

Let:

$$P = 164.9 \text{ J/s}$$

$$D = 2,5 \text{ cm} = 0.025 \text{ m}$$

$$T_1 = 500^\circ\text{C}$$

$$T_2 = 20^\circ\text{C}$$

$$l = 30 \text{ cm} = 0.3 \text{ m}$$

$$k = ?$$

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According to the Fourier's law:

$$Q = t * k \frac{S\Delta T}{l};$$

$$\text{As: } P = \frac{Q}{t};$$

$$P = k \frac{S\Delta T}{l};$$

$$k = \frac{Pl}{S\Delta T};$$

$$S = \pi * \frac{D^2}{4}$$

Let's enter the data:

$$S = 3.14 * \frac{0.025^2}{4} = 0.000491 \text{ m}^2$$

$$\Delta T = T_1 - T_2 = 500 - 20 = 480^\circ$$

$$k = \frac{164.9 * 0.3}{0.000491 * 480} = 209,9 \text{ W/mC}$$

**Answer: "B" 209,9 W/mC**