WebCorr
CORROSION CONSULTING
SERVICES

Home | Consulting | Training | Expert Witness | Failure Analysis | Design Review | Corrosion Test | Corrosion Software | Coatings | Materials | CP

The Cost-Effective Software Solutions to Corrosion in Every Industry

Recommended Corrosion Prediction Software and Corrosion Modeling Software for Corrosion Risk Assessment and Corrosion Life Prediction

Why WebCorr | Performance Guarantee | Unparalleled Functionality | Unmatched Usability | Any Device Any OS | Free Training & Support

Corrosion poses a major risk to many industrial facilities and structures such as pipelines, storage tanks, boilers, heat exchangers, and other equipment and systems. To estimate the design life or residual life of an industrial component, corrosion rate data for a given material-environment system must be known. WebCorr's high-value corrosion prediction software and corrosion modeling software can provide essential corrosion rate data to the design team, the operation, inspection, and maintenance personnel, making possible a more realistic estimation of the design life or residual life of a component or asset in various industries. Click the software title below for details and application examples of the most cost-effective software solutions to corrosion in every industry.

Oil and Gas Industry

CO2Compass: Modeling and Prediction of Corrosion by Carbon Dioxide (CO_2), Hydrogen Sulfide (H_2S), Acetic Acid (HAc), Elemental Sulfur (S), and Mercury (Hg) in Oil and Gas Pipelines and Production Tubing.

OCTG-Compass: Corrosion Prediction and CRA Materials Selection Guide for Oil and Gas Production Systems

CP-Compass: Cathodic Protection Design Calculations, Verification, Assessment and Solutions.

CRA-Compass: Corrosion Modeling and Corrosion Prediction for Corrosion Resistant Alloys - the Threshold Temperature and Chloride Concentration for Pitting, Crevice Corrosion, and Stress Corrosion Cracking (SCC).

GC-Compass: Galvanic Corrosion Prediction and Materials Compatibility Assessment

SC-Compass: Stray Current Corrosion and AC Corrosion - Identification, Assessment and Prediction

ACE - Apps for Corrosion Engineers: A Collection of Essential Corrosion Software Applications for Corrosion Engineers,

	Corrosion Researchers, and Corrosion Technicians in Laboratories and in Fields.
Pipeline Industry 	**CO2Compass:** Modeling and Prediction of Corrosion by Carbon Dioxide (CO_2), Hydrogen Sulfide (H_2S), Acetic Acid (HAc), Elemental Sulfur (S), and Mercury (Hg) in Oil and Gas Pipelines and Production Tubing. **PipelineCompass**: Pipeline Corrosion Modeling, Prediction, Assessment and Solutions **CP-Compass**: Cathodic Protection Design Calculations, Verification, Assessment and Solutions **SC-Compass**: Stray Current Corrosion and AC Corrosion - Identification, Assessment and Prediction **CRA-Compass**: Corrosion Modeling and Corrosion Prediction for Corrosion Resistant Alloys - the Threshold Temperature and Chloride Concentration for Pitting, Crevice Corrosion, and Stress Corrosion Cracking (SCC) **CUI-Compass**: Prediction and Risk Assessment of Corrosion Under Insulation and Fireproofing **EVS-Compass:** Extreme Value Statistics in Corrosion Modeling and Corrosion Life Prediction of Structures and Plant Assets
Oil Refining, Petrochemical, Chemical Processing, Pharmaceutical, Pulp & Paper, Energy & Power Industries 	**O2Compass:** Modeling and Prediction of High Temperature Oxidation **CSR-Compass:** Modeling and Remaining Life Prediction of Creep and Stress Rupture of Boiler and Heater Tubes **H2Compass:** Modeling and Prediction of Low Temperature Hydrogen Damages (Hydrogen Blistering, Hydrogen-Induced Cracking, Hydrogen Embrittlement) and High Temperature Hydrogen Attack (HTHA) **S-Compass:** Modeling and Prediction of High Temperature Sulfidation/Sulfidic Corrosion/H2-H2S Corrosion and Low Temperature Elemental Sulfur Corrosion **NAC-Compass:** Modeling and Prediction of High Temperature Naphthenic Acid Corrosion **CCC-Compass:** Modeling and Prediction of Caustic Corrosion and Caustic Stress Corrosion Cracking

