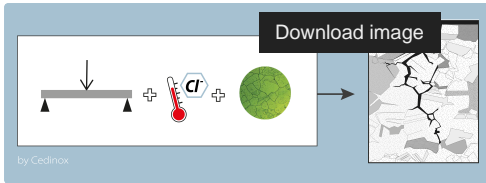


Stress corrosion



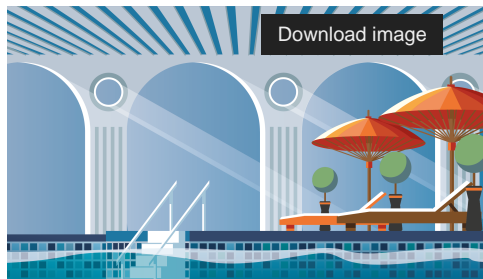
Stress corrosion, or stress corrosion cracking, is a phenomenon that occurs in certain metallic materials, such as stainless steel, when exposed to a corrosive environment, high temperatures and mechanical stresses. This corrosion can result in premature fracture of the material, even in the absence of visible signs of surface

deterioration.

It develops without any previous alarming signs, after an incubation period, and when it becomes visible it is because the material has deep cracks in its interior that go through the grain structure (transgranular progress) or that surround the contour (intergranular progress). Sometimes, both cases occur at the same time.

Also known as stress corrosion, this is a type of localised corrosion that can be avoided if we are aware of the conditions that favour its appearance:

- **Aggressive environments.** In environments with the presence of corrosive agents such as chlorides, acids or alkaline solutions, these agents can concentrate in certain points of the material and promote corrosion.
- **Mechanical stresses.** It can be affected by external stresses, such as movements in the foundations, thermal fluctuations and/or internal stresses such as those generated by plastic deformation work.
- **Temperature.** Plays a fundamental role as it influences on the speed at which the metal can corrode. Generally, it occurs at elevated temperatures.



When these conditions combine, they can generate micro-cracks on the surface of the material, which facilitates the entry of corrosive agents such as oxygen, chlorides or acids. These agents can initiate and propagate corrosion along the grain boundaries or crystalline surfaces of the material, weakening it structurally and increasing the risk of premature fracture.

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