

Basiseinheiten Umrechnungen

1.) Temperatur

a) Fahrenheit-Skala (teilt Schmelz- und Siedepunkt von Wasser in 180 Teile)

$$T[{}^{\circ}F] = \frac{9}{5} \cdot T[{}^{\circ}C] + 32 \quad T[{}^{\circ}C] = \frac{5}{9} \cdot (T[{}^{\circ}F] - 32)$$

b) Kelvin-Skala (teilt Schmelz- und Siedepunkt von Wasser in 100 Teile)

$$T[{}^{\circ}K] = T[{}^{\circ}C] + 273,15$$

c) Rankine-Skala, wie Fahrenheit, beginnt aber am absoluten Nullpunkt

$$T[{}^{\circ}R] = \frac{5}{9} \cdot T[{}^{\circ}C] \quad 0^{\circ}C = 491,67^{\circ}R \quad 100^{\circ}C = 671,67^{\circ}R$$

T[[°] C]	-273,15	-17,77	0	4,62	15,55	20	21,11	37,77	60,18	93,33	100
T[[°] K]	0	255,38	273,15	277,77	288,71	293,15	294,26	310,92	333,33	366,48	373,15
T[[°] F]	-459,67	0	32	40,32	60	68	70	100	140,33	200	212
T[[°] R]	0	459,67	491,67	500	519,67	527,67	529,67	559,65	600	659,67	671,67

$$T[{}^{\circ}R] = T[{}^{\circ}F] + 459,67$$

$$T[{}^{\circ}R] = 9/5 * T[{}^{\circ}C] + 491,67$$

2.) Länge

1 in (inch, Zoll,“) = 2,540005 cm

1 ft = 12 in = 30,48006 cm

1 yd = 3 ft = 91,44018 cm

3.) Masse

1 oz (ounce, Unze) = 1/16 lb = 28,349527 g

1 lb (pound) = 0,45359243 kg

Standardschwere $g_0 = 9,80665 \text{ m/s}^2$

4.) Volumen

1 gal (Gallone) = 4,546 dm³ (UK,AUS)

1 US gal = 3,785 dm³ (US,CAN)

1 qt (quart) = 1/4 gal = 1,1365 dm³ (UK)

1 qt = 0,94625 dm³ (US)

1 pt (pint) = 1/2 qt = 0,568 dm³ (UK)

1 liq pt = 0,473 dm³ (US)

1 dry pt = 0,551 dm³ (US)

1 fl.oz. = 1/20 pt = 28,413 ml (GB)

1 fl.oz. = 1/16 liq pt = 29,574 ml

1 in³ = 16,387 ml

1 ft³ = 28,3168 l

5.) Druck

1 psi (pound per square-inch) = 6894,757 Pa = 68,94757 mbar

1 atm = 101325 Pa (= 760 Torr)

physikalische Atmosphäre

1 at = 98067 Pa (= 1 kp/cm²)

technische Atmosphäre

1 kg/cm² = 980,67 mbar (~ 1 bar)

1 Torr = 1 mmHg @ 0°C = 1013,25/760 Pa = 133,3223 Pa

1 Pa = 1N/m² = 1kg/(m s²)

Wasser-, bzw. Quecksilbersäulesäule bei Standardschwere 9,80665 m/s² :

Temperatur	0°C	4°C	60°F/15,55°	20°C/68°F	70°F/21,11°C
ρ_{H_2O} [kg/m ³]	999,868	1000	999,024	998,232	997,983
1 mmWS [Pa]	9,80535	9,80665	9,7970	9,78931	9,7868
1 inWS [Pa]	249,056	249,089	248,845	248,648	248,586
1 ft WS [Pa]	2988,67	2989,02	2986,14	2983,776	2983,03
ρ_{Hg} [kg/m ³]	13,5951			13,5458	
1 mmHg [Pa]	133,3224			132,839	
1 inHg [Pa]	3386,39			3374,118	

Schwere in Steinenbronn: 9,8082175 m/s² , Abw. = +0,016%

29,92"Hg = 1013,25 hPa 29,53"Hg = 1000 hPa

ρ_{Hg} [Pa] = 13,556786 * (1 - 0,0001818 * (t[°C] - 15,555))

