

Stainless steel types

Austenitic stainless steel - Generality

General remarks about austenitic stainless steel

The basic structure of austenitic stainless steel is the well-known alloy of 18% CHROMIUM and 8% NICKEL. The CHROMIUM and NICKEL content can be increased to improve corrosion resistance. In order to do this, supplementary elements such as Molybdenum can also be added.

AUSTENITIC STEELS are non-magnetic and cannot be heat-treated or tempered. Cold working or work hardening is the only way to harden this type of steel but the process must happen quickly. The steel can later be converted back to its initial state if it is annealed. This solution is used as a replacement for heat treatment.

Type Z8CNF18.09

(stainless steel 303)

- Colour code: white
- Austenitic: non-magnetic
- SULPHUR added to facilitate machining.
- Good corrosion resistance
- Weldability: acceptable (but in general oxyacetylene welding is not recommended)
- Cold forming is possible but bends with sharp angles should be avoided.
- **Applications:** Production by batch machining, automated machines...

Type Z4CN19.10FF

(stainless steel 304)

- Colour code: yellow
- Austenitic: non-magnetic
- This is the most common type of stainless steel used
- Machining quality: acceptable
- Good corrosion resistance
- Good weldability (but in general oxyacetylene welding is not recommended)
- Cold forming gives very good results (slightly magnetic when cold-formed)
- **Applications:** hospitals, laundries, all general mechanical applications.

Type Z3CND18.14.08

(stainless steel 316L)

- Colour code: red
- Austenitic steel: non-magnetic
- High corrosion resistance, especially against salt water and acids.
- Machining quality: acceptable
- Good weldability
- Cold forming gives very good results (non-magnetic when reheated, slightly magnetic when cold-formed)
- **Applications:** petrochemical industry, marine environments, hospitals, catering.

Type Z6DNT18.10

(stainless steel 321)

- Colour code: blue
- Austenitic steel: non-magnetic
- Machining quality: acceptable
- Good corrosion and oxidation resistance
- Very good weldability
- Cold forming gives very good results (non-magnetic when reheated, slightly magnetic when cold-formed).
- **Applications:** petrochemical industry, in general all mechanical applications...

Martensitic steels

- These steels, which generally contain 13% Chromium, are the least corrosion-resistant stainless steels. They should therefore be used when corrosive conditions are relatively rare. Their main application is for cutlery.

Austenitic steels

- This type of stainless steel is by far the most widely-used. It resists most types of corrosion and is principally used in food preparation areas, dairies, breweries, and other processing plants, as well as in several parts of the chemical industry.

Ferritic steels

- The most commonly used ferritic steel is Z8C17 (stainless steel 430) which contains 17% Chromium. They have a greater corrosion resistance than martensitic steels, without being as efficient as standard austenitic steels. They are generally used for decorative trim on car motors and household appliances.

Le molybdenum

- Molybdenum, when added to austenitic steel, greatly improves corrosion resistance. Type 316 stainless steels contain between 2 and 3% Molybdenum.
- This type of steel is principally used in chemical and petrochemical industries where resistance to chlorine, as an example, is necessary. Nevertheless, it is important to mention that these steels are not resistant to all types of chemical attacks (such as hydrochloric or oxalic acid, especially when hot or in high concentrations).