

GRADES	Chemical composition (cast analysis) <sup>(1)(7)</sup> of stainless steel flat products												
	Name Designation EN	EN Number Designation	Designation AISI/ASTM	C	Si	Mn	P max	S	N	Cr	Mo	Ni	Others
AUSTENITIC	X12CrMnNiN17-7-5	1.4372	201	≤0,15	≤1,00	5,50 to 7,50	0,045	≤0,015	0,05 to 0,25	16,00 to 18,00		3,50 to 5,50	
	X12CrMnNiN18-9-5	1.4373	202	≤0,15	≤1,00	7,50 to 10,50	0,045	≤0,015	0,05 to 0,25	17,00 to 19,00		4,00 to 6,00	
	X10CrNi18-8	1.4310	301	0,05 to 0,15	≤2,00	≤2,00	0,045	≤0,015	≤0,11	16,00 to 19,00	≤0,80	6,00 to 9,50	
			301 L <sup>(6)</sup>	≤0,030	≤1,00	≤2,00	0,045	≤0,030	≤0,20	16,00 to 18,00		6,00 to 8,00	
	X2CrNi18-7	1.4318	301 LN	≤0,030	≤1,00	≤2,00	0,045	≤0,015	0,10 to 0,20	16,50 to 18,50		6,00 to 8,00	
			302 <sup>(8)</sup>	≤0,15	≤0,75	≤2,00	0,045	≤0,030	≤0,10	17,00 to 19,00		8,00 to 10,00	
	X8CrNiS18-9	1.4305	303	≤0,10	≤1,00	≤2,00	0,045	0,15 to 0,35	≤0,11	17,00 to 19,00		8,00 to 10,00	Cu≤1,00
	X5CrNi18-10	1.4301	304	≤0,07	≤1,00	≤2,00	0,045	≤0,015 <sup>(2)</sup>	≤0,11	17,00 to 19,50		8,00 to 10,50	
	X2CrNi18-10	1.4311	304 LN	≤0,030	≤1,00	≤2,00	0,045	≤0,015 <sup>(2)</sup>	0,12 to 0,22	17,00 to 19,50		8,50 to 11,50	
	X6CrNi18-10	1.4948 <sup>(9)</sup>	304 H	0,04 to 0,08	≤1,00	≤2,00	0,035	≤0,015 <sup>(2)</sup>	≤0,11	17,00 to 19,00		8,00 to 11,00	
	X2CrNi18-9	1.4307	304 L	≤0,030	≤1,00	≤2,00	0,045	≤0,015 <sup>(2)</sup>	≤0,11	17,50 to 19,50		8,00 to 10,00	
	X2CrNi19-11	1.4306	304 L	≤0,030	≤1,00	≤2,00	0,045	≤0,015 <sup>(2)</sup>	≤0,11	18,00 to 20,00		10,00 to 12,00	
			304 N <sup>(8)</sup>	≤0,08	≤0,75	≤2,00	0,045	≤0,030	0,10 to 0,16	18,00 to 20,00		8,00 to 10,50	
	X4CrNi18-12	1.4303	305	≤0,06	≤1,00	≤2,00	0,045	≤0,015 <sup>(2)</sup>	≤0,11	17,00 to 19,00		11,00 to 13,00	
	X15CrNiSi 20-12	1.4828 <sup>(10)</sup>		≤0,20	1,50 to 2,50	≤2,00	0,045	≤0,015	≤0,11	19,00 to 21,00		11,00 to 13,00	
	X12CrNi 23-13	1.4833 <sup>(10)</sup>	309 S	≤0,15	≤1,00	≤2,00	0,045	≤0,015	≤0,11	22,00 to 24,00		12,00 to 14,00	
	X8CrNi 25-21	1.4845 <sup>(10)</sup>	310 S	≤0,10	≤1,50	≤2,00	0,045	≤0,015	≤0,11	24,00 to 26,00		19,00 to 22,00	
