

Pressure Vessel

Bolt Safety

10/22/13

Assume: ASME PV Code VIII-1 sect U1(c) 2
h(c) Press < 15 psi Dim 6" = 152 mm

Cylinder ϕ 152 mm $\times$ 902 mm

$$Vol = \frac{\pi d^2}{4} L = \left(\frac{\pi}{4}\right) (0.152 \text{ m})^2 (0.912 \text{ m})$$

$$V = 0.016549 \text{ m}^3$$

Find: Number of moles of Ideal gas @ 20°C / atm in V.

$$PV = nRT$$

$$\text{where } P = 101,325 \text{ Pa}$$

$$R = 8.3144621 \frac{\text{J}}{\text{mole K}}$$

$$T = 20^\circ\text{C} + 273 = 293^\circ\text{K}$$

Then

$$n = \frac{PV}{RT} = \frac{(101,325)(0.016549)}{(8.3144621)(293)} = \underline{\underline{0.688314 \text{ moles}}}$$