Datasheet:

EN 1.4404/316L – Austenite Quarto Plates - Stainless Steel

Alumeco ApS
03-12-2024

Internal alloy name:	**1.4404**
Alloy type:	**Acid-resistance Austenite**
Chemical Symbol:	**X2CrNiMo17-12-2**
EN:	**EN 1.4404**
AISI:	**316L**
UNS:	**S31603**
SS:	**2348**
JIS:	**SUS316L**
GB:	**S31603**

Main usage:

- Food processing industry
- Petrochemical equipment
- Chemical and pharmaceutical industry
- Construction sector
- Automotive and aerospace industry
- Electronical equipment

Main properties:

- Great weldability
- High corrosion resistance to non-oxidising acids and chlorine-containing materials
- Good formability, both cold and hot
- Higher thermal expansion and lower heat conductivity compared to other carbon steels

Important norms and literature:

General Standards:
EN 10088-1: List of stainless Steel

Product standards:
EN 10088-2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purposes

EN 10028-7: Flat products made of steels for pressure purposes - Part 7: Stainless steels

Geometric Tolerance:
EN 18286: Hot rolled stainless-steel plates -Tolerances on dimensions & shape

Bending Tolerance:
DIN 6935:2011-10: Cold bending of flat rolled steel

Surface condition:
EN 10088-2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purposes

Chemical composition in %: EN 10088-2

C	Si	Mn	P	S	Cr	Mo	Ni	Remarks	Rest
≤ 0,030	≤ 1,00	≤ 2,00	≤ 0,045	≤ 0,030*	16,5-18,5	2,0-2,5	10,0-13,0	N ≤ 0,10	Fe

*** For machinability, a controlled sulfur content of 0,015%-0,030% is recommended & permitted. For weldability a controlled sulfur content of 0,008%- 0,030% is recommended & permitted. For polishability, a controlled sulfur content of 0,015% is recommended.**

Mechanical properties: EN 10088-3

Dim. range (mm)	Temper	Rm MPa	$Rp_{0,2}$ MPa	$Rp_{1,0}$ MPa	Elongation (Longitudinal) A%	Impact energy (Longitudinal) KV_2	Hardness* HB
15-150	Hot rolled	530 - 680	Min. 220	Min. 260	40	100	Max. 215

*** Information values only;**

Physical properties:

Density g/cm³	Electrical resistivity Ω mm² / m	Thermal conductivity W/m K	Thermal expansion (µm m^{-1} K^{-1})	Specific heat (J kg^{-1} K^{-1})	E - modulus (N / mm²)	Magnetizable	PREN (Min.)
8,0	0,75	15	16,0	500	200.000	No	16,5

Typical Alumeco products with this alloy

- **Plates - Dim: 15-150 mm x Length: >1500/(2000) mm**

Surface definition: Hot rolled (HR) – 1D

Surface finish	Free of scale
Type of process route	Hot rolled, heat treated, pickled.
Notes	Usually standard for most steel types to ensure good corrosion resistance; also common finish for further processing. It is permissible for grinding marks to be present. Not as smooth as 2D or 2B.
Typical Roughness *Ra*	3,26 µm

Tolerances for Quarto Plates for EN 1.4404:

Tolerances on thickness

Nominal thickness t (mm)	Width w (mm)			
	$w < 2100$	$2100 \leq w < 3000$	$3000 \leq w < 3600$	$w \geq 3600$
$t < 10$	+1,15	+1,30	+2,15	-
$10 \leq t < 20$	+1,40	+1,55	+2,15	+2,30
$20 \leq t < 25$	+1,55	+1,65	+2,15	+2,55
$25 \leq t < 50$	+1,80	+1,90	+2,40	+2,95
$50 \leq t < 75$	+2,55	+2,75	+2,95	+3,15
$75 \leq t < 100$	+2,75	+2,95	+3,15	+3,35
$100 \leq t < 150$	+2,95	+3,15	+3,35	+3,55

* Values are referred from Table 1 of ISO 18286:2008

Tolerance on width and length

At the time of enquiry and purchase order, the purchaser shall specify which width and length tolerance class is applicable to the purchased material.
The choice of the trimming procedure is left to the manufacturer's discretion, unless otherwise stated in the purchase order.

