Engineering Example

A 10 ft. stainless steel braid hose, 1/2" O.D., needs to be heated to 400°F from 70°F.
Insulation: 1/2". The voltage is 220V.

1. **Determine the Length.** To cover the hose completely would take
   \[ \pi \times \frac{1}{2} \times 120 = 188 \text{ sq. in.} \]
   A 12" length of 1/2" tape would cover 6 sq. in. of hose; therefore, 31 ft. of 1/2" tape would completely cover the hose, spiral wrapped edge to edge.

2. **Determine the Watts.** Total Power (Tp) = P x L x \(\Delta T\)
   From the chart, P = .09 for a 1/2" hose with 1/2" insulation, therefore
   Tp = .09 x 10 ft. x (400-70) = 297 Watts. For rapid start-up and to compensate for colder material flowing through the hose, increase the wattage by 25% to 400W.

3. **Calculate the Ohms per Foot.** The ohms/ft. = \(E^2 + (Tp \times L)\)
   Therefore ohms/ft. = 220\(^2\) + (400W x 31 ft.) = 3.9 ohms per ft.

4. **Calculate the Watts per Foot.** The Watts per ft. = Tp + L
   Therefore the watts/ft. = 400 watts + 31 ft. = 12.9 watts/ft.

5. **Choose Heat Tape Material from the Table.** From the table, the FTP0035, 1/2" tape with four conductors and silicone adhesive in the parallel/series connection at 4.0 ohm/ft. would fill the requirements. The required 12.9 watts/ft. is well under the maximum rating of 62 watts/ft.

**CHART NOTES**

**Resistance Wiring**

Type 1. Ohms per foot, with all conductors in a *Parallel Connection.*

Type 2. Ohms per foot, with all conductors in a *Series Connection.*

Type 3. Ohms per foot, with all conductors in a *Parallel - Series Pair Connection.*

**Max. Watts/ft. in Ohms-Per-Foot Table**

The maximum wattage per lineal foot is when the heat tape is applied to a metal heat sink at room temperature. Reduce these ratings linearly to zero watts output at 500°F. Adhesion to heat sink along entire length is important to prevent burnout when tape is used near maximum wattage rating.

**Example:** A tape that is 70W/ft. maximum watt density at 74°F, would derate to about 35W/ft. maximum watt density at 250°F.

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**Ordering Information — Bulk Heat Tape**

Heat Tape can be ordered in bulk in 50 or 100 ft. rolls or in custom assemblies. The part number for each item is completed by filling in the box with a number from the following table to detail adhesive type and tape width:

- 1-silicone, 1/6" wide (1 cond.)
- 2-acrylic, 1/6" wide (1 cond.)
- 3-silicone, 1/4" wide (2 cond.)
- 4-acrylic, 1/4" wide (2 cond.)
- 5-silicone, 1/2" wide (4 cond.)
- 6-acrylic, 1/2" wide (4 cond.)

**Custom Engineered/Manufactured Heaters**

For a quote, *Please Specify* the following:

- Application Information
- Wattage Requirements
- Lead Information

**WARNING:** Cancer and Reproductive Harm - [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

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