

From: Lobo, Deborah

Sent: 12/11/2014 11:27:46 AM

To: TTAB E Filing

CC:

Subject: U.S. TRADEMARK APPLICATION NO. 79124239 - VULCANIC - 06286-T0002A - Request for Reconsideration Denied - Return to TTAB - Message 3 of 7

Attachment Information:

Count: 23

Files: GraingerDiffusers4.jpg, GraingerFinnedTube.jpg, GraingerFinnedTube2.jpg, GraingerFinnedTube3.jpg, GraingerImmersionHeaters.jpg, GraingerImmersionHeaters2.jpg, GraingerImmersionHeaters3.jpg, GraingerVentHood.jpg, GraingerVentHood2.jpg, JohnsonControlsCooling.jpg, JohnsonControlsDiffuser.jpg, JohnsonControlsHeatExchangers.jpg, JohnsonControlsVentilationClimatecontrolSystem.jpg, TempcoEnclosedHeaters.jpg, TempcoEnclosedHeaters2.jpg, TempcoEnclosedHeaters3.jpg, TempcoEnclosedHeaters4.jpg, TempcoFinnedTubular.jpg, TempcoHeatingElements.jpg, TempcoHeatingelements3.jpg, TempcoHeatingelements4.jpg, TempcoHeatingElements5.jpg, TempcoHeatingTape.jpg

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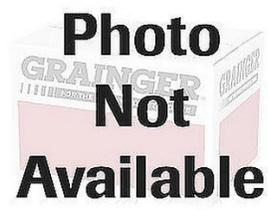


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Pneumatics | Replacement Parts | Parts | Tube, Finned

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Tube, Finned

GRAINGER APPROVED VENDOR

Price: **\$522.00** / each

Deliver one time only
 Save Time & Auto-Reorder Every 1 Month

1 **Add to Cart**

+ Add to List

Check Availability

☆☆☆☆ Be the first to write a review | Ask & Answer

Item # **26CV08** Mfr. Model # **32211690** UNSPSC # **99999999**
Catalog Page # **N/A** Shipping Weight **4.1 lbs.**

Country of Origin **USA** | Country of Origin is subject to change.

How can we improve our Product Images?
 Compare

Technical Specs

click to chat

Technical Specs			
Item	Tube,Finned	For Use With Mfr. Model Number	2545 Series
For Use With Grainger Item Number	16V892-895, 1WF63-65, 3FRU6-8, 4KR52-54, 4M362-64, 4M376-82, 4M391, 4M393, 4M414, 4M429, 4M470-71, 4M475-85, 4MJ02-05, 4TN87	Fits Brand	Ingersoll Rand

How can we improve our Technical Specifications?

Compliance and Restrictions

This item is restricted for international sale.

Category Top Sellers

1 of 7 Prev | Next >

 <p>Idle Arm Assembly Item # 21GZ91 DYNABRADE</p>	 <p>Hose Reel Swivel, Use w/2Z862,2Z863,3VE25 Item # 1GYJ8 REELCRAFT</p>	 <p>Oil Filter, For 50-100 HP Compressors Item # 2CEN9 INGERSOLL-RAND</p>	 <p>Framing Tool Fuel Cartridge Item # 31EE19 PASLODE</p>
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HVAC and Refrigeration \ Electric Process Heaters and Accessories \ Immersion Heaters Print

Filter Results By

Search within these results

GO

Item

- Automatic Bushing Immersion Heater (2)
- Bottom Outlet Immersion Heater (2)
- Cartridge Immersion Heater (35)
- Circulation Booster Heater (5)
- Circulation Booster Heater Elements (6)
- Circulation Heater (7)
- [View More](#)

Watts

- 10,000 (6)

