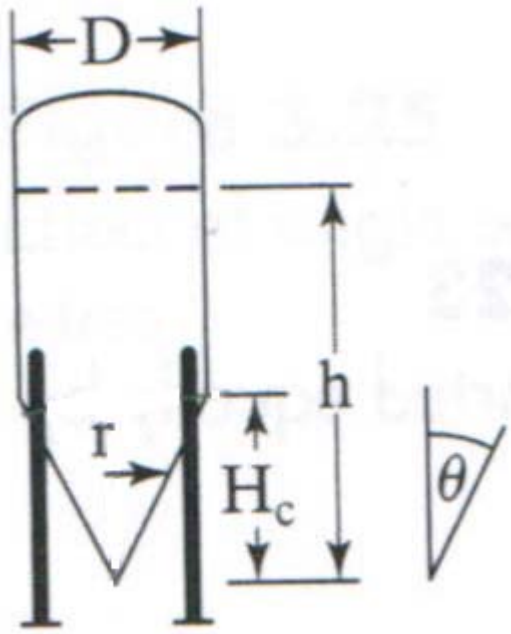
Volumen and Mass of a Substance in a Storage Tank



If height of solid is less than height of conical section:

$$Vc = \left(\frac{1}{3}\cdot\pi\cdot r^2\cdot h\right)$$

If height of solid is larger than height of conical section:

$$V = \frac{1}{3}\cdot\pi\cdot R^2\cdot H_c + \pi\cdot R^2\cdot\left(h - H_c\right)$$

with $R = \frac{D}{2}$

and $r = h\cdot\tan\theta$

$D := 12\,ft$

$\theta := 30\,deg$

$\rho_a := 20\,\frac{lb}{ft^3}$

$R := \frac{D}{2}$

$H_c := \frac{R}{\tan(\theta)}$

$H_c = 10.392\,ft$ $\quad$ $h := 21\,ft$

$r := h \cdot \tan(\theta)$

$V_c := \frac{1}{3} \cdot \pi \cdot r^2 \cdot h$

$V_h := \frac{1}{3} \cdot \pi \cdot R^2 \cdot H_c + \pi \cdot R^2 \cdot (h - H_c)$

$V := if(h < H_c, V_c, V_h)$

$V = 1591.48\,ft^3$

$m := \rho_a \cdot V$

$m = 31829.65\,lb$