ifm electronic – close to you!

ifm electronic

°F = (°C x 1.8) + 32

1 kp / cm² (at)

1 inch = 1" = 25.4 mm

psi

DIN

Overview pressure units

	Pa	MPa	bar	mbar	mWS	mmWS	mmHG	psi	kp/cm²
	N/m²	MN/m²					(Torr)		(at)
1 PA = 1N/m²	1	10^{-6}	10^{-5}	10^{-2}	1.02×10^{-4}	1.02×10^{-1}	7.5×10^{-3}	1.45×10^{-4}	1.02×10^{-5}
1 MPA = 1MN/m²	10^{6}	1	10	10^{4}	102	1.02×10^{5}	7500	145	10.2
1 bar	10^{5}	10^{-1}	1	10^{3}	10.2	1.02×10^{4}	750	14.5	1.02
1 mbar	10^{2}	10^{-4}	10^{-3}	1	1.02×10^{-2}	10.2	7.5×10^{-1}	1.45×10^{-2}	1.02×10^{-3}
1 mWS	9.81×10^{3}	9.81×10^{-3}	9.81×10^{-2}	9.81×10^{1}	1	10^{3}	7.36×10^{1}	1.42	10^{-1}
1 mmWS	9.81	9.81×10^{-6}	9.81×10^{-5}	9.81×10^{-2}	10^{-3}	1	7.36×10^{-2}	1.42×10^{-3}	10^{-4}
1 mmHG (Torr)	1.33×10^{2}	1.33×10^{-4}	1.33×10^{-3}	1.33	1.36×10^{-2}	1.36×10^{1}	1	1.93×10^{-2}	1.36×10^{-3}
1 psi	6.89×10^{3}	6.89×10^{-3}	6.89×10^{-2}	6.89×10^{1}	7.03×10^{-1}	7.03×10^{2}	5.17×10^{1}	1	7.03×10^{-2}
1 kp/cm² (at)	9.81×10^{4}	9.81×10^{-2}	9.81×10^{-1}	9.81×10^{2}	10	10^{4}	7.36×10^{2}	1.42×10^{1}	1

Definitions:

P = F/A
at = technic atmosphere
kp/cm² = kilopond / square centimeter
PA = Pascal
MPA = Mega-Pascal
N/m² = Newton / square meter
MN/m² = Mega-Newton / square meter
bar = bar
mbar = millibar
mWS = meter water column
mmWS = millimeter water column
mmHG = millimeter mercury column at 0 °C
psi = english pound / square inch

Thread overview

name	sign	example	size	used for
metric ISO-thread	M M	DIN13 - M30 DIN13 - M20x1	1 - 68 mm 1 - 1000 mm	common common (fine thread)
pipe thread, zylindrical	G	DIN ISO 228-G1 1/2 (inside) DIN ISO 228-G1 1/2 A (outside)	1/8 - 6 inch	thread is not sealing
steel-"panzerrohr" thread	Pg	DIN 40 430 - Pg 21	Pg 7 - Pg 48	used in the electronic ind.

name	sign	example	size	used in following countries
Unified Coarse Thread	UNC	1/4 - 20 UNC-2A	UNC-thread with 1/4 inch diameter, 20 pitch/inch, class 2A	USA, GB, CDN
Unified Fine Thread	UNF	1/4 - 28 UNF-3A	UNF-thread with 1/4 inch diameter, 28 pitch/inch, class 3A	USA, GB, CDN
American standart-tube-thread (conical)	NPT	3/8 - 18 NPT	NPT-thread with 3/8 inch diameter, 18 pitch/inch	USA
American conical fine tube thread	NPTF	1/2 - 14 NPTF (dryseal)	NPTF-thread with 1/2 inch diameter, 14 pitch/inch (dry sealing)	USA

Conversion factors

Temperature

°F = (°C x 1.8) + 32
°C = (°F - 32) / 1.8

0 K = -273 °C
0 °C = 273 K

Example

T = t + 273
T = 20 (°C) + 273 = 293 K

Lenght

1 inch = 1 " = 25.4 mm

Air

844 l/kg (20 °C)
1.18 kg/m^3 (20 °C)

Weight

1 gr = 0.0353 oz
1 kg = 2.2046 lb
1 t = 1.1023 short tons
1 t = 0.9842 long ton

1 oz = 28.350 gr
1 lb = 16 oz = 0.4536 kg
1 short ton = 0.9072 t
1 long ton = 1.0161 t

Conversion factors

Lenght

1 mm = 0.0394 in
1 cm = 0.3937 in
1 m = 1.0936 yd
1 km = 1000 m = 0.6214 mile

1 in = 25.4 mm
1 ft = 12 in = 0.3048 m
1 yd = 3 ft = 0.9144 m
1 mile = 1760 yd = 1.6093 km

1 inch = 1" = 25.4 mm

Volume

1 cm^3 = 0.0610 in^3
1 dm^3 = 0.0353 ft^3
1 m^3 = 1.3080 yd^3
1 l = 0.2642 US gal

1 ft^3 = 0.0283 m^3
1 yd^3 = 27 ft^3 = 0.7646 m^3
1 US gal = 3.7854 l

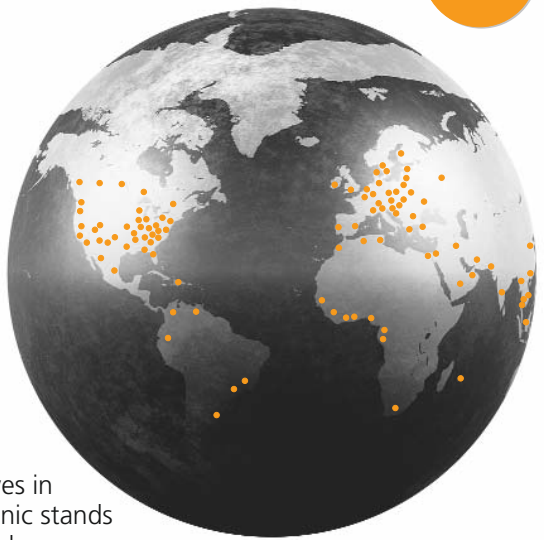
1 m^3 = 1000 l
1 cm^3 = 1000000 ml
1 dm^3 = 1 l

Air loss, Energy loss and annual costs		
hole Ø (mm)	6 bar	12 bar
1	1.2 l/s 0.3 kWh 144 Euro	1.8 l/s 1.0 kWh 480 Euro
3	11.1 l/s 3.1 kWh 1488 Euro	20.8 l/s 12.7 kWh 6096 Euro
5	30.9 l/s 8.3 kWh 3984 Euro	58.5 l/s 33.7 kWh 16176 Euro
10	123.8 l/s 33.0 kWh 15840 Euro	235.2 l/s 132.0 kWh 63360 Euro

10 m^3/h = 1 kWh
Euro / kWh = 0.06
operating hours / year = 8000

source: „Druckluft effizient" / VDI
http://www.durchluft-effizient.de/e/index.php

Category	Particles		Water		Oil
	Particulate material size (µm)	particle density (mg/m³)	pressure dew point	water content (mg/m³)	quality of oil (max. concentration mg/m³)
1	0.1	0.1	-70 °C	3	0.01
2	1	1	-40 °C	120	0.1
3	5	5	-20 °C	880	1
4	15	8	+3 °C	6000	5
5	40	10	+7 °C	7800	25
6	–	–	+10 °C	9400	–



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