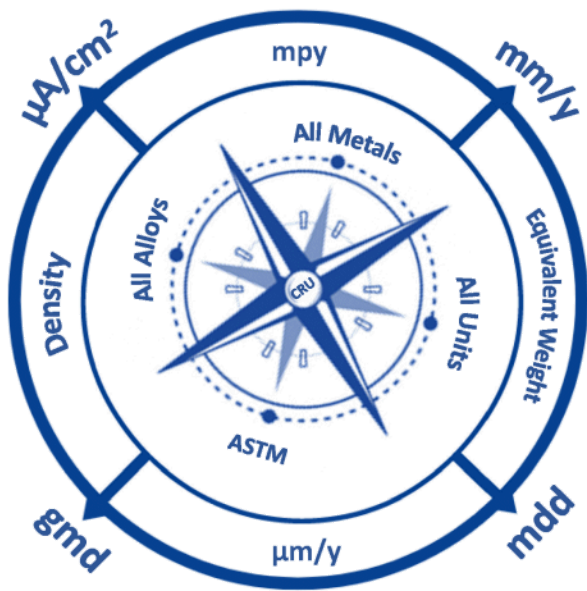


WebCorr Corrosion Rate Units Converter

- Converting between All Corrosion Rate Units for All Metals and Alloys



Version 9.22

★ 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

Features and Functions of Corrosion Rate Units Converter

Corrosion rate units commonly reported in the corrosion literature include:

- micro-ampere per cm²: $\mu\text{A}/\text{cm}^2$,
- milli-inch per year: mpy,
- micrometer per year: $\mu\text{m}/\text{y}$,
- millimeter per year: mm/y,
- gram per m² per day: gmd,
- milligram per dm² per day: mdd

Converting the corrosion rate from one unit to another for comparison and for engineering applications is frequently required for numerous metals and alloys. For a given alloy, the conversion

factors are different for each unit ($\mu\text{A}/\text{cm}^2$, mpy, $\mu\text{m}/\text{y}$, mm/y , mdd, gmd); for a given unit conversion (e.g. mdd \Rightarrow mpy), the conversion factors are different for different alloys which are influenced by the density, chemical compositions, atomic mass of elements, and the valence of metallic elements in the alloy. Manual conversion requires multiple steps of calculation using a set of equations. The procedure is time-consuming and prone to errors, particularly for many engineering alloys that contain multiple metallic elements in their chemical compositions. Try to manually convert a corrosion current density of $1 \mu\text{A}/\text{cm}^2$ to mm/y for the titanium alloy Ti-3Al-8V-6Cr-4Mo-4Zr and see for yourself how long it takes you to get an accurate conversion.

WebCorr Corrosion Rate Units Converter is the only device and OS independent software tool on the market for instantly converting between all corrosion rate units for all metals and alloys with precision. Users simply choose the metal or alloy from the list and the conversion between all corrosion rate units for the selected alloy is instantly displayed (Figure 1). If a metal or alloy is not available in the database, users can easily define their own alloys for the conversion (Figure 2).

WebCorr Corrosion Rate Unit Converter										
<i>CorrRateUnitConverter converts between all corrosion rate units for all metals and alloys.</i> $\mu\text{A}/\text{cm}^2$: micro-ampere per cm^2 mpy: milli-inch per year $\mu\text{m}/\text{y}$: micrometer per year mm/y : millimeter per year gmd: gram per m^2 per day mdd: milligram per dm^2 per day		From	$\mu\text{A}/\text{cm}^2$	To	mpy	$\mu\text{m}/\text{y}$	mm/y	gmd	mdd	
			1.0000	=	0.5454	13.8541	0.0139	0.1828	1.8285	
		From	mdd	To	mpy	$\mu\text{m}/\text{y}$	mm/y	gmd	$\mu\text{A}/\text{cm}^2$	
			1.0000	=	0.2983	7.5768	0.0076	0.1000	0.5469	
		From	gmd	To	mpy	$\mu\text{m}/\text{y}$	mm/y	$\mu\text{A}/\text{cm}^2$	mdd	
	1.0000	=	2.9830	75.7676	0.0758	5.4690	10.0000			
Select the alloy: <input type="text" value="Ti-3Al-8V-6Cr-4Mo-4Zr"/>		From	mpy	To	$\mu\text{A}/\text{cm}^2$	$\mu\text{m}/\text{y}$	mm/y	gmd	mdd	
OR define your own below:			1.0000	=	1.8334	25.4000	0.0254	0.3352	3.3524	
User-defined alloy	Use default density, g/cm^3	M1 ~ M10: metallic elements in the user-defined alloy								
Metallic elements	Fe	Cr	Ni	Mo	M5	M6	M7	M8	M9	M10
Weight%	71.5000	18.0000	8.0000	2.5000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Figure 1 Overview of Corrosion Rate Units Converter

