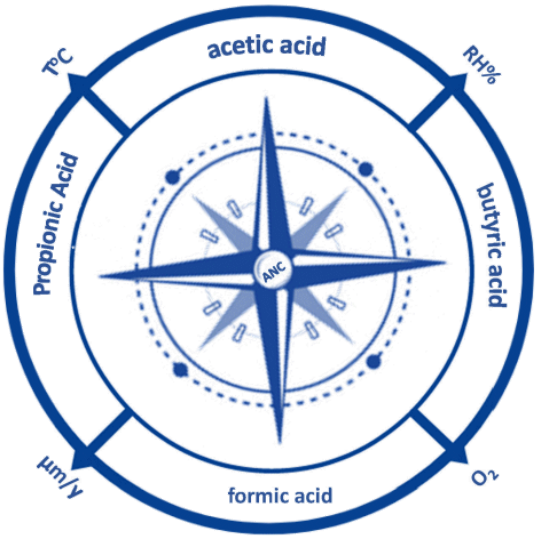

Corrosion Modeling Software and Corrosion Prediction Software Series

ANC-Compass®: Modeling and Life Prediction of Ant Nest Corrosion (Formicary Corrosion) in Copper Tubes

The Effective Software Solutions to Ant Nest Corrosion

Version 12.4

★ **Performance** ★ **Functionality** ★ **Usability**

Anytime Anywhere Any Device Any OS

No USB dongles No installation No Browser Plug-ins

Contact Us for Licensing Details

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

Overview and Application Examples of ANC-Compass Software for Predictive Modeling of Ant Nest Corrosion

Ant nest corrosion, also known as formicary corrosion, refers to the rapid failure of copper tubes due to micro-pitting (tunneling) under the conjoint action of oxygen (air), moisture and a weak organic acid. Statistics shows that approximately 10% of all premature failures of copper tubes used in the heating, ventilation and air-conditioning (HVAC) industry is the direct result of ant-nest corrosion on a worldwide scale. Copper tubes used in other applications, including heat pumps,

dehumidifiers, air coolers, heat exchangers, freezers, and chiller units, are also susceptible to ant nest corrosion or formicary corrosion.

ANC-Compass is the only device and OS independent software tool on the market for the modeling and prediction of ant nest corrosion (formicary corrosion) in copper tubes. Designers, OEM engineers, consultants, operation personnel, maintenance and inspection engineers can quickly and accurately determine: (1) the corrosion rate of copper tubes under the prevailing operating condition; (2) the effects of moisture, oxygen, and temperature on the corrosion rate; and (3) the life expectancy of copper tubes under the prevailing operating conditions. ANC-Compass is a cloud-based software that works on any device running any OS without the need for users to install or download anything.

Figure 1 below shows the user interface of ANC-Compass. Using ANC-Compass is as easy as 1-2-3.

(1) Enter the design data

(2) Enter the service environment data

(3) Review the prediction results

ANC-Compass® Modeling and Prediction of Ant Nest Corrosion in Copper Tubes Version 12.4.8

Tube Location ID	Condenser XYZ-Tube#123	
Tube Outside Diameter	mm	7.000
Wall Thickness	mm	0.250
Design Life	years	30.000
Relative Humidity	%RH	100
Temperature	°C	33.00
O2 Concentration in Air/Vapor	Measured, %mole	20.946

ANC Prediction Results		
Predicted ANC Corrosion Rate	µm/y	37
Predicted Tube Life	years	6.677

The design life is not met. ANC mitigation is required.

Concentrations of Carboxylic Acids in Air or Vapor Space		
Acetic Acid	µg/m^3	50,000
Formic Acid	µg/m^3	1,000
Butyric Acid	µg/m^3	1,000
Propionic Acid	µg/m^3	500
Other Organic Acids	µg/m^3	500

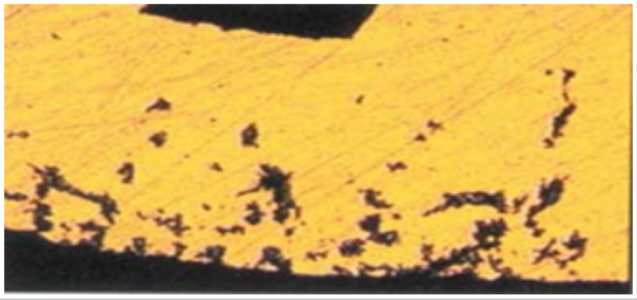

Figure 1 ANC-Compass models and predicts ant nest corrosion (formicary corrosion) in copper tubes.

