1.3
>18 to 20	0.93	-0.3	+1.3
>20 to 22	1.00	-0.3	+1.3
>22 to 25	1.11	-0.3	+1.3
≥25 to 28	1.23	-0.3	+1.7
>28 to 30	1.30	-0.3	+1.7
>30 to 32	1.38	-0.3	+1.7
>32 to 35	1.49	-0.3	+1.7
>35 to 40	1.68	-0.3	+1.7
≥40 to 50	2.05	-0.3	+2.3
> 50 to 55	2.43	-0.3	+2.3

Note:

1. Tolerance can be split in any way within the mill's best range

4.4 Width Tolerances

All material is supplied with a mill edge in the untrimmed condition. Trimmed material is available upon request.

4.4.1 Hot Rolled Untrimmed Width Tolerances

Hot rolled coil and plates cut from coil material is produced to the aim width tolerances in Table 12. Tighter tolerances should be negotiated with order placement.

Table 12: Untrimmed width tolerances

Specification	Gauge Min (mm)	Gauge Max (mm)	Width Min (mm)	Width Max (mm)	Negative (mm)	Positive (mm) ¹
EN 10051	2.5	55	945	≤ 1575	0	20
ASTM A568M	2.5	< 6	945	≤ 1200	0	28
	2.5	< 6	1200	≤ 1500	0	38
	2.5	< 6	1500	≤ 1575	0	45

Note:

1. Due to flare the head and tail ends of the coil may exceed these positive values

4.4.2 Hot Rolled Trimmed Width Tolerances

Trimming options on coil and plate are available upon request. Trimmed hot rolled coil and plate material are produced to the aim width tolerances in Table 13. Tighter tolerances should be negotiated with order placement.

Table 13: Trimmed width tolerances according to specification

Specification	Gauge Min (mm)	Gauge Max (mm)	Width Min (mm)	Width Max (mm)	Negative (mm)	Positive (mm)
EN 10051	2.5	55	945	≤ 1200	0	3
	2.5	55	1200	≤ 1575	0	5
ASTM A568M	2.5	< 6	945	≤ 1200	0	5
	2.5	< 6	1200	≤ 1500	0	6
	2.5	< 6	1500	≤ 1575	0	8
EN 10029	2.5	< 40	-	-	0	20
	≤ 40	< 55	-	-	0	25



4.5 Length Tolerances

4.5.1 Plate Length Tolerance

Plate material is produced to the aim length tolerances in Table 14.

Table 14: Plate length tolerance

Specification	Length (mm)	Negative (mm)	Positive (mm)
EN 10051	2500 to < 8000	0	0.005 x (Plate Length)
EN 10029	2500 to < 4000	0	20
	≤ 4000 to < 6000	0	30
	≤ 6000 to < 8000	0	40
ASTM A568M	2500 to < 3000	0	20
	≤ 3000 to < 4000	0	25
	≤ 4000 to < 5000	0	35
	≤ 5000 to < 6000	0	40
	≤ 5000 to < 8000	0	45

4.6 Flatness Tolerances

Table 15 applies to plates and plates cut from coils, sold by Columbus Stainless Steel. As per EN 10029 and EN 10051 for all types listed in Table 3. For plate dimensions not covered in Table 14, please inquire regarding flatness. Requirements for coil flatness shall be agreed at the time of order. Adequate flattening equipment at the customer is assumed when coils are cut into plates.

Table 15: For supplied plates cut from coil by Columbus. As per EN 10029 Table 4 and EN 10051 Table 9 and 10.

Specification	Specified minimum yield strength	Length (mm)	Gauge (mm)	Flatness (mm)
EN 10029	Re ≤ 460 MPa ¹	1000	8 ≤ to < 15	7
			15 ≤ to < 25	7
			25 ≤ to < 40	6
			40 ≤ to < 55	5
		2000	8 ≤ to < 15	11
			15 ≤ to < 25	10
			25 ≤ to < 40	9
			40 ≤ to < 55	8
	Re > 460 MPa ¹	1000	8 ≤ to < 15	10
			15 ≤ to < 25	10
		2000	25 ≤ to < 40	9
			40 ≤ to < 55	8
Specification	Specified minimum yield strength	Width (mm)	Gauge (mm)	Flatness (mm)
EN 10051	Re ≤ 300 MPa ¹	≤ 1200	8 to ≤ 25	15
		1200 < width ≤ 1500		18
		> 1500		23
	300 MPa ² < Re ≤ 900 MPa ¹	≤ 1200	≤ 25	18
		1200 < width ≤ 1500		23
		> 1500		28

Note:

- 1 MPa = 1 N/mm



4.7 Out-of-square tolerance

As per ASTM A568M for all types listed in Table 3: Out-of-square is the greatest deviation of an end edge from a straight line at right angle to a side and touching one corner. It is also obtained by measuring the difference between the diagonals of the cut length. The out-of-square deviation is one half of that difference. The tolerance for all thicknesses and all sizes is 1.0 mm/100 mm of width or fraction thereof.

5. Testing and Releasing

Material will be tested in accordance with the requested certifications. Additional test requirements and exceptions need to be specified and negotiated with order acceptance.

6. Coil Diameter

Inner diameter: Mill Edge Black Hot Band: 762 mm (30") or 610 mm (24") at Mill's option.

Outer Diameter: Mill Edge Coils - Maximum of 2 100 mm

7. Marking

In Section 7 the standard markings are defined. Detailed requirements must be noted on order placement.

7.1 HR and HRA Coils

Coils are identified by being marked on the outer wrap with gauge, type and MPO (coil) number, as well as a case label. Figure 1 is an example of a typical case label. The part number will only be displayed if supplied and captured on the Columbus system. If required, additional information can be added as text or in a barcode.

