

teilungsmöglichkeiten von hirth ringen

Anzahl Hirth Zähne eines Vollkreises von 360°	Winkelschritt pro Zahn	Teilungsmöglichkeiten innerhalb eines Vollkreises von 360°
48	7° 30'	2-3-4-6-8-12-16-24-48
56	6° 25' 43"	2-4-7-8-14-28-56
60	6°	2-3-4-5-6-10-12-15-20-30-60
63	5° 42' 51"	3-7-9-21-63
70	5° 8' 34"	2-5-7-10-14-35-70
72	5°	2-3-4-6-8-9-12-18-24-36-72
78	4° 36' 55"	2-3-6-13-26-39-78
80	4° 30'	2-4-5-8-10-16-20-40-80
84	4° 17' 9"	2-3-4-6-7-12-14-21-28-42-84
90	4°	2-3-5-6-9-10-15-18-30-45-90
96	3° 45'	2-3-4-6-8-12-16-24-32-48-96
100	3° 36'	2-4-5-10-20-25-50-100
108	3° 20'	2-3-4-6-9-12-18-27-36-54-108
110	3° 16' 22"	2-5-10-11-22-55-110
112	3° 12' 51"	2-4-7-8-14-16-28-56-112
120	3°	2-3-4-5-6-8-10-12-15-20-24-30-40-60-120
126	2° 51' 26"	2-3-6-7-9-14-18-21-42-63-126
140	2° 34' 17"	2-4-5-7-10-14-30-28-35-70-140
144	2° 30'	2-3-4-6-8-9-12-16-18-24-36-48-72-144
156	2° 18' 27"	2-3-4-6-12-13-26-39-52-78-156
180	2°	2-3-4-5-6-9-10-12-15-18-20-30-36-45-60-90-180
240	1° 30'	2-3-4-5-6-8-10-12-15-16-20-24-30-40-48-60-80-120-240
255	1° 24' 42"	3-5-15-17-51-85-255
360	1°	2-3-4-5-6-8-9-10-12-15-18-20-24-30-36-40-45-60-72-90-120-180-360
720	30'	2-3-4-5-6-8-9-10-12-15-16-18-20-24-30-36-40-45-48-60-72-80-90-120-144-180-240-360-720

▶ Anteiliger Außenumfang von Kreissegmenten

Planscheiben \varnothing in mm	1 Winkelsekunde gemessen am Planscheibenumfang in mm
160	0,00038
225	0,00054
280	0,00067
320	0,00078
355	0,00086
420	0,00102
500	0,00121
520	0,00126
630	0,00153
800	0,00194
1000	0,00242
1250	0,00303
1500	0,00363
1800	0,00436

abgeleitete Einheiten ◀

1 N	= 1 kg m / s ²		
1 Pa	= 1 N / m ²	= 1 kg / s ² m	
1 bar	= 10 ⁵ N / m ²	= 10 ⁵ kg / s ² m	
1 Pa s	= 1 N s / m ²	= 1 kg / ms	
1 J	= 1 W s	= 1 N m	= 1 kg m ² / s ²
1 W	= 1 J / s	= 1 N m / s	= 1 kg m ² / s ²
1 V	= 1 W / A	= 1 J / A s	= 1 Ω A = 1 N m / A s
1 Ω	= 1 V / A	= 1 W / A ²	= 1 J / A ² s = 1 Nm / A s
1 S	= 1 / Ω		
1 C	= 1 A s		

► physikalische konstanten

Gravitationskonstante	G	= 6,6720 10 ⁻¹¹ N m ² / kg
Normalfallbeschleunigung	g _n	= 9,8067 m / s ²
Gaskonstante	R	= 8.314,41 J / (kmol K)
molares Normvolumen	V _m	= 22,414 m ³ / kmol (1,01325 bar, 0° C)
Avogadro-Konstante	N _A	= 6,0221 10 ²⁶ kmol ⁻¹
Loschmidt-Konstante	N _L	= 2,6868 10 ²⁵ m ⁻³
Boltzmann-Konstante	k	= 1,3807 10 ⁻²³ J / K
elektrische Feldkonstante	ε ₀	= 8,8541 10 ⁻¹² F/ m
magnetische Feldkonstante	μ ₀	= 1,2566 10 ⁻⁶ H/ m
elektrische Elementarladung	e	= 1,6022 10 ⁻¹⁹ C
Faraday-Konstante	F	= 9,6485 10 ⁷ C / kmol
Lichtgeschwindigkeit im Vakuum	c	= 2,9979 10 ⁸ m / s
Planck-Wirkungsquantum	h	= 6,626 10 ⁻³⁴ J s
Wellenwiderstand des Vakuums	Γ	= 376,731 Ω
Stefan-Boltzmann-Strahlungskonstante	σ	= 5,6703 10 ⁻⁸ W / (m ² K ⁴)
Planck-Strahlungskonstante	c ₁	= 3,741 10 ⁻¹⁶ W m ²
	c ₂	= 1,438 10 ⁻² m K
Wien-Konstante	K	= 2,8978 10 ⁻³ m K
Rydberg-Konstante	R	= 1,09737 10 ⁷ m ⁻¹
Ruhemasse des Elektrons	m _e	= 9,109 10 ⁻³¹ kg
Elektronenradius	r _e	= 2,8178 10 ⁻¹⁵ m
atomare Masseneinheit	u	= 1,6606 10 ⁻²⁷ kg
Zahl E	e	= 2,7182
Zahl PI	π	= 3,1415