WebCorr Corrosion Rate Unit Converter

<i>CorrRateUnitConverter converts between all corrosion rate units for all metals and alloys.</i> $\mu\text{A}/\text{cm}^2$: micro-ampere per cm^2 mpy: milli-inch per year $\mu\text{m}/\text{y}$: micrometer per year mm/y: millimeter per year gmd: gram per m^2 per day mdd: milligram per dm^2 per day			From	$\mu\text{A}/\text{cm}^2$	To	mpy	$\mu\text{m}/\text{y}$	mm/y	gmd	mdd
				1.0000	=	0.4134	10.5002	0.0105	0.2267	2.2670
			From	mdd	To	mpy	$\mu\text{m}/\text{y}$	mm/y	gmd	$\mu\text{A}/\text{cm}^2$
				1.0000	=	0.1824	4.6317	0.0046	0.1000	0.4411
Select the alloy: <input type="text" value="User-Defined"/>			From	gmd	To	mpy	$\mu\text{m}/\text{y}$	mm/y	$\mu\text{A}/\text{cm}^2$	mdd
				1.0000	=	1.8235	46.3172	0.0463	4.4111	10.0000
OR define your own below:			From	$\mu\text{m}/\text{y}$	To	mpy	$\mu\text{A}/\text{cm}^2$	mm/y	gmd	mdd
				1.0000	=	0.0394	0.0952	0.0010	0.0216	0.2159
User-defined alloy	Use default density, g/cm^3		M1 ~ M10: metallic elements in the user-defined alloy							
Metallic elements	Fe	Cr	Ni	Mo	M5	M6	M7	M8	M9	M10
Weight%	71.5000	18.0000	8.0000	2.5000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Figure 2 User-Defined Alloy in Corrosion Rate Units Converter

WebCorr Corrosion Rate Units Converter provides error-free conversion conforming to relevant ISO, ASTM and NACE standards. Current database in WebCorr Corrosion Rate Units Converter contains the following metals and alloys:

Aluminum and Aluminium Alloys

Aluminum

- AA1100 (A91100)
- AA1199 (A91199)
- AA2024 (A92024)
- AA2060 (A92060)
- AA2219 (A92219)
- AA3003 (A93003)
- AA3004 (A93004)
- AA5005 (A95005)
- AA5050 (A95050)
- AA5052 (A95052)
- AA5083 (A95083)
- AA5086 (A95086)
- AA5154 (A95154)
- AA5357 (A95357)
- AA5454 (A95454)
- AA5456 (A95456)
- AA6061 (A96061)

AA6062 (A96062)

AA6070 (A96070)

AA6101 (A96101)

AA7050 (A97050)

AA7072 (A97072)

AA7075 (A97075)

AA7079 (A97079)

AA7178 (A97178)

Copper and Copper Alloys

Copper

CDA110 (C11000)

CDA220 (C22000)

CDA230 (C23000)

CDA260 (C26000)

CDA280 (C28000)

CDA442 (C44200)

CDA443 (C44300)

CDA444 (C44400)

CDA510 (C51000)

CDA524 (C52400)

CDA608 (C60800)

CDA612 (C61200)

CDA655 (C65500)

CDA687 (C68700)

CDA706 (C70600)

CDA710 (C71000)

CDA715 (C71500)

CDA752 (C75200)

Stainless Steels and Alloys

201 (S20100)

202 (S20200)

302 (S30200)