	FAC-Compass: Erosion Corrosion and Flow - Accelerated Corrosion Modeling, Life Prediction and Materials Selection in Water-Steam Systems
	CRA-Compass: Corrosion Modeling and Corrosion Prediction for Corrosion Resistant Alloys - the Threshold Temperature and Chloride Concentration for Pitting, Crevice Corrosion, and Stress Corrosion Cracking (SCC)
	CUI-Compass: Prediction and Risk Assessment of Corrosion Under Insulation and Fireproofing
	Dew-Point-Compass: Prediction of Dew Point Temperatures of Flue Gases and the Risk of Dew Point Corrosion
	H2SO4-Compass: Corrosion Prediction and Materials Selection Guide for H2SO4 Services
	GC-Compass: Galvanic Corrosion Prediction and Materials Compatibility Assessment
	CIPAL-Compass: Copper-Induced Pitting in Aluminium Alloys - Modeling, Life Prediction and Process Control
	CP-Compass: Cathodic Protection Design Calculations, Verification, Assessment and Solutions
	SC-Compass: Stray Current Corrosion and AC Corrosion - Identification, Assessment and Prediction
	ACP-Compass: Prediction and Modeling of Atmospheric Corrosion of Metals and Alloys
	VPC-Compass: Prediction and Modeling of Internal Corrosion in Vapor Phase in Closed Systems
	EVS-Compass: Extreme Value Statistics in Corrosion Modeling and Corrosion Life Prediction of Structures and Plant Assets
Marine and Offshore Industry	**ACP-Compass:** Prediction and Modeling of Atmospheric Corrosion of Metals and Alloys
	CRA-Compass: Corrosion Modeling and Corrosion Prediction for Corrosion Resistant Alloys - the Threshold Temperature and Chloride Concentration for Pitting, Crevice Corrosion, and Stress Corrosion Cracking (SCC)

GC-Compass: Galvanic Corrosion Prediction and Materials Compatibility Assessment

CUI-Compass: Prediction and Risk Assessment of Corrosion Under Insulation and Fireproofing

PipelineCompass: Pipeline Corrosion Modeling, Prediction, Assessment and Solutions

CP-Compass: Cathodic Protection Design Calculations, Verification, Assessment and Solutions

EVS-Compass: Extreme Value Statistics in Corrosion Modeling and Corrosion Life Prediction of Structures and Plant Assets

Microelectronics and Semiconductor Manufacturing Industry
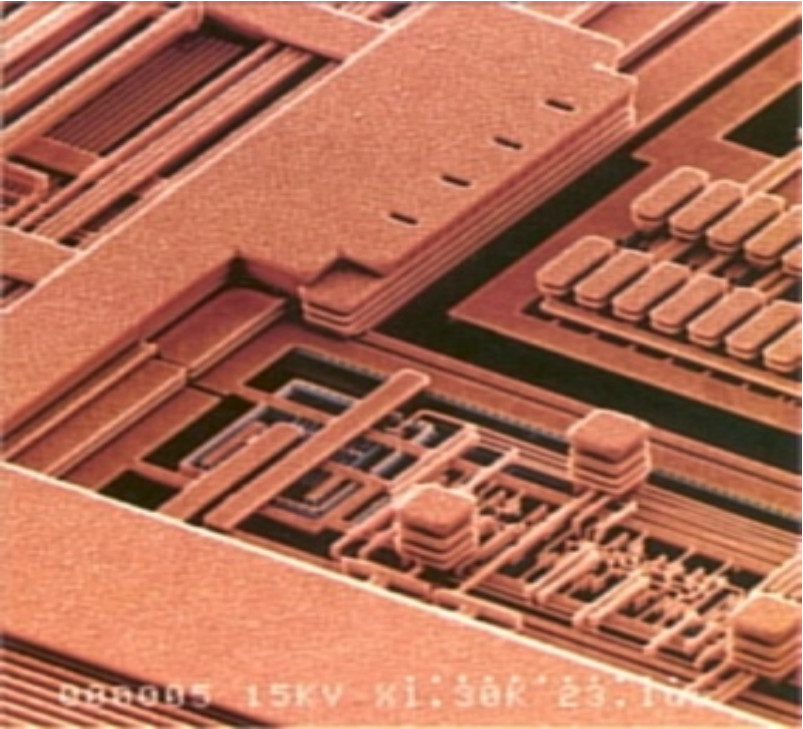
VPC-Compass-SE: Prediction and Modeling of Corrosion in Microelectronic Packages