Immersion Heaters

14 Results Found that Include 176 Products

Sort results by: Top Sellers View Previously Purchased Products Only

Grid | List | Results per page: 16 | **32** | 48



VULCAN
Automatic Bushing Immersion Heater
Multiple product options available

Price:
\$187.50 - \$205.00

View All 2 Products

Expand to Compare **Quick View Most Popular Products** **+**



TEMPCO
Screw Plug Immersion Heater
Multiple product options available

Price:
\$144.05 - \$1,269.00

View All 68 Products

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- Watt Density**
 - 106 sq. in. (2)
 - 124 sq. in. (2)
 - 13 sq. in. (1)
 - 130 sq. in. (2)
 - 134 sq. in. (1)
 - 14 sq. in. (1)
 - View More
- Flange Size**
 - 2-1/2 x 2-1/2" (2)
 - 3" (10)
 - 3-1/2 x 3-1/2" (3)
 - 5" (5)
 - 6 x 6" (2)
 - 6-1/2" (3)
- Voltage**
 - 120 (71)
 - 230 (1)
 - 240 (63)
 - 480 (2)
 - 480 (39)
- Phase**
 - 1 (119)
 - 3 (57)

TEMPCO
Cartridge Immersion Heater
Multiple product options available
Price: \$37.65 - \$194.75
View All 35 Products



Expand to Compare Quick View Most Popular Products

VULCAN
Screw Plug Immersion Heater
Multiple product options available
Price: \$151.50 - \$922.00
View All 14 Products



Expand to Compare Quick View Most Popular Products

TEMPCO
Drum Immersion Heater
Multiple product options available
Price: \$578.00 - \$674.50
View All 4 Products



Expand to Compare Quick View Most Popular Products



gas. Since immersion heaters come in direct contact with the target material, they are nearly 100% energy efficient. Flanged immersion heaters are commonly used in steam boilers. Screw-plug heaters are designed for industrial tanks and process piping. Use Grainger immersion heaters for safe, dependable heating of water tanks and containers of industrial fluids and gases.

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ventilation hood

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Price

ventilation hood

58 Results Found that Include 58 Products

Sort results by: Best Match View Previously Purchased Products Only

Grid | List | Results per page: 16 | 32 | 48 1 2 ... Next



TJERNLUND
Hood, Vent, 4 In
Item # **4C845**
Mfr. Model # VH1-4
High Temperature Vent Hood, Fits Duct Size 4 In, Construction Material Aluminum Alloy, For Use With...More

Price: **\$144.30** / each

Qty: **Add to Cart**

[+Add to list](#)

[Check Availability](#)

Catalog Page # 4318

Compare

Category : Vent Caps



TJERNLUND
Vent Hood, High Temp, 6 In
Item # **6KXZ2**

Price: **\$171.50** / each

Qty: **Add to Cart**

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INDUSTRIAL REFRIGERATION SYSTEMS

Leading the Way with New Industrial Cooling Technology

So much of our lives rely on refrigeration, from the food that we eat to the transportation and processing of vital resources. Even our personal comfort requires effective industrial refrigeration systems. That's why we are dedicated to providing the world with the refrigeration and gas compression technology required for today and tomorrow.

Our industrial refrigeration systems bring food to your favorite supermarket by providing essential industrial cooling equipment to the food processing industry. We also build the unique industrial refrigeration systems required to move gas through pipelines, produce energy, manufacture chemicals and nearly all of the items we use in our daily lives.

For more help finding the right industrial refrigeration systems, [contact Johnson Controls](#).



Industrial refrigeration and industrial cooling systems for applications including gas compression, oil & gas processing, petrochemicals, chemicals, power generation, carbon capture, pharmaceuticals and test chambers.

[Learn more about YORK® Process Systems.](#)



Industrial refrigeration and industrial cooling systems for applications including food processing, food storage, beverage production, poultry, red meat, ice, seafood, dairy, fruit & vegetables and convenience foods.

[Learn more about Frick® Food & Beverage Industrial Refrigeration Systems.](#)



Sanitary Air Distribution

AcuAir Supply Air Diffusers Provide A Sanitary Way to Distribute Air In Your Food Process Space for Maximum Efficiency and Condensation Control

Stainless Steel Material

The supply air diffusers are constructed of 304 stainless steel. With fully welded drain pans, AcuAir sanitary diffusers provide a level of hygienic quality similar to that required of other components in the processing area.

