Chloride Stress Corrosion

EPSC Learning Sheet , July 2018

EPSC

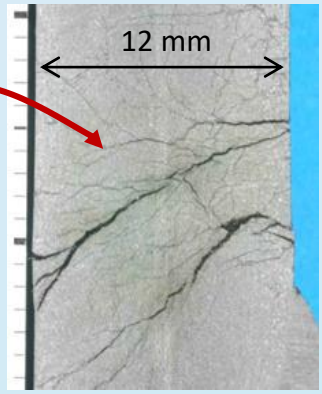
What Happened:

A leak was discovered on a stainless steel pressure vessel, that showed large cracks that started underneath adhesive tape. The cracks grew undetected behind thermal insulation.

Crack in vessel wall (visible with red die)

Corrosion developed under adhesive tape

Cracks through wall



Aspects:

- Chloride Stress Corrosion Cracking occurs as of ca 50 °C on Stainless Steel (like 304 & 316) in the presence of Cl^-
- Adhesive tape was found to be the source of the chlorides: 4% Chlorine was detected in the remains of it
- Local repair can be possible, never easy
- Avoid chlorides on stainless steel
- Be aware that glue (e.g. tape), inks marker pens) and sometimes insulation can contain chlorides

Next crack location?

Avoid corrosion of Stainless Steel by Chlorides, here from an unexpected source