CIPAL-Compass: Copper-Induced Pitting in Aluminium Alloys - Modeling, Life Prediction and Process Control

GC-Compass: Galvanic Corrosion Prediction and Materials Compatibility Assessment

ACP-Compass: Prediction and Modeling of Atmospheric Corrosion of Metals and Alloys

ACE - Apps for Corrosion Engineers: A Collection of Essential Corrosion Software Applications for Corrosion Engineers, Corrosion Researchers, and Corrosion Technicians in Laboratories and in Fields.

O2Compass: Modeling and Prediction of High Temperature Oxidation

Desalination, Water and Waste Water Industries

PipelineCompass: Pipeline Corrosion Modeling, Prediction, Assessment and Solutions

CRA-Compass: Corrosion Modeling and Corrosion Prediction for Corrosion Resistant Alloys - the Threshold Temperature and Chloride Concentration for Pitting, Crevice Corrosion, and Stress Corrosion Cracking (SCC)

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CP-Compass: Cathodic Protection Design Calculations, Verification, Assessment and

Solutions

CUI-Compass: Prediction and Risk Assessment of Corrosion Under Insulation and Fireproofing

Dew-Point-Compass: Prediction of Dew Point Temperatures of Flue Gases and the Risk of Dew Point Corrosion

ACP-Compass: Prediction and Modeling of Atmospheric Corrosion of Metals and Alloys

CIPAL-Compass: Copper-Induced Pitting in Aluminium Alloys - Modeling, Life Prediction and Process Control

SC-Compass: Stray Current Corrosion and AC Corrosion - Identification, Assessment and Prediction

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Public Transportation Industry

SC-Compass: Stray Current Corrosion and AC Corrosion - Identification, Assessment and Prediction

ACP-Compass: Prediction and Modeling of Atmospheric Corrosion of Metals and Alloys

GC-Compass: Galvanic Corrosion Prediction and Materials Compatibility Assessment

CRA-Compass: Corrosion Modeling and Corrosion Prediction for Corrosion Resistant Alloys - the Threshold Temperature and Chloride Concentration for Pitting, Crevice Corrosion, and Stress Corrosion Cracking (SCC)

CP-Compass: Cathodic Protection Design Calculations, Verification, Assessment and Solutions

EVS-Compass: Extreme Value Statistics in Corrosion Modeling and Corrosion Life Prediction of Structures and Plant Assets

VPC-Compass: Prediction and Modeling of Internal Corrosion in Vapor Phase in Closed Systems

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Automotive and Aerospace Industries

GC-Compass: Galvanic Corrosion Prediction and Materials Compatibility Assessment

CRA-Compass: Corrosion Modeling and Corrosion Prediction for Corrosion Resistant Alloys - the Threshold Temperature and Chloride Concentration for Pitting, Crevice Corrosion, and Stress Corrosion Cracking (SCC)

H2Compass: Modeling and Prediction of Low Temperature Hydrogen Damages (Hydrogen Blistering, Hydrogen-Induced Cracking, Hydrogen Embrittlement) and High Temperature Hydrogen Attack (HTHA)

VPC-Compass: Prediction and Modeling of Internal Corrosion in Vapor Phase in Closed Systems

