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Rédiger votre note de calcul sur une double feuille.

## CUVE DE STOCKAGE

### Présentation générale :

Une entreprise qui fabrique des cuves horizontales de longueur importante (pouvant dépasser les 10m de long) souhaite dimensionner la cuve suivante :





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on cherche

$$e_{\text{just}} = \text{Max}(e_s, e_y, e_b)$$

\* Calcul de  $e_s$

$$e_s = \frac{p \times R}{2 \times f - 0,5 \times p} = \underline{5,6 \text{ mm}}$$

\* Calcul de  $e_y$ :

$$D_i = D_e - 2 \times \frac{e_{\text{vital}}}{e_s} = 950 - 2 \times 9,25 = 931,5 \text{ mm}$$

$$e_y = \beta \times (0,75 \times R + 0,2 \times D_i) \times \frac{p}{f}$$

2/5

$$= 0,14 \cdot \sqrt{340 \times 35 \times 9,25} = 13,15$$

on a  $d > 0,14 \cdot \sqrt{D_{m \times e}}$  donc on doit bien vérifier la résistance de l'enveloppe comportant une ouverture :  
il faut que  $S_x \cdot (f - 0,5 \cdot p) + S_t \cdot (f - 0,5 \cdot p) \geq p \cdot G$

Calculons S

$$S = e \cdot L$$

Déterminons  $k_0$  :

$$k_0 = \frac{d}{\sqrt{D_{m \times e}}} = \frac{108}{\sqrt{1940,75 \times 9,25}} = 1,15$$

donc  $k_0 = 1$

d'où  $L = k_0 \cdot \sqrt{D_{m \times e}} = 33,21 \text{ mm}$ ,  $S = 9,25 \times 33,21 = 867,19 \text{ mm}^2$

Calculons  $S_t$  :  $S_t = e_t \cdot (l_t - e_n)$   $l_t = 95 - 5 = 90 \text{ mm}$ ,  $e_n = 3,6 \text{ mm}$

$l = \min(\sqrt{d_m \cdot e_t}, l_t)$   $e_t = e_n - 0,125 e_n = 3,15 \text{ mm}$

$d_m = d_e - e_t = 108 - 3,15 = 104,85 \text{ mm}$ ;  $\sqrt{d_m \cdot e_t} = 18,17$

d'où  $l = \min(\sqrt{104,85 \times 3,15}, 90) = 18,17 \text{ mm}$



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