

## Austenitic chromium-manganese stainless steel

Type 17Cr-5Ni-7Mn stainless steel:  
EN 1.4372, AISI 201

- A low nickel variation to standard austenitic stainless steel grade 1.4301.

### Applications

- Applications like cookware, washing machine baskets and hose clamps are generally used. In contact with food there are national regulations and in some of them chromium content Min. 17 % and nickel content Min. 4 % are required for cutlery materials.
- Due to its high strength, corrosion resistance and competitive costs, steel grade is suited for the transportation industry.
- Material is used also in architectural applications, like elevators, windows, doors and lamp posts.

### Welding

- Conventional welding methods and filler materials applied to 300-series can be used. Proper shield against possible Mn-oxide fumes is recommended.
- Sensitive to intergranular corrosion in the weld heat affected zone when material thickness exceeds 6 mm.
- 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 1.4372 suits for demanding forming operations as well as bending, and drawing due to its high elongation to fracture.
- Work hardening is pronounced. Sensitivity to delayed cracking after demanding forming processes may be observed, e.g. when deep drawing ratio is close to 2,0 and 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 1.4372 typically with a chromium content of about 17 wt-% and a nitrogen content of 0,20 wt-% giving the material a corrosion resistance close to grade 1.4301 / AISI 304. Repassivation enhanced by nickel is lower than that of grade 1.4301.
- In chloride containing solutions pitting and crevice corrosion is possible depending on various parameters like chloride concentration, temperature, pH value, redox potential, crevice geometry and others.

- Oxidation resistance is good and comparable to steel grade 1.4310 / AISI 301 up to 840°C.
- 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 when deformed.
- Density: 7,8 g/cm<sup>3</sup>
- Coefficient of thermal expansion:  $17 \times 10^{-6} 1/K$  ( $T = 20 \dots 100^\circ C$ )
- Thermal conductivity at 20°C: 15 W/(m x K)
- Modulus of elasticity: 200 GPa

### Mechanical properties

- For cold rolled materials.

	Grade	Proof strength R <sub>p0,2</sub> (N/mm <sup>2</sup> )	Tensile strength R <sub>m</sub> (N/mm <sup>2</sup> )	Elongation after fracture A (%)
EN	1.4372	Min. 350	750...950*	Min. 45
ASTM	201**	Min. 310	Min. 655	Min. 40

\* Outokumpu 4372 fulfils Min. 655 N/mm<sup>2</sup>.

\*\* These values apply for lean side Type 201-2.

- Minimum values of 0,2 % proof strength (R<sub>p0,2</sub>, N/mm<sup>2</sup>) at elevated temperatures, EN 10088-2.

EN	100	150	200	250	300	350
1.4372	295	260	230	220	205	185

### Chemical compositions (typical)

Grade	C wt-%	Cr wt-%	Mn wt-%	Ni wt-%	N wt-%	Fe wt-%
4372	0,05	17,2	6,5	4,5	0,20	Bal.
4372	0,05	17,0	7,0	3,6	0,20	Bal.

### Further information

- Standards EN 10088-2:2005 and ASTM A 240 - 08
- Technical Customer Service

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