ACP-Compass: Prediction and Modeling of Atmospheric Corrosion of Metals and Alloys

O2Compass: Modeling and Prediction of High Temperature Oxidation

CSR-Compass: Modeling and Remaining Life Prediction of Creep and Stress Rupture of High Temperature Components

Defense and Military Industry

GC-Compass: Galvanic Corrosion Prediction and Materials Compatibility Assessment

ACP-Compass: Prediction and Modeling of Atmospheric Corrosion of Metals and Alloys

CRA-Compass: Corrosion Modeling and Corrosion Prediction for Corrosion Resistant Alloys - the Threshold Temperature and Chloride Concentration for Pitting, Crevice Corrosion, and Stress Corrosion Cracking (SCC)

CP-Compass: Cathodic Protection Design Calculations, Verification, Assessment and Solutions

PipelineCompass: Pipeline Corrosion Modeling, Prediction, Assessment and Solutions

FAC-Compass: Erosion Corrosion and Flow - Accelerated Corrosion Modeling, Life Prediction and Materials Selection in Water-Steam Systems

VPC-Compass: Prediction and Modeling of Internal Corrosion in Vapor Phase in Closed Systems

Building and Construction Industry

CP-Compass: Cathodic Protection Design Calculations, Verification, Assessment and Solutions

GC-Compass: Galvanic Corrosion Prediction and Materials Compatibility Assessment

CRA-Compass: Corrosion Modeling and Corrosion Prediction for Corrosion Resistant Alloys - the Threshold Temperature and
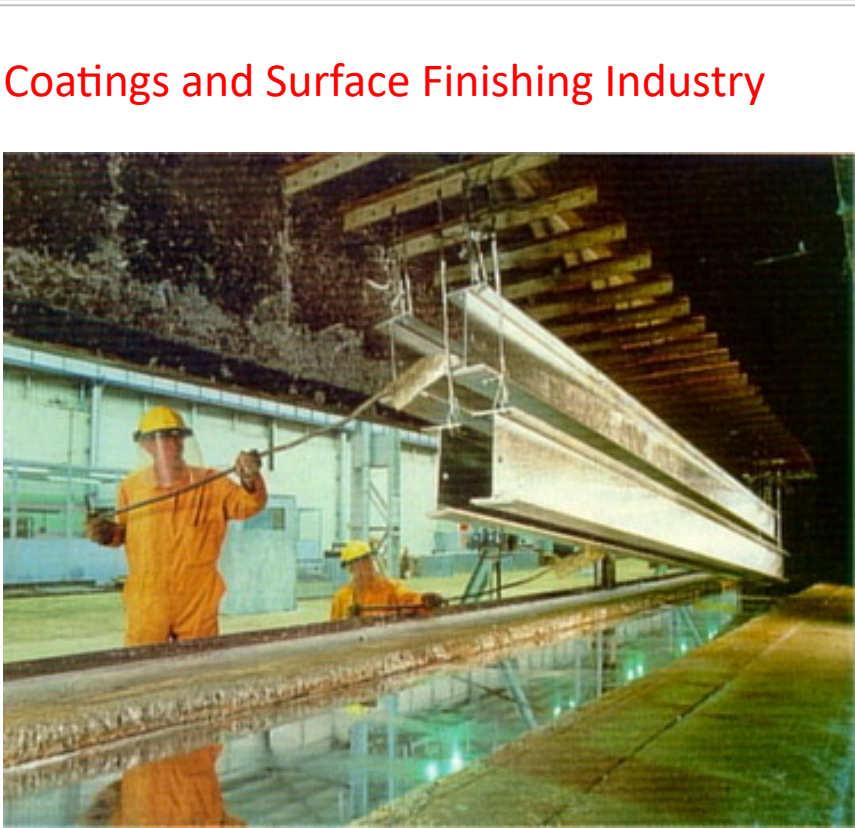
Chloride Concentration for Pitting, Crevice Corrosion, and Stress Corrosion Cracking (SCC)