Under the prevailing operating conditions shown in Figure 1 above, the predicted corrosion rate is 37 um/y, and the predicted tube life is 6.677 years. Figure 2 shows that ANC-Compass also models the effect of oxygen on ant nest corrosion. Users have the option to enter the measured oxygen concentration if the exposure environment is not ambient atmosphere. Figure 3 shows the effect of relative humidity (90%RH in Fig.3 vs. 100%RH in Fig.1) and temperature (18^{o}C in Fig.3 vs. 33^{o}C in Fig.1) on the ant nest corrosion rate.

ANC-Compass® Modeling and Prediction of Ant Nest Corrosion in Copper Tubes Version 12.4.8

Tube Location ID	Condenser XYZ-Tube#123		Concentrations of Carboxylic Acids in Air or Vapor Space		
Tube Outside Diameter	mm	7.000	Acetic Acid	µg/m^3	50,000
Wall Thickness	mm	0.250	Formic Acid	µg/m^3	1,000
Design Life	years	30.000	Butyric Acid	µg/m^3	1,000
Relative Humidity	%RH	100	Propionic Acid	µg/m^3	500
Temperature	°C	33.00	Other Organic Acids	µg/m^3	500
O2 Concentration in Air/Vapor	Atmospheric				
ANC Prec	Atmospheric / Measured, %mole				
Predicted ANC Corrosion Rate	µm/y	37			
Predicted Tube Life	years	6.677			

The design life is not met. ANC mitigation is required.

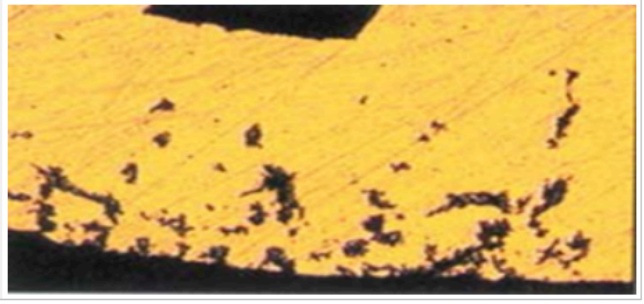

Figure 2 ANC-Compass models the effect of oxygen on ant nest corrosion.

ANC-Compass® Modeling and Prediction of Ant Nest Corrosion in Copper Tubes Version 12.4.8

Tube Location ID	Condenser XYZ-Tube#123		Concentrations of Carboxylic Acids in Air or Vapor Space		
Tube Outside Diameter	mm	7.000	Acetic Acid	µg/m^3	10,000
Wall Thickness	mm	0.250	Formic Acid	µg/m^3	5,000
Design Life	years	30.000	Butyric Acid	µg/m^3	400
Relative Humidity	%RH	90	Propionic Acid	µg/m^3	300
Temperature	°C	18.00	Other Organic Acids	µg/m^3	100
O2 Concentration in Air/Vapor	Atmospheric				
ANC Prediction Results					
Predicted ANC Corrosion Rate	µm/y	6			
Predicted Tube Life	years	43.605			

The predicted tube life meets the design life.

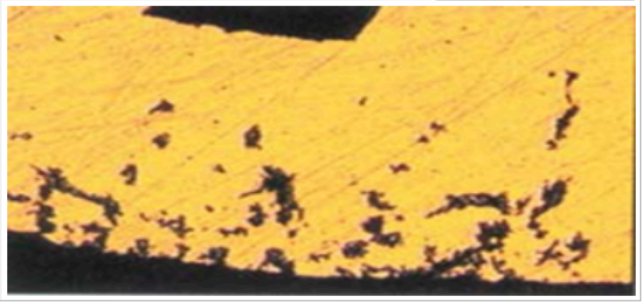

Figure 3 ANC-Compass models the effect of relative humidity and temperature on ant nest corrosion.

The powerful applications of ANC-Compass are truly unlimited in engineering design, materials selection, process operation, inspection and maintenance, modeling and prediction of ant nest corrosion in copper tubes.

Click here to contact us for licensing details and experience the power of ANC-Compass.

ANC-Compass, giving you the right directions in the Modeling and Prediction of Ant Nest Corrosion (Formicary Corrosion).