



• Consulting • Training • Expert Witness • Failure Analysis • Design Review • Corrosion Test • Inspection • Coatings • Materials • CP • >>>

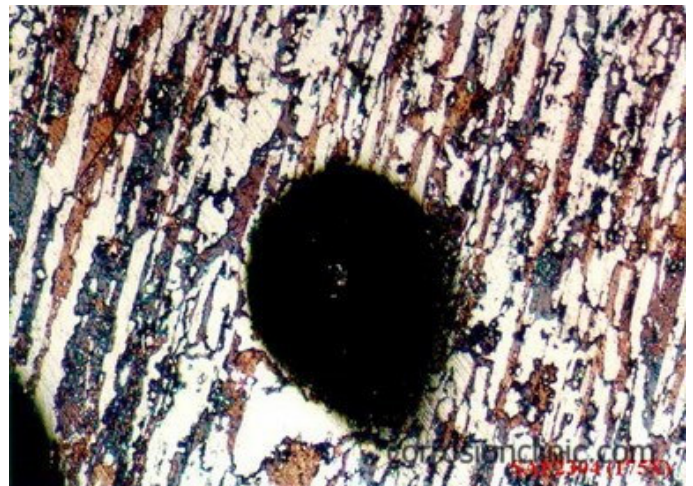
Corrosion Diagnosis & Corrosion Failure Analysis

WebCorr has NACE certified Corrosion Specialist providing corrosion advisory and corrosion consulting services, in-house corrosion training, online and distance learning corrosion courses, corrosion diagnosis, corrosion failure analysis and corrosion expert witness in litigation and



arbitration cases related to corrosion, materials, metallurgy, paints & metallic coatings including thermal spray metallizing, galvanizing, anodizing, chromating, phosphating, electroless plating, electroplating, mechanical plating, and sheradizing or diffusion coating.

- Corrosion consultancy, corrosion failure analysis, and trouble-shooting of materials and corrosion related issues
- Professional corrosion advisory services on corrosion failure avoidance and various corrosion related issues.
- Coatings failure analysis & paints failure analysis
- Verification and measurements of seal quality and seal value of anodized coatings using electrochemical impedance spectroscopy (EIS) and equivalent circuit modeling.
- Verification and assessment of surface preparation standard of coated steel structure for its compliance with contract
- Failure analysis and trouble-shooting of anodizing, chromating, galvanizing, phosphating, electroplating and electroless plating processes and metallic coatings.



- Failure analysis of fasteners, weldments, pipelines, vessels/tanks and various equipment and structures.
- Failure analysis of corrosion resistant alloys (CRA) used in oil and gas, petrochemical, refining, chemical processing, pharmaceutical, and other industries.
- Failure analysis of stainless steels, duplex stainless steels and other corrosion resistant alloys used in architectural applications.
- Expert witness and support in litigation and arbitration matters related to corrosion, materials, metallurgy, paints & metallic coatings including thermal spray metallizing, galvanizing, anodizing, chromating, phosphating, electroplating, electroless plating, mechanical plating, and sheradizing or diffusion coating.

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Typical Services Provided to Clients:

- Corrosion failure analysis of an aircraft engine AOC valve
- Corrosion failure analysis of overhead power cables in a DC rail system
- Corrosion failure analysis of a 316L stainless steel plug and seat valve used in a chemical process plant
- Corrosion expert witness in the corrosion of stainless steel assembly
- Corrosion expert witness in corrosion of stainless cladding in buildings
- Corrosion expert witness in the corrosion of stainless steel chains
- Corrosion expert assistance in the corrosion of hot-rolled and cold-rolled steel plates
- Corrosion expert witness in the corrosion of silver coatings on mirrors
- Corrosion expert witness in the corrosion of steel pipe piles
- Corrosion expert witness in the corrosion of a lamppost

- Expert assistance in electroless plating processes
- Corrosion failure analysis of a galvanized roof in an industrial area
- Paint failure analysis of bus shelters
- Corrosion failure analysis of military vehicles
- Corrosion failure analysis of pinhole leaks in copper tubes in drinking water distribution network
- Corrosion failure analysis of hearing aids

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1. Failure Analysis of Underground Fuel Pipes

Sent: 16 September 2004 18:06

Subject: fuel pipe corrosion

We have 2 pipe sections that are leaked. They are made of API schedule 40 pipes and are of 8.1 mm thickness and 200 mm dia. The inputs we need are as follows:

1. Did corrosion start from inside out or outside in?
2. The probable cause or causes which triggered the corrosion which led to the leak/failure i.e. the nature of the corrosion.
3. The likely period as to the initiation of the corrosion.
4. As for the other part of the section which appears to be in good condition, what would be the estimated remaining shelf life? Basically, we would like to determine whether this is an isolated incident or there is "more" to come.

