

Низкотемпературная коррозия воздухоподогревателя

Вариант 3 (мазут)

$$\alpha_T := 1.05 \quad q_f := 5.3 \frac{\text{МВт}}{\text{м}^2} \quad Q_{\text{н.п.}} := 38.9 \frac{\text{МДж}}{\text{кг}} \quad S_{\text{п.}} := 3 \%$$

$$t_{\text{п.с.}} = 50 + 250 \cdot (S_{\text{п.}})^{0.5} \cdot (O_{2\text{.r.}})^{0.25} \cdot \left(\frac{q_f}{3.5}\right)^{0.5}$$

$$S_{\text{п.}} := \frac{S_{\text{п.}}}{Q_{\text{н.п.}}} \quad S_{\text{п.}} = 0.077 \frac{\% \cdot \text{кг}}{\text{МДж}} \quad O_{2\text{.r.}} := \frac{21(\alpha_T - 1)}{\alpha_T} \quad O_{2\text{.r.}} = 1 \%$$

$$t_{\text{п.с.}} := 50 + 250 \cdot (S_{\text{п.}})^{0.5} \cdot (O_{2\text{.r.}})^{0.25} \cdot \left(\frac{q_f}{3.5}\right)^{0.5} \quad t_{\text{п.с.}} = 135.434 \text{ } ^\circ\text{C}$$

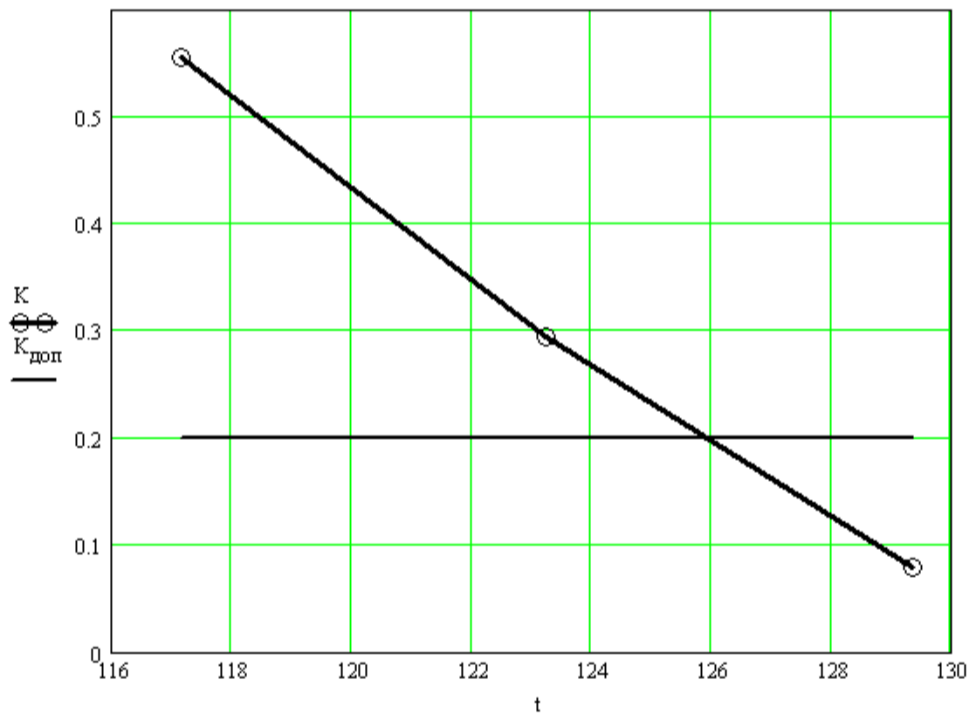
$$m := 0.8$$

$$K_{\text{max}} := 1.2 \cdot m \cdot \left(\frac{t_{\text{п.с.}}}{145}\right)^4 \quad K_{\text{max}} = 0.731 \frac{\text{мм}}{\text{год}}$$

$$t_{\text{МСК}} := 0.82 \cdot t_{\text{п.с.}} \quad t_{\text{МСК}} = 111.056 \text{ } ^\circ\text{C}$$

$$\delta := \begin{pmatrix} 0.25 \\ 0.50 \\ 0.75 \end{pmatrix} \quad t := \delta \cdot (t_{\text{п.с.}} - t_{\text{МСК}}) + t_{\text{МСК}} \quad t = \begin{pmatrix} 117.15 \\ 123.245 \\ 129.339 \end{pmatrix} \text{ } ^\circ\text{C}$$

$$K := K_{\text{max}} \left[1 - 13.5 \cdot \left(\frac{t}{t_{\text{п.с.}}} - 0.82\right)^{1.5} \right]^2 \quad K = \begin{pmatrix} 0.554 \\ 0.295 \\ 0.08 \end{pmatrix} \frac{\text{мм}}{\text{год}} \quad K_{\text{доп}} := 0.2 + 0 \cdot t$$



$$t_{\text{ст.}} := 125.9 \text{ } ^\circ\text{C} \quad \theta_{\text{yx}} := 130 \text{ } ^\circ\text{C}$$

Первое приближение $t_{\text{ВП}} := 30 \text{ } ^\circ\text{C}$

Given

$$t_{\text{ВП}} = t_{\text{ст.}} - \frac{\theta_{\text{yx}} - t_{\text{ВП}}}{1 + 1.8}$$

$$\text{Find}(t_{\text{ВП}}) = 123.622 \quad t_{\text{ВП}} = 123.6 \text{ } ^\circ\text{C}$$

$$t_{\text{п.с.}} = 135.434 \text{ } ^\circ\text{C}$$

$$K_{\text{max}} = 0.731 \quad K_{\text{доп}} := 0.2$$

$$y_{\text{max}} := \frac{K_{\text{доп}}}{K_{\text{max}}} \quad y_{\text{max}} = 0.274$$

$$\delta := \left(1 - y_{\text{max}} \right)^{\frac{2}{3}} \quad \delta = 0.61$$

$$t_{\text{доп}} := t_{\text{п.с.}} \cdot (0.82 + 0.18 \cdot \delta) \quad t_{\text{доп}} = 125.934 \text{ } ^\circ\text{C}$$