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$F_g = 600\,N$

$F = 400\,N$

$\rho_l = ? \left[\frac{kg}{m^3}\right]$

$\rho_k = 1000\ \frac{kg}{m^3}$

$g \doteq 10\ \frac{N}{kg}$

$\rho_l = \frac{m_l}{V_l}$

$\rho_l = \frac{60}{0{,}02}$

$\rho_l = 3000\ \frac{kg}{m^3}$

$\boxed{F_g = m_l \cdot g} \Rightarrow m_l = \frac{F_g}{g}$

$m_l = \frac{600}{10}$

$m_l = 60\,kg$

$F_{vz} = F_g - F$

$F_{vz} = 600 - 400$

$F_{vz} = 200\,N$

$\boxed{F_{vz} = V_l \cdot \rho_k \cdot g} \Rightarrow V_l = \frac{F_{vz}}{\rho_k \cdot g}$

$V_l = \frac{200}{1000 \cdot 10}$

$V_l = 0{,}02\ m^3$

Hustota látky je $3000\ \frac{kg}{m^3}$.