	X15CrNiSi 25-21	1.4841 <sup>(10)</sup>	314	≤0,20	1,50 to 2,50	≤2,00	0,045	≤0,015	≤0,11	24,00 to 26,00		19,00 to 22,00	
	X5CrNiMo17-12-2	1.4401	316	≤0,07	≤1,00	≤2,00	0,045	≤0,015 <sup>(2)</sup>	≤0,11	16,50 to 18,50	2,00 to 2,50	10,00 to 13,00	
	X3CrNiMo17-13-3	1.4436	316	≤0,05	≤1,00	≤2,00	0,045	≤0,015 <sup>(2)</sup>	≤0,11	16,50 to 18,50	2,50 to 3,00	10,50 to 13,00	
		316 N <sup>(8)</sup>	≤0,08	≤0,75	≤2,00	0,045	≤0,030	0,10 to 0,16	16,00 to 18,00	2,00 to 3,00	10,00 to 14,00		
		316 H <sup>(8)</sup>	0,04 to 0,10	≤0,75	≤2,00	0,045	≤0,030		16,00 to 18,00	2,00 to 3,00	10,00 to 14,00		
X2CrNiMo17-12-2	1.4404	316 L	≤0,030	≤1,00	≤2,00	0,045	≤0,015 <sup>(2)</sup>	≤0,11	16,50 to 18,50	2,00 to 2,50	10,00 to 13,00		
X2CrNiMo18-14-3	1.4435	316 L	≤0,030	≤1,00	≤2,00	0,045	≤0,015 <sup>(2)</sup>	≤0,11	17,00 to 19,00	2,50 to 3,00	12,50 to 15,00		
X2CrNiMo17-12-3	1.4432	316 L	≤0,030	≤1,00	≤2,00	0,045	≤0,015 <sup>(2)</sup>	≤0,11	16,50 to 18,50	2,50 to 3,00	10,50 to 13,00		
X2CrNiMoN17-11-2	1.4406	316 LN	≤0,030	≤1,00	≤2,00	0,045	≤0,015 <sup>(2)</sup>	0,12 to 0,22	16,50 to 18,50	2,00 to 2,50	10,00 to 12,00		
X2CrNiMoN17-13-3	1.4429	316 LN	≤0,030	≤1,00	≤2,00	0,045	≤0,015	0,12 to 0,22	16,50 to 18,50	2,50 to 3,00	11,00 to 14,00		
X6CrNiMoTi17-12-2	1.4571	316 Ti	≤0,08	≤1,00	≤2,00	0,045	≤0,015 <sup>(2)</sup>		16,50 to 18,50	2,00 to 2,50	10,50 to 13,50	Ti:5 x C to 0,70	
X6CrNiMoNb17-12-2	1.4580	316 Cb	≤0,08	≤1,00	≤2,00	0,045	≤0,015 <sup>(2)</sup>		16,50 to 18,50	2,00 to 2,50	10,50 to 13,50	Nb:10 x C to 1,00	
		317 <sup>(8)</sup>	≤0,08	≤0,75	≤2,00	0,045	≤0,030	≤0,10	18,00 to 20,00	3,00 to 4,00	11,00 to 15,00		
X2CrNiMo18-15-4	1.4438	317 L	≤0,030	≤1,00	≤2,00	0,045	≤0,015 <sup>(2)</sup>	≤0,11	17,50 to 19,50	3,00 to 4,00	13,00 to 16,00		
X2CrNiMoN18-12-4	1.4434	317 LN	≤0,030	≤1,00	≤2,00	0,045	≤0,015	0,10 to 0,20	16,50 to 19,50	3,00 to 4,00	10,50 to 14,00		
X2CrNiMoN17-13-5	1.4439	317 LMN	≤0,030	≤1,00	≤2,00	0,045	≤0,015	0,12 to 0,22	16,50 to 18,50	4,00 to 5,00	12,50 to 14,50		
X6CrNiTi18-10	1.4541	321	≤0,08	≤1,00	≤2,00	0,045	≤0,015 <sup>(2)</sup>		17,00 to 19,00		9,00 to 12,00	Ti:5 x C to 0,70	
