



**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 (m<sup>2</sup>).

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/mm<sup>2</sup> is frequently used, this is equal to the MPa.

1 psi = 0.006 895 MPa      1 MPa = 1 N/mm<sup>2</sup> = 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