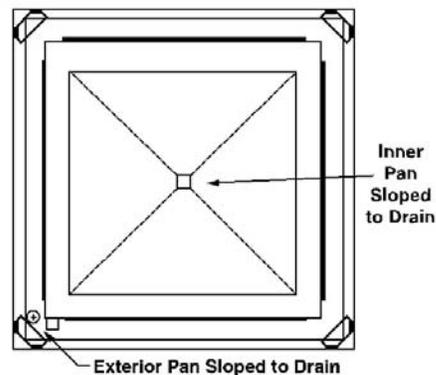


Insulated and Heated Drain Pan

The oversized drain pan has fully welded inner and outer stainless steel surfaces. Insulation between the inner and outer surfaces, along with electric heat tracing, prevents condensation from forming on the outside surface of the diffuser drain pan.

Drain Pan Water Outlets

The AcuAir supply air diffuser is designed with two moisture capturing pans. Inside the diffuser, the inner pan slopes to a recessed outlet. The oversized outer drain pan extends horizontally beyond the face of the directional louvers. The outer pan has a separate drip capturing channel with a dedicated drain outlet.



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Heat Exchangers & Pressure Vessels

New Equipment Sales

For more than 50 years, our team of dedicated professionals have been where you need us, when you need us...around the world!

YORK® Process Systems is your full performance partner. From the complete design of your system to the manufacture of all system elements, we fully integrate the operation of every critical unit.



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- ▶ Shell and Tube Heat Exchangers
- ▶ Flooded, Thermosiphon, and Direct Expansion Evaporators
- ▶ Condensers and Economizers
- ▶ Intercoolers and aftercoolers
- ▶ Easy to clean; withstands high pressure and low temperatures
- ▶ Carbon Steel, Stainless Steel, Copper Alloys
- ▶ Air Cooled and Evaporative Condensers
- ▶ Copper Tubes / Aluminum Fins
- ▶ Carbon Steel Tubes
- ▶ Codes (ASME, TEMA, SQLO)
- ▶ Designed to meet the most exacting requirements of the industry
- ▶ Built and tested in: Waynesboro, PA; Wuxi, PRC; Sao Paulo, Brazil



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MODULAR ELECTRONIC CONTROL SYSTEMS

System 350 Temperature Controls - Family Overview

The System 350™ Temperature family includes On/Off (SPDT), proportional (0 to 10 VDC and 0 to 20 mA output), and reset (SPST) controls in addition to stage, display, and power modules. The controls are used in conjunction with the A99B Series Temperature Sensors and TE-6001 Series Sensor Mounting Accessories.

Products

- ▶ A350 A/B Series
- ▶ A350 E Series
- ▶ A350 P Series
- ▶ A350 R Series
- ▶ A350 S Series
- ▶ Temperature Stage Modules



Applications

- ▶ Frozen/refrigerated display cases
- ▶ Ventilation control
- ▶ Space temperature control
- ▶ Temperature reset for single or multistage boilers
- ▶ Modulating dampers
- ▶ Temperature indication
- ▶ Cooling tower control
- ▶ Beverage/milk coolers
- ▶ Modulating chilled/hot water valves

Features and Benefits

- ▶ **Electronic Accuracy and Repeatability** - Provides reliable performance
- ▶ **Field Selectable Modes Heating/Cooling – Temperature** - Covers a wide range of applications with minimal inventory investment
- ▶ **Adjustable Settings Over a Wide Range** - Provides versatility for a wide range of applications; enables user to match equipment cycle rate and/or sequencing for a given application
- ▶ **Surface-Mount or DIN Rail-Mounting Ability** - Provides flexible installation capabilities
- ▶ **Plug-Together, 5-Pin Connectors** - Eliminates wiring between modules
- ▶ **Sensors Included with Most Models** - Gives convenient, cost-effective, pre-packaged options
- ▶ **Proportional/Integral Selectable Option on Some Controls** - Holds setpoint regardless of load on system and its rate of change
- ▶ **Modular Design** - Provides flexible and customizable application solutions

- Home US Products & Solutions Building Efficiency Products and Systems Commercial Refrigeration Modular Control Systems
- System 350 Modular Control System 350 Temperature Controls



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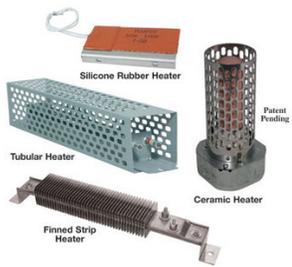
[Cabinet Enclosure Heaters](#)

