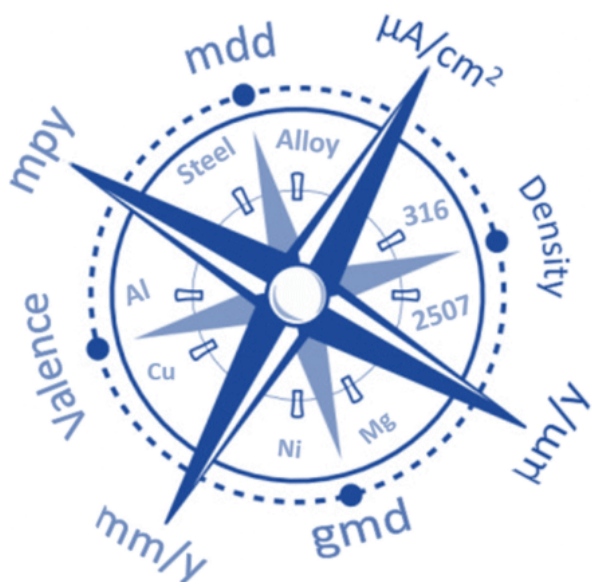# WebCorr Corrosion Rate Units Converter

- 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

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Features and Functions of Corrosion Rate Units Converter

Corrosion rate units commonly reported in the corrosion literature include:

- micro-ampere per cm^2: uA/cm^2,

- milli-inch per year: mpy,

- micrometer per year: um/y,

- millimeter per year: mm/y,

- gram per m^2 per day: gmd,

- milligram per dm^2 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 (uA/cm^2, mpy, um/y, mm/y, mdd, gmd); for a given unit conversion (e.g. mdd => 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 uA/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

CorrRateUnitConverter converts between all corrosion rate units for all metals and alloys.		From	µA/cm²	To	mpy	µm/y	mm/y	gmd	mdd
			1.0000	=	0.5454	13.8541	0.0139	0.1828	1.8285
µA/cm²: micro-ampere per cm²		From	mdd	To	mpy	µm/y	mm/y	gmd	µA/cm²
mpy: milli-inch per year			1.0000	=	0.2983	7.5768	0.0076	0.1000	0.5469
µm/y: micrometer per year		From	gmd	To	mpy	µm/y	mm/y	µA/cm²	mdd
mm/y: millimeter per year			1.0000	=	2.9830	75.7676	0.0758	5.4690	10.0000
gmd: gram per m² per day		From	µm/y	To	mpy	µA/cm²	mm/y	gmd	mdd
mdd: milligram per dm² per day			1.0000	=	0.0394	0.0722	0.0010	0.0132	0.1320
Select the alloy: Ti-3Al-8V-6Cr-4Mo-4Zr		From	mpy	To	µA/cm²	µm/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/cm3		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

CorrRateUnitConverter converts between all corrosion rate units for all metals and alloys.		From	µA/cm²	To	mpy	µm/y	mm/y	gmd	mdd
			1.0000	=	0.4134	10.5002	0.0105	0.2267	2.2670
µA/cm²: micro-ampere per cm²		From	mdd	To	mpy	µm/y	mm/y	gmd	µA/cm²
mpy: milli-inch per year			1.0000	=	0.1824	4.6317	0.0046	0.1000	0.4411
µm/y: micrometer per year		From	gmd	To	mpy	µm/y	mm/y	µA/cm²	mdd
mm/y: millimeter per year			1.0000	=	1.8235	46.3172	0.0463	4.4111	10.0000
gmd: gram per m² per day		From	µm/y	To	mpy	µA/cm²	mm/y	gmd	mdd
mdd: milligram per dm² per day			1.0000	=	0.0394	0.0952	0.0010	0.0216	0.2159
Select the alloy: User-Defined		From	mpy	To	µA/cm²	µm/y	mm/y	gmd	mdd
OR define your own below:			1.0000	=	2.4190	25.4000	0.0254	0.5484	5.4839
User-defined alloy	Use default density, g/cm3		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 uA/cm^2?

What is the corrosion rate expressed in um/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 uA/cm^2.

The corrosion rate in um/y is 22.7844.

The corrosion rate in mpy is 0.897.

WebCorr Corrosion Rate Unit Converter

CorrRateUnitConverter converts between all corrosion rate units for all metals and alloys.		From	μA/cm^2	To	mpy	μm/y	mm/y	gmd	mdd
			1.0000	=	0.8566	21.7575	0.0218	0.1072	1.0724
μA/cm^2:	micro-ampere per cm^2	From	mdd	To	mpy	μm/y	mm/y	gmd	μA/cm^2
mpy:	milli-inch per year		1.1230	=	0.8970	22.7844	0.0228	0.1123	1.0472
μm/y:	micrometer per year	From	gmd	To	mpy	μm/y	mm/y	μA/cm^2	mdd
mm/y:	millimeter per year		1.0000	=	7.9877	202.8888	0.2029	9.3250	10.0000
gmd:	gram per m^2 per day	From	μm/y	To	mpy	μA/cm^2	mm/y	gmd	mdd
mdd:	milligram per dm^2 per day		1.0000	=	0.0394	0.0460	0.0010	0.0049	0.0493
Select the alloy:	AZ61	From	mpy	To	μA/cm^2	μm/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/cm3			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

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