X8CrNiTi18-10	1.4878 <sup>(10)</sup>	321H	≤0,10	≤1,00	≤2,00	0,045	≤0,015		17,00 to 19,00		9,00 to 12,00	Ti:5 x C to 0,80	
X6CrNiNb18-10	1.4550	347	≤0,08	≤1,00	≤2,00	0,045	≤0,015		17,00 to 19,00		9,00 to 12,00	Nb:10 x C to 1,00	
		347 H <sup>(8)</sup>	0,04 to 0,10	≤0,75	≤2,00	0,045	≤0,015		17,00 to 19,00		9,00 to 12,00	Nb:8 x C to 1,00	
X1CrNi25-21	1.4335		≤0,20	≤0,25	≤2,00	0,025	≤0,010	≤0,11	24,00 to 26,00	≤0,20	20,00 to 22,00		
X1CrNiMoN25-22-2	1.4466	310 MoLN	≤0,020	≤0,70	≤2,00	0,025	≤0,010	0,10 to 0,16	24,00 to 26,00	2,00 to 2,50	21,00 to 23,00		
X1CrNiSi18-15-4	1.4361		≤0,015	3,70 to 4,50	≤2,00	0,025	≤0,010	≤0,11	16,50 to 18,50	≤0,20	14,00 to 16,00		
X1NiCrMoCu31-27-4	1.4563		≤0,020	≤0,70	≤2,00	0,030	≤0,010	≤0,11	26,00 to 28,00	3,00 to 4,00	30,00 to 32,00	Cu:0,70 to 1,50	
X1NiCrMoCu25-20-5	1.4539	904 L	≤0,020	≤0,70	≤2,00	0,030	≤0,010	≤0,15	19,00 to 21,00	4,00 to 5,00	24,00 to 26,00	Cu:1,20 to 2,00	
X1CrNiMoCuN20-18-7 *	1.4547		≤0,020	≤0,70	≤1,00	0,030	≤0,010	0,18 to 0,25	19,50 to 20,50	6,00 to 7,00	17,50 to 18,50	Cu:0,50 to 1,00	
X1NiCrMoCuN25-20-7	1.4529		≤0,020	≤0,50	≤1,00	0,030	≤0,010	0,15 to 0,25	19,00 to 21,00	6,00 to 7,00	24,00 to 26,00	Cu:0,50 to 1,50	
X12NiCrSi35-16	1.4864 <sup>(10)</sup>	330	≤0,015	1,00 to 2,00	≤2,00	0,045	≤0,015	≤0,11	15,00 to 17,00		33,00 to 37,00		
X9CrNiSiN21-11-2	1.4835 <sup>(10)</sup>		0,05 to 0,12	1,40 to 2,50	≤1,00	0,045	≤0,015	0,12 to 0,20	20,00 to 22,00		10,00 to 12,00	Ce:0,03 to 0,08	
X10NiCrAlTi32-21	1.4876 <sup>(10)</sup>		≤0,12	≤1,00	≤2,00	0,030	≤0,015		19,00 to 23,00		30,00 to 34,00	Al:0,15 to 0,60; Ti:0,15 to 0,60	
X6NiCrNbCe32-27	1.4877 <sup>(10)</sup>		0,04 to 0,08	≤0,30	≤1,00	0,020	≤0,010	≤0,11	26,00 to 28,00		31,00 to 33,00	Al≤0,025; Ce:0,05 to 0,10; Nb:0,60 to 1,00	
X6CrNiSiN21-11-2	1.4818 <sup>(10)</sup>		0,04 to 0,08	1,00 to 2,00	≤1,00	0,045	≤0,015	0,12 to 0,20	18,00 to 20,00		9,00 to 11,00	Ce:0,03 to 0,08	
X6NiCrSiN21-11-2	1.4854 <sup>(10)*</sup>		0,04 to 0,08	1,20 to 2,00	≤2,00	0,040	≤0,015	0,12 to 0,20	24,00 to 26,00		34,00 to 36,00	Ce:0,03 to 0,08	

