

## 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:  $17 \times 10^{-6} 1/K$  ( $T = 20...100^\circ C$ )
- 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

#### Disclaimer:

Information given in this document may be amended without notice. Care has been taken to ensure that the contents are accurate but Outokumpu and its affiliated companies makes no warranty underrating and have no liability for the anything in this document unless explicitly agreed in writing.

#### Outokumpu Tornio Works