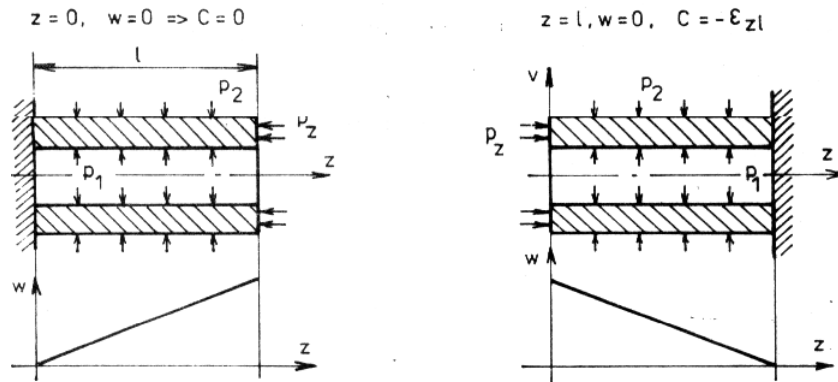
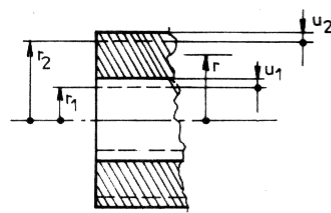


Válcové těleso¹

A) deformační zatížení



Obr. 60



Obr. 61

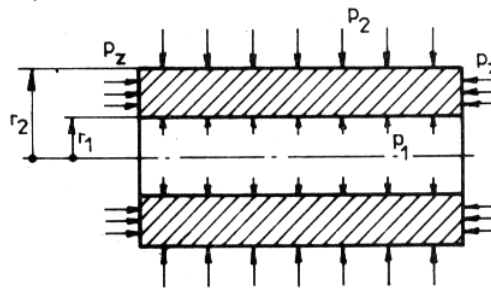
- 1) $r = r_1$
 $u = u_1$
- 2) $r = r_2$
 $u = u_2$
- 3) $w = \Delta l$

$$u = + \frac{r_2 u_2 - r_1 u_1}{r_2^2 - r_1^2} r + (r_2 u_1 - r_1 u_2) \frac{r_1 r_2}{r_2^2 - r_1^2} \frac{1}{r} \quad (5.16)$$

$$\sigma_r = \frac{E}{1 + \mu} \left[\frac{1}{1 - 2\mu} \frac{r_2 u_2 - r_1 u_1}{r_2^2 - r_1^2} \mp (r_2 u_1 - r_1 u_2) \frac{r_1 r_2}{r_2^2 - r_1^2} \frac{1}{r^2} + \frac{\mu}{1 - 2\mu} \frac{\Delta l}{l} \right] \quad (5.17)$$

$$\sigma_z = \frac{E}{1 + \mu} \left[\frac{2\mu}{1 - 2\mu} \frac{r_2 u_2 - r_1 u_1}{r_2^2 - r_1^2} + \frac{1 - \mu}{1 - 2\mu} \frac{\Delta l}{l} \right] \quad (5.18)$$

B) Silové zatížení



Obr. 63

$$\sigma_r = \frac{p_1 r_1^2 - p_2 r_2^2}{r_2^2 - r_1^2} - (p_1 - p_2) \frac{r_1^2 r_2^2}{r_2^2 - r_1^2} \frac{1}{r^2}$$

$$\sigma_t = \frac{p_1 r_1^2 - p_2 r_2^2}{r_2^2 - r_1^2} + (p_1 - p_2) \frac{r_1^2 r_2^2}{r_2^2 - r_1^2} \frac{1}{r^2} \quad (5.20)$$

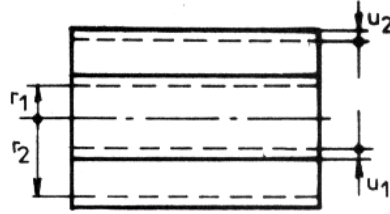
$$\sigma_z = -p_z$$

¹ Ondráček, E., Vrbka, J., Janíček, P. Mechanika těles, Pružnost a pevnost II, skriptum VUT v Brně, str. 94 – 105, 1991.

$$u = \frac{1-\mu}{E} \frac{p_1 r_1^2 - p_2 r_2^2}{r_2^2 - r_1^2} r + \frac{1+\mu}{E} (p_1 - p_2) \frac{r_1^2 r_2^2}{r_2^2 - r_1^2} \frac{1}{r} + \frac{\mu}{E} p_z r \quad (5.21)$$

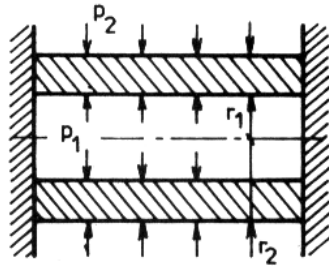
C) Kombinované okrajové podmienky

Obr. 70



$$\frac{\Delta l}{l} = - \frac{2\mu}{1-\mu} \frac{(r_2 u_2 - r_1 u_1)}{r_2^2 - r_1^2}$$

$$\sigma_{r_i} = E \left[\frac{1}{1-\mu} \frac{r_2 u_2 - r_1 u_1}{r_2^2 - r_1^2} \mp \frac{1}{1+\mu} (r_2 u_1 - r_1 u_2) \frac{r_1 r_2}{r_2^2 - r_1^2} \frac{1}{r^2} \right] \quad (5.32)$$



$$\sigma_{r_i} = \frac{p_1 r_1^2 - p_2 r_2^2}{r_2^2 - r_1^2} \mp (p_1 - p_2) \frac{r_1^2 r_2^2}{r_2^2 - r_1^2} \frac{1}{r^2} \quad (5.33)$$

$$\sigma_z = 2\mu \frac{p_1 r_1^2 - p_2 r_2^2}{r_2^2 - r_1^2}$$

$$u = \frac{(1+\mu)(1-2\mu)}{E} \frac{p_1 r_1^2 - p_2 r_2^2}{r_2^2 - r_1^2} r + \frac{1+\mu}{E} (p_1 - p_2) \frac{r_1^2 r_2^2}{r_2^2 - r_1^2} \frac{1}{r} \quad (5.34)$$