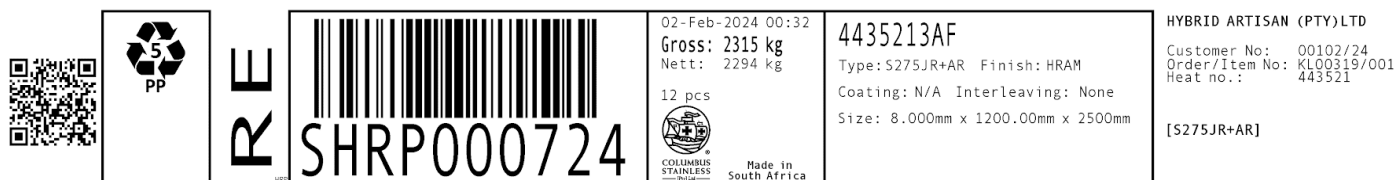


Figure 1: Example of case marking

7.2 Plates

Plate materials are continuously line marked with white paint on the top with MPO (coil) number, type, gauge, dimensions, finish and specification, unless otherwise specified. Alternative requirements must be noted on order placement.

8. End Use

Products are produced to suit customers' end use as much 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.

9. Pack Mass

Delivery tolerances are $\pm 10\%$ on order mass.

9.1 Typical Coil Mass

The maximum length of a slab is 11.95 m due to the size of the reheat furnace. Since the thickness of the slab is fixed, the mass of the slab is therefore determined by the width. It is given by the factor of 18.8kg/mm width (i.e. a 1000 mm wide slab will be 18 800 kg, and 1500 mm slab will be 22 500 kg). Orders for the product of a slab as a minimum must consider this. Orders for coils bigger than a single coil must also be optimised to multiples of a single coil.

Take note that the minimum pack mass per coil is ± 10 tons at Mill's option.

Table 16: Coil typical pack mass examples

No of Coils Ordered	Mass (t)					
	½	1	2	3	4	5
Width						
1000	± 10	19	34	49	66	83
1500	± 12	23	50	73	95	118



9.2 Plate Pack Mass

Maximum plate pack mass: The maximum pack mass depends on the skid carrying capacity, which is dependent on the gauge and case length.

Table 17: Plate typical pack mass examples

Gauge (mm)	Skid length (mm)			
	≤2800	> 2800 to ≤ 4000	> 4000 to ≤ 6200	> 6200
2.5 to 3	4000kg	3000kg	3000kg	-
> 3 to < 60	4000kg	4000kg	3000kg	5000kg
≤ 60	5000kg	5000kg	5000kg	5000kg

10. Packing

Packing is suitable for rail and road transport. For sea transport please enquire about packing.

10.1 Coils

Coil axis is horizontal. Coil is without packing material and strapping is with suitable steel strapping (see Figures 2 and 3). Strapping will depend on domestic or export locations. The coil is labelled with two bar code labels, one on either side of the coil.



Figure 2: Domestic strapping



Figure 3: Export strapping

10.2 Plates

Plates are packed with suitable steel strapping and separated by wood dunnage for stacking purposes (see Figure 4).

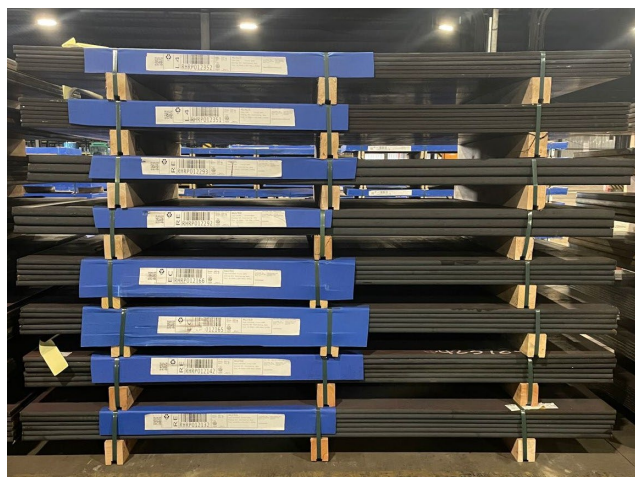


Figure 4: Plate packing



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11. Additional Order Requirements

The following information must be specified on your order if the requirement deviates from the standard method. If not specified the standard method will be used.

Table 18: Order specific enquiries

Description	Standard	Specify on order if requirements deviate from the standard
Width tolerances	Tightest limits are assumed as per section 4.4	Alternative requirements should be communicated on order placement
Gauge tolerances	Normal or positive as per section 4.3	Alternative requirements should be communicated on order placement
Flatness tolerances for purchased plates and plates cut from coils	Tightest limits are assumed as per section 4.6. For plate dimensions not covered in Table 13, please inquire regarding flatness.	Alternative requirements should be communicated on order placement
Flatness tolerances for coils	Adequate flattening equipment at the customer is assumed when coils are cut into plates.	Requirements for coil flatness shall be agreed at the time of order.
Coil inner diameter	762mm or 610mm at Mills option as per section 6	Alternative requirements should be communicated on order placement
Marking	See section 7. Take note that we use white paint.	Specify any additional markings. It can be added as text or in a barcode.
Pack mass	Minimum pack mass per coil is ± 10 ton as per section 9	Alternative requirements should be communicated on order placement

12. Revision History

Table 19: Revision history

Revision	Section	Nature of Change
0	0	Created

13. Document Approval

	Job Title	Co No
Prepared by	Engineer	13027
	Engineer TCS & TCC	5736
Checked by	Engineer TCS	13047
	Manager: Technical Customer Services	1885
Approved by	Business Unit Manager: Technical	8412
	General Manager Manufacturing	5565