



Pressure/Stress/Force/Torque

Compilation of technical data.
 PAI does not assume any responsibility.

1 inch = 25.4 mm (exact) 1 mm = 0.039 37 inches

PRESSURE AND STRESS

FLUID PRESSURE

Basic metric unit for pressure is PASCAL (Pa).

Pascal is derived from the direct relationship between the basic unit of force NEWTON (N) and the unit of area square meter (m²).

The PASCAL is very small, and it is most frequently used with prefixes:

Kilo Pascal (KPa) = 1 000 Pa Mega Pascal (MPa) = 1 000 000 Pa

100 KPa = 1 bar = 14.5 psi 1 psi = 0.068 95 bar

STRESS

For tensile strength and yield strength the recognized SI unit is the MPa.

Note: In the industrial metric countries, the term N/mm² is frequently used, this is equal to the MPa.

1 psi = 0.006 895 MPa

1 MPa = 1 N/mm² = 145 psi

FORCE

The metric unit of force is NEWTON, which is a force of about 3.6 ounces.

1 lb (force) = 4.448 N

1 N = 0.224 8 lb (force)

	Newton N	Kilo Newton KN	Kilogram Force kgf*	Pound Force lbf
Newton	1	0.001	0.102 0	0.224 8
Kilo Newton (1 000N)	1 000	1	102.00	224.8
Kilogram-force	9.807	0.009 807	1	2.204 6
Pound-force	4.448	0.004 448	0.453 6	1

*The kgf is sometimes known as the kilopound (kp)

TORQUE

The metric unit of torque is NEWTON-meter (abbreviated N-m).

1 lbf/ft = 1.356 N-m

1 N-m = 0.737 6 lbf/ft

	N-m	kgf/m	lbf/in	lbf/ft
Newton-meter	1	0.102 0	8.851	0.737 6
Kilogram-force meter	9.807	1	86.794	7.233
Pound-force inch	1.356	0.138 6	1	12.00
Pound-force foot	0.113 0	0.011 52	0.083 33	1