WIND PRESSURE AND ITS UNITS OF MEASURE

WIND PRESSURE

$q = 0.5 * \rho * V^2$

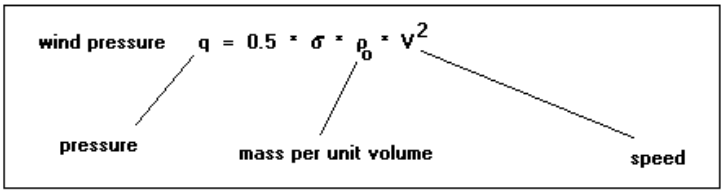
density: effects of altitude & air temperature

velocity: effects of speed as speed squared

usually "book-kept" as standard density x density ratio (to standard)

density ratio: $\sigma = (P/Po) / (T/To)$ where subscript o denotes standard values at sea level

DIMENSIONALLY-CONSISTENT UNITS OF MEASURE



q, $lb/ft^2 = \sigma * 11.89 * (V, ft/sec / 100\ ft/sec)^2$

q, $lb/ft^2 = \sigma * 25.58 * (V, mph / 100\ mph)^2$ statute

q, $lb/ft^2 = \sigma * 33.87 * (V, knots / 100\ knots)^2$ nautical

q, $N/m^2 = \sigma * 0.6125 * (V, m/sec)^2$ SI metric

q, $N/m^2 = \sigma * 7.938 * (V, kph)^2$ common metric

standard values	pressure	temperature	density
US customary	14.696 psi	59 F	.0765 lbm/ft^3
metric	101.325 KPa	15 C	1.225 kg/m^3