NIDAAN™

The Complete Oxygen Scavenger
A Powerful Corrosion Inhibitor

निदान करें हमेशा इस्तेमाल
और
पायें करोज़न् से निरन्तर निदान

Showing corrosion due to oxygen in boiler feed water

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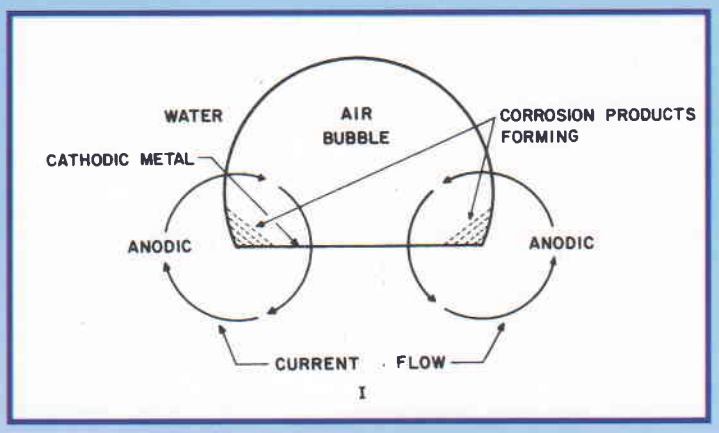
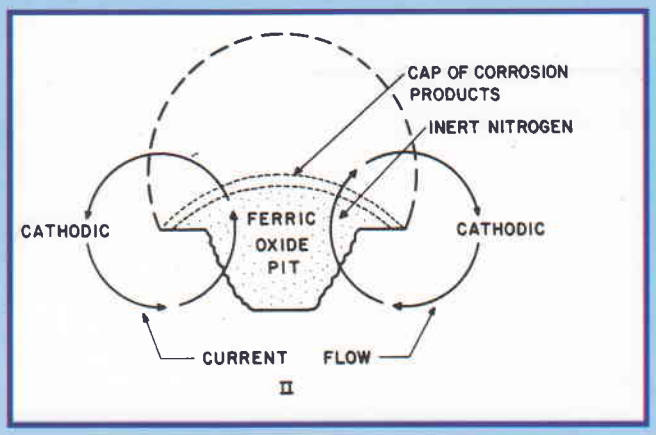
CHEMISTRY OF CORROSION & DISSOLVED OXYGEN

The corrosion is the reversion of a metal to its ore form. When a metal is oxidized corrosion takes place. e.g. iron reverts to iron oxide. Further, the following figures illustrate the reaction of corrosion.





$2\bar{e} + 1/2O_2 + H_2O = 2OH^-$ *(Cathodic)*

$2OH^- + Fe = Fe(OH)_2 + 2\bar{e}$ *(Anodic)*

Dissolved gases like oxygen, carbon dioxide along with electrochemical reaction leads to corrosion of boiler metal. As cold water saturated with air contains 10 ppm dissolved oxygen and its tendency remains to produce pitting.

Carbonic acid corrosion

Oxygen pitting

$Fe + O_2 + H_2O \longrightarrow Fe(OH)_3$ **(Corrosion Product)** .: Oxygen Corrosion

$Fe + CO_2 + H_2O \longrightarrow FeCO_3$ **(Corrosion Product)** : Carbon Dioxide corrosion

$Fe + H_2O \longrightarrow Fe(OH)_3 + H_2$: Electrochemical Attack

(Corrosion Product)

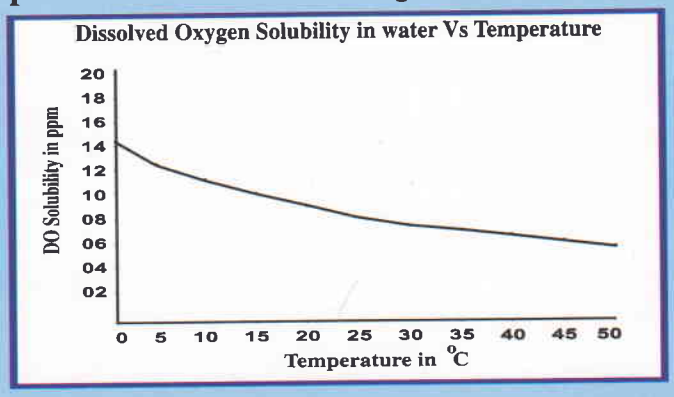
The corrosion attack over a metal results pinpoint penetration of the metal.

