Galvanised steel, copper and stainless steel in potable water applications- The Stainless Steel Pressfitting System

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1. Metallic materials for potable water pipe systems

Different materials can be used for construction of systems for transportation and storage of drinking water. The choice of an appropriate material is up to the planner, the plumber or the house owner. There are a lot of data sheets and even guidance standards which give recommendations for the choice of a material appropriate to be used in a certain water distribution system.

The European Standard prEN 12502 gives recommendations for avoiding corrosion damages with metallic materials in contact with drinking water. The likelihood of corrosion damages, due to e.g. weight loss or pitting corrosion, depends on different factors.

For galvanised steel and copper the composition of the water distributed in a certain area may lead to an increase of the corrosion likelihood, so that it is not recommendable to use these materials for piping systems, whereas Molybdenum bearing austenitic stainless steels can be applied in all drinking waters without any limitations.

Nevertheless, for all materials further influencing factors deriving from

- surface characteristics of the material
- design and construction
- pressure testing and commissioning and
- operating conditions

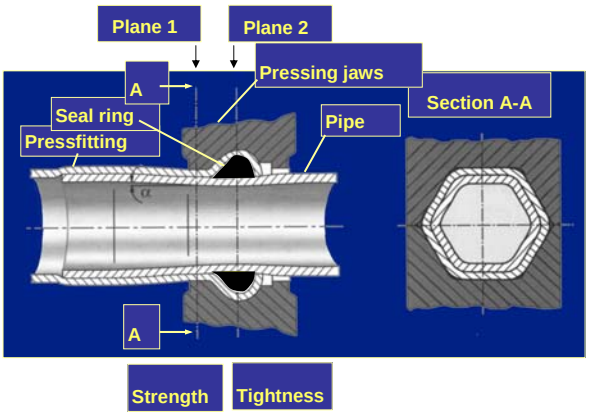
have to be considered. Depending on the material these factors may be of different importance.

For all materials, the choice of an appropriate joining technique is of major importance. As to stainless steel piping systems welding is mostly used for connecting pipes. But in drinking water installations with small pipe dimensions it is difficult to guarantee that all welds are free from oxide scales, which strongly influence the corrosion behaviour of the material. In some cases, brazing might be an alternative, but it is well known, that with some braze metals knife-line corrosion may occur even after prolonged service times.

Corrosion damage in poorly welded joint grade X6CrNiMoTi 17-12-2/1.4571

2. Stainless Steel Pressfitting System for potable water

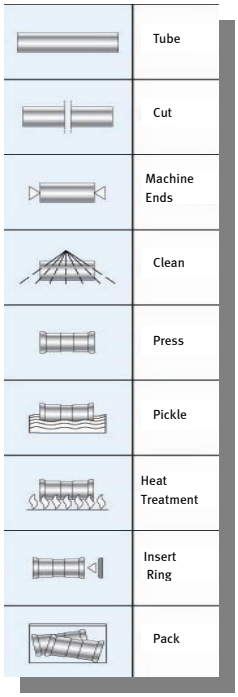
The best way of joining stainless steel pipes in drinking water installations is by mechanical techniques. Complete installation systems based on a radial pressfitting connection have been developed.



Pressfitting Connection (Photo: Mapress)

The pressfitting system allows a quick and easy connection of pipes and fittings with an electromechanical/hydraulic pressing tool for the dimensions OD 12 to 108 mm.

During the fitting production, all welding, pickling and annealing steps are carefully controlled. On site only pipe cutting, pipe and fitting assembling and pressing have to be done. This technique leads to a shortening of assembling time and cost up to 50%.



Fittings and pipes of austenitic stainless steel (grade EN X5CrNiMo 17-2-2/1.4401, ASTM 316) offer corrosion resistance and keep the water quality high so stainless steel pressfitting systems are commonly used in hospitals.

One of the latest developments, a flexible stainless steel pipe with a polypropylene coating, can be bent by hand when branching the water distribution system on each floor.

Flexible stainless steel tube with PP coating (Photo: Mapress Edelflex)

Fitting programme for flexible tubes

Toilet flush

Wash basin

Application examples of flexible tubing