

## Different Types of Corrosion

- Recognition, Mechanisms & Prevention

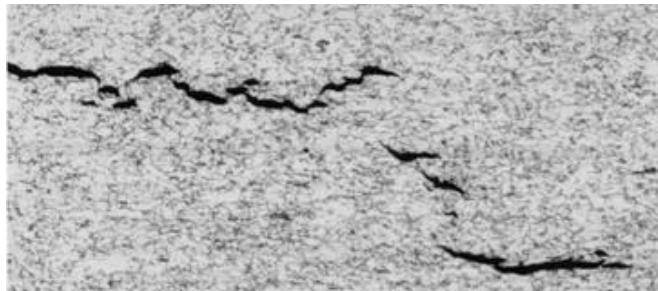
### Hydrogen-Induced Cracking

#### Recognition of Hydrogen-Induced Cracking (HIC)

##### What is hydrogen-induced cracking?

Hydrogen-Induced Cracking (HIC) is the stepwise internal cracks that connect adjacent hydrogen blisters on different planes in the metal, or to the metal surface. It is also known as stepwise cracking.

HIC is especially prevalent in iron alloys because of the restricted slip capabilities in the predominantly body-centered cubic (BCC) structure. HIC is generally limited to steels having a hardness of 22 or greater on the Rockwell C scale.



#### Mechanisms of Hydrogen-Induced Cracking (HIC)

##### What causes hydrogen-induced cracking?

Hydrogen-induced cracking results from atomic hydrogen being absorbed by solid metals. This can occur during elevated-temperature thermal treatments and in service during electroplating, contact with maintenance chemicals, wet H<sub>2</sub>S, corrosion reactions, cathodic protection, and operating in high-pressure hydrogen-containing environments.

#### Prevention of Hydrogen-Induced Cracking (HIC)

**How to prevent hydrogen-induced cracking?** Hydrogen-induced cracking can be prevented through:

- Control of stress level (residual or load) and hardness.
- Avoid the hydrogen source.
- Baking to remove hydrogen.

#### For more details on Hydrogen-Induced Cracking (HIC)

**Where can I learn more about hydrogen-induced cracking?** More details on hydrogen-induced cracking are included in the following corrosion courses which you can take as in-house training courses, course-on-demand, online courses or distance learning courses:

Corrosion and Its Prevention (5-day module)

API 571 Damage Mechanisms Affecting Fixed Equipment in the Refining and Petrochemical Industries (5 days)

Corrosion, Metallurgy, Failure Analysis and Prevention (5 days)

Marine Corrosion, Causes and Prevention (2 days)

Materials Selection and Corrosion (5 days)

Stainless Steels and Alloys: Why They Resist Corrosion and How They Fail (2 days)

If you require corrosion expert witness or corrosion consulting service on hydrogen induced cracking, our NACE certified Corrosion Specialist is able to help. Contact us for a quote.

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