

28. The weight of the additional cargo ΔW the blimp could carry is equal to the difference between the weight of the helium and that of the hydrogen gas inside the blimp:

$$\begin{aligned}\Delta W &= W_{\text{He}} - W_{\text{H}_2} = (\rho_{\text{He}} - \rho_{\text{H}_2})gV \\ &= \left(0.16 \text{ kg/m}^3 - 0.081 \text{ kg/m}^3\right) (9.8 \text{ m/s}^2) (5000 \text{ m}^3) \\ &= 3.9 \times 10^3 \text{ N}\end{aligned}$$

which corresponds to about 400 kg of mass. The reason why helium is used is because it is safer (non-flammable).