

Where:

P = force transmitted by the bolt, lb (kN)

F_y = published minimum yield strength of the sheet or plate, psi (MPa)

t = thickness of the thinner sheet or plate in the joint connection, in. (mm)

5.5.2 *Multiple bolt lines.* When multiple bolt lines are used, the effective net section area shall not be taken as greater than 85 percent of the gross area.

5.5.3 *Tension on the net section.* The tensile stress on the net section of a bolted connection shall not exceed the lesser of the values determined by the following formulas:

$$f_t = 0.6F_y (1.0 - 0.9r + 3rd/s) \leq 0.6F_y \quad (\text{Eq 5-4})$$

or

$$f_t = 0.40F_u \quad (\text{Eq 5-5})$$

Where:

f_t = allowable tensile stress, psi (MPa)

F_y = published minimum yield strength of the sheet or plate, psi (MPa)

r = force transmitted by the bolt or bolts at the section considered, divided by the tensile force in the member at that section. If r is less than 0.2, it may be taken to equal zero.

d = diameter of bolt in inches (mm)

s = spacing of bolts perpendicular to line of stress in inches (mm)

F_u = published minimum ultimate strength of the sheet or plate, psi (MPa)

5.5.4 *Hole bearing stress.* The hole bearing stress on the area $d \times t$ shall not exceed $1.35F_y$. The symbols d and F_y are as defined in Sec. 5.5.3; t is the thickness of the sheet or plate under consideration.

5.5.5 *Bolt shear.* Shear on bolts in live and dead loads shall not exceed the value as determined from the formula

$$f_v = F_u (0.6)(0.9)/2.2 \leq 0.25 F_u \quad (\text{Eq 5-6})$$

Where:

f_v = allowable shear stress to the affected area, whether tensile stress area or gross area, psi (MPa)

F_u = published minimum tensile strength of bolt, psi (MPa)

5.5.6 *Bolt tension.* The tensile stress on the tensile stress area of bolts, other than anchor bolts, shall not exceed the lesser of the following: