

Phoenix Thermal Supply

Electrical Resistance Heating Tape - Adhesive Backed

Designed for High Heat Transfer

All electrical resistance elements create heat, but some systems are better at transferring this energy. The secret to this heating tape is in its thermally conductive adhesive and its outer reflective sheath.

The adhesive surrounds the resistance wire and transfers the thermal energy directly to the surface of the load. The resistance wire itself has a back and forth kink that acts as a spring to absorb expansion and contraction.

The outer aluminum sheath spreads heat evenly over the entire surface of the tape and also reflects heat back onto the load.

The end result is a highly efficient heating source with maximum heat being transferred to the desired material.

Typical Applications:

- Cylinder wrap ideal for tubes, pipes or vessels.
- Placed directly on PVC, PTFE plastic pipe without the need for other material.
- Excellent for prototype engineering, placing heat exactly where it is needed.
- Even heating throughout the length of a heated hose for hot wax handling, food processing, hot melt and other plastic processing
- De-fogging, de-icing, fuel line warming.
- Acrylic product approved by NASA for space flight.
- Acrylic low outgassing perfect for vacuum applications.



Typical finished assembly with leads



Bulk Roll of Heat Tape



Example of tape wrapped around a tube

Product Types

4 Conductor Tape 1/2" (12.7 mm) wide; has the highest watt density and the most variety of resistances. It can have leads at one end in the case of a series connection or a series/parallel connection, or leads at either end in a parallel connection.

The tightest wrap this tape can achieve is on a 1/4" (6.3 mm) O.D. surface. A smaller tube should be

2 Conductor Tape 1/4" (6.3 mm) wide; has leads on one end in the series connection, and leads at both ends for parallel connections. This tape will wrap down to 1/8" (3.17 mm) O.D.

1 Conductor Tape 1/6" (4.2 mm) wide; can wrap down to .060" (1.52 mm) O.D. A lead will be present at both ends.

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wrapped with 1/4" (6.3 mm) or 1/6" (4.2 mm) tape.

Adhesive Specifications		
	Silicone	Acrylic
Operating Temperature Range	-100°C to 250°C	-100°C to 180°C
	-148°F to 482°F	-148°F to 356°F
Outgassing...TML/VCM	1.047%/.322%	.264%/.000%
Adhesion to Etched Aluminum(oz/inch width)	28 @ +125°C	29 @ +125°C
	450 @ -100°C	50 @ -100°C
Overall Thickness Applied	.025" (.63 mm)	.028" (.71 mm)
Dielectric Strength	600 Vdc	600Vdc

General Purpose Wattage Calculations for Tube and Pipe Heating

T_p = Total Watts Required

P = Watts per lineal foot of tube per °F temp. rise (see chart below)

L = Length of tube in feet

ΔT = Temperature rise, °F above ambient

To Find P: Look at the intersection of Tube O.D. and Insulation thickness.

Insulation Thickness	Tube Outside Diameter			
	1/4"	1/2"	1"	2"
Bare	.10	.13	.21	.40
1/2"	.07	.09	.13	.20
1"	--	.05	.08	.11

Note: This is for estimating power requirements only. Confirmation by prototype testing is recommended.
 • If the temperature rise is over 100 degrees, increase the

Engineering Example

A 10 ft. stainless steel braided 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 $\pi \times 1/2" \times 120" = 188$ 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 (T_p) = $P \times L \times \Delta T$
 From the chart, $P = .09$ for a 1/2" hose with 1/2" insulation, therefore $T_p = .09 \times 10 \text{ ft.} \times (400-70) = 297$ 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. = $E^2 \div (T_p \times L)$. Therefore ohms/ft. = $220^2 \div (400W \times 31 \text{ ft.}) = 3.9$ ohms per ft.

4. Calculate the Watts per Foot. The Watts per ft. = $T_p \div L$. Therefore the watts/ft. = $400 \text{ watts} \div 31 \text{ ft.} = 12.9$ watts/ft.

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wattage by 10%.