WHEN & WHERE CORROSION TAKES PLACE

*** Where levels of oxygen and carbon dioxide are high:** Dissolved oxygen and Carbon dioxide are major causes of corrosion in boilers, condensate return lines and other equipment. Carbon dioxide, dissolved in condensed steam, forms corrosive carbonic acid. If oxygen is present with carbon dioxide the corrosion rate is much higher. Ammonia, in combination with oxygen, also attacks copper alloys.

* **Where total dissolved solids are at very high:** Higher the concentration of total dissolved solids, grater the conductivity and more corrosion.

* **Where low Feed water temperature :** Corrosion rate is higher at lower temperature.



* **Where ph values are low:** If the ph of feed water is tends to acidic corrosion may develop.

$$3Fe + 4H_2O = Fe_3O_4 + 4H_2$$ ***(Reduction of Hydrogen ions)***

$$2H^+ + Fe = Fe^{++} + H_2$$ ***(Acidic Water)***

* **When boiler water alkalinity is too low or too high:** The considerable fluctuations of alkalinity shows the occurrence of corrosion.

* **When boiler metal have High temperatures and stresses:** Boiler metals have high temperature because of improper heat transfer results corrosion in the metal.

PROBLEMS CAUSED BY CORROSION

Corrosion leads to leakage, tube failures and expensive downtime. Corrosion increases maintenance costs, results in premature replacement of tubes, equipment and causes unnecessary safety risks.

NIDAAN DESCRIPTION

NIDAAN range of boiler water treatment chemicals are a combination of polymers and organo-inorganic chemical treatment programms. Oxygen should be removed before the water enters the boiler. The general approach involves removing oxygen mechanically as well as chemically. Deaerators and feed water heaters can reduce, mechanically, oxygen upto a very low level but very small amount of oxygen can cause corrosion. Complete oxygen removal requires chemical treatment. NIDAAN provides pretreatment of make up water to minimize potential carbon dioxide formation in the boiler. The special blend of volatile amines with NIDAAN neutralize carbonic acid formed when carbon dioxide dissolves in condensate. NIDAAN's this volatile filming characteristic develops a barrier between the metal and corrosive condensate. Catalyzed NIDAAN removes last traces of dissolved oxygen from boiler feed water.

DOSAGE AND APPLICATION

About 8 ppm of NIDAAN is required for the removal of 1 ppm of oxygen from boiler feed water. NIDAAN is to be added directly to the feed water at a point after deaeration but before the entrance to the boiler drum. Continuous feeding is always preferred, however intermittent application may suffice in some cases.

AVAILABILITY

NIDAAN is available in various grades for multiple application. Custom made NIDAAN to suit for a specific utility.

EASY TO USE LIQUID

All NIDAAN Oxygen Scavenger chemical formulations are available as easy to use liquids which provide wide flexibility with regards to dosage levels and sufficient room for operational errors.

HANDLING, STORAGE AND PRECAUTIONS

Though NIDAAN is not hazardous chemical it may cause irritation to sensitive parts of skin. In case of contact with sensitive parts of skin, flush with a plenty of clean cold water and seek medical attention. Store in an air tight container and away from direct heat.

TECHNICAL SERVICE

In order to ensure maximum efficiency, our experienced technical staff, after a careful and systematic study of plant and boiler equipment, make recommendations for optimum dosages for operating conditions and requirements.

Authorised dealers