Kap 6

Massetetthet

$$\rho = \frac{m}{V}$$

m ← masse [kg]

V ← volum [m^3] [dm^3]

ρ ↑ Symbol for massetetthet

Eks:

Vann: $\rho_V = 1{,}0 \frac{kg}{dm^3}$

$= 1{,}0 \cdot 10^3 \frac{kg}{m^3}$

$1{,}0\ m^3 = 10^3\ dm^3 = 10^3\ dm^3$

Massetettheten for de forskjellige stoffene står i tabell s. 13 og 14

Eks:

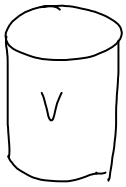
Vann: $0{,}998 \cdot 10^3 \frac{kg}{m^3}$

Tallet — Benevnelse

$0{,}998 \frac{kg}{dm^3}$

Massetettheten kan også regnes ut ved å finne massen [kg] og volum [dm^3]

6.02

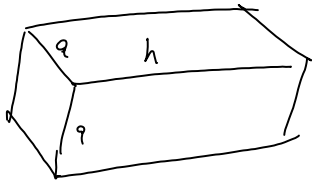


$V = \pi r^2 \cdot h$

$r = \frac{2,471}{2}\,cm = 1,2355\,cm$

(se hjemmeside)

6.03



$V = a^2 \cdot h$

$a = 11,4\,[mm]$

$a_{max} = 11,4 + 0,2 = 11,6\,[mm]$

$a_{min} = 11,4 - 0,2 = 11,2\,[mm]$

$h = 63,7\,[mm]$

$h_{max} = 63,7 + 0,3 = 64,0\,[mm]$

$h_{min} = 63,7 - 0,3 = 63,4\,[mm]$

$m = 65,85\,g$

$m_{max} = 65,85 + 0,05 = 65,90\,g$

$m_{min} = 65,85 - 0,05 = 65,80\,g$

$$\rho_{min} = \frac{m_{min}}{V_{max}} = \frac{0,06580\,[kg]}{a_{max}^2 \cdot h_{max}} = \frac{0,06580\,[kg]}{(0,0116)^2 \cdot 0,064\,[m^3]} = 7629\left[\frac{kg}{m^3}\right]$$

$$\rho_{max} = \frac{m_{max}}{V_{min}} = \frac{0,06590\,[kg]}{(0,0112)^2 \cdot 0,0634\,[m^3]} = 8273\left[\frac{kg}{m^3}\right]$$

$$\rho = \frac{m}{V} = \frac{0,06585\,[kg]}{(0,0114)^2 \cdot 0,0637\,[m^3]} = 7954\,\frac{kg}{m^3} = 7,954 \cdot 10^3\,\frac{kg}{m^3}$$

Finner avvik

$7954 - 7629 = 325\,\frac{kg}{m^3} = 0,325 \cdot 10^3$

$7954 - 8273 = -319\,\frac{kg}{m^3} = -0,319 \cdot 10^3$

$$\rho = 8,0 \pm 0,3\left[\frac{kg}{m^3}\right]$$

Trykk

$$p = \frac{F}{A}$$

kraft [N]

areal [m^2]

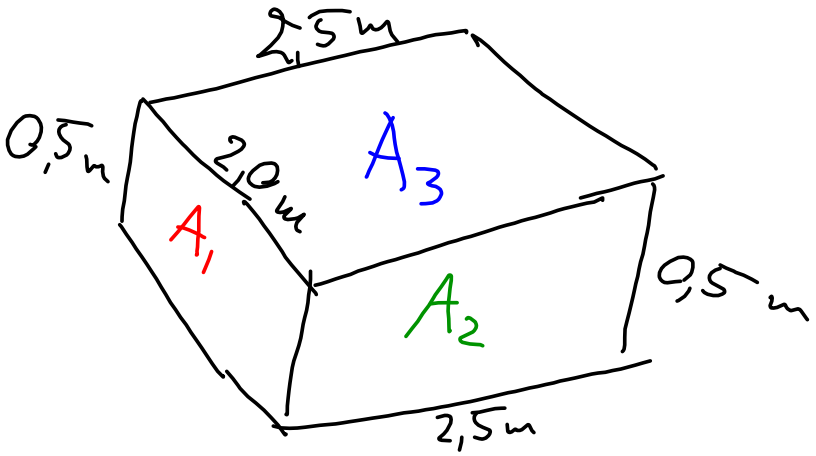
Symbol for trykk

Benevnelse for trykk:

$$\left[\frac{N}{m^2}\right] \Rightarrow [Pa]$$

Pascal

6.06



$A_1 = 0{,}5\,m \cdot 2{,}0\,m = 1{,}0\,m^2$

$A_2 = 0{,}5\,m \cdot 2{,}5\,m = 1{,}25\,m^2$

$A_3 = 2{,}5\,m \cdot 2{,}0\,m = 5{,}0\,m^2$

$T = m \cdot g = 3{,}0\,kN$

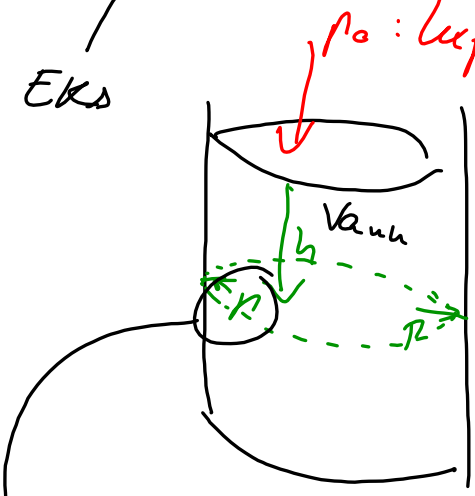
$$p_1 = \frac{T}{A_1} = \frac{3{,}0\,kN}{1{,}0\,m^2} = 3{,}0\,[kPa]$$

$$p_2 = \frac{T}{A_2} = \frac{3{,}0\,kN}{1{,}25\,m^2} = 2{,}4\,[kPa]$$

$$p_3 = \frac{T}{A_3} = \frac{3{,}0\,kN}{5{,}0\,m^2} = 0{,}6\,[kPa]$$

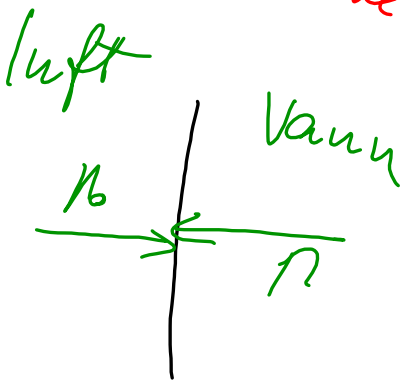
Hydrostatisk trykk

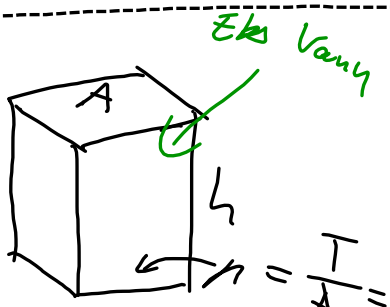
Eks



$$p = p_0 + \rho \cdot g \cdot h$$

↑ ikke alltid at p_0 tas med:





$$\rho = \frac{m}{V}$$

$$m = \rho \cdot V$$

$$p = \frac{F}{A} = \frac{m \cdot h}{A} = \frac{\rho \cdot V}{A} = \frac{\rho \cdot A \cdot h}{A}$$

$$= \rho \cdot h$$