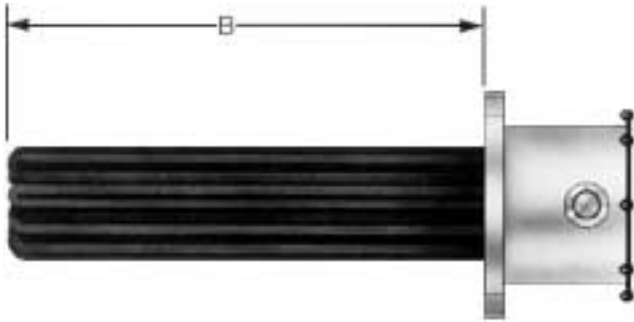


DETERMINING WATT DENSITY

IMMERSION HEATERS:



$$B \text{ dim.} = \frac{\text{EHL}}{\# \text{elements} \times 2} + \text{cold area}$$

$$\text{EHL} = (\# \text{ elements} \times 2 \times B) - (\text{cold area} \times \# \text{ elements} \times 2)$$

$$\text{EHL} = \frac{\text{Wattage}}{\text{element dia.} \times \text{w/sq.in.} \times \pi}$$

$$\text{Watt Density (w/sq.in.)} = \frac{\text{Wattage}}{\text{element dia.} \times \text{EHL} \times \pi}$$

To determine the watt density when kw and immersion depth (B dim.) are known:

Assume—25kw

B = 30" (6 cold area)

6" Flanged Immersion Heater—18 elements

Find—Watt density

$$\text{EHL} = (18 \times 2 \times 30) - (6 \times 18 \times 2)$$

$$\text{EHL} = 864"$$

$$\text{Watt density} = \frac{25000}{.475 \times 864 \times \pi}$$

$$\text{Watt density} = 19.4 \text{ w/sq.in.}$$

To determine immersion depth when kw and watt density limitations are known:

Assume—48kw
22w/sq.in.

8" Flanged Immersion Heater
24 elements (6" cold area)

Find—B dimension

$$\text{EHL} = \frac{48000}{.475 \times 22 \times \pi}$$

$$\text{EHL} = 1463"$$

$$B = \frac{1463}{(24 \times 2)} + 6$$

$$B = 36\frac{1}{2}"$$

ESTIMATING SHEATH WATT DENSITY FOR OTHER PRODUCTS

BAND HEATERS:

$$\text{Watts/sq.in.} = \frac{\text{Wattage}}{(\text{dia} \times \pi \times \text{width}) - \text{width}}$$

See respective catalog section for each band heater for accurate watt density formulas.

CARTRIDGE AND TUBULAR HEATERS:

$$\text{Watts/sq.in.} = \frac{\text{Wattage}}{\text{dia.} \times \text{heated length} \times \pi}$$

MICA STRIP HEATERS:

$$\text{Watts/sq.in.} = \frac{\text{Wattage}}{(\text{heated length} \times \text{width}) - \text{width}}$$

HD STRIP HEATERS:

$$\text{Watts/sq.in.} = \frac{\text{Wattage}}{\text{heated length} \times 3.75}$$

CHANNEL HEATERS:

$$\text{Watts/sq.in.} = \frac{\text{Wattage}}{\text{heated length} \times 3.625}$$