

Austenitic chromium-manganese stainless steel

Type 15Cr-8Mn-1Ni-2Cu stainless steel

- An extra low-nickel CrMn-alloyed stainless steel grade.

Applications

- Applications like cookware, tableware, cutlery and shallow/medium drawn utensils are applicable. National requirements for materials in contact with food may restrict the use of low-Cr and low-Ni grades, like 204Cu.
- Kitchen sinks, fresh water tanks (room temperature), white goods in dry applications, steel furniture and interior decorative accessories.
- Due to its high strength, corrosion resistance and competitive costs, steel grade is suited for the transportation industry like bus body and rail car but uncoated structures may be attacked by corrosion in coastal areas and severe corrosive atmospheres. They also have an advantage in applications involving wear, abrasion and erosion.
- Material is also used in architectural applications like elevators and frames for windows and doors. Due to the aesthetic reasons a high quality in surface finishing is necessary.

Welding

- Common fusion and resistance welding methods can be used and filler materials applied to 300-series are suitable. Proper shield against possible Mn-oxide fumes is recommended.
- This grade is slightly more sensitive to intergranular corrosion in the weld heat affected zone than standard austenitic grades due to its high carbon content. Low heat input is recommended especially in thicker gauges.
- Cleaning of the weld seam is important for corrosion resistance. Pickling is recommended.

Fabrication

- Formability is good, but the forces needed and the elastic return are bigger compared to carbon steels and grade 1.4301 / AISI 304.
- Steel grade 204Cu suits for forming operations as well as bending, and drawing due to its high ductility.
- Work hardening is pronounced. Sensitivity to delayed cracking is higher than that of CrMn grade EN 1.4372 / AISI 201 (~4% Ni) when residual tensile stresses are present.
- Typically Mn-alloyed grades have a slightly lower surface reflectivity compared to the CrNi-grade 1.4301. This can lead for the need of increased material removal in further polishing and brushing processes.

Corrosion resistance

- Outokumpu produces grade 204Cu typically with a chromium content of about 15 wt-% and a nitrogen content of 0,1 wt-% giving the material a corrosion resistance lower compared to the grade 1.4301 / AISI 304.
- Immersion to chloride containing solutions is recommended to be avoided due to a risk for pitting and crevice corrosion. It is either recommended to use this grade for handling/storage of acids and other highly corrosive industrial chemicals.
- In the case of damaged passive layer, repassivation ability is reduced due to a low nickel content.
- The best material performance is reached usually with the help of adequate design, correct post-weld treatment and regular cleaning during use (if applicable).

Physical properties

- Crystal structure is austenitic, and therefore material is non-magnetic as soft annealed condition. Crystal structure becomes slightly magnetic by the formation of martensite when deformed.
- Density: 7,8 g/cm³
- Coefficient of thermal expansion ~16x10⁻⁶1/K(T = 20...100°C)
- Thermal conductivity at 20°C ~15 W/(m x K)
- Thermal capacity ~520 J/kg°C (T = 40°C)
- Electrical resistance ~ 0,73 μΩm (T = 25°C)
- Modulus of elasticity: 200 GPa

Mechanical properties

- For cold rolled materials.

Grade	Proof strength R _{p0,2} (N/mm ²)	Tensile strength R _m (N/mm ²)	Elongation after fracture A (%)
204Cu	Min. 325	Min. 700	Min. 40

Chemical compositions (typical)

Grade	C wt-%	Cr wt-%	Mn wt-%	Ni wt-%	N wt-%	Cu wt-%	Fe wt-%
204Cu	0,08	15,0	8,5	1,1	0,1	1.6	Bal.

Note: 204Cu is modified EN 1.4597 & UNS S20430

Further information

- Technical Customer Service

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