KOLOKVIJ – NAČRTOVANJE TKANIN

① PODATKI:

$N = 2.000$ niti $K_{c_2} = 500$ navitkov

$\ell = 3000$ m (dolžina tkanine)

$T_t = 25$ tex   PASOVNO SNOVANJE

$V_s = 8$ niti

$K_{c_1} = 400$ navitkov

CEVČNICA = ?

a) $X = \dfrac{K_{c_1}}{V_s} = \dfrac{400 \text{ navitkov}}{8 \text{ niti}} = \underline{\underline{50}}$

$X_2 = \dfrac{K_{c_2}}{V_s} = \dfrac{500 \text{ navitkov}}{8 \text{ niti}} = \underline{\underline{62,5}}$

barvno sosledje (50x po 8 niti se ponavlja)
barvni vzorec

b) $Y_1 = X_1 \cdot V_s = 50 \times 8 = \underline{\underline{400}} \text{ navitkov}$

$Y_2 = X_2 \cdot V_s = 62 \times 8 = \underline{\underline{496}} \text{ navitkov}$ ×

c) $z_1 = \dfrac{M}{Y_1} = \dfrac{2000 \text{ niti}}{400} = \underline{\underline{5 \text{ pasov}}}$

$z_2 = \dfrac{M}{Y_2} = \dfrac{2000 \text{ niti}}{496} = 4,03 \rightarrow \underline{\underline{4 \text{ pasovi}}}$

d) $O_1 = M - z_1 \cdot Y_1 = 2000 \text{ niti} - 5 \cdot 400 = \underline{\underline{0}}$

$O_2 = M - z_2 \cdot Y_2 = 2000 \text{ niti} - 4 \cdot 496 = \underline{\underline{16}} \text{ niti (v petem pasu)}$

e) $\eta_1 = \dfrac{z_1 \cdot Y_1 + O}{K_c \cdot (z_1 + 1)} \cdot 100 = \dfrac{5 \cdot 400 + 0}{400 \cdot (5)} \cdot 100 = \underline{\underline{100\%}}$

$\eta_2 = \dfrac{z_2 \cdot Y_2 + O}{K_{c_2}(z_2 + 1)} \cdot 100 = \dfrac{4 \cdot 496 + 16}{500 \, (4 + 1)} \cdot 100 = \underline{\underline{80\%}}$

ODG: Izberemo cevčnico s kapaciteto 400 navitkov, ker ni ostankov.

② $m = 2\,kg$ (masa navitka)

$\ell =$ dolžina niti na navitku

$$T_t = \frac{m \cdot 10^3}{\ell} \Rightarrow \ell = \frac{m \cdot 10^3}{T_t} = \frac{2000g \cdot 10^3}{25\,tex} = \underline{\underline{80000\,m}}$$

(na vsakem navit[ku]

Iporabljene preje $= 5\,pasov \times 3000m = \underline{15000\,m\ preje}$

$l_o = l - l_{por} = 80000\,m - 15000\,m = \underline{65\,000\,m}$

③ PODATKI :   SKICA :

$K_{bar.apar.} = 100\,kg$

$\check{s}t.\ nav = 50$

$d_{minc} = 3,15\,cm$ $(\longleftrightarrow)$

$d_{max\,n} = 30\ cm$

$\rho_{nav} = ?\ \ [g/cm^3]$

$\rho = \frac{m}{V}$
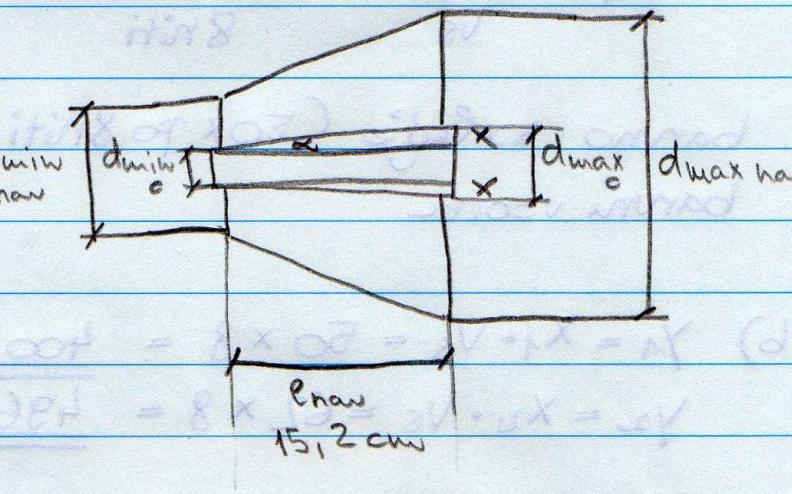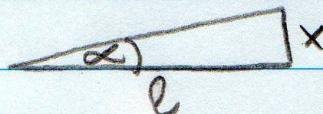
$d_{max} = d_{minc} + 2x = d_{min} + 2 \cdot \ell \cdot \tan\alpha = 3,15cm + 2 \cdot 15,2\,cm \cdot$

$\cdot \tan 4,2 = \underline{\underline{5,38\,cm}}$

$d_{src} = \frac{d_{cmax} + d_{cmin}}{2} = \frac{5,38cm + 3,15cm}{2} = \underline{\underline{4,27}\ cm}$

