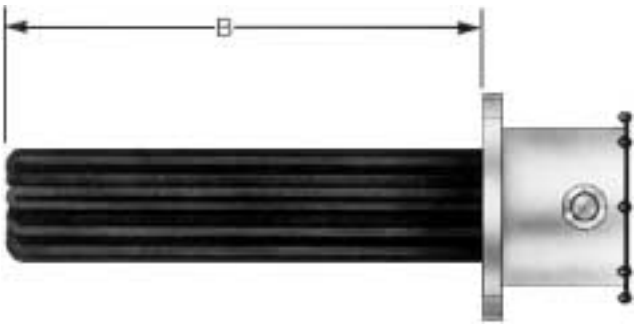
DETERMINING WATT DENSITY

IMMERSION HEATERS:



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

EHL = (# elements x 2 x B) - (cold area x # elements x 2)

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

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

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

EHL = (18 x 2 x 30) - (6 x 18 x 2)

EHL = 864"

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

Watt density = 19.4 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

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

EHL = 1463"

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

B = 36½"

ESTIMATING SHEATH WATT DENSITY FOR OTHER PRODUCTS

BAND HEATERS:

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

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

CARTRIDGE AND TUBULAR HEATERS:

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

MICA STRIP HEATERS:

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

HD STRIP HEATERS:

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

CHANNEL HEATERS:

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