<b>DUPLEX</b>	X2CrNiMoN22-5-3	1.4462		≤0,030	≤1,00	≤2,00	0,035	≤0,015	0,10 to 0,22	21,00 to 23,00	2,50 to 3,50	4,50 to 6,50	
	X2CrNiN23-4 *	1.4362		≤0,030	≤1,00	≤2,00	0,035	≤0,015	0,05 to 0,20	22,00 to 24,00	0,10 to 0,60	3,50 to 5,50	Cu:0,10 to 0,60
	X2CrNiMoN25-7-4 *	1.4410		≤0,030	≤1,00	≤2,00	0,035	≤0,015	0,20 to 0,35	24,00 to 26,00	3,00 to 4,50	6,00 to 8,00	
	X2CrNiMoCuN25-6-3	1.4507		≤0,030	≤0,70	≤2,00	0,035	≤0,015	0,15 to 0,30	24,00 to 26,00	2,70 to 4,00	5,50 to 7,50	Cu:1,00 to 2,50
	X2CrNiMoCuWN25-7-4	1.4501		≤0,030	≤1,00	≤1,00	0,035	≤0,015	0,20 to 0,30	24,00 to 26,00	3,00 to 4,00	6,00 to 8,00	Cu:0,50 to 1,00; W: 0,50 to 1,00
<b>FERRITIC</b>	X6CrAl13	1.4002	405	≤0,08	≤1,00	≤1,00	0,040	≤0,015 <sup>2)</sup>		12,00 to 14,00			Al: 0,10 to 0,30
	X2CrNi12	1.4003		≤0,030	≤1,00	≤1,50	0,040	≤0,015	≤0,030	10,50 to 12,50		0,30 to 1,00	
	X2CrTi12	1.4512	409	≤0,030	≤1,00	≤1,00	0,040	≤0,015		10,50 to 12,50			Ti:6x(C+N) to 0,65
	X6Cr13	1.4000	410S	≤0,08	≤1,00	≤1,00	0,040	≤0,015 <sup>2)</sup>		12,00 to 14,00			
			429 <sup>(6)</sup>	≤0,12	≤1,00	≤1,00	0,04	≤0,030		14,00 to 16,00			
	X6Cr17	1.4016	430	≤0,08	≤1,00	≤1,00	0,040	≤0,015 <sup>2)</sup>		16,00 to 18,00			
	X2CrTi17	1.4520		≤0,025	≤0,50	≤0,50	0,040	≤0,015	≤0,015	16,00 to 18,00			Ti: 0,30 to 0,60
	X3CrNb17	1.4511		≤0,05	≤1,00	≤1,00	0,040	≤0,015		16,00 to 18,00			Nb:12xC to 1,00
	X6CrNi17-1 *	1.4017 *		≤0,08	≤1,00	≤1,00	0,040	≤0,015		16,00 to 18,00		1,20 to 1,60	
	X6CrMo17-1	1.4113	434	≤0,08	≤1,00	≤1,00	0,040	≤0,015 <sup>2)</sup>		16,00 to 18,00	0,90 to 1,40		
	X3CrTi17	1.4510	439	≤0,05	≤1,00	≤1,00	0,040	≤0,015 <sup>2)</sup>		16,00 to 18,00			Ti:4x(C+N)+0,15 to 0,80 <sup>5)</sup>
	X6CrNiTi12	1.4516		≤0,08	≤0,70	≤1,50	0,040	≤0,015		10,50 to 12,50		0,50 to 1,50	Ti:0,05 to 0,35
	X2CrMoTi17-1	1.4513		≤0,025	≤1,00	≤1,00	0,040	≤0,015	≤0,015	16,00 to 18,00	1,00 to 1,50		Ti: 0,30 to 0,60
	X2CrMoTi18-2	1.4521	444	≤0,025	≤1,00	≤1,00	0,040	≤0,015	≤0,030	17,00 to 20,00	1,80 to 2,50		Ti:4x(C+N)+0,15 to 0,80 <sup>5)</sup>
	X6CrMoNb17-1	1.4526	436	≤0,08	≤1,00	≤1,00	0,040	≤0,015	≤0,040	16,00 to 18,00	0,80 to 1,40		Nb:7x(C+N)+0,10 to 1,00
	X2CrTiNb18	1.4509		≤0,030	≤1,00	≤1,00	0,040	≤0,015		17,50 to 18,50			Nb:3xC+0,30 to 1,00; Ti:0,10 to 0,60
	X18CrN28	1.4749 <sup>(10)</sup>	446	0,15 to 0,20	≤1,00	≤1,00	0,040	≤0,015	0,15 to 0,25	26,00 to 29,00			
	X10CrAlSi7	1.4713 <sup>(10)</sup>		≤0,12	0,50 to 1,00	≤1,00	0,040	≤0,015		6,00 to 8,00			Al: 0,50 to 1,00
	X10CrAlSi13	1.4724 <sup>(10)</sup>		≤0,12	0,70 to 1,40	≤1,00	0,040	≤0,015		12,00 to 14,00			Al: 0,70 to 1,20
