$$\dot{m} = \frac{\Gamma}{\sqrt{R}} \frac{P_{t8}}{\sqrt{T_{t8}}} A_8 = \frac{0.6847}{\sqrt{287 \frac{m^2}{s^2 K}}} \frac{973{,}266.5 \frac{kg}{m s^2}}{\sqrt{1500 K}} 0.5\ m^2$$

$$\dot{m} = 507.83\ \frac{kg}{s}$$

$$F = \frac{F}{\dot{m}} \dot{m} = 493.85 \frac{m}{s}\ 507.83 \frac{kg}{s} = 250{,}792\ N$$

c)

$$S = \frac{f}{F/\dot{m}} \qquad (\text{with } \tau_c = 1)$$

$$f = \frac{C_p T_0}{h} (\tau_\lambda - \tau_r) = \frac{1004.9 \frac{J}{kg K}\ 223.26 K}{4.4 \times 10^7 \frac{J}{kg}} (6.72 - 2.8)$$

$$f = 0.019988$$

$$S = \frac{0.019988}{493.85\ m/s} = 4.04736 \times 10^{-5}\ s/m$$

$$S = \frac{\dot{m}_f}{F} \Rightarrow \dot{m}_f = SF = 4.04736 \times 10^{-5} \frac{s}{m} \times 250{,}792 \frac{kg}{s}$$

$$\dot{m}_f = 10.15\ \frac{kg}{s}$$