

EFFECTS OF HYDROGEN SULFIDE ON METAL

Hydrogen Sulfide dissolved in water to form a weak acid that can cause some pitting, particularly in the presence of Oxygen and/or Carbon Dioxide. However, the most significant action of H₂S is Sulfide Stress Cracking. Sulfide Stress Cracking is result of metals being subjected to high stress levels in a corrosive environment where H₂S is present. The metal will often fail catastrophically in a brittle manner. Sulfide Stress Cracking steel is dependent upon and determined by:

1. Strength (hardens) of the Steel:
The higher the strength, the greater the susceptibility to Sulfide Stress Cracking. Steels having yielded strengths up to 95,000 psi and hardness up to Rc22 are generally resistant to Sulfide Stress Cracking. These limitations can be extended slightly higher for properly quenched and tempered materials.
2. Total Member Stress (Load):
The higher the stress level (load) the greater the susceptibility to Sulfide Stress Cracking.
3. Corrosive Environment:
Corrosive reactions, acids, bacterial action, thermal degradation of low pH fluid environment.