vorsätze von einheiten ←

10^{15}	Peta	P	Billarde	(US) (Quadrillion)
10^{12}	Tera	T	Billion	(Trillion)
10^9	Giga	G	Milliarde	(Billion)
10^6	Mega	M	Million	
10^3	Kilo	K		
10^2	Hekto	h		
10	Deka	da		
10^{-1}	Dezi	d		
10^{-2}	Zenti	c		
10^{-3}	Milli	m		
10^{-6}	Mikro	μ		
10^{-9}	Nano	n		
10^{-12}	Piko	p		
10^{-15}	Femto	f		

arbeit, energie, wärme ←

1 N m	= 1,0000	J
1 W s	= 1,0000	J
1 dyn cm	= 1,0000 10^{-7}	J
1 erg	= 1,0000 10^{-7}	J
1 Dyn m	= 1,0000	J
1 kp m	= 9,8067	J
1 kcal	= 4,1868 10^3	J
1 kW h	= 3,6000 10^6	J
1 PS h	= 2,6478 10^6	J
1 Btu	= 1,0551 10^3	J
1 Chu	= 1,8991 10^3	J
1 ft pdl	= 4,2139 10^{-2}	J
1 ft lbf	= 1,3558	J
1 hp hr (britisch)	= 2,6845 10^6	J
1 therm	= 1,0551 10^8	J

ausdehnungskoeffizient (volumetrisch)

1 g / cm ³ °C	= 1,0000 10 ³	kg / m ³ K
1 lb / ft ³ °C	= 1,6018 10	kg / m ³ K
1 lb / ft ³ °F	= 2,8833 10	kg / m ³ K

beschleunigung

1 ft / s ²	= 3,0480 10 ⁻¹	m / s
-----------------------	---------------------------	-------

dichte

1 grain / ft ³	= 2,2884 10 ⁻³	kg / m ³
1 lb / ft ³	= 1,6018 10	kg / m ³
1 lb / UK gal	= 9,9779 10	kg / m ³
1 lb / US gal	= 1,1983 10 ²	kg / m ³

druck, mechanische spannung

1 bar	= 1,0000 10 ⁵	Pa
1 at	= 9,8067 10 ⁴	Pa
1 kg / cm ²	= 9,8067 10 ⁴	Pa
1 atm	= 1,0133 10 ⁵	Pa
1 Torr	= 1,3332 10 ²	Pa
1 mm Hg (1 mm QS)	= 1,3332 10 ²	Pa
1 mm WS	= 9,8067	Pa
1 dyn / cm ²	= 1,0000 10 ⁻¹	Pa
1 pdl / ft ²	= 1,4881	Pa
1 lbf / ft ²	= 4,7880 10	Pa
1 pdl / in ²	= 2,1429 10 ²	Pa
1 in water	= 2,4909 10 ²	Pa
1 ft water	= 2,9891 10 ³	Pa
1 in HG (1 in mercury)	= 3,3866 10 ³	Pa
1 lbf / in ² (oder psi)	= 6,8948 10 ³	Pa
1 ton f / in ²	= 1,5444 10 ⁷	Pa

enthalpie, spezifische

1 kcal / kg	= 4,1868 10 ³	J / kg
1 Btu / lb	= 2,3260 10 ³	J / kg
1 Chu / lb	= 4,1868 10 ³	J / kg

fläche

1 in ²	= 6,4516 10 ⁻⁴	m ²
1 ft ²	= 9,2903 10 ⁻²	m ²
1 yd ²	= 8,3613 10 ⁻¹	m ²
1 acre	= 4,0469 10 ³	m ²
1 mile ²	= 2,5900 10 ⁶	m ²

geschwindigkeit

1 ft / hr	= 8,4667 10 ⁻⁵	m / s
1 ft / min	= 5,0800 10 ⁻³	m / s
1 ft / s	= 3,0480 10 ⁻¹	m / s
1 mile / hr	= 4,4704 10 ⁻¹	m / s
1 knot	= 5,1441 10 ⁻¹	m / s

kalorische größen, volumenbezogene

1 kcal / m ³	= 4,1868 10 ³	J / m ³
1 Btu / ft ³	= 3,7260 10 ⁴	J / m ³
1 Chu / ft ³	= 6,7067 10 ⁴	J / m ³
1 therm / ft ³	= 3,7260 10 ⁹	J / m ³

