

Thread shear Area

18-8 SS 10-24 Thread 2" long

$$A_{th} = .577 L_e (D - .64952 P)$$

$$L_e = 2.19$$

Min tensile strength = 72,000 psi

$$D = .1900 \text{ in}$$

$$P = \frac{1}{24} \text{ threads/inch}$$

$$(.577)(2.19)(.1900 \text{ in} - (.64952)\left(\frac{1}{24}\right))$$

$$A_{th} = .511 \text{ in}^2 \text{ per screw}$$

Shear area for internal thread

$$A_n = n L_e (D_s \text{ min}) \left(\frac{1}{n} + .57735 (D_s \text{ min} - E_{\text{max}}) \right)$$

$$n = 24 \text{ threads}$$

$$L_e = 2 - .25 = 1.75 \text{ in}$$

Worst case = No counter bore

$$(24)(1.75 \text{ in})(.188 \text{ in}) \left(\frac{1}{24} + .57735 (.188 \text{ in} - .1901 \text{ in}) \right)$$

$$D_{\text{min}} = .188 \text{ in}$$

$$E_{\text{max}} = \text{Max major diameter} + .001 = .1901 \text{ in}$$

$$A_n = .01603 \text{ in}^2$$

Max force = 20 lbs = full load of base

$$\tau_{th} = \frac{F}{A} = \frac{20 \text{ lb}}{.511 \text{ in}^2} = 39.13 \text{ psi}$$

$$\tau_n = \frac{20 \text{ lb}}{.01603} = 1247.66 \text{ psi}$$

Shear Strength	:	PVC: 1,240 psi	>	τ_{PVC}	} No failure
		SS: 85,000 psi	>	τ_{screws}	

SIGNATURE

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DATE

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