6.) Durchfluß

1 cfm = 28,317 l/min = 1,6990 m³/h

1 in³/min = 16,387 ml/min = 0,98323 l/h

	ml/s	ml/min	ml/h	l/s	l/min	l/h	m ³ /s	m ³ /min	m ³ /h
1 ml/s =	1	60	3,6E3	1E-3	0,06	3,6	1E-6	6E-5	3,6E-3
1ml/min=	1,67E-2	1	60	1,67E-5	1E-3	6E-2	1,67E-8	1E-6	6E-5
1 ml/h =	2,78E-4	1,67E-2	1	2,78E-7	1,67E-5	1E-3	2,78E-10	1,67E-8	1E-6
1 l/s =	1E3	6E4	3,6E6	1	60	3,6E3	1E-3	6E-2	3,6
1 l/min =	16,67	1E3	6E4	1,67E-2	1	60	1,67E-5	1E-3	6E-2
1 l/h =	0,278	16,67	1E3	2,78E-4	1,67E-2	1	2,78E-7	1,67E-5	1E-3
1 m ³ /s =	1E6	6E7	3,6E9	1E3	6E4	3,6E6	1	60	3,6E3
1m ³ /min=	1,67E4	1E6	6E7	16,67	1E3	6E-2	1,67E-2	1	60
1 m ³ /h =	2,78E2	1,67E4	1E6	0,278	16,67	1E3	2,78E-4	1,67E-2	1

7.) Dichte ρ

1 lbs/ft³ = 16,018732 kg/m³

1 lb/Gal = 0,11984 kg/m³ (US,CAN) bzw. 0,099778 kg/m³ (UK,AUS)

8.) Dynamische Viskosität η - (Poise)

1 Poi = 0,1 Pa s ; 1 cPoi = 0,001 Pa s

1 lbs/inch s = 1,7858268 E+01 Pa s

1 μ Poi = 1,0 x E-07 Pa s = 1,0 x E-07 N s / m²

9.) Kinematische Viskosität $\nu = \eta/\rho$ - (Stokes)

1 St = 1,0 x E-04 m²/s ; 1 cSt = 1,0 x E-06 m²/s

Liste der Basiseinheiten – Umrechnung

SI-Faktor	X- or Y-Faktor: 1/SI-Faktor	A = a ₀	Einheit	Display Abkürzung
Druck /			Differenzdruck Absolutdruck Bezugsabsolutdruck Relativdruck	Pdif Pabs RPab Prel
1,00000E-00	1,00000E-00	0,000	Pascal	Pa
1,00000E+02	1,00000E-02	0,000	HektoPascal	hPa
1,00000E+03	1,00000E-03	0,000	KiloPascal	kPa
1,00000E+02	1,00000E-02	0,000	Millibar	mbar
1,00000E+05	1,00000E-05	0,000	Bar	bar
9,80670E+04	1,01971E-05	0,000	techn. Atmosphäre	at
1,01325E+05	9,86923E-06	0,000	phys. Atmosphäre	atm
3,38639E+03	2,95300E-04	0,000	inch Quecks. @0°C	inHG
2,49089E+02	4,01463E-03	0,000	inch Ws @4°C	inWC
6,89476E+03	1,45038E-04	0,000	Pounds/in ²	lbi2
4,78802E+01	2,08855E-02	0,000	Pounds/ft ²	lbf2
1,33322E+02	7,50062E-03	0,000	mm Quecksilb. @0°C	mmHG
9,80670E-00	1,01971E-01	0,000	mm Wasser @4°C	mmWC
6,89476E+03	1,45038E-04	0,000	Pounds /in ²	psi
1,33322E+02	7,50062E-03	0,000	Torr	Torr
9,79000E-00	1,02145E-01	0,000	mm Wasser @20° C	mmWC
2,48648E+02	4,02175E-03	0,000	inch Ws @20°C	inWC
Dichte:			Aktuelle Dichte Normdichte Bezugsdichte	ADen NDen RDen
1,00000E-00	1,00000E-00	0,000	Kg/m ³	kgm ³
1,00000E-03	1,00000E+03	0,000	g/m ³	g/m ³
1,60185E+01	6,24278E-02	0,000	lb/Kubikfuß	lbcf
2,76799E+04	3,61273E-05	0,000	lb/Kubikin	lbci
Massenstrom:			Massenstrom	Qmas
1,00000E-00	1,00000E-00	0,000	kg/sec	kg/s
1,66667E-02	6,00000E+01	0,000	kg/min	kg/m
2,77778E-04	3,60000E+03	0,000	kg/hour	kg/h
1,00000E-03	1,00000E+03	0,000	g/sec	g/s
1,66667E-05	6,00000E+04	0,000	g/min	g/m
2,77778E-07	3,60000E+06	0,000	g/hour	g/h
4,53590E-01	2,20463E-00	0,000	lb/sec	PPS
7,55980E-03	1,32279E+02	0,000	lb/min	PPM
1,25000E-04	8,00000E+03	0,000	lb/hour	PPH
Masse			Gesamtmasse	Mass
1,00000E-00	1,00000E-00	0,000	kg	kg
1,00000E-03	1,00000E+03	0,000	g	g
4,53590E-01	2,20463E-00	0,000	lb	lb
1,00000E+03	1,00000E-03	0,000	t	t

