

Corrosion Modeling Software and Corrosion Prediction Software Series

HCL-Compass®: HCl Corrosion Modeling and Prediction

High-Value Software Solutions to Costly Corrosion

Version 9.23

★ **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 of HCL-Compass Corrosion Prediction Software

HCL-Compass is the only device and OS independent predictive software on the market for the modeling and prediction of corrosion by aqueous hydrochloric acid and dry HCl gas. Designers, engineers, consultants, maintenance and inspection personnel can quickly assess and quantify the impact of process variables on the corrosion rate and the remaining life of piping, vessels, and other equipment handling hydrochloric acid in aqueous or gaseous phases.

Figures below demonstrate the operation of HCl-Compass. With HCl-Compass, corrosion prediction and materials selection for hydrochloric acid services are as easy as 1-2-3.

- (1) Select the material from the dropdown list,
- (2) Enter the temperature and the concentration of hydrochloric acid (or the pH, or the chloride concentration)
- (3) Review the prediction results

HCl-Compass predicts the specific gravity, the freezing point, and the boiling point of the hydrochloric acid (HCl), the corrosion rate of the selected alloy at the specified temperature and concentration or pH, and the remaining life of the component. In addition to that, HCl-Compass also plots the isocorrosion diagram for the selected alloy so as to give users a complete picture of the corrosion behavior of the selected alloy across the entire ranges of the HCl acid concentration and the service temperature.

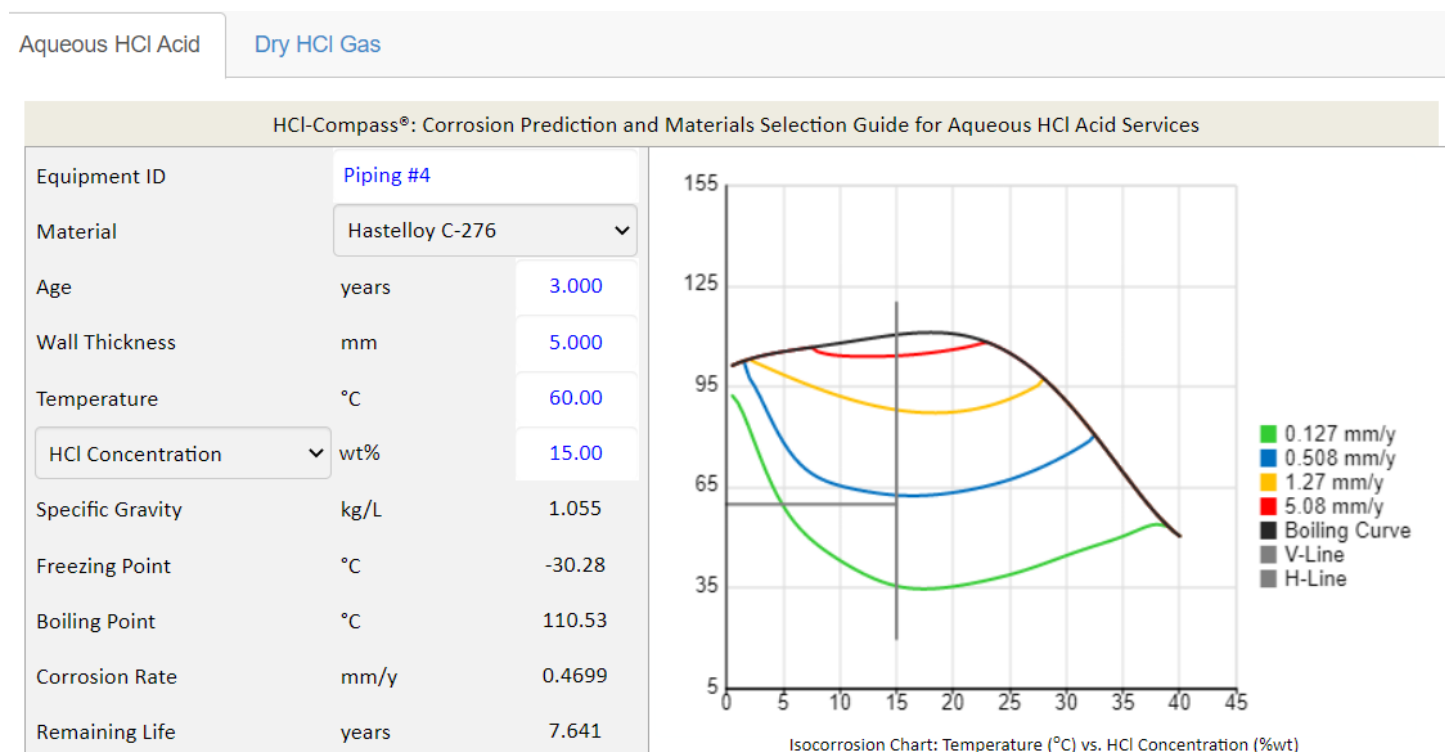


Figure 1 HCl-Compass Predicts the Corrosion Rate of Alloys in Hydrochloric Acid Corrosion Services