Tolerances on width for Class A

Nominal width w (mm)	Tolerances
$600 \leq w < 2000$	0 +15
$2000 \leq w < 3000$	0 +20
$w \geq 3000$	0 +25

* Values are referred from Table 2 of ISO 18286:2008

Tolerances on length for Class A

Nominal width L (mm)	Tolerances
$600 \leq L < 4000$	0 +20
$4000 \leq L < 6000$	0 +30
$6000 \leq L < 8000$	0 +40
$8000 \leq L < 10000$	0 +50
$10000 \leq L < 15000$	0 +75
$15000 \leq L \leq 20000$	0 +100

* Values are referred from Table 3 of ISO 18286:2008

Tolerances on width and length for Class B (i.e. flame-cut plate)

Nominal thickness t (mm)	Tolerances (mm)
$t \leq 50$	0 +10
$50 < t \leq 75$	0 +13
$75 < t \leq 150$	0 +19

* Values are referred from Table 4 of ISO 18286:2008

Tolerances on width and length for Class C (i.e. abrasive-cut plate)

Nominal thickness *t* (mm)	Tolerances (mm)
$t \leq 25$	3,2
$25 < t \leq 50$	4,8
$50 < t \leq 75$	6,4
$75 < t \leq 100$	7,9

* Values are referred from Table 5 of ISO 18286:2008

Normal tolerances for flatness

Nominal thickness *t* (mm)	Tolerances (mm) Measuring length	
	1000	2000
$4 \leq t < 5$	9	14
$5 \leq t < 8$	8	12
$8 \leq t < 15$	7	10
$15 \leq t < 25$	7	10
$25 \leq t < 40$	6	9
$40 \leq t \leq 250$	5	8

* Values are referred from Table 6 of ISO 18286:2008

Cold bending of flat rolled steel according to DIN 6935:2011

To obtain uniform bends on bending rails, it is recommended that only bending radii from the series below be selected. The values printed in bold are to be preferred. (Dimensions in millimetres)

r	**1**	1,2	**1,6**	2	**2,5**	3	4	5	**6**	8	**10**	12	**16**	**20**	**25**	28	**32**	36	**40**	45	**50**	**63**	**80**	**100**

* Values are referred from DIN 6935:2011-10

Minimum permissible bending radius *r* according to DIN 6935:2011

Steel Grades	For bending transverse or parallel to the rolling direction	Minimum permissible bending radius *r* for thicknesses *s* *(mm)*														
		$s \leq 1$	$1 < s \leq 1{,}5$	$1{,}5 < s \leq 2{,}5$	$2{,}5 < s \leq 3$	$3 < s \leq 4$	$4 < s \leq 5$	$5 < s \leq 6$	$6 < s \leq 7$	$7 < s \leq 8$	$8 < s \leq 10$	$10 < s \leq 12$	$12 < s \leq 14$	$14 < s \leq 16$	$16 < s \leq 18$	$18 < s \leq 20$
S 355 J2	Transverse	1,6	2,5	4	5	6	8	10	12	16	20	25	32	36	45	50
	Parallel	1,6	1,6	4	5	8	10	12	16	20	25	32	36	40	50	63

* Values are referred from Table 1 of DIN 6935:2011-10 (S = Structual; XXX = Min. yield strength in MPa; J2 = Steel sub-grade).

Permissible deviations for minimum bending radii *r* according to DIN 6935:2011

Steel Grades	Permissible deviations for minimum bending radii *r* for thicknesses *s*		
	≤ 3	$3 < s \leq 8$	$8 < s \leq 20$
S 355 JR	+ 1 0	+ 2 0	+ 3 0

* Values are referred from Table 2 of DIN 6935:2011-10