Exposurción 3

1) $F = p \cdot A$

$A = \dfrac{F}{p} \approx$

$D = \sqrt{\dfrac{\sqrt{F}}{\pi p}}$

$\therefore \boxed{I = \dfrac{\pi d^4}{64}}$

Esbeltez $= l_h \sqrt{\dfrac{A}{I}}$

$= 100 \sqrt{\dfrac{\frac{\pi d^2}{4}}{\frac{\pi d^2}{64}}}$

$P_{cr} = \dfrac{\pi^2 \varepsilon \cdot I}{L^2 \cdot 14} = F \cdot F_S$

2') $S_u = \dfrac{\pi D^2}{4}$

$A = \dfrac{0.81}{90 mm} = \boxed{0.09 m^2}$

$3000 N = 0.81 \left(\dfrac{\pi D^2}{4} \right)$

$\dfrac{\sqrt{4(0.009)}}{\pi^2} = 107 mm$

2) $Q = 2 \left(\dfrac{0.0871 \varepsilon}{0.987} \right) \left(\dfrac{\pi (0.03)^2 (0.05)}{40\,000\,C} \right) (9) = 5.7925 \times 10^{-9}$ dm^3/mm

$\sqrt{\left(\dfrac{0.987 + 0}{0.997} \right) \left(\dfrac{0.05(9)}{100} \right)} = 4.0974 \times 10^{-2}$ m/s

3) $19\ dm^3/min = \left(\dfrac{0.987 + P}{0.987} \right) \left(\dfrac{\pi (0.036)^2 (1.4)}{400000} \right) (7)$

$\therefore \boxed{P = 1.88 \times 10^9\ bar}$