ACP-Compass: Prediction and Modeling of Atmospheric Corrosion of Metals and Alloys

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Coatings and Surface Finishing Industry

ACP-Compass: Prediction and Modeling of Atmospheric Corrosion of Metals and Alloys

VPC-Compass: Prediction and Modeling of Internal Corrosion in Vapor Phase in Closed Systems

GC-Compass: Galvanic Corrosion Prediction and Materials Compatibility Assessment

CRA-Compass: Corrosion Modeling and Corrosion Prediction for Corrosion Resistant Alloys - the Threshold Temperature and Chloride Concentration for Pitting, Crevice Corrosion, and Stress Corrosion Cracking (SCC)

CP-Compass: Cathodic Protection Design Calculations, Verification, Assessment and Solutions

CUI-Compass: Prediction and Risk Assessment of Corrosion Under Insulation and Fireproofing

EVS-Compass: Extreme Value Statistics in Corrosion Modeling and Corrosion Life Prediction of Structures and Plant Assets

Archaeology, National Heritage, Museums and Arts Industry

CO2Compass-SE: Shipwreck Corrosion Modeling and Corrosion Prediction

ACP-Compass: Prediction and Modeling of Atmospheric Corrosion of Metals and Alloys

GC-Compass: Galvanic Corrosion Prediction and Materials Compatibility Assessment

CRA-Compass: Corrosion Modeling and Corrosion Prediction for Corrosion Resistant Alloys - the Threshold Temperature and Chloride Concentration for Pitting, Crevice Corrosion, and Stress Corrosion Cracking (SCC)

VPC-Compass: Prediction and Modeling of Internal Corrosion in Vapor Phase in Closed Systems

EVS-Compass: Extreme Value Statistics in Corrosion Modeling and Corrosion Life Prediction of Structures and Plant Assets

CP-Compass: Cathodic Protection Design Calculations, Verification, Assessment and Solutions

H2Compass: Modeling and Prediction of Low Temperature Hydrogen Damages (Hydrogen Blistering, Hydrogen-Induced Cracking, Hydrogen Embrittlement) and High Temperature Hydrogen Attack (HTHA)

General Industry

ACP-Compass: Prediction and Modeling of Atmospheric Corrosion of Metals and Alloys

GC-Compass: Galvanic Corrosion Prediction and Materials Compatibility Assessment

CRA-Compass: Corrosion Modeling and Corrosion Prediction for Corrosion Resistant Alloys - the Threshold Temperature and Chloride Concentration for Pitting, Crevice Corrosion, and Stress Corrosion Cracking (SCC)

VPC-Compass: Prediction and Modeling of Internal Corrosion in Vapor Phase in Closed Systems

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Why You Should Consider WebCorr WebCorr Corrosion Consulting Services is in the corrosion consultancy business. Corrosion prediction and corrosion modeling are integral parts of our expertise and strength. Extensive field data from our corrosion consulting work help keep the predictive engines in our corrosion software always accurate, up-to-date, and directly applicable to the various systems, processes and industries. Unlike other corrosion prediction software and corrosion modeling software developed by computer programmers, mechanical engineers, metallurgists or chemists with no or very limited practical corrosion experience, WebCorr's corrosion prediction software and corrosion modeling software were developed by NACE certified Corrosion Specialists with both BEng and PhD degrees in corrosion, and decades of practical corrosion experience. The WebCorr team knows corrosion from inside out. We are confident that the accuracy of prediction by WebCorr's corrosion prediction software and corrosion modeling software is simply unmatched by any other corrosion prediction and corrosion modeling software on the market. Do not take our word for it - show us proof of your current ownership of any commercial corrosion prediction or corrosion modeling software and we will give you a license for the full version of WebCorr's CorrCompass software suite completely free for up to 3 months. Validate your existing corrosion modeling software and WebCorr's CorrCompass using the recommended validation matrix such as CO2 corrosion model validation matrix and see for yourself the striking performance difference.

