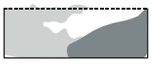
CORROSION **Information**



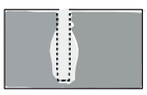
GALVANIC CORROSION:

	Cuivre	Laiton	Acier Cuivré	Acier Inox 304	Acier Inox 316	Acier	Acier Galvanisé	Aluminium	Zinc
Cuivre	🙂	🙂	🙂	🙂	🙂	☹	☹	☹	☹
Laiton	🙂	🙂	🙂	😐	🙂	☹	☹	☹	☹
Acier Cuivré	🙂	🙂	🙂	😐	🙂	☹	☹	☹	☹
Acier Inox 304	😐	😐	😐	🙂	🙂	😐	☹	😐	☹
Acier Inox 316	🙂	🙂	🙂	🙂	🙂	🙂	☹	☹	☹
Acier	☹	☹	☹	😐	🙂	🙂	🙂	🙂	🙂
Acier Galvanisé	☹	☹	☹	😐	😐	🙂	🙂	🙂	🙂
Aluminium	☹	☹	☹	😐	☹	🙂	🙂	🙂	🙂
Zinc	☹	☹	☹	☹	☹	🙂	🙂	🙂	🙂

🙂 Very low corrosion potential 😐 Low corrosion potential ☹ High corrosion potential

THERE ARE SEVERAL DIFFERENT TYPES OF CORROSION:

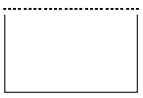
Corrosion by pitting (all stainless steel grades can be affected by this)
Causes (examples of factors that can cause or increase the risk of this type of corrosion):
- extended contact with saline solution if your stainless steel has a low chrome-content (this type of stainless steel is not suitable for this usage as it is not resistant enough for such an aggressive product)
- cleaning product stagnation or permanent presence of chlorides (inadequate rinsing)
- poor quality welding (e.g. too much residual oxygen during the welding process) or welding which has not been stripped/passivated
- iron contamination (e.g. iron particles embedded in the material during its manufacture etc.)
- welding which has not been followed by a decontamination or passivation process



Crevice corrosion (all stainless steel grades can be affected by this)
Causes (examples of factors that can cause or increase the risk of this type of corrosion):
- confined areas (e.g. gaps, areas under gaskets, clamps etc.) which make it harder to carry out passivation processes
- deposit build up (e.g. limescale, dirt etc.) which make it harder to carry out passivation processes

Stress corrosion (only for austenitic stainless steel)
3 trigger factors (when cumulated):
Tensile stresses* in the stainless steel + the presence of chlorides** + temperature >60°C***
*If tensile stresses in the austenitic stainless steel exceed 20% of its yield strength, the risk of stress corrosion is high. If tensile stresses are greater than 50% of its yield strength, the risk is very high or this could even lead to pervasive corrosion etc.
**This can be triggered by tap water (with the presence of 30 to 60ppm chlorides).
***The higher the temperature, the quicker corrosion will take place.

Corrosion by erosion (all stainless steel grades can be affected by this)
Example: the mechanical wear of a pipe's passivation layer due to fluid cavitation etc.



Intergranular corrosion (all stainless steel grades can be affected by this)
This type of corrosion can occur in heat-affected zones (on machine-welded structures). The high heat that is applied to steel during the welding process can modify an alloy's molecular characteristics and, as a consequence, change its properties.

HOW TO PREVENT CORROSION

During the design phase you should: choose your material according to your process's risks (e.g. chlorides, temperature etc.); choose your components' shapes and assembly techniques so that you favour fluid flow, avoid creating retention zones, limit material stresses and confinement zones etc.

During manufacture you should: preserve the material's surface condition (e.g. surface finish, make sure there is no iron contamination etc.); limit stresses; carry out decontamination, stripping and passivation processes; carry out electrolytic polishing etc.

During use you should: limit the period of time that surfaces are in contact with aggressive products; keep surfaces in a good state of cleanliness (but be careful to minimise cleaning time length and the concentration of cleaning products that are applied to the surfaces); make sure you rinse all cleaning products from the surface carefully after cleaning.

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