

→ Cálculo da Incerteza da Densidade ( $g/mm^3$ )

- Régua

$$C_p = \bar{p} \sqrt{\left(\frac{y_m}{\bar{m}}\right)^2 + \left(\frac{y_L}{\bar{L}}\right)^2 + \left(\frac{y_H}{\bar{H}}\right)^2} \Rightarrow \sqrt{\left(\frac{0,001}{1,1}\right)^2 + \left(\frac{0,1}{1,1}\right)^2 + \left(\frac{0,1}{21,2}\right)^2} = 0,008677$$

$$\Rightarrow 0,008677 \cdot \sqrt{\frac{0,0001}{2,9} + \frac{1}{11,46} + \frac{0,0001}{196,96}} \Rightarrow$$

$$\Rightarrow 0,008677 \cdot \sqrt{0,0000137 + 0,000087 + 0,00000221} \Rightarrow \sqrt{0,0001037} \Rightarrow$$

$$\Rightarrow 0,008677 \cdot 0,022578 \Rightarrow C_p = 0,002740 \text{ g/mm}^3$$

~~0,00272~~

→ Paquímetro

$$C_p = \bar{p} \sqrt{\left(\frac{y_m}{\bar{m}}\right)^2 + \left(\frac{y_L}{\bar{L}}\right)^2 + \left(\frac{y_H}{\bar{H}}\right)^2} \Rightarrow \sqrt{\left(\frac{0,001}{1,1}\right)^2 + \left(\frac{0,001}{1,1}\right)^2 + \left(\frac{0,001}{21,2}\right)^2} = 0,00052$$

$$\Rightarrow \sqrt{\frac{0,0001}{2,9} + \frac{0,0001}{11,46} + \frac{0,0001}{196,96}}$$

$$\Rightarrow 0,00052 \cdot \sqrt{0,0000137 + 0,000007403 + 0,0000002525} \Rightarrow \sqrt{0,0000076754} \Rightarrow$$

$$\Rightarrow 0,00052 \cdot 0,003760 \Rightarrow C_p = 0,000046 \text{ g/mm}^3$$

~~0,000022~~

→ micrometro

$$C_p = \bar{p} \sqrt{\left(\frac{y_m}{\bar{m}}\right)^2 + \left(\frac{y_L}{\bar{L}}\right)^2 + \left(\frac{y_H}{\bar{H}}\right)^2} \Rightarrow \sqrt{\left(\frac{0,001}{1,1}\right)^2 + \left(\frac{0,001}{1,1}\right)^2 + \left(\frac{0,001}{21,2}\right)^2} = 0,00097$$

$$\Rightarrow 0,00097 \cdot \sqrt{\frac{0,0001}{2,9} + \frac{0,0001}{11,46} + \frac{0,0001}{196,96}}$$

$$\Rightarrow 0,00097 \cdot \sqrt{0,0000137 + 0,000007403 + 0,0000002525} \Rightarrow \sqrt{0,0000076754} \Rightarrow$$

$$\Rightarrow 0,00097 \cdot 0,003760 \Rightarrow C_p = 0,000036 \text{ g/mm}^3$$