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

## **Overview of Seawater-Compass**

Seawater-Compass models and predicts the corrosion rate and remaining service life for metals and alloys used in seawater services. Seawater-Compass is the only device and OS independent software tool on the market for the modeling and life prediction of seawater corrosion of metals and alloys including carbon steels, aluminum alloys, brass, copper-nickel alloys, nickel alloys, stainless steels, duplex stainless steels, and titanium alloys. Designers, OEM engineers, consultants, operation personnel, maintenance and inspection engineers can quickly and accurately determine: (1) the seawater corrosion rate of the selected metal or alloy; (2) the remaining life of the equipment or component; (3) the major forms of corrosion expected in seawater services, (4) the cautious notes on (a) the high risk of stress corrosion cracking (SCC) when the temperature exceeds the threshold; (b) the risk of erosion corrosion and cavitation when the seawater velocity is high; (c) the risk of pitting, crevice corrosion, and microbiologically-influenced corrosion (MIC) when the velocity is too low.

Figure 1 below shows an overview of Seawater-Compass. Users simply select one of the 50 metals and alloys from the list (Figure 2). Seawater-Compass models the effects of seawater temperature, seawater salinity, dissolved oxygen concentration, and seawater velocity on the seawater corrosion and predicts the corrosion rate and the remaining life of equipment or component under the prevailing operating conditions.

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Figure 1 Overview of the Seawater-Compass for Predictive Modeling of Seawater Corrosion of Metals and Alloys

Seawater-Compass is a cloud-based software that works on any device running any OS without the need for users to install or download anything. Experience the industry's first cross-platform and device-independent seawater corrosion modeling and prediction app 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. Seawater-Compass simply works on any device running any OS. All you need is an internet browser.

In the application example in Figure 1 above, the predicted corrosion rate of carbon steel in seawater of salinity of 35‰ is 0.296 mm/y at the operating temperature of 45°C and seawater velocity of 1.5 m/s. Seawater-Compass predicts that the major forms of corrosion expected is general attack and pitting under the prevailing operating conditions.



Figure 2 Seawater-Compass: A Predictive Corrosion Software Tool for Materials Selection for Seawater Services

Using Seawater-Compass is as easy as 1-2-3.

(1) Select the material from the dropdown list and enter the design data (Figures 1 & 2)

(2) Enter the seawater data

(3) Review the prediction results

Seawater-Compass has the following materials in the selection list. If you cannot find the material of your interest, contact us and we will conduct the necessary tests and add that material to the selection list, free of charge for licensed users.

- AA1100 AA2024 AA2050 AA2060 AA2195 AA2219 AA5083 AA6061 AA7050 AA7075 **Carbon Steel** AISI 1020 HY-80 Steel AISI 4130 AISI 4340 Type 304 Type 316 AL6-XN 13-8PH 17-4PH 904L Inconel 625 Hastelloy C Hastelloy C-276 Duplex 2205
- Duplex 2304

Duplex 2507

Duplex 2707 HD

Brass

Bronze

Monel 400

Naval Brass

Admiralty Brass

Nickel-Aluminium-Bronze

Cu70Ni30 (C71500)

Cu90Ni10 (C70600)