→ kraft

1 kp	= 9,8067	N
1 dyn	= 1,0000 10^{-5}	N
1 Dyn	= 1,0000	N
1 pdl	= 1,3825 10^{-1}	N
1 lb f	= 4,4482	N
1 ton f	= 9,9640 10^3	N

länge ←

1 Å	= 1,0000 10^{-10}	m
1 μ (micron)	= 1,0000 10^{-6}	m
1 in	= 2,5400 10^{-2}	m
1 ft = 12 in	= 3,0480 10^{-1}	m
1 thou	= 2,5400 10^{-5}	m
1 mile (statute)	= 1,6094 10^3	m
1 mile (nautical)	= 1,8533 10^3	m
1 rod = 1 perch = 5,5 yd	= 5,292	m
1 chain	= 2,0117	m
1 furlong	= 2,0117 10^2	m

→ leistung, wärme fluß

1 m kp / s	= 9,80665	W
1 kcal / h	= 1,1630	W
1 erg / s	= 1,0000 10^{-7}	W
1 PS	= 7,3548 10^2	W
1 m ³ atm / h	= 2,8150 10	W
1 ft lb f / min	= 2,2597 10^{-2}	W
1 ft lb f / s	= 1,3558	W
1 ft pdl / s	= 4,2139 10^{-2}	W
1 Btu / hr	= 2,9308 10^{-1}	W
1 Chu / hr	= 5,2754 10^{-1}	W
1 hp (britisch)	= 7,4570 10^2	W
1 ton refrigeration	= 3,5169 10^3	W
1 therm / hr	= 2,9308 10^4	W

→ **masse**

1 kp s ² / m	= 9,80665	kg
1 grain	= 6,4800 10 ⁻⁵	kg
1 lb	= 4,5359 10 ⁻¹	kg
1 oz	= 2,83495 10 ⁻²	kg
1 seng	= 1,4594 10 ¹	kg
1 ton (short) = 20 cwt brit.	= 9,0718 10 ²	kg
1 ton (long) = 20 cwt UK	= 1,0160 10 ³	kg

→ **massenstrom**

1 lb / hr	= 1,2600 10 ⁻⁴	kg / s
1 ton / day (short)	= 1,0500 10 ⁻²	kg / s
1 ton / day (long)	= 1,1760 10 ⁻²	kg / s
1 ton / hr (short)	= 2,5200 10 ⁻¹	kg / s
1 ton / hr (long)	= 2,8224 10 ⁻¹	kg / s

massenstromdichte ←

1 lb / hr ft ²	= 1,3562 10 ⁻³	kg / m ² s
1 kg / hr ft ²	= 2,9900 10 ⁻³	kg / m ² s
1 lb / s ft ²	= 4,8824	kg / m ² s

spannung (mechanisch), druck ←

1 bar	= 1,0000 10 ⁵	Pa
1 at	= 9,8067 10 ⁴	Pa
1 kg / cm ²	= 9,8067 10 ⁴	Pa
1 atm	= 1,0133 10 ⁵	Pa
1 Torr	= 1,3332 10 ²	Pa
1 mm Hg (1 mm QS)	= 1,3332 10 ²	Pa
1 mm WS	= 9,8067	Pa
1 dyn / cm ²	= 1,0000 10 ⁻¹	Pa
1 pdl / ft ²	= 1,4881	Pa
1 lbf / ft ²	= 4,7880 10	Pa
1 pdl / in ²	= 2,1429 10 ²	Pa
1 in water	= 2,4909 10 ²	Pa
1 ft water	= 2,9891 10 ³	Pa
1 in HG (1 in mercury)	= 3,3866 10 ³	Pa
1 lbf / in ² (oder psi)	= 6,8948 10 ³	Pa
1 ton f / in ²	= 1,5444 10 ⁷	Pa