Volumenstrom:			Akt. Volumenstrom Normvolumenstrom Bezugsvolumenstrom	QVac QVno QVre
1,00000E-00	1,00000E-00	0,000	m ³ /sec	m ³ /s
1,66667E-02	6,00000E+01	0,000	m ³ /min	m ³ /m
2,77778E-04	3,60000E+03	0,000	m ³ /hour	m ³ /h
1,00000E-03	1,00000E+03	0,000	Liter/sec	L/s
1,66667E-05	6,00000E+04	0,000	Liter/min	L/m
2,77778E-07	3,60000E+06	0,000	Liter/hour	L/h
1,00000E-06	1,00000E+06	0,000	cm ³ /sec	cm ³ /s
1,66667E-08	6,00000E+07	0,000	cm ³ /min	cm ³ /m
2,77778E-10	3,60000E+09	0,000	cm ³ /hour	cm ³ /h
2,83170E-02	3,53145E+01	0,000	ft ³ /sec	CFS
4,71950E-04	2,11887E+03	0,000	ft ³ /min	CFM
7,86580E-06	1,27133E+05	0,000	ft ³ /hour	CFH
1,63870E-05	6,10240E+04	0,000	inch ³ /sec	CIS
2,73120E-07	3,66139E+06	0,000	inch ³ /min	CIM
4,55190E-09	2,19688E+08	0,000	inch ³ /h	CIH
Volumen:			Akt. Gesamtvolumen Normgesamtvolumen Referenzges.volumen	Avol Nvol Rvol
1,00000E-00	1,00000E-00	0,000	m ³	m ³
1,00000E-03	1,00000E+03	0,000	Liter	Lit.
1,00000E-06	1,00000E+06	0,000	cm ³	cm ³
2,83170E-02	3,53145E+01	0,000	ft ³	CF
1,63870E-05	6,10240E+04	0,000	inch ³	CI
Feuchte:			Feuchte Bezugsfeuchte	Hum RHum
1,00000E-00	1,00000E-00	0,000	Rel. Luftfeuchte	-
1,00000E-02	1,00000E+02	0,000	Rel. Luftf. [%]	%rH
Temperatur:			Temperatur Bezugstemperatur	Temp RTem
1,00000E-00	1,00000E-00	0,000	Kelvin	"K
1,00000E-00	1,00000E-00	273,150	Celsius	"C
5,55556E-01	1,80000E-00	255,372	Fahrenheit	"F
5,55556E-01	1,80000E-00	0,000	Rankine	"R
Viskosität:			Aktuelle Viskosität Kalibrierviskosität Bezugsviskosität	AVis CVis RVis
1,00000E-00	1,00000E-00	0,000	Pascalsek.	Pa*s
1,00000E-07	1,00000E+07	0,000	Micropoises	uPoi
1,00000E-03	1,00000E+03	0,000	Centipoises	cPoi
1,78583E+01	5,59965E-02	0,000	lbm / (in * s)	lbis
Druckverlust pro Zeit:			Druckverlust pro Zeit:	dpdt
1,00000E-00	1,00000E-00	0,000	Pascal/sec.	Pa/s
1,66667E-02	6,00000E+01	0,000	Pascal/Min.	Pa/m
2,77778E-04	3,60000E+03	0,000	Pascal/h	Pa/h
1,00000E+02	1,00000E-02	0,000	Millibar/sec	mb/s

