

c)

$$\alpha = 3.94$$

$$\gamma_t = 1 - \frac{2.25}{7} [2.168 - 1 + 3.94(1.22 - 1)] = 0.346$$

(1) CORE AB:

$$\frac{F}{\dot{m}_c + \dot{m}_f} = \frac{293.92}{1 + 3.94} \left\{ \left[\frac{2}{\gamma - 1} \frac{8}{(2.25)(2.168)(0.346)} (2.25(2.168)(0.346) - 1) \right]^{\frac{1}{2}} - 2.5 \right. \\ \left. + 3.94 \left[\left[\frac{2}{\gamma - 1} (2.25(1.22) - 1) \right]^{\frac{1}{2}} - 2.5 \right] \right\}$$

$$\frac{F}{\dot{m}_c + \dot{m}_f} = \underline{\underline{197.9}} \frac{\text{N}\cdot\text{s}}{\text{kg}}$$

$$f = \frac{(1000)(215)}{4.43(10)^7} [8 + 3.94(2.25)(1.22) - (1 + 3.94)2.25]$$

$$f = 0.0374$$

$$S = \frac{0.0374(10)^6}{(1 + 3.94)197.9} = \underline{\underline{38.23}} \frac{\text{mg}}{\text{N}\cdot\text{s}}$$

(2) FAN AB:

$$\frac{F}{\dot{m}_c + \dot{m}_f} = \frac{293.92}{1 + 3.94} \left\{ \left[\frac{2}{\gamma - 1} \frac{7}{(2.25)(2.168)} (2.25(2.168)(0.346) - 1) \right]^{\frac{1}{2}} - 2.5 \right. \\ \left. + 3.94 \left[\left[\frac{2}{\gamma - 1} \frac{8}{(2.25)(1.22)} (2.25(1.22) - 1) \right]^{\frac{1}{2}} - 2.5 \right] \right\}$$

$$\frac{F}{\dot{m}_c + \dot{m}_f} = \underline{\underline{579.5}} \frac{\text{N}\cdot\text{s}}{\text{kg}}$$

$$f = \frac{(1000)(215)}{4.43(10)^7} [7 + 3.94(8) - (1 + 3.94)2.25]$$

$$f = 0.133$$

$$S = \frac{0.133(10)^6}{(1 + 3.94)579.5} = \underline{\underline{46.46}} \frac{\text{mg}}{\text{N}\cdot\text{s}}$$

(3) BOTH AB'S:

$$\frac{F}{\dot{m}_c + \dot{m}_f} = \frac{293.92}{1 + 3.94} \left\{ \left[\frac{2}{\gamma - 1} \frac{8}{(2.25)(2.168)(0.346)} (2.25(2.168)(0.346) - 1) \right]^{\frac{1}{2}} - 2.5 \right. \\ \left. + 3.94 \left[\left[\frac{2}{\gamma - 1} \frac{8}{(2.25)(1.22)} (2.25(1.22) - 1) \right]^{\frac{1}{2}} - 2.5 \right] \right\}$$

$$\frac{F}{\dot{m}_c + \dot{m}_f} = \underline{\underline{687.52}} \frac{\text{N}\cdot\text{s}}{\text{kg}}$$

$$f = \frac{(1000)(215)}{4.43(10)^7} [8 + 3.94(8) - (1 + 3.94)2.25] = 0.1379$$

$$S = \frac{0.1379(10)^6}{(1 + 3.94)687.52} = \underline{\underline{40.59}} \frac{\text{mg}}{\text{N}\cdot\text{s}}$$