304 (S30400)

304L (S30403)

304LN (S30453)

309 (S30900)

310 (S31000)

311 (S31100)

316 (S31600)

316L (S31603)

316LN (S31653)

317 (S31700)

317L (S31703)

317LMN (S31726)

321 (S32100)

329 (S32900)

330 (N08330)

347 (S34700)

410 (S41000)

430 (S43000)

446 (S44600)

502 (S50200)

PH13-8 (S13800)

PH15-5 (S15500)

PH17-4 (S17400)

254SMO (S31254)

654SMO (S32654)

Nicrofer 3228 NbCe (S33228)

Nicrofer 2509 Si7 (S70003)

Ferralium 255 (S32550)

Zeron 100 (S32760)

7Mo Plus (S32950)

2RE69 (S31050)

3RE60 (S31500)

44LN (S31200)

IN-744 (S31100)

Uranus 50 (S32404)

Uranus B66 (S31266)

DP-3W (S39274)

Monit (S44635)

2205 (S31803)

2304 (S32304)

2507 (S32750)

2707 HD (S32707)

Sea-Cure (S44660)

Nickel and Nickel Alloys

Nickel

200 (N02200)

400 (N04400)

600 (N06600)

Inconel 625 (N06625)

Incoloy 825 (N08825)

Hastelloy B (N10001)

Hastelloy B-2 (N10665)

Hastelloy C (N10002)

Hastelloy C-4 (N06455)

Hastelloy C-22 (N06022)

Hastelloy C-2000 (N02000)

Hastelloy C-276 (N10276)

Alloy 20 (UNS N08020)

Hastelloy G (N06007)

Hastelloy G-3 (N06985)

Hastelloy G-30 (N06030)

20Cb-3 (N08020)

20Mo-4 (N08024)

20Mo-6 (N08026)

Al-6X (N08366)

AL-6XN (N08367)

904L (N08904)

Allcorr (N06110)

Sanicro 28 (N08028)

Cronifer 1925 hMo (N08925)

Nicrofer 5923 hMo (N06059)

Inconel 686 (N06686)

Inconel 690 (N06690)

JS700 (N08700)

Carbon Steels, Cast Irons and Low Alloy Steels

Carbon Steels

Low Alloy Steels

Gray Cast Iron

Silicon Cast Iron

Titanium and Alloys

Titanium (unalloyed)

Ti-3Al-2.5V

Ti-5Al-2.5Sn

Ti-6Al-2Sn-4Zr-2Mo

Ti-6Al-6V-2Sn

Ti-6Al-4V

Ti-6Al-7Nb

Ti-5Al-2Zr-2Sn-4Mo-4Cr

Ti-6Al-2Sn-4Zr-6Mo

Ti-4.5Al-3V-2Mo-2Fe

Ti-4Al-4Mo-2Sn-0.5Si

Ti-10V-2Fe-3Al

Ti-3Al-8V-6Cr-4Mo-4Zr

Metals

Aluminium

Cadmium

Copper

Chromium

Iron

Lead

Molybdenum

Nickel

Silver

Gold

Palladium

Platinum

Tantalum

Tin

Titanium

Zinc

Zirconium

Magnesium and Magnesium Alloys

Magnesium

AZ63

AZ31

AZ33

AZ81

AZ91

AM60

AM50

AM20

AS41

AS21

ZK51

ZK61

ZE41

ZC63

EZ33

HK31

HZ32

QE22

QH21

WE54

WE43

M1

AZ31

AZ61

AZ80

ZM21

ZMC711

LA141

ZK31

ZK61

HK31

HM21

HZ11

User-Defined Alloy

Users can define their own alloy for the conversion by entering the chemical composition (wt%) of the metallic elements in the alloy. WebCorr Corrosion Rate Units Converter instantly displays the results of the conversion between all corrosion rate units, saving users' time and effort.

Application Example

Weight loss coupon test for magnesium alloy AZ61 reported a corrosion rate of 1.123 mdd.

What is the equivalent corrosion current density in $\mu\text{A}/\text{cm}^2$?

What is the corrosion rate expressed in $\mu\text{m}/\text{y}$?