$d_{min\,nav} = d_{maxc} - 2x = 30cm - 2 \cdot \tan 4,2 \cdot 15,2\,cm = \underline{\underline{27,77\,cm}}$

$d_{sr\,nav} = \frac{d_{max} + d_{min}}{2} = \frac{27,77 + 30}{2} = \underline{\underline{28,88}\ cm}$

$V_p = V_{nav} - V_c = \underline{\underline{9739,32\ cm^3}}$

$$V_{nav} = \pi \cdot \ell \cdot r^2 = \pi \cdot 15{,}2 \, cm \cdot \left(\frac{28{,}88}{2}\right)^2 = 9956{,}98 \, cm^3$$

$$V_c = \pi \cdot 15{,}2 \, cm \cdot \left(\frac{4{,}27}{2}\right)^2 = 217{,}66 \, cm^3$$

$$\varrho = \frac{2000 \, g}{9739{,}52 \, cm^3} = 0{,}21 \, g/cm^3$$

$$V = o \cdot V =$$
$$= \pi r^2 \cdot \ell$$
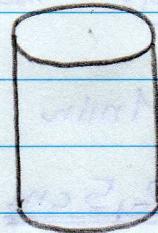
④ PODATKI :

$m = 0{,}3 \, kg$

$n = 250 \, obr/min$

$\check{s}_{tk} = 180 \, cm$

$g_o = g_v = 20 \, votkov/cm$

$\varepsilon_o = \varepsilon_v = 5\%$

$T_{to} = T_{tv}$

$T_{tv} = ?$

$m_v = ?$

$V_{vna\check{s}.} = ?$

1) $m_v = \ell_{tk} \cdot \check{s}_{tk} \cdot g_v \cdot \frac{100 + \varepsilon_v}{100} \cdot$
$\cdot T_{tv} \cdot 10^{-3}$

$m_{tk} = m_o + m_v$

$m_{tk} = 2 \cdot m_v$

tekoči $m = 1m$, ki se odvije z
blagovnega valja

$\ell_{tk} \cdot 1m$
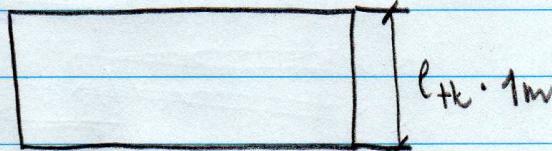
$\check{s}_{tk} = 1{,}8 \, m$

$$m_v = \ell_{tk} \cdot \overbrace{\check{s}_{tk}}^{N} \cdot g_v \cdot \frac{100 + \varepsilon_v}{100} \cdot T_{tv} \cdot 10^{-3} =$$
$$\underset{[cm]}{}$$

$$= 100 \, cm \cdot 1{,}8 \, m \cdot 20 \, v/cm \cdot \frac{100 + 5}{100} \cdot T_{tv} \cdot 10^{-3} =$$

$$= 3{,}78 \cdot T_{tv} = 3{,}78 \cdot 40 \, tex = \underline{151{,}2 \, g}$$

$$m_o = \overbrace{g_o}^{N} \cdot \ell_{tk} \cdot \overset{[m]}{\check{s}_{tk}} \cdot \frac{100 + \varepsilon_o}{100} \cdot T_{to} \cdot 10^{-3} =$$
$$\underset{[cm]}{}$$

$$= 1m \cdot 180 \, cm \cdot 20 \, v/cm \cdot \frac{100 + 5}{100} \cdot T_{to} \cdot 10^{-3} = \underline{3{,}78 \cdot T_{to}}$$

$$m_{tk} = m_o + m_v = 2 \cdot (3{,}78 \cdot T_{tex})$$

$$T_{tex} = \frac{m_{tk}}{7{,}56} = \frac{300 \, g}{7{,}56} = 39{,}86 \cong \underline{40 \, tex}$$

$t = 60s$ $g_v = 20\,v/cm$ $v = \dfrac{\ell}{t}$

$250\,v \ldots 1\,min$

$\dfrac{250}{20} = \underline{12{,}5\,cm/min}$

⑤ PODATKI: $\qquad P_p = T_{tex} \cdot \eta \cdot v \cdot t \cdot \boxed{i} \cdot 10^{-6}$

$M_{pr} = 300\,kg/h$ $\qquad\qquad\qquad\qquad$ št. previjalnih mest

$5\%\ izg.$

$V_{pr} = 850\,m/min$ $\qquad\qquad i = \dfrac{P_p \cdot 10^6}{T_{tex} \cdot \eta \cdot v \cdot t} =$

$\eta = 75\%$

$T_{tex} = 25\,tex$

$\dfrac{10\%\ rezerve}{i = ?}$ $\qquad = \dfrac{315\,kg \cdot 10^6}{25\,tex \cdot 0{,}75 \cdot 850\,m/min \cdot 60} =$

$\qquad\qquad\qquad\qquad = 329{,}41 \approx \underline{330}\ prev.\ mest$

$\qquad\qquad\qquad\qquad 330 \cdot 1{,}1 = \underline{363}\ prev.\ mest$

$\qquad\qquad\qquad\qquad 300\,kg \cdot 1{,}05 = 315\,kg = P_p$