

Corrosion Modeling Software and Corrosion Prediction Software

CUI-Compass®: A Software Tool for the Prediction and Assessment of Corrosion Under Insulation and Fireproofing

Version 9.20

☆ Performance ☆ Functionality ☆ Usability



Anytime Anywhere Any Device Any OS

No USB dongles No installation No Browser Plug-ins

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

Overview and Application Examples of CUI-Compass

CUI-Compass is the only device and OS independent software tool on the market for the prediction and assessment of corrosion under insulation and fireproofing (CUI and CUF). Designers, engineers, architects, consultants, maintenance and inspection personnel can quickly assess and quantify the CUI and CUF likelihood ratings and risk rankings of their components or systems, anytime, anywhere, on any device running any OS without the need to install or download anything. CUI-Compass also predicts external chloride stress corrosion cracking, or ECSCC, and the temperature and chloride application limits for stainless steels and alloys.

CUI-Compass has 3 modules under the CUI, ECSCC, and CUF tabs. The CUI module is for the prediction and assessment of corrosion under insulation for carbon and low alloy steels, austenitic and duplex stainless steels. The ECSCC module is for the prediction and assessment of external chloride stress corrosion cracking (ECSCC), maximum pit depth, the temperature limit, and the chloride concentration limit for stainless steels and alloys. The CUF module is for the the prediction and assessment of corrosion under fireproofing.

Figures below show the screen shots of CUI-Compass.

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

	Carbon and Low Alloy Steels	Austenitic and Duplex Stainless Steels
Temperature	100°F to 170°F or 230°F to 270°F	120°F to 140°F (47°C to 60°C)
System Age (years)	15.00	15.00
Coating/Age	Quality coating within 8 years	Quality coating within 8 years
Jacketing/Insulation Condition	Damaged condition with several deficiencies	No deficiencies
Heat Tracing	Steam system with medium integrity	Steam system with medium integrity
External Environment	No sweating	No sweating
Insulation Type	Insulating coating	Insulating coating
Line Size or Nozzle Size	>2 in. to 6 in.	>2 in. to 6 in.
API 583 CUI Likelihood Rating	C	B
CUI Risk Ranking	Medium Risk	Low Risk
Corrosion Rate at System Age (mm/y)	0.073	0.004
Corrosion Depth at System Age (mm)	0.354	0.076

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Figure 1 CUI-Compass Predicts the CUI Likelihood Rating and CUI Risk Ranking.

Prediction and Assessment of Corrosion Under Insulation for Carbon and Low Alloy Steels, Austenitic and Duplex Stainless Steels

CUI-Compass models the effects of the following 7 parameters on the likelihood and risk of corrosion under insulation for carbon and low alloy steels, austenitic and duplex stainless steels:

- (1) Temperature
- (2) Coating condition and age
- (3) Jacketing and insulation condition
- (4) Heat tracing
- (5) External environment
- (6) Insulation type
- (7) Line size or nozzle size

Users of CUI-Compass simply select the parameters from the dropdown list. CUI-Compass makes an overall assessment of the contributing factors to corrosion under insulation and computes the CUI likelihood rating and CUI risk ranking in compliance with the latest edition of API RP 583. The CUI likelihood rating and the CUI risk ranking can be used in Risk-Based Inspection (RBI) assessment (API 580, API 581) and Fitness-For-Service Assessments (API 579-1 / ASME FFS-1).

CUI-Compass can also be used for materials evaluation and selection. Figure 1 shows the CUI performance difference between carbon/low alloy steels and austenitic/duplex stainless steels under similar conditions.

Prediction and Assessment of External Chloride Stress Corrosion Cracking (ECSCC)

Under the ECSCC tab, CUI-Compass models the effects of temperature and chloride concentration on the probability of external chloride stress corrosion cracking (ECSCC) and resistance to localized corrosion such as pitting and crevice corrosion. The outputs from CUI-Compass includes the following (Figure 2):

- (1) The pitting index (PREN) of selected alloy in accordance with ISO 15156
- (2) The maximum temperature for resistance to localized corrosion such as pitting corrosion and crevice corrosion (when the user input is chloride concentration)
- (3) The maximum chloride concentration (when the user input is temperature)
- (4) The predicted open circuit potential of the selected alloy

- (5) The critical pitting potential of the selected alloy
- (6) The repassivation potential of the selected alloy
- (7) The probability of chloride stress corrosion cracking when the maximum temperature is exceeded.
- (8) The maximum pit depth
- (9) The rust rating number based on JIS G0595