## SMO254

Ti6Al4V

Ti-CP-TA2

Aluminium

- Cadmium
- Copper
- Lead

Magnesium

Nickel

Silver

Tin

Titanium

Zinc

Type 316 🗸		1.000								
mm	3.000	0.900-								
°C	40.00	0.800								
%	35.00	0.700								
measured, ppm 🗸	6.000	0.600								
m/s	0.100	0.500-								
Prediction Results										
μA/cm <sup>2</sup>	1.40 <mark>9</mark>	0.300-								
mm/y	0.015	0.200-								
years	>100	0.100-								
oitting, crevice, SCC, MIC		0.000	2.0	4.0	6.0	8.0	10.0	12.0	14.0	16.0
	Type 316 mm °C %₀ measured, ppm ✓ m/s Prediction Results µA/cm <sup>2</sup> mm/y years pitting, crevice, SCC, MIC	Type 316          mm       3.000         °C       40.00         %0       35.00         measured, ppm       6.000         m/s       0.100         Prediction Results       μA/cm <sup>2</sup> μA/cm <sup>2</sup> 1.409         mm/y       0.015         years       >100	Type 316       I.000         mm       3.000       0.900         °C       40.00       0.800 $\%$ 35.00       0.700         measured, ppm       6.000       0.600         m/s       0.100       0.500         Prediction Results       0.400 $\mu$ A/cm <sup>2</sup> 1.409       0.300         years       >100       0.200         witting, crevice, SCC, MIC       0.000       0.000	Type 316          mm       3.000       0.900         °C       40.00       0.800         %°       35.00       0.700         measured, ppm       6.000       0.600         m/s       0.100       0.500         prediction Results       0.400         μA/cm <sup>2</sup> 1.409       0.300         years       >100       0.200         witting, crevice, SCC, MIC       0.000       2.0	Type 316       I.000         mm       3.000 $0.900$ °C       40.00 $0.800$ $\%_0$ 35.00 $0.700$ measured, ppm       6.000 $0.600$ m/s $0.100$ $0.500$ $\mu$ A/cm <sup>2</sup> $1.409$ $0.300$ mm/y $0.015$ $0.100$ wars       >100 $0.200$ witting, crevice, SCC, MIC $0.000$ $2.0$ $4.0$	Type 316     Imm       mm     3.000       °C     40.00       %°     35.00       %°     35.00       measured, ppm     6.000       m/s     0.100       0.600     0.500       0.400     0.500       0.400     0.300       mm/y     0.015       years     >100       ottting, crevice, SCC, MIC     0.000	Type 316          mm       3.000       0.900         °C       40.00       0.800         %o       35.00       0.700         measured, ppm       6.000       0.600         m/s       0.100       0.500         prediction Results       0.400         μA/cm²       1.409       0.300         years       >100       0.200         otitting, crevice, SCC, MIC       0.000       2.0       4.0       6.0       8.0	Type 316          mm       3.000         °C       40.00         %°       35.00         %°       35.00         measured, ppm       6.000         ms/s       0.100         0.400         0.400         0.500         0.400         0.500         mm/y       0.015         years       >100         0.100       2.0       4.0       6.0         8.000       0.100       0.000       0.200         0.100       0.200       0.100       0.100	Type 316       Imm         mm       3.000         °C       40.00 $\%$ 35.00 $\%$ 35.00         measured, ppm       6.000         m/s       0.100         0.600       0.500         0.500       0.500         0.400       0.500         0.400       0.300         0.400       0.300         0.400       0.300         0.400       0.300         0.400       0.100         0.400       0.100         0.400       0.100         0.100       0.200         0.100       0.200         0.100       0.000         0.200       0.100         0.100       0.000         0.100       0.100         0.100       0.000         0.000       2'0       4'0       6'0         0.100       0.000       2'0       4'0       6'0	Type 316       Imm         mm       3.000         °C       40.00         %       35.00         %       35.00         0.700       0.800         %       35.00         measured, ppm       6.000         m/s       0.100         0.500       0.500         prediction Results       0.400         μA/cm <sup>2</sup> 1.409         wmm/y       0.015         years       >100         0.100       2'0         4'0       6'0         8'0       10.0         0.100       12.0

Figure 3 Seawater-Compass predicts the risk of pitting and microbiologically-influenced corrosion (MIC) under low flow or stagnant condition.

In Figure 3 above, the seawater velocity is low, at 0.1 m/s. Seawater-Compass predicts the risk of pitting and MIC with a cautious note for

the user. In Figure 4 below, the seawater temperature is high at 60°C, Seawater-Compass predicts the risk of chloride stress corrosion

cracking (SCC) for type 316 stainless steel. In Figure 5, Seawater-Compass predicts the risk of hydrogen embrittlement for titanium in

seawater services.



Figure 4 Seawater-Compass predicts the risk of stress corrosion cracking (SCC) of austenitic stainless steels in seawater services.

Material	Titanium 🗸		1.000								
Remaining Thickness	mm	3.000	0.900								
Seawater Temperature	°C	25.00	0.800								
Seawater Salinity	‰	35.00	0.700								
Dissolved Oxygen	measured, ppm 🖌	6.000	0.600								
Seawater Velocity	m/s	3.000	0.500								
Prediction Results			0.400-								
Predicted Corrosion Current	μA/cm <sup>2</sup>	0.044	0.300								
Predicted Corrosion Rate	mm/y	0.001	0.200-								
Predicted Remaining Service Life	years	>100	0.100-								
lajor Forms of Corrosion Expected: pitting, hydrogen embrittlement		0.000	2.0	4.0	6.0	8.0	10.0	12.0	14.0	16.0	

Figure 5 Seawater-Compass predicts the risk of hydrogen embrittlement (HE) of Titanium in seawater services.

The powerful applications of Seawater-Compass are truly unlimited in engineering design, materials selection, process operation, inspection and maintenance, corrosion risk assessment, setting the IOW limits, corrosion modeling and remaining life prediction.

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

Seawater-Compass, giving you the right directions in Seawater Corrosion Modeling and Prediction.

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