[Silicone Rubber Enclosure Heaters](#) | [Tubular Enclosure Heaters](#)

[Finned Strip Enclosure Heaters](#) | [Ceramic Enclosure Heaters](#)

[Remote Thermostat for Enclosure Heaters](#)

[Cabinet Enclosure Heaters](#) (Catalog PDF)



Tempco enclosure heaters are the answer to all your enclosure heater needs. Our heaters are designed to help electric, electronic, pneumatic, hydraulic and mechanical equipment perform at top capacity by protecting them against low temperatures, condensation and corrosion. Tempco offers many different styles of heaters that can be used in enclosure heating applications. Our most popular styles are displayed on the next few pages.

[Typical Applications](#)

- [Traffic Signal](#)
- [Control](#)

Styles are displayed on the next few pages.

Typical Applications

- Traffic Signal Control Boxes
- Automatic Teller Machines
- Outdoor Electrical Power Enclosures
- Control Panels
- Control Valve Housings
- Switch Gear
- Clothing Lockers

Determining the Minimum Wattage for Your Application

- Determine the lowest temperature to which the enclosure is expected to be exposed.
- Determine the operating temperature to which you want the enclosure heated.
- Subtract the ambient temperature from the the enclosure temperature to get the temperature change required.
- Calculate the surface area of the enclosure. For a rectangular enclosure use the formula:
 $2 [(Length \times Width) + (Length \times Height) + (Width \times Height)]$
- Select the correct table below

Selecting the Right Heater for Your Application

1. Determine the wattage of heater(s) that you need. See the instructions on this page to determine your wattage requirements.
2. Determine the type of heater that you need. Depending upon conditions, one heater type might be better than others. Items to take into consideration are space constraints inside the enclosure and wattages required.
3. Determine the number of heaters

enclosure use the formula:
 $2[(Length \times Width) + (Length \times Height) + (Width \times Height)]$
 • Select the correct table below depending upon whether your box is insulated or non-insulated. Read from the table the wattage required depending upon your calculated temperature change and surface area.
 • Add an additional 50% of the determined wattage if the enclosure is to be located in windy conditions.

constraints inside the enclosure and wattages required.

- Determine the number of heaters you need. You can combine multiple heaters to achieve your wattage requirements.
- Determine how you will control the heaters. Will you use built-in thermostats to monitor the temperature? Or will you use a single temperature control to monitor and control the heaters? Tempco manufactures a wide range of temperature control devices and when multiple heaters are required, Tempco can supply you with the temperature controls that will meet your needs.

Insulated Enclosure Wattage Selection Table

Temperature °F (°C)	TOTAL SURFACE AREA ft ² (m ²)													
	2 (0.19)	3 (0.28)	4 (0.37)	5 (0.47)	6 (0.56)	7.5 (0.70)	9 (0.84)	10 (0.93)	15 (1.40)	20 (1.86)	25 (2.33)	30 (2.79)	40 (3.72)	50 (4.65)
20 (11)	10	10	15	20	20	25	30	35	50	65	80	100	130	160
40 (22)	15	20	30	35	40	50	60	65	100	130	160	195	260	320
60 (33)	20	30	45	50	60	75	90	100	145	195	240	290	385	480
80 (44)	30	40	55	65	80	100	115	130	195	260	320	320	515	640
100 (56)	35	50	65	80	100	125	145	160	240	320	400	400	640	800
120 (67)	40	60	80	100	115	150	175	195	290	385	480	480	770	960
140 (78)	45	70	90	115	135	175	205	225	340	450	560	560	900	1120

Uninsulated Enclosure Wattage Selection Table

monitor and control the heaters:
 Tempco manufactures a wide range of temperature control devices and when multiple heaters are required, Tempco can supply you with the temperature controls that will meet your needs.