1,66667E-00	6,00000E-01	0,000	Millibar/min	mb/m
2,77778E-02	3,60000E+01	0,000	Millibar/hour	mb/h
1,00000E+05	1,00000E-05	0,000	Bar/sec	b/s
1,66667E+03	6,00000E-04	0,000	Bar/min	b/m
2,77778E+01	3,60000E-02	0,000	Bar/hour	b/h
6,89476E+03	1,45038E-04	0,000	Pounds /in ² /sec	PSIs
1,14913E+02	8,70227E-03	0,000	Pounds /in ² /min	PSIm
1,91521E-00	5,22136E-01	0,000	Pounds /in ² /hour	PSIh
Zeit:			Zeit:	TMea
1,00000E-00	1,00000E-00	0,000	Sekunde (s)	sec.
6,00000E+01	1,66667E-02	0,000	Minute (min)	min.
3,60000E+03	2,77778E-04	0,000	Stunde (h)	hour
8,64000E+04	1,15741E-05	0,000	Tag	day
Weg / Länge:			Messzeit:	D / d / S / s
1,00000E-00	1,00000E-00	0,000	Meter (m)	m
1,00000E+02	1,00000E-02	0,000	Centimeter (cm)	cm
1,00000E+03	1,00000E-03	0,000	Millimeter (mm)	mm
1,00000E+03	1,00000E-03	0,000	Kilometer (m)	km
3,048006E-01	3,2808334E-00	0,000	Fuß (ft)	feet
2,540005E-02	3,39370E+01	0,000	Zoll / inch (in)	inch
9,144018E-01	1,0936111E-00	0,000	yard (yd)	yard
1,609344E+03	6,213711E-04	0,000	mile (mil)	mile
Geschwindigkeit:			Geschwindigkeit:	v
1,00000E-00	1,00000E-00	0,000	Meter/Sekunde (m/s)	m/s
6,00000E+01	1,66667E-02	0,000	Meter/Minute (m/min)	m/mi
3,60000E+03	2,77778E-04	0,000	Kilometer/Stunde (km/h)	km/h
1,00000E+03	1,00000E-03	0,000	Kilometer/Sekunde (m/s)	km/s
2,540005E-02	3,39370E+01	0,000	Inch/Sekunde (in/s)	in
3,048006E-01	3,2808334E-00	0,000	Fuß/Sekunde (ft/min)	ft/s
9,144018E-01	1,0936111E-00	0,000	Yard/Sekunde (yd/s)	yd/s
1,609344E+03	6,213711E-04	0,000	Meile/Sekunde (mil/s)	mils
2,68244E+01	3,72823E-2	0,000	Meilen/Minute (mil/min)	milm
4,47040E-00	2,23694E-00	0,000	Meilen/Stunde (mil/h)	milh
5,14444E-01	1,94384E-00	0,000	Knoten	knot
Dimensionslos:			Anzahl der Meßwerte	Nval
1,00000E-00	1,00000E-00	0,000	dimensionslos -	-
1,00000E-02	1,00000E+02	0,000	Prozent %	%
1,00000E+03	1,00000E-03	0,000	Kilo	E+03
1,00000E+06	1,00000E-06	0,000	Mega	E+06
1,00000E-03	1,00000E+03	0,000	Milli	E-03
1,00000E-06	1,00000E+06	0,000	Mikro	E-06
Spannung:			Spannung	U
1,00000E-00	1,00000E-00	0,000	Volt	V
1,00000E-03	1,00000E+03	0,000	MilliVolt	mV
1,00000E-06	1,00000E+06	0,000	MikroVolt	uV
Strom:			Strom	I
1,00000E-00	1,00000E-00	0,000	Ampere	A
1,00000E-03	1,00000E+03	0,000	Milliampere	mA
1,00000E-06	1,00000E+06	0,000	Mikroampere	uA