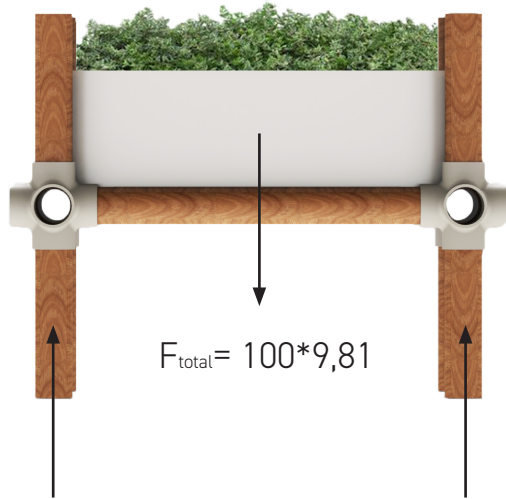


# SMART & MODULAR VERMIPONICS

## Bamboo strength calculations



### DATA:

- Total weight flowerpot with soil: 100 kg
- R1= outside radius of bamboo= 35 mm (diameter= 70 mm )
- R2= inside radius of bamboo= 30 mm (diameter=60 mm)
- Length of length. horizontal bar: 1100 mm
- Maximum compressive strength of bamboo: 40-80 N/mm<sup>2</sup>
- Maximum tensile strength of bamboo: 160 N/mm<sup>2</sup>

### CALCULATION

Compressive strength on 1 height bar:

$$B = F/A = F/4/A \text{ (for one bar)}$$

$$B = m \cdot 9,81 / 4 / (\pi \cdot r_1^2 - \pi \cdot r_2^2)$$

$$B = (100 \cdot 9,81 / 4) / (\pi \cdot (35)^2 - \pi \cdot (30)^2)$$

$$B = 245 \text{ N} / (3849 - 2827)$$

$$B = 245 \text{ N} / 1022 \text{ mm}^2$$

$$B = 0,24 \text{ N} / \text{mm}^2$$

Tensile strength on 1 length bar:

$$B = \frac{(F/2 \cdot L/2) \cdot (\text{Diameter}/2)}{l}$$

$$B = \frac{(100 \cdot 9,81 / 2 \cdot 1100 / 2) \cdot (70 / 2)}{\pi \cdot (\text{outer } \varnothing^4 - \text{inner } \varnothing^4) / 64}$$

$$B = \frac{(490,5 \cdot 550) \cdot 35}{\pi \cdot ((70)^4 - (60)^4) / 64}$$

$$B = \frac{9442125}{542415,6} = 17,4 \text{ N/mm}^2$$