This is only the first stage of the inputs required. The second stage study would require a non-destruction manner of assessing the overall health state of the piping network. This would need to be discussed further after the first stage is completed.

Thank you and regards

[name removed]

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2. Corrosion Analysis and Diagnosis

Sent: Wednesday, March 30, 2005 6:21 PM

Subject: Corrosion Analysis

We have a case whereby the customer's pipes (Galvanized Steel Pipe, Mild Steel Pipe) have signs of corrosion:

- Galvanized Steel Pipe show white rust (spots),
- Mild Steel Pipe show brown rust (spots),
- Painted (red) mild steel pipe show yellow patches.

All of them are being used (in service) in a chemical storage room. The Galvanized Steel Pipe and unpainted Mild Steel Pipe are air ducts. The painted mild steel pipe is the sprinkler system. These corrosion spots are only observed within the room. The pipes run through another room but no signs of corrosion were observed on the pipe in other rooms. We are suspecting the air containing certain chemicals that are causing the observed corrosion. The owner would like to know what chemicals are causing the corrosion and how should the chemicals be stored upon identifying the source of corrosion. Can we have your advice and recommendations please?

Regards,

[name removed]

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3. Failure Analysis and Life Prediction

Sent: Tuesday, October 12, 2004 11:54 AM

Subject: CORROSION ANALYSIS OF BOLTS

I have the following case which will require your analysis. A tensile test was conducted on the bolt. The sample fractured at the center where the gasket was located instead of at the thread. The bolts were used on manhole of a chemical storage tank. These tanks are fibreglass with PVC lining inside. The Dia/Ht is 8 x 19.8 M. Design density is 1.25. Typical 33.4% HCL density is abt 1.17. Machined bolt A4 SS316 for the manhole covers with neoprene gasket were used. We wanted to know:

1. What caused the fracture of the bolt at the gasket area? (i.e. embrittlement, crevice...)
2. What is the approximate lifespan of the bolt (or maintenance plan) if they were to continue using stainless steel?

3. Any recommendation of a better material for the application?

Regards,

[name removed]

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4. Corrosion Diagnosis

Date: Mon, 21 Aug 2006 03:12:51 -0700 (PDT)

Subject: Icon control panel corrosion

Photos of the corrosion are attached.

The corroded block is Nickle plated mild steel with stainless steel plugs and fittings attached. All tubing and the reservoir are Stainless Steel. The 3,000 psi MWP, pump body is Steel with Stainless Steel bolts and mounting frame.

All paint is supposed to be, two-pak Epoxy with zinc base coat. The Blue paint flaked off very easy indicating poor surface preparation. The white Accumulators appeared to be well painted.

The installation is an Off-Shore drilling rig which may use caustic chemicals. Although this area is not directly exposed to the fluid it may be subject to; splash, spray or wash-down of the drilling fluids.

The unit itself is mounted approximately 20 meters above the Sea with an ambient breeze of about 10 km.

I look forward to your diagnosis and hope to meet you,

Best Regards

[name removed]

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Training Courses Related to Failure Analysis & Prevention:

The following corrosion short courses are relevant to failure analysis and prevention. They can be conducted at any time for you as in-house training courses, online or distance-learning courses. Public courses, seminars and workshops are also conducted regularly. The contents and schedules of public

short courses for the current year is available [here](#).

- Corrosion, Metallurgy, Failure Analysis and Prevention (5 days)
- A Basic Course in Corrosion Control and Prevention (5 days)
- Stainless Steels and Alloys: Why They Resist Corrosion and How They Fail (1 day)
- Life Predication of Corrodible Structures and Components (1 day)
- Preferential Weld Corrosion: Causes and Prevention (3 days)
- Pinhole Leaks in Copper Pipes in Potable Water Distribution System: Causes & Prevention (1 day)
- Protective Coatings: Inspection, Maintenance and Repair (5 days)
- Corrosion Control by Materials Selection and Design (5 days)
- Methods and Materials for Corrosion Control and Prevention (5 days)
- Marine Corrosion, Causes and Prevention (2 days)