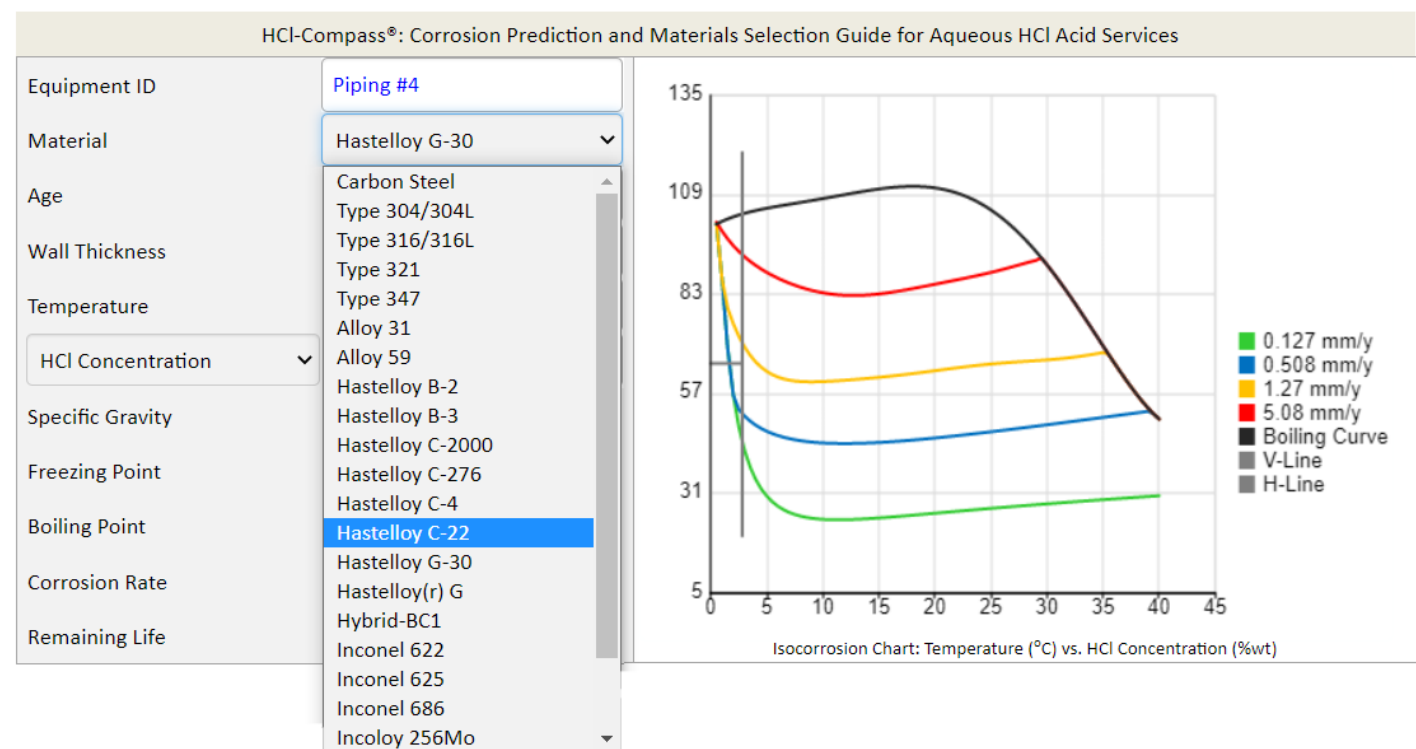


Figure 2 HCl-Compass Predicts HCl Corrosion and Simplifies Materials Selection for Hydrochloric Acid Services

The following corrosion resistant alloys for aqueous HCl services are included in HCl-Compass software:

Carbon Steel

Type 304/304L

Type 316/316L

Type 321

Type 347

Alloy 31

Alloy 59

Hastelloy B-2

Hastelloy B-3

Hastelloy C-2000

Hastelloy C-276

Hastelloy C-4

Hastelloy C-22

Hastelloy G-30

Hastelloy(r) G

Hybrid-BC1

Inconel 622

Inconel 625

Inconel 686

Incoloy 256Mo

Incoloy 825

Monel 400

Zirconium

For equipment and piping systems directly handling hydrochloric acid, users can use the acid concentration (wt%) as input parameter to predict the HCl corrosion rate (Figure 3). For dilute HCl condensate as is the case in HCl transmission tubing in plants manufacturing microchips and semiconductors and in crude distillation, hydrotreating, and catalytic reforming units in oil refineries where HCl forms by the hydrolysis of magnesium and calcium chloride salts and results in dilute HCl in the overhead system, users can choose to use *pH* or *chloride concentration* (in ppmw) as the input parameter to predict the HCl corrosion rate (Figures 4-5).

HCl-Compass®: Corrosion Prediction and Materials Selection Guide for HCl Services

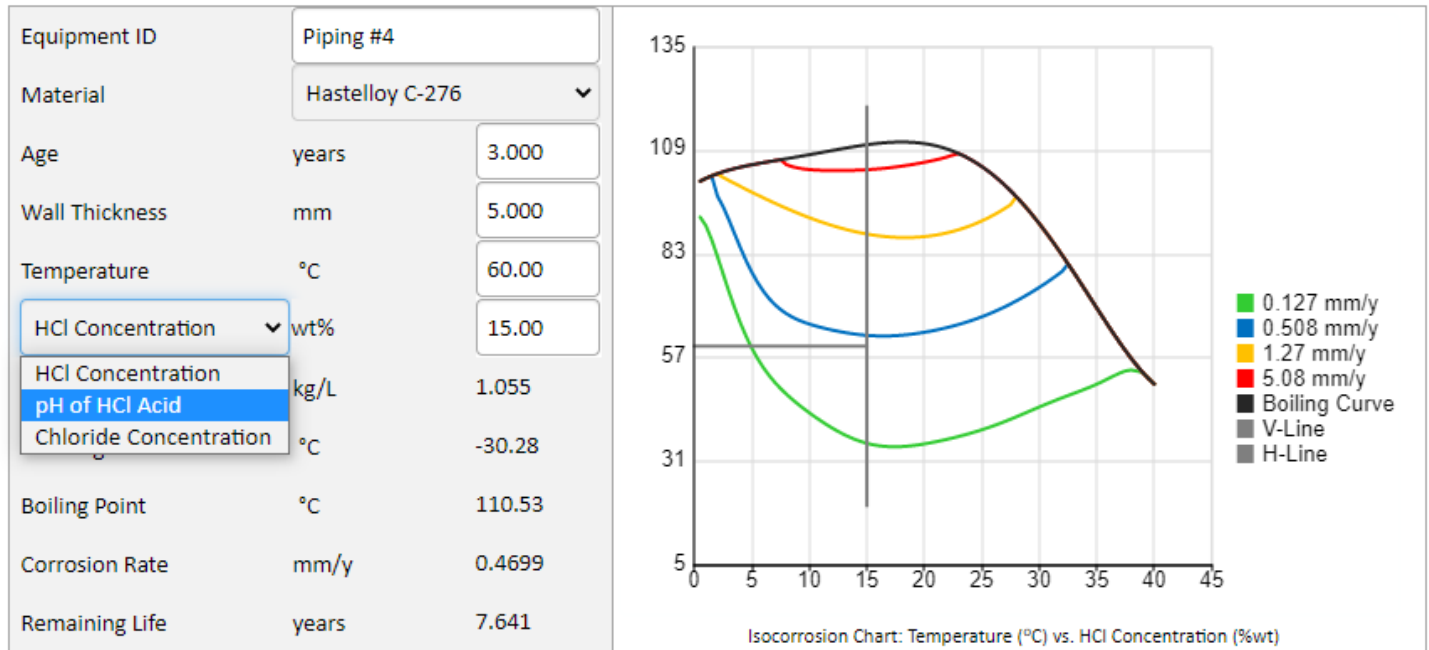


Figure 3 HCl-Compass Predicts and Models the Effects of HCl Concentration, or pH, or Chloride Concentration on the Corrosion Rate