Performance Guarantee WebCorr is the only corrosion software developer that offers performance guarantee. If at any time during the licensing period, the corrosion rates predicted by WebCorr's corrosion prediction software and corrosion modeling software are not closer to the measured values than the values predicted by any other corrosion prediction and corrosion modeling software on the market, we will refund

the pro-rated licensing fee to you. It is that simple. No other corrosion prediction software and corrosion modeling software developer offers you this performance guarantee.

Unparalleled Functionality WebCorr's corrosion prediction software and corrosion modeling software utilize machine learning and cloud computing to optimize the predictive engines such that all contributing factors to the corrosion process are accurately processed. The prediction and modeling results are validated against field data and lab data. Take CO2 corrosion modeling as an example, traditional CO2 corrosion modeling software is limited in their capability to the prediction of the corrosion rate only, without due consideration to the CO2 corrosion control strategy under the prevailing operating conditions of a pipeline or production tubing. WebCorr's CO2Compass, the next generation of CO2 corrosion modeling software goes far beyond the prediction of the corrosion rate, it utilizes machine learning and cloud computing to optimize a particular CO2 corrosion control strategy with specific and quantitative control targets under the prevailing operating conditions of a pipeline or production tubing. Significant cost savings can be realized for asset owners at both the design and operation phases of pipelines. CO2Compass is not just for CO2 corrosion rate prediction, it also provides users with expert guidance on practical solutions for mitigating CO2 corrosion. Based on the predicted corrosion rate, the prevailing operating conditions, the flow regimes, and the water analysis results, CO2Compass makes an overall assessment of the complete system and generates recommendations for CO2 corrosion mitigation strategies. Click here to read more on CO2Compass, the next generation of CO2 corrosion prediction and CO2 corrosion modeling software.

Unmatched Usability WebCorr' CorrCompass suites of corrosion software are designed with end users in mind. Experience the industry's first cross-platform and device-independent corrosion modeling and corrosion prediction applications on your iPads, tablets, smart phones, notebooks and desktops, at any time and anywhere, in the office or in the field. No installation files to download, no browser plug-ins required, no USB dongles to carry around, and no license keys to transfer from one PC to another. **WebCorr's Compass series of software simply works on any device running any OS**. All you need is an internet browser. You can run WebCorr's Compass series of corrosion software simultaneously on all your mobile devices and desktop computers and see for yourself what you have missed with your current corrosion prediction software. The predictive engines in the Compass software perform calculations in the cloud, with real-time display of prediction results and graphical charts. Unlike the black-box style of other corrosion modeling software, WebCorr's Compass series of corrosion software gives the user complete and direct control over the modeling of the effects of all parameters contributing to corrosion. Take CO2 corrosion modeling as an example, CO2Compass gives the user complete and direct control over the modeling of the effects of scaling, oil wetting, glycol, CO2 fugacity, in-situ pH, liquid velocity, organic acids, and H2S with user-controlled ON/OFF switches, and direct inputs overriding the default settings. No other CO2 corrosion modeling software gives you all of these controls. Automatically generated and dynamically updated graphs are plotted in real-time as the user makes adjustments to the input parameters. These plots include corrosion rate profile, effect of temperature, effect of velocity, and effect of pH on the predicted CO2 corrosion rates. Saturation indices of carbonates and sulphate scales are also plotted. A clean and concise report is automatically generated and dynamically updated in real-time as you enter or change the input parameters.

Click here to read more on CO2Compass, the next generation of CO2 corrosion prediction and CO2 corrosion modeling software.

Any Device Any OS WebCorr's Compass series of corrosion software simply works on any device running any OS. All you need is an internet browser. You can run the corrosion prediction and corrosion modeling software simultaneously on your iPads, tablets, smart phones, notebooks and desktops, at any time and anywhere, in the office or in the field. There are no installation files to download and install, no browser plugins required, no USB dongles to carry around, and no license keys to transfer from one PC to another. Just login with your username and password, enter your data and print out the report. It is that simple.

