

[Remarks:](#) See § 4.4, pages 168 till 170

See §4.6, pages 184 till 186

See §4.7.4, pages 196 till 198

[Answer:](#)

$$q = 6 \text{ kN/m}$$

[Explanation:](#)

$$M_{\max} = \frac{1}{8} q \ell^2$$

The largest bending stresses are in the bottom fibers, since $e_b > e_t$.

$$\sigma_b = \frac{M_{\max}}{W_o} \leq 6 \text{ N/mm}^2 \quad \text{where} \quad W_b = \frac{I}{e_b}$$

or:

$$\sigma_b = \frac{M_{\max} z_{\max}}{I} \quad \text{where} \quad z_{\max} = e_b$$

Working this out leads to:

$$\sigma_b = \frac{\frac{1}{8} q (4 \times 10^3 \text{ mm})^2 \times (400 \text{ mm})}{800 \times 10^6 \text{ mm}^4} \leq 6 \text{ N/mm}^2 \Rightarrow q \leq 6 \text{ kN/m}$$