



AISI 316 / 316L

AUSTENITIC STAINLESS STEELS

Reference standard: EN 10088-3:2023

W.-Nr.	1.4401 / 1.4404	AFNOR	-
AISI	316 / 316L	BS	EN 10088-3
UNI	EN 10088-3	JIS	-
DIN	EN 10088-3	Other	-

CHEMICAL COMPOSITION

C	Si	Mn	P	S	Cr	Ni	Mo	N
0.030 ±0.005	1.00 ±0.05	2.00 ±0.04	0.045 +0.010	0.030 ±0.005	16.5-18.5 ±0.20	10.0-13.0 ±0.15	2.00-2.50 ±0.10	0.10 ±0.01

Cast analysis composition, maximum values in % by mass except where a range is given; the second line is the permissible deviation of the product analysis (Table 6) | The row applies to bar of DUAL designation 1.4401 / 1.4404, that is the tighter of the two limits: taken alone, 1.4401 allows C up to 0.07 and 1.4404 allows Mo up to 3.00 | EN designation: X5CrNiMo17-12-2 for 1.4401 and X2CrNiMo17-12-2 for 1.4404; UNI, DIN and BS adopt EN 10088-3 and use the same one

Controlled sulfur contents, permitted by the standard: 0.015-0.030 for machinability, 0.008-0.030 for weldability, 0.015 max for polishability | On 1.4404 the maximum nickel content may be raised by 1.50 points where delta ferrite or magnetic permeability has to be kept low

TEMPERATURE IN °C

Hot working	Solution annealing +AT
1200-900 °C air cooling	1020-1120 °C water or air

MECHANICAL PROPERTIES

BRIGHT BARS (cold-drawn, peeled, ground) - solution annealed +AT, at 20 °C EN 10088-3:2023 Tab. 13							
Diameter/thick. (in mm)		Rp 0.2 N/mm ² min	R N/mm ²	A% L min	A% T min	KV2 L J min	KV2 T J min
>	≤						
-	10	400	600-930	25	-	-	-
10	16	380	580-930	25	-	-	-
16	40	200	500-830	30	-	100	-
40	63	200	500-830	30	-	100	-
63	160	200	500-700	40	-	100	-
160	250	200	500-700	-	30	-	60

Rp 0.2 = 0.2% proof strength | A% L and T = elongation after fracture, longitudinal and transverse | KV2 = Charpy V impact energy, striker radius 2 mm | For hexagons the dimension is the width across flats | Elongation applies from 5 mm up; below that, and on non-round sections thinner than 5 mm, the values are agreed at the time of order

Figures for bar of dual designation: where 1.4401 and 1.4404 differ, the table carries the tighter limit. Taken alone, 1.4401 allows a tensile strength up to 950 N/mm² below 16 mm and up to 850 between 16 and 63 mm

HOT-ROLLED - solution annealed +AT, at 20 °C EN 10088-3:2023 Tab. 8									
Diameter/thick. (in mm)		HBW max	Rp 0.2 N/mm ² min	Rp 1.0 N/mm ² min	R N/mm ²	A% L min	A% T min	KV2 L J min	KV2 T J min
>	≤								
-	160	215	200	235	500-700	40	-	100	-
160	250	215	200	235	500-700	-	30	-	60

PROOF STRENGTH AT ELEVATED TEMPERATURE - solution annealed +AT, minimum values in N/mm ² EN 10088-3:2023 Tab. 20										
°C	100	150	200	250	300	350	400	450	500	550
Rp 0.2 - 1,4401	175	158	145	135	127	120	115	112	110	108
Rp 0.2 - 1,4404	165	150	137	127	119	113	108	103	100	98
Rp 1.0 - 1,4401	210	190	175	165	155	150	145	141	139	137
Rp 1.0 - 1,4404	200	180	165	153	145	139	135	130	128	127

This is where the two grades diverge: at 20 °C the standard specifies the same minima for both, while hot 1.4401 sits about 10 N/mm² above 1.4404 at every temperature, up to 550 °C

The standard's scope stops at 250 mm: we supply hot-rolled round up to 300 mm, and above 250 the mechanical values are agreed at the time of order

Intergranular corrosion: in the delivery condition both resist. After sensitization - 15 minutes at 700 °C and air cooling, the standard's test - only 1.4404 resists. This is why the low-carbon grade is preferred on welded sections that are not solution annealed again

Austenitic: not hardenable by heat treatment, it is strengthened only by cold work. Solution annealing dissolves the carbides and restores the condition in which corrosion resistance is full | We supply this steel as bar in the solution annealed condition, hot-rolled or cold-drawn, peeled and ground, with cutting to size

EN 10088-3 specifies no physical properties: elastic moduli, expansion, conductivity and density are given in EN 10088-1, which is why they do not appear on this sheet