

Stainless Steel Properties

Extract from DIN 267 Part 11 - Chemical Composition of austenitic chromium-nickels steels in % by weight

| Austenitic | Material | C | Si | Mn | P | S | Cr | Mo | Ni |
|------------|-------------|------|----|----|------|--------------|--------------|------------|--------------|
| Grade | No. to AISI | | | | | | | | |
| A1 | 303 | 0.12 | 1 | 2 | 0.2 | 0.15 to 0.35 | 17.0 to 19.0 | 0.6 | 8.0 to 10.0 |
| A2 | 304 | 0.08 | 1 | 2 | 0.05 | 0.03 | 17.0 to 20.0 | - | 8.0 to 13.0 |
| A4 | 316 | 0.08 | 1 | 2 | 0.05 | 0.03 | 16.0 to 18.5 | 2.0 to 3.0 | 10.0 to 14.4 |

Maximum values unless otherwise stated.

Types A2 and A4 may contain up to a maximum of 4% copper.

The selection of steel grades within a group is the prerogative of the manufacturer, unless the purchaser has specified particular steels to ISO or national standards.

Different grades of steel may be used as long as all physical and mechanical properties and the corresponding corrosion resistance of the finished product are achieved. Only when all these conditions are fulfilled may finished articles be marked in accordance with DIN 267 Part 11.

Mechanical Properties-Austenitic Grades

Bolts, Screws and Studs

| Grade | Property Class | Tensile Strength Rm MPa(N/mm ²) Min. | Yield Stress Rp 0.2 Mpa(N/mm ²) Min. |
|-----------|--------------------------------|--|---|
| A2 and A4 | 70 | 700 | 450 |
| | 80 | 800 | 600 |
| Grade | Elongation A _{L, Min} | Proof Load Stress Sp Mpa (N/mm ²) Min | Diameter Range |
| A2 and A4 | 0.4d | 700 | =<M20 |
| | 0.3d | 800 | =<M20 |

Comparative International Stainless Steel Grades

| British | French | German | Italian | Japanese | Swedish | USA |
|---------|-------------|--------|----------------|----------|----------|------|
| 304S21 | Z12CN17.08 | 1.431 | X12CrNi 17 07 | SUS301 | 14 23 31 | 301 |
| 304S31 | | | | SUS302 | 14 23 32 | 302 |
| 304S15 | Z8CN18.09 | 1.4301 | X5CrNi 18 10 | SUS301 | 14 23 33 | 304 |
| 304S16 | | | | | | |
| 304S11 | Z2CN18.10 | 1.4306 | X2CrNi 18 11 | SUS304L | 14 23 52 | 304L |
| 305S19 | Z8CN18.12 | | X8CrNi 18 12 | SUS305 | | 305 |
| 309S24 | Z15CN24.13 | | X16CrNi 23 14 | SUS309 | | 309 |
| 310S24 | Z12CN25.20 | 1.4845 | Z22CrNi 25 20 | SUS310S | 14 23 61 | 310 |
| 315S16 | | | | | 14 23 40 | |
| 316S31 | Z6CND17.11 | 1.4401 | X8CrNiMo 17 13 | SUS316 | 14 23 43 | 316 |
| 316S33 | | 1.4436 | | | 14 23 47 | |
| 316S11 | Z2CND17.12 | 1.4404 | X2CrNiMo 17 12 | SUS316L | 14 23 53 | 316L |
| 316S13 | | 1.4435 | | | 14 23 48 | |
| 317S12 | Z2CND19.15 | 1.4435 | X2CrNiMo 18 16 | SUS317L | 14 23 67 | 317L |
| 317S16 | | 1.4436 | | SUS317 | 14 23 66 | 317 |
| 320S31 | Z8CND17.12 | 1.4571 | | | 14 23 50 | |
| 320S33 | | 1.4573 | | | | |
| 321S31 | Z6CNT18.12 | 1.4541 | X6CrNiTi 18 11 | SUS321 | 14 23 37 | 321 |
| 347S31 | Z6CNNb18.11 | 1.4558 | X6CrNiNb 18 11 | SUS347 | 14 23 38 | 347 |
| | | | X8CrNiNb 18 11 | | | |
| 403S17 | Z6C13 | 1.4 | X6Cr13 | SUS403 | 14 23 01 | 403 |
| 405S17 | Z6CA13 | 1.4002 | Z6CrA1 13 | SUS405 | | 405 |
| 409S19 | | 1.4512 | | | | 409 |
| 430S17 | Z8C17 | 1.4016 | X8Cr 17 | SUS430 | 14 23 20 | 430 |
| 434S17 | Z8CD17.01 | 1.4113 | X8CrMo 17 | SUS434 | 14 23 25 | 434 |
| 410S21 | Z12C13 | 1.4006 | X12Cr 13 | SUS410 | 13 23 02 | 410 |
| | | 1.4024 | | | | |
| 410S45 | Z30C13 | | X30Cr 13 | SUS420JS | 14 23 04 | 420 |

Steels For Screws, Bolts and Studs

Steels generally used for metric screws, bolts and studs

| Property Class | Size | Materials per DIN ¹⁾ | Materials per ANSI ¹⁾ |
|----------------|-----------------|---------------------------------|----------------------------------|
| 3.6/4.6 | to M39 | QSt 36-2 | 1006/1010 |
| | | USt 38-2 | |
| | | UQSt 36-2 | |
| | | UQSt 38-2 | |
| 4.8 | to M16 | QSt 36-2 | 1006/1010 |
| | | QSt 38-2 | |
| 5.6 | to M39 | Cq 22 | 1022 |
| 5.8 | to M39 | Cq 22 | 1022/1035 |
| | | Cq 35 | |
| 8.8 | to M12 | 22B2 | 10B22/10B28/1035 (1038) |
| | | 28B2 | |
| | | Cq 35 | |
| | to M22 | 35B2 | 10B35(1038) /1045 |
| | | Cq 35 | |
| | | Cq 45 | |
| | | 46 Cr 1 | |
| | over M24 to M39 | 34 Cr 4 | 5132/5135 |
| | | 37 Cr 4 | |
| | | 46 Cr2 | |
| 10.9 | to M6 | 35B2 | 10B35/1035 |
| | | Cq 35 | |
| | over M6 to M18 | 34 Cr 4 | 5132/5140 |
| | | 41 Cr 4 | |
| | to M39 | 41 Cr 4 | 5135/4137/4140 |
| | | 34 CrMo 4 | |
| 42 CrMo 4 | | | |
| 12.9 | to M18 | 34 CrMo4 | 4137/5135/5140 |
| | | 37 Cr 4 | |
| | | 41 Cr 4 | |
| | to M24 | 42CrMo 4 | 4140 |
| | to M39 | 34 CrNiMo 6 | 4340 |