- For rapid start-up and to allow for colder material entering the hose, increase the wattage by 25% and use a temperature controller with a temperature sensor.

Warning !! This product is essentially resistance wire mounted in an adhesive tape and must be designed as a heater prior to purchase.

5. Choose Heat Tape Material from the Table Below.

From the table, the FTP00035, 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.

Heating Tape - Ohms-per-foot Table

Width		1/6" (4.2 mm)		1/4" (6.3 mm)			1/2" (12.7 mm)			
Number of Conductors		1 conductor		2 conductors			4 conductors			
Part Number		Ohms/ft.	Max Watts/ft.	Ohms/ft. (1)	Ohms/ft. (2)	Max Watts/ft.	Ohms/ft. (1)	Ohms/ft. (3)	Ohms/ft. (2)	Max Watts/ft.
50 ft. roll	100 ft. roll									
FTP0001_	FTP1001_	1.9	25	.9	3.8	40	.5	1.9	7.6	70
FTP0002_	FTP1002_	3.2	25	1.6	6.4	40	.8	3.2	12.8	70
FTP0003_	FTP1003_	4.0	23	2.0	8.0	35	1	4.0	16.0	62
FTP0004_	FTP1004_	4.9	20	2.4	9.8	30	1.2	4.9	19.6	52
FTP0005_	FTP1005_	7.0	25	3.5	14	40	1.7	7.0	28.0	70
FTP0006_	FTP1006_	8.8	23	4.4	17.6	35	2.2	8.8	35.2	62
FTP0007_	FTP1007_	10.8	20	5.4	21.6	30	2.7	10.8	43.2	52
FTP0008_	FTP1008_	13.2	20	6.6	26.4	30	3.3	13.2	52.8	52
FTP0009_	FTP1009_	21.3	13	10.6	42.6	20	5.3	21.3	85.2	32
FTP0010_	FTP1010_	26.8	10	13.4	53.6	16	6.7	26.8	107.2	25

How To Order Bulk Heat Tape

Heat Tape can be ordered in bulk in 50 or 100 ft. rolls or in custom assemblies. The part number above for each item is completed by adding a number (1 through 6) as the last digit (_) from the following table to specify adhesive type and tape width:

1- silicone, 1/6" wide (1 conductor)

2-acrylic, 1/6" wide (1 conductor)

3-silicone, 1/4" wide (2 conductor)

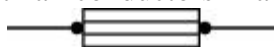
5-silicone, 1/2" wide (4 conductor)

4-acrylic, 1/4" wide (2 conductor)

6-acrylic, 1/2" wide (4 conductor)

CHART NOTES

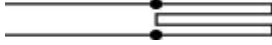
1. Ohms Per foot with all conductors in a parallel connection.



Terminal kits are required to terminate the bulk tape into a finished heater assembly. To determine 1-wire or 2 wire, refer

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2. Ohms per foot with all conductors in a series connection.



3. Ohms per foot with all conductors in a parallel pair-series connection.



Accessories

Terminal Kit for 1-wire

2-wire

Additional Solderless Crimps

16-20 Ga.

FTP00911

FTP00912

FTP00920

22-26 Ga.

FTP00913

FTP00914

FTP00921

Aluminum/Silicone
Heat Transfer Tape

3/4" x 27 ft.
FTP00930

1-1/4" x 27 ft.
FTP00931

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1- silicone, 1/6" wide(1 cond.)

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

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

2-acrylic, 1/6" wide(1 cond.)

4-acrylic, 1/4" wide (2 cond.)

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

Custom Engineered/Manufactured Heaters

Understanding that an electric heater can be very application specific, for sizes and ratings not listed, PTSHEAT will design and manufacture a Duo-Tape Heater to meet your requirements.

Standard Lead time is 4 to 5 weeks.

Please Specify the following:

- Application Information
- Lead Information
- Wattage Requirements

Phoenix **Thermal** Supply



Sales@ptsheat.com

**Dave Farmery
Ben Midulla**

Toll Free Phone/Fax

**844-787-4328
844-PTSHEAT**

www.PhoenixThermalSupply.com