FIZYKA DREWNA - spis najważniejszych wzorów

Wilgotność

$$W_o = \frac{m_{\mathrm{H_2O}}}{m_o} = \frac{m_w - m_o}{m_o} = \frac{m_w}{m_o} - 1$$

$$W_o = \frac{W_w}{1 - W_w}$$

$$W_w = \frac{m_{\mathrm{H_2O}}}{m_w} = \frac{m_w - m_o}{m_w} = 1 - \frac{m_o}{m_w}$$

$$W_w = \frac{W_o}{1 + W_o}$$

$$W_r = \frac{120}{t_s - t_m + 5} \qquad W_r = \frac{115}{t_s - t_m + 4}$$

$$W_{r(20^o\mathrm{C})} = 3{,}3066\, e^{0{,}0197\varphi}$$

$$W_{r(t^{\circ}\mathrm{C})} = W_{r(20^{\circ}\mathrm{C})} \cdot \left[1 - 0{,}00772\,(t - 20)\right]$$

Pęcznienie

$$k_o = \frac{a_y - a_x}{a_o}; \quad K_o = \frac{a_{\mathrm{pnw}} - a_o}{a_o}; \quad K_o = \frac{K_w}{1 - K_w};$$

$$K_{ov} = (1 + K_{or}) \cdot (1 + K_{ot}) \cdot (1 + K_{ol}) - 1$$

$$\alpha = \frac{K_o}{W_{\mathrm{pnw}}} = \frac{a_x - a_y}{a_o\,(W_x - W_y)}; \quad \alpha = \frac{\beta}{1 - \beta\, W_{\mathrm{pnw}}}$$

$$K_{o\eta} = K_{or} \cos^2 \eta + K_{ot} \sin^2 \eta$$

$$W_x, W_y \in <0, W_{\mathrm{pnw}} > \ \text{i} \ W_x > W_y$$

$$K_{ov} = (1 + K_{or})(1 + K_{ot})(1 + K_{ol}) - 1$$

$$\alpha_\eta = \alpha_r \cos^2 \eta + \alpha_t \sin^2 \eta$$

Kurczenie

$$K_{wv} = 1 - (1 - K_{or})(1 - K_{ot})(1 - K_{ol})$$

$$k_w = \frac{a_y - a_x}{a_{\mathrm{pnw}}}; \quad K_w = \frac{a_{\mathrm{pnw}} - a_o}{a_{\mathrm{pnw}}}; \quad K_w = \frac{K_o}{1 + K_o};$$

$$\beta = \frac{K_w}{W_{\mathrm{pnw}}} = \frac{a_x - a_y}{a_{\mathrm{pnw}}\,(W_x - W_y)}; \quad \beta = \frac{\alpha}{1 + \alpha\, W_{\mathrm{pnw}}}$$

$$K_{w\eta} = K_{wr} \cos^2 \eta + K_{wt} \sin^2 \eta$$

$$W_x, W_y \in <0, W_{\mathrm{pnw}} > \ \text{i} \ W_x > W_y$$

$$K_{wv} = 1 - (1 - K_{wr})(1 - K_{wt})(1 - K_{wl})$$

$$\beta_\eta = \beta_r \cos^2 \eta + \beta_t \sin^2 \eta$$

Gęstość, objętość, porowatość

$$g_o = \frac{m_o}{V_o}; \quad g_w = \frac{m_w}{V_w}; \quad g_u = \frac{m_o}{V_{\mathrm{pnw}}}$$

$$V_w = V_o (1 + \alpha_v \cdot W) \ \text{dla} \ W < W_{pnw} \qquad V_w = V_o\,(1 + K_{ov}) \ \text{dla} \ W \geq W_{\mathrm{pnw}}$$

$$g_w = \frac{g_o (1 + W)}{1 + \alpha_v W} \ \text{dla} \ W < W_{pnw} \qquad g_w = \frac{g_o\,(1 + W)}{1 + K_{ov}} \ \text{dla} \ W \geq W_{\mathrm{pnw}}$$

$$C_o + D_o = 1; \qquad D_o = \frac{g_o}{g_s}; \qquad C_o = \frac{g_s - g_o}{g_s} \qquad g_u = g_o\,(1 - K_{wv})$$

$$C_w + D_w = 1; \qquad D_w = \frac{g_u}{g_s}; \qquad C_w = \frac{g_s - g_u}{g_s} \qquad g_o \approx \frac{K_{wv}\ g_{\mathrm{H_2O}}}{W_{\mathrm{pnw}}}$$

Nasiąkliwość

$$W_{\max} = W_{\mathrm{pnw}} + g_{\mathrm{H_2O}}\, \frac{g_s - g_o}{g_s\ g_o} = 0{,}3 + \frac{1500 - g_o}{1{,}5\, g_o} \qquad m_{\mathrm{H_2O}\max} = m_{w\max} - m_o$$

$$W_{\max} = \frac{g_{\mathrm{H_2O}}}{g_u} - \frac{g_{\mathrm{H_2O}}}{g_s} = \frac{1000}{g_u} - 0{,}67 \qquad S = \frac{W}{W_{\max}}$$

$$W_{\max} = \frac{g_{\mathrm{H_2O}}\,[g_s - g_o\,(1 - K_{wv})]}{g_s\ g_o\,(1 - K_{wv})} = \frac{1500 - g_o\,(1 - K_{wv})}{1{,}5\, g_o\,(1 - K_{wv})} \qquad v_n = \frac{\Delta W}{\Delta \tau}$$

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