What is the corrosion rate expressed in mpy?

Answers to the above are instantly available (Figure 3) after selecting the alloy AZ61 from the dropdown list and entering the weight loss data "1.123" in the "mdd" field:

The equivalent corrosion current density is 1.0472 $\mu\text{A}/\text{cm}^2$.

The corrosion rate in $\mu\text{m}/\text{y}$ is 22.7844.

The corrosion rate in mpy is 0.897.

WebCorr Corrosion Rate Unit Converter

<i>CorrRateUnitConverter converts between all corrosion rate units for all metals and alloys.</i> $\mu\text{A}/\text{cm}^2$: micro-ampere per cm^2 mpy: milli-inch per year $\mu\text{m}/\text{y}$: micrometer per year mm/y: millimeter per year gmd: gram per m^2 per day mdd: milligram per dm^2 per day		From	$\mu\text{A}/\text{cm}^2$	To	mpy	$\mu\text{m}/\text{y}$	mm/y	gmd	mdd	
			1.0000	=	0.8566	21.7575	0.0218	0.1072	1.0724	
		From	mdd	To	mpy	$\mu\text{m}/\text{y}$	mm/y	gmd	$\mu\text{A}/\text{cm}^2$	
			1.1230	=	0.8970	22.7844	0.0228	0.1123	1.0472	
		From	gmd	To	mpy	$\mu\text{m}/\text{y}$	mm/y	$\mu\text{A}/\text{cm}^2$	mdd	
			1.0000	=	7.9877	202.8888	0.2029	9.3250	10.0000	
		From	$\mu\text{m}/\text{y}$	To	mpy	$\mu\text{A}/\text{cm}^2$	mm/y	gmd	mdd	
			1.0000	=	0.0394	0.0460	0.0010	0.0049	0.0493	
Select the alloy:	AZ61	From	mpy	To	$\mu\text{A}/\text{cm}^2$	$\mu\text{m}/\text{y}$	mm/y	gmd	mdd	
OR define your own below:			1.0000	=	1.1674	25.4000	0.0254	0.1252	1.2519	
User-defined alloy	Use default density, g/cm^3	M1 ~ M10: metallic elements in the user-defined alloy								
Metallic elements	Fe	Cr	Ni	Mo	M5	M6	M7	M8	M9	M10
Weight%	71.5000	18.0000	8.0000	2.5000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Figure 3 Converting Corrosion Rate for Magnesium Alloy AZ61

List of All Corrosion Modeling and Prediction Software (click each title to view details)

1. **ABC-Compass:** Ammonium Bisulfide Corrosion Modeling and Life Prediction
2. **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
3. **ACMF-Compass:** Modeling and Prediction of the Effects of AC and Magnetic Field on Metal Corrosion
4. **ANC-Compass:** Modeling and Prediction of Ant Nest Corrosion (Formicary Corrosion) in Copper Tubes
5. **Atmosphere-Compass:** Prediction and Modeling of Atmospheric Corrosion of Metals and Alloys
6. **CCC-Compass:** Modeling and Prediction of Caustic Corrosion and Caustic Stress Corrosion Cracking
7. **CIPAL-Compass:** Copper-Induced Pitting in Aluminium Alloys - Modeling, Life Prediction and Process Control
8. **Cl2Compass:** Modeling and Prediction of Corrosion by Dry Chlorine Gas
9. **CO2Compass:** Modeling and Prediction of Corrosion by Carbon Dioxide (CO₂), Hydrogen Sulfide (H₂S), Acetic Acid (HAc), Elemental Sulfur (S), and Mercury (Hg) in Oil and Gas Pipelines and Production Tubing
10. **Concrete-Compass:** Concrete Corrosion Prediction and Modeling
11. **CP-Compass-Pipeline:** Cathodic Protection Design Calculations, Verification, Assessment and Solution for Underground Pipelines
12. **CP-Compass-Concrete:** Design Calculations for Cathodic Protection of Reinforced Concrete Structures
13. **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)
14. **CSR-Compass:** Modeling and Remaining Life Prediction of Creep and Stress Rupture of Boiler and Heater Tubes
15. **CUI-Compass:** Prediction and Risk Assessment of Corrosion Under Insulation and Fireproofing
16. **Dew-Point-Compass:** Prediction of Dew Point Temperatures of Flue Gases and the Risk of Dew Point Corrosion