Free Training and Technical Support Your initial 1-year license comes with free training in our Singapore office for 2 persons from your company. Fees for additional persons or on-site training at your company will be quoted on request.

Unlike other corrosion prediction software developer who charges maintenance support fees, WebCorr Corrosion Consulting Services provides free technical support to our customers. Our Compass series of software utilizes cloud computing and every time when you login to the software portal, you are using the most up-to-date version. There is no need for end users to download or apply any update.

WebCorr provides comprehensive corrosion consulting, corrosion training and corrosion expert witness services across the globe. If required, WebCorr can carry out the corrosion modeling, corrosion prediction, corrosion simulation, review and validation of reports/designs/calculations for your company, at a fee to be quoted on request.

WebCorr has provided the following corrosion prediction and corrosion modeling services for our clients:

- CO2 Corrosion prediction and CO2 corrosion modeling in oil and gas pipelines and production tubing.
- H2S Corrosion prediction and H2S corrosion modeling in oil and gas pipelines and production tubing.
- Corrosion prediction and corrosion modeling of **bottom of line corrosion** (BOL or BLC) in multiphase flow pipelines.
- Corrosion prediction and corrosion modeling of top of line corrosion (TOL or TLC) in multiphase flow pipelines.
- Corrosion prediction and corrosion modeling of internal pitting corrosion in pipelines.
- Corrosion prediction and corrosion modeling of external pitting corrosion of buried pipelines.
- Corrosion prediction and corrosion modeling of the effects of chemical treatment and corrosion inhibitors on the corrosion rate of specific alloys.
- Corrosion prediction and corrosion modeling of corrosion in chemical process and pharmaceutical industries
- Corrosion prediction and corrosion modeling of the effects of process pressure, velocity (flow rate) and temperature (PVT) on the corrosion rate of steels and alloys.
- Independent 3rd party verification/validation of modeled/predicted corrosion growth rates. At WebCorr, our NACE certified Corrosion Specialist will validate your modeled/predicted corrosion growth rates using properly selected models, laboratory test results and field data in the literature. Our

verification/validation report will come complete with all supporting data and reference documents. If necessary, we can train your engineers on CO2 corrosion modeling. Click the link below to see details on our 5-day training course on CO2 corrosion modeling:

CO2 Corrosion Modeling for the Prediction of Internal Corrosion in Oil Gas Pipelines and Production Tubing.

- CO2 Corrosion Model Validation Matrix and CO2 Corrosion Model Validation Index Score (CO2MoVIS).

In the case illustrated below, corrosion modeling is the only solution to establish the safe operation limits (temperature, concentrations of impurities) for the tanks carrying phosphoric acid.

Sent: Wednesday, March 17, 2010 1:47 PM

To: WebCorr Corrosion Consulting Services Singapore

Subject: Consultancy Services - Carriage of Phosphoric Acid in Stainless Steel Ship Tanks

We are a ship-owner with a fleet of stainless steel ocean-going tankers.

Our ships carry Phosphoric Acid cargo from time to time. We would like to know whether a particular grade of Phosphoric Acid is suitable for our stainless steel tankers. We are not able to provide the phosphoric acid sample to you. However we can provide the specifications of phosphoric acid to you. For example:

P_2O_5 49.0 - 51.0

Sp. Gr   1.65 - 1.67

Fe_2O_3 min 0.65 pct

Al_2O_3 min 0.8 pct

MgO   0.45 - 0.55

CaO   0.15 - 0.25

K_2O 0.06 - 0.08

Na_2O 0.7 - 0.95

SO_4 max 4.0 pct

F   max 0.8 pct

Cl   max 200 ppm

Solids   max 1.0 pct

Temp max 45 deg C

Total voyage time about 12-15 days.

Question – can this grade of Phosphoric Acid be carried on our ship cargo tanks made of 316L 2.1% Mo and of 316L 2.7% Mo?

If it cannot be carried because of certain parameters out of limits, please advise the max limits allowed and if the temp is too high, what the max temp allowed?