→ temperatur

x _c in °C	= x _c + 273,15	K
x _F in °F	= 5 / 9 (x _F - 32) + 273,15	K
1 °R	= 5 / 9	K

temperaturdifferenz ←

1 °C	= 1	K
1 °F	= 5 / 9	K
1 °R	= 5 / 9	K

→ Viskosität, dynamische

1 kp s / m ²	= 9,80665	Pa s
1 kp h / m ²	= 3,532 10 ⁻⁴	Pa s
1 Poise = 1 g / cm s	= 1,0000 10 ⁻¹	Pa s
1 lb / ft hr	= 4,1338 10 ⁻⁴	Pa s
1 kg / ft hr	= 9,1134 10 ⁻⁴	Pa s
1 lb / ft s	= 1,4882	Pa s

viskosität, kinematische ←

1 Stoke = 1 cm ² / s	= 1.0000 10 ⁻⁴	m ² / s
1 dm ³ / hr in	= 1,0936 10 ⁻⁵	m ² / s
1 ft ² / hr	= 2,5806 10 ⁻⁵	m ² / s
1 ft ² / s	= 9,2903 10 ⁻²	m ² / s

→ volumen

1 in ³	= 1,6387 10 ⁻⁵	m ³
1 ft ³	= 2,8317 10 ⁻²	m ³
1 yd ³	= 7,6455 10 ⁻¹	m ³
1 US gal	= 3,7853 10 ⁻³	m ³
1 ounce	= 2,957 10 ⁻⁵	m ³
1 UK gal	= 4,5460 10 ⁻³	m ³
1 US bushel (dry)	= 3,5239 10 ⁻²	m ³
1 UK bushel (dry)	= 3,6369 10 ⁻²	m ³
1 barrel (petroleum US)	= 1,5898 10 ⁻¹	m ³
1 barrel (UK)	= 1,635 10 ⁻¹	m ³
1 lube oil barrel	= 2,0819 10 ⁻¹	m ³
1 gill	= 1,1829 10 ⁻⁴	m ³
1 register ton = 100 ft ³	= 2,8317	m ³
1 quarter = 8 UK bushel		
	= 32 pecks	
	= 64 UK gallons	
	= 256 quarts	
	= 512 pints = 2,9095 10 ⁻¹	m ³

volumen, spezifisches

1 ft ³ / kg	= 2,8317 10 ⁻²	m ³ / kg
1 ft ³ / lb	= 6,2428 10 ⁻²	m ³ / kg

volumenstrom

1 ft ³ / hr	= 7,8658 10 ⁻⁶	m ³ / s
1 ft ³ / min = 1 cu min	= 4,7195 10 ⁻⁴	m ³ / s
1 ft ³ / s = 1 cu sec	= 2,8317 10 ⁻²	m ³ / s
1 US gal / hr	= 1,0515 10 ⁻⁶	m ³ / s
1 UK gal / hr	= 1,2628 10 ⁻⁶	m ³ / s
1 barrel / day (petroleum US)	= 1,8401 10 ⁻⁶	m ³ / s
1 US gal / min	= 6,3089 10 ⁻⁵	m ³ / s
1 UK gal / min	= 7,5766 10 ⁻⁵	m ³ / s
1 mgd = 106 UK gal / day	= 5,2617 10 ⁻²	m ³ / s

wärmedurchgangskoeffizient

1 kcal / m ² °C	= 1,1630	W / m ² K
1 cal / m ² s °C	= 4,1868 10 ⁻⁴	W / m ² K
1 kcal / ft ² hr °C	= 1,2518 10	W / m ² K
1 Btu / ft ² hr °F	= 5,6785	W / m ² K
1 Chu / f ² hr °C	= 5,6783	W / m ² K

wärmeleitfähigkeit

1 kcal / m h °C	= 1,1630	W / m K
1 cal / cm s °C	= 4,1868 10 ⁻²	W / m K
1 Btu / ft ² hr (°F / in)	= 1,4423 10 ⁻¹	W / m K
1 Btu / ft hr °F	= 1,7308	W / m K
1 Chu / ft hr °C	= 1,7308	W / m K

→ wärme kapazität, spezifische

1 kcal / kg °C	= 4,1868 10 ³	J / kg K
1 cal / g °C	= 4,1868 10 ³	J / kg K
1 Btu / lb °F	= 4,1868 10 ³	J / kg K
1 Chu / lb °C	= 4,1868 10 ³	J / kg K

wärmestromdichte, heizflächenbelastung ←

1 kcal / m ² h	= 1,1630	W / m ²
1 kcal / ft ² hr	= 1,2518 10	W / m ²
1 cal / cm ² s	= 4,1868 10 ⁴	W / m ²
1 Btu / ft ² hr	= 3,1546	W / m ²
1 Chu / ft ² hr	= 5,6784	W / m ²