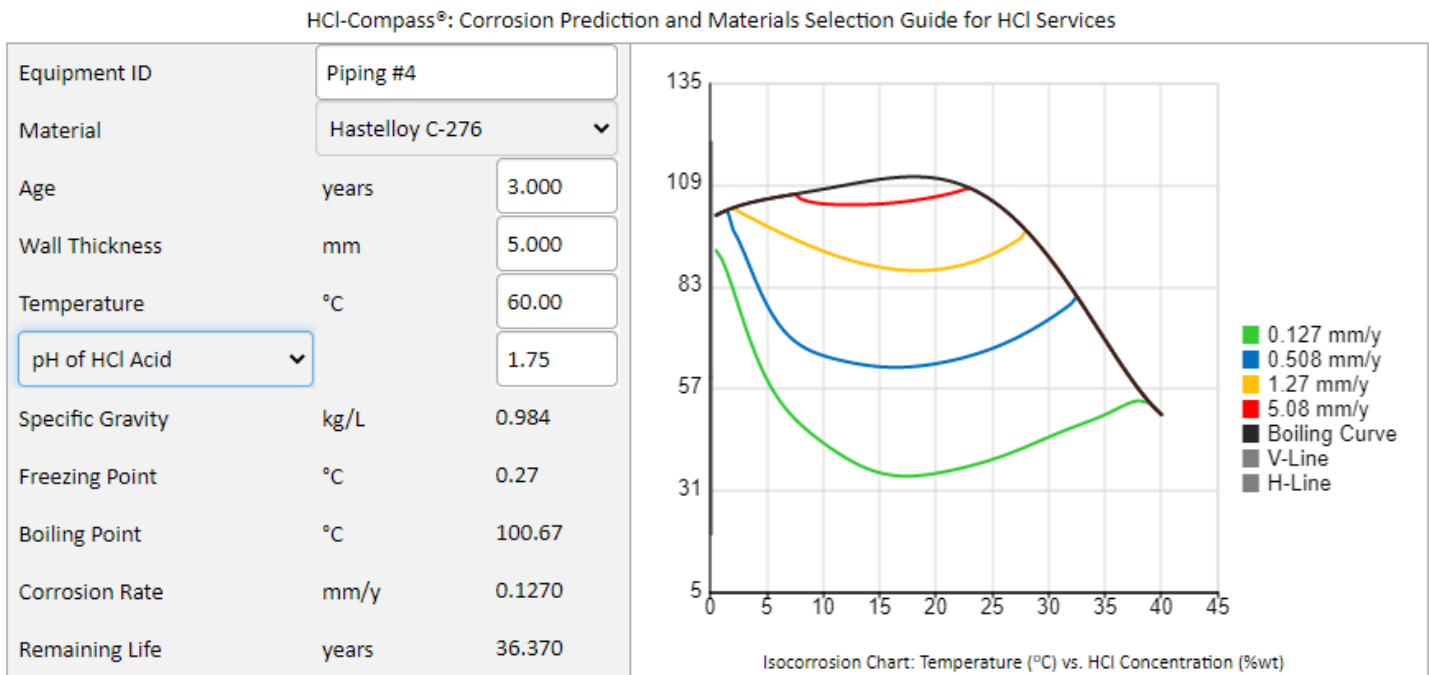


Figure 4 HCl-Compass Predicts and Models the Effects of pH on HCl Corrosion

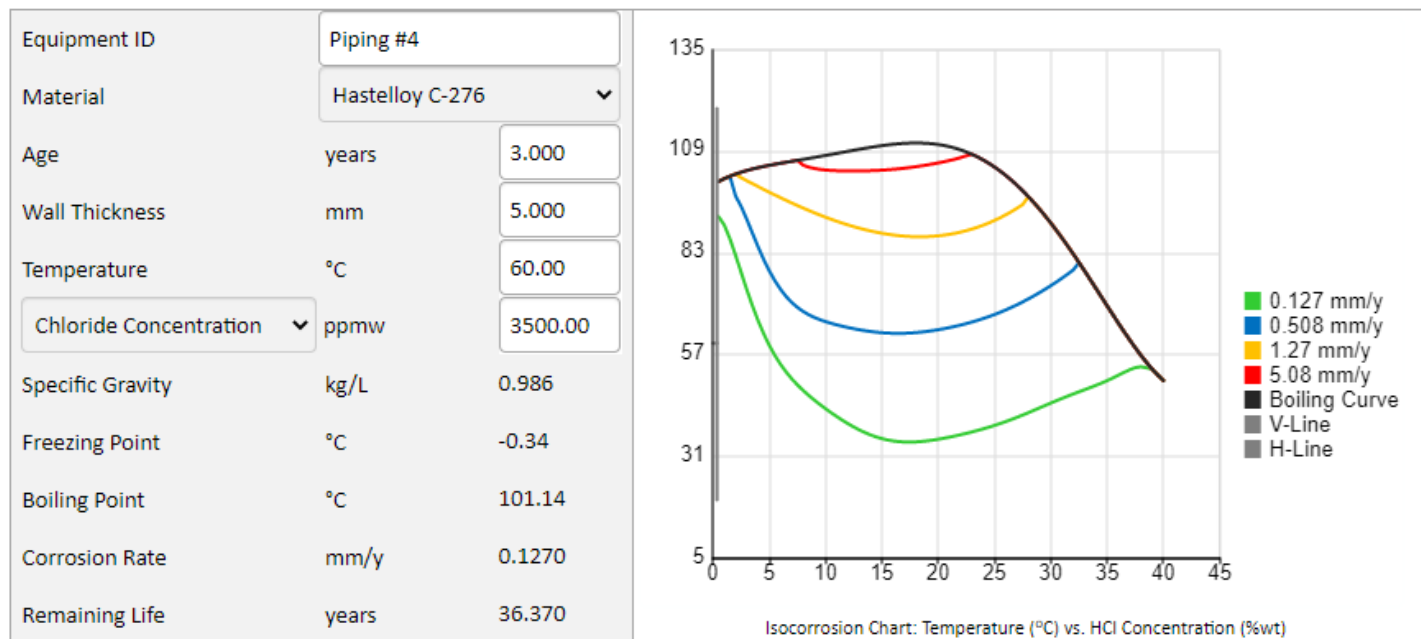


Figure 5 HCl-Compass Predicts and Models the Effects of Chloride Concentration on HCl Corrosion

HCl-Compass also predicts corrosion by dry hydrochloric acid gas at high temperature (Figures 6-7). The software provides a cost-effective solution to selection of materials for piping, vessels, and other equipment handling dry hydrochloric acid gas.

Aqueous HCl Acid

Dry HCl Gas

HCl-Compass® for Dry HCl Gas Services

Equipment ID	Piping #4	
Material	Cast Iron ▼	
Recommended Upper Temperature Limit, °C	200	
Age	years	3.000
Wall Thickness	mm	2.000
Temperature	°C	300.00
Corrosion Rate	mm/y	0.19229
Remaining Life	years	7.401

Figure 6 HCl-Compass Predicts and Models the Corrosion by Dry HCl Gas

Aqueous HCl Acid

Dry HCl Gas

HCl-Compass® for Dry HCl Gas Services

Equipment ID	Piping #4
Material	Cast Iron
Recommended Upper	<div> <div>AISI 304 SS</div> <div>AISI 316 SS</div> <div>AISI 310-Cb SS</div> <div>Alloy 400 (UNS N04400)</div> <div>Alloy 600 (UNS N06600)</div> <div>Alloy B (UNS N10001)</div> <div>Alloy C (UNS N10002)</div> <div>Carbon Steel</div> <div>Cast Iron</div> <div>Copper (UNS C11000)</div> <div>Gold</div> <div>Nickel 201</div> <div>Ni-Resist (type 1)</div> <div>Platinum</div> <div>Silver</div> </div>
Age	
Wall Thickness	
Temperature	
Corrosion Rate	
Remaining Life	

Figure 7 HCl-Compass Provides Software Solutions to Material Selection for Dry HCl Gas Services

The following corrosion resistant alloys for dry hydrochloric acid services are included in the corrosion prediction software:

- AISI 304 SS
- AISI 316 SS
- AISI 310-Cb SS
- Alloy 400 (UNS N04400)
- Alloy 600 (UNS N06600)
- Alloy B (UNS N10001)
- Alloy C (UNS N10002)
- Alloy C-22 (UNS N06022)

Carbon Steel

Cast Iron

Copper (UNS C11000)

Gold

Nickel 201

Ni-Resist (type 1)

Platinum

The powerful applications of HCl-Compass are truly unlimited in engineering design, remaining life prediction, and materials selection for HCl services.

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HCl-Compass, giving you the right directions in HCl corrosion prediction and materials selection.

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