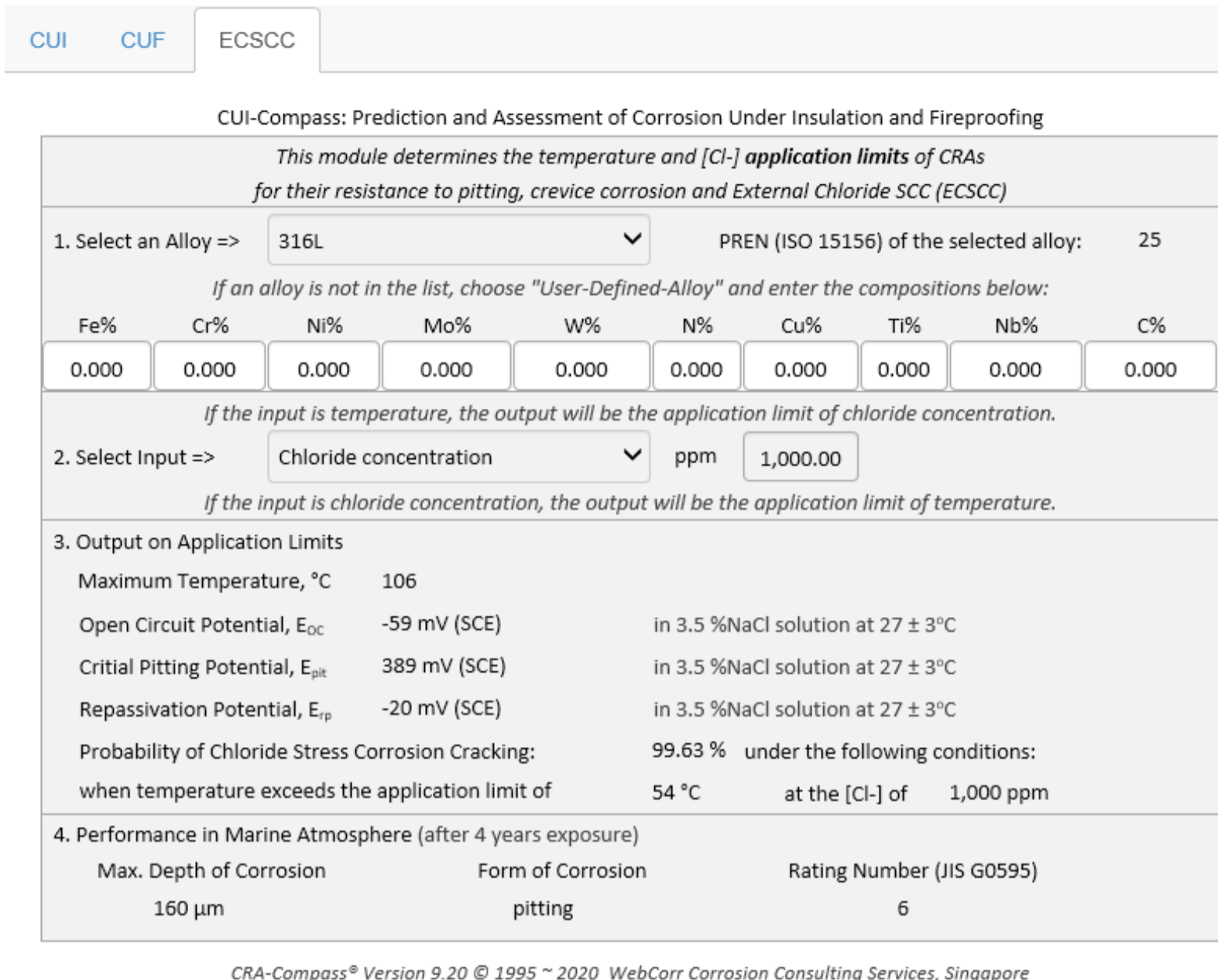


Figure 2 CUI-Compass Predicts External Chloride Stress Corrosion Cracking (ECSCC), Temperature and Chloride Application Limits.

Prediction and Assessment of Corrosion Under Fireproofing (CUF)

The CUF module is for the prediction and assessment of corrosion under fireproofing. CUI-Compass models the effects of the following 6 parameters on the likelihood and risk of corrosion under fireproofing (CUF):

- (1) Temperature
- (2) Coating condition and age
- (3) Fireproofing condition
- (4) Potential for water ingress
- (5) External environment
- (6) Materials type

Users of CUI-Compass simply select the parameters from the dropdown list (Figure 3). CUI-Compass makes an overall assessment of the contributing factors to corrosion under fireproofing (CUF) and computes the CUF likelihood rating and CUF risk ranking in compliance with the latest edition of API RP 583. The CUF

likelihood rating and the CUF risk ranking can be used in Risk-Based Inspection (RBI) assessment (API 580, API 581) and Fitness-For-Service Assessments (API 579-1 / ASME FFS-1).

CUI	CUF	ECSCC
CUF Assessment		
Operating Temperature	140°F to 250°F (60°C to 121°C)	▼
Coating/Age	General coating 8 to 15 years	▼
Fireproofing Condition	Average condition with cracking evident	▼
Potential for Water Ingress	Design allows for water ingress/travel from above	▼
External Environment	Coastal and marine, cooling tower overspray, or	▼
Material Type	Intumescent coating, silica aerogel, flexible blanket	▼
API 583 CUF Likelihood Rating	E	
CUF Risk Ranking	Very High Risk	

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Figure 3 CUI-Compass Predicts the CUF Likelihood Rating and CUF Risk Ranking.

The powerful applications of CUI-Compass are truly unlimited in engineering design, CUI-CUF prediction and risk assessment, materials selection, RBI inspection and RBI assessment, trouble-shooting process-related issues and failure analysis of components and systems.

[Click here to contact us for a free trial and experience the power of CUI-Compass in CUI-CUF prediction and risk assessment.](#)

CUI-Compass, giving you the right directions in CUI-CUF Prediction and Risk Assessment