17. **DWD-Compass:** Modeling and Life Prediction of Corrosion in Drinking Water Distribution Systems
18. **EN-Compass:** Modeling and Prediction of the Corrosion Resistant Properties of Electroless Nickel Coatings
19. **EVS-Compass:** Extreme Value Statistics in Corrosion Modeling and Corrosion Life Prediction of Structures and Plant Assets
20. **F2Compass:** Modeling and Prediction of Corrosion by Dry Fluorine Gas
21. **FAC-Compass:** Erosion Corrosion and Flow - Accelerated Corrosion Modeling, Life Prediction and Materials Selection in Water-Steam Systems
22. **FuelAsh-Compass:** Fuel Ash Corrosion Modeling and Life Prediction of Boiler and Heater Tubes
23. **GC-Compass:** Galvanic Corrosion Prediction and Materials Compatibility Assessment
24. **H2Compass:** Modeling and Prediction of Low Temperature Hydrogen Damages (Hydrogen Blistering, Hydrogen-Induced Cracking, Hydrogen Embrittlement) and High Temperature Hydrogen Attack (HTHA)
25. **H2O-Compass:** Modeling and Prediction of Water Corrosivity and Scaling Tendency
26. **H2SO4-Compass:** Corrosion Prediction and Materials Selection Guide for Sulphuric Acid (H2SO4) Services
27. **HBr-Compass:** Corrosion Prediction and Materials Selection Guide for Hydrobromic Acid (HBr) Services
28. **HCl-Compass:** Corrosion Prediction and Materials Selection Guide for Hydrochloric Acid (HCl) Services
29. **HF-Compass:** Corrosion Prediction and Materials Selection Guide for Hydrofluoric Acid (HF) Services
30. **ISO15156-Compass:** Modeling and Prediction of in-situ pH, Region of Environmental Severity, and Susceptibility to Sulfide Stress Cracking (SSC) of Carbon and Low Alloy Steels
31. **MIC-Compass:** Modeling and Prediction of Microbiologically Influenced Corrosion in Oil and Gas Pipelines
32. **MSC -Compass:** Modeling and Prediction of Molten Salts Corrosion in TES and MSR Applications
33. **NAC-Compass:** Modeling and Prediction of High Temperature Naphthenic Acid Corrosion
34. **NH3Compass:** Modeling and Prediction of Corrosion in Ammonia Production, Storage, and Transport
35. **O2Compass:** Modeling and Prediction of High Temperature Oxidation
36. **OCTG-Compass:** Corrosion Prediction and CRA Materials Selection Guide for Oil and Gas Production Systems
37. **PCW-Compass:** Corrosion Prediction and Modeling in Process Cooling Water Systems
38. **PipelineCompass:** Pipeline Corrosion Modeling, Prediction, Assessment and Solutions
39. **S-Compass:** Modeling and Prediction of High Temperature Sulfidation/Sulfidic Corrosion/H₂-H₂S Corrosion and Low Temperature Elemental Sulfur Corrosion
40. **SC-Compass:** Stray Current Corrosion and AC Corrosion - Identification, Assessment and Prediction
41. **Seawater-Compass:** Seawater Corrosion Prediction for Metals and Alloys
42. **Shipwreck-Compass:** Shipwreck Corrosion Modeling and Corrosion Prediction
43. **Soil-Compass:** Soil Corrosion Prediction and Modeling for Metals and Alloys
44. **SPE-Compass:** Solid Particle Erosion Modeling and Prediction

45. **VPC-Compass:** Prediction and Modeling of Internal Corrosion in Vapor Phase in Closed Systems
46. **VPC-Compass-SE:** Prediction and Modeling of Corrosion in Microelectronic Packages
47. **WebCorr Corrosion Rate Units Converter:** Converting Between All Corrosion Rate Units for All Metals and Alloys

Corrosion Rate Units Converter, making your conversion easier and faster.