

## Stainless steel grades

### Chemical composition

Group	Grade	Chemical composition, mass content % <sup>1)</sup>									
		C	Si	Mn	P	S	Cr	Mo <sup>7)</sup>	Ni	Cu	Notes
Austenitic	A 1	0,12	1	6,5	0,2	0,15–0,35	16–19	0,7	5–10	1,75–2,25	2) 8) 13)
	A 2	0,1	1	2	0,05	0,03	15–20	–	8–19	4	6) 9) 12)
	A 3	0,08	1	2	0,045	0,03	17–19	–	9–12	1	3) 4) 8)
	A 4	0,08	1	2	0,045	0,03	16–18,5	2–3	10–15	1	5) 12)
	A 5	0,08	1	2	0,045	0,03	16–18,5	2–3	10,5–14	1	3) 4) 5)
Martensitic	C 1	0,09–0,15	1	1	0,05	0,03	11,5–14	–	1	–	5)
	C 3	0,17–0,25	1	1	0,04	0,03	16–18	–	1,5–2,5	–	
	C 4	0,08–0,15	1	1,5	0,06	0,15–0,35	12–14	0,6	1	–	2) 5)
Ferritic	F 1	0,12	1	1	0,04	0,03	15–18	–	1	–	6) 10) 11)
Austenitic-Ferritic	FA <sup>14)</sup>	0,03	1,7	1,5	–	–	18–19	2–2,7	4,5–5	–	N = 0,07
		0,03	1	2	–	–	21–23	2,5–3	5–5,5	–	N = 0,14

<sup>1)</sup> Values are maximum unless otherwise indicated.

<sup>2)</sup> Sulphur may be replaced by selenium.

<sup>3)</sup> Must contain titanium  $\geq 5 \times C$  up to 0,8% maximum for stabilization, or<sup>4)</sup>.

<sup>4)</sup> Must contain niobium (columbium) and/or tantalum  $\geq 10 \times C$  up to 1% maximum for stabilization, or<sup>3)</sup>.

<sup>5)</sup> At the option of the manufacturer the carbon content may be higher where required to obtain the specified mechanical properties at larger diameters, but shall not exceed 0,12% for austenitic steels.

<sup>6)</sup> Molybdenum may also be present at the option of the manufacturer.

<sup>7)</sup> If for some applications a maximum molybdenum content is essential, this must be stated.

<sup>8)</sup> If the nickel content is below 8%, the minimum manganese content must be 5%.

<sup>9)</sup> If the chromium content is below 17%, the minimum nickel content should be 12%.

<sup>10)</sup> May contain titanium  $\geq 5 \times C$  up to 0,8% maximum.

<sup>11)</sup> May contain niobium (columbium) and/or tantalum  $\geq 10 \times C$  up to 1,0% maximum.

<sup>12)</sup> For austenitic stainless steels having a maximum carbon content of 0,03%, nitrogen may be present to a maximum of 0,22%.

<sup>13)</sup> There is no minimum limit to the copper content providing that the nickel content is greater than 8%.

<sup>14)</sup> For information only, will most probably be included in the future.

### Corrosion resistance

Resistance group	Loss of material g/m <sup>2</sup> h	Loss of material in mm per year	Comments
0	max. 0,1	max. 0,11	completely resistant
1	> 0,1–1,0	> 0,11–1,1	sufficiently resistant
2	> 1,0–10,0	> 1,1–11,0	less resistant
3	> 10,0	> 11,0	not resistant
X	Risk of pitting even in resistance group 0		

The data listed are based on laboratory tests. If parts are intended for a critical application, they should be tested in a practice oriented experiment (consult an expert if necessary).

**If there is a risk of inter-granular corrosion (mainly in chlorine bearing environments) use titanium or niobium stabilized steels (grade A3 or A5) or low carbon stainless steels (grade A2L or A4L). For details see ISO 3506 or consult an expert.**