	X10CrAlSi25	1.4762 <sup>(10)</sup>		≤0,12	0,70 to 1,40	≤1,00	0,040	≤0,015		23,00 to 26,00			Al: 1,20 to 1,70
<b>PH MARTENSITIC<sup>(6)</sup></b>	X12Cr13	1.4006	410	0,08 to 0,15	≤1,00	≤1,50	0,040	≤0,015 <sup>2)</sup>		11,50 to 13,50		≤0,75	
	X20Cr13	1.4021	420	0,16 to 0,25	≤1,00	≤1,50	0,040	≤0,015 <sup>2)</sup>		12,00 to 14,00			
	X30Cr13	1.4028	420	0,26 to 0,35	≤1,00	≤1,50	0,040	≤0,015 <sup>2)</sup>		12,00 to 14,00			
	X39Cr13	1.4031	420	0,36 to 0,42	≤1,00	≤1,00	0,040	≤0,015 <sup>2)</sup>		12,50 to 14,50			
	X46Cr13	1.4034	420	0,43 to 0,50	≤1,00	≤1,00	0,040	≤0,015 <sup>2)</sup>		12,50 to 14,50			
	X50CrMoV15	1.4116		0,45 to 0,55	≤1,00	≤1,00	0,040	≤0,015 <sup>2)</sup>		14,00 to 15,00	0,50 to 0,80		V: 0,10 to 0,20
	X39CrMo17-1	1.4122		0,33 to 0,45	≤1,00	≤1,50	0,040	≤0,015 <sup>2)</sup>		15,50 to 17,50	0,80 to 1,30	≤1,00	
	X3CrNiMo13-4	1.4313		≤0,05	≤0,70	≤1,50	0,040	≤0,015	≥0,020	12,00 to 14,00	0,30 to 0,70	3,50 to 4,50	
	X4CrNiMo16-5-1	1.4418		≤0,06	≤0,70	≤1,50	0,040	≤0,015 <sup>2)</sup>	≥0,020	15,00 to 17,00	0,80 to 1,50	4,00 to 6,00	
	X5CrNiCuNb16-4	1.4542	630	≤0,07	≤0,70	≤1,50	0,040	≤0,015 <sup>2)</sup>		15,00 to 17,00	≤0,60	3,00 to 5,00	Cu:3,00 to 5,00; Nb: 5xC to 0,45
X7CrNiAl17-7	1.4568	631	≤0,09	≤0,70	≤1,00	0,040	≤0,015		16,00 to 18,00		6,50 to 7,80 <sup>4)</sup>	Al: 0,70 to 1,50	

(1) Elements not quoted in this table may not be intentionally added to the steel without the agreement of the purchaser except for the finishing of the cast. All appropriate precautions are to be taken to avoid the addition of such elements from scrap and other materials used in production which would impair mechanical properties and the suitability of the steel.

(2) For products to be machined, a controlled sulfur content of 0,015% to 0,030% is recommended and permitted.

(\*) Patented steel grade.

(4) For better cold deformability, the upper limit may be increased to 8,30%.

(5) The stabilization may be made by use of titanium or niobium or zirconium. According to the atomic number of these elements and the content of carbon and nitrogen, the equivalence shall be the following  $Ti^A=7/4Nb^A=7/4Zr$

(6) Tighter Carbon ranges may be agreed at the time of enquiry and order.

(7) Unless mentioned otherwise (where notes (8), (9), (10) apply), the source of the data is EN 10088

(8) From ASTM A240/A240M-99a

(9) From EN 10028-7 (2000)

(10) From EN 10095 (1999)

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