Insulated Enclosure Wattage Selection Table

Temperature	TOTAL SURFACE AREA ft ² (m ²)															
°F (°C)	2	3	4	5	6	7.5	9	10	15	20	25	30	40	50		
20 (11)	10	10	15	20	20	25	30	35	50	65	80	100	130	160	190	260
40 (22)	15	20	30	35	40	50	60	65	100	130	160	195	260	320	385	480
60 (33)	20	30	45	50	60	75	90	100	145	195	240	290	385	480	560	640
80 (44)	30	40	55	65	80	100	115	130	195	260	320	320	515	640	770	860
100 (56)	35	50	65	80	100	125	145	160	240	320	400	400	640	800	960	1120
120 (67)	40	60	80	100	115	150	175	195	290	385	480	480	770	960	1120	1280
140 (78)	45	70	90	115	135	175	205	225	340	450	560	560	900	1120	1280	1440

Uninsulated Enclosure Wattage Selection Table

Temperature	TOTAL SURFACE AREA ft ² (m ²)															
°F (°C)	2	3	4	5	6	7.5	9	10	15	20	25	30	40	50		
20 (11)	30	40	55	70	80	100	120	135	205	270	335	405	540	670	805	1075
40 (22)	55	80	110	135	160	200	245	270	405	540	670	805	1075	1340	1610	2010
60 (33)	90	120	160	205	245	300	365	405	605	805	1005	1210	1610	2010	2410	2810
80 (44)	110	160	215	270	325	400	485	540	805	1075	1340	1610	2145	2680	3215	3750
100 (56)	135	200	270	335	405	500	605	670	1005	1340	1675	2010	2680	3350	4020	4690
120 (67)	165	240	320	405	485	600	725	805	1210	1610	2010	2415	3220	4020	4820	5620
140 (78)	190	280	375	470	565	700	845	940	1410	1880	2345	2815	3775	4690	5610	6510



Tubular Heaters

Finned and Single Ended Elements

Finned Tubular Heaters

Tempco finned tubular heaters provide rapid heat transfer for natural convection or forced air space heating in industrial process air heating systems.

Finned tubular heaters start out as a standard tubular heater with the fins being attached on a custom built finning machine.

Standard Sizes and Materials

304 Stainless Steel .475" diameter tubular element with 1.12" diameter fin.
Copper Clad Steel .430" diameter tubular element with 1.31" diameter fin.

Other materials available for the element sheath and fins include Monel, 316 Stainless Steel and Steel with high temperature aluminum paint.

Specifications

Diameter: .315", .430", .475"

Material: 304SS, 316SS, Steel Copper Clad, Monel, Steel

Mln. Sheath Length: 11"

Max Sheath Length: 256"

Fin Diameter: 1.31", 1.14", 1.12", 0.84"

Terminations: All Tubular Heater

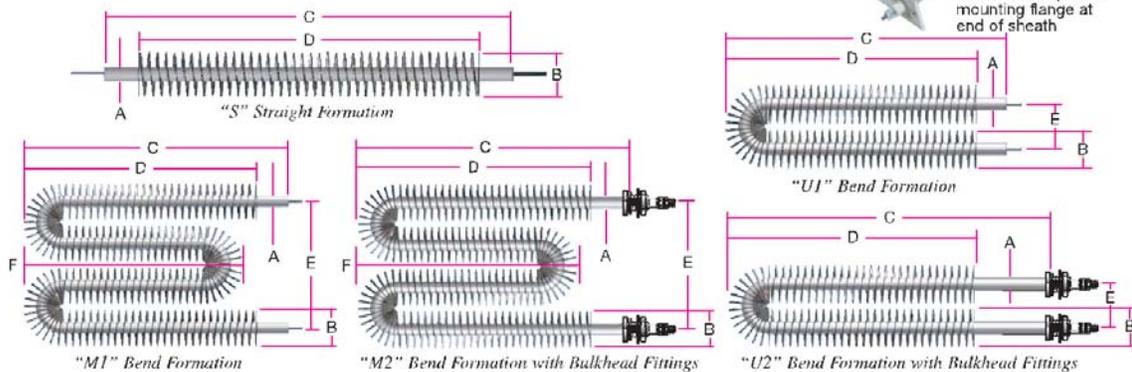
Max. Volts: 480 Vac

Max. Amperage: 40 Amp

Shown with optional bulkhead fittings



Shown with optional mounting flange at end of sheath



Ordering Information, Finned Tubular Heaters

- Please Specify the following:
- | | | |
|-------------------------------------------------|---------------------------------------------------------|--------------------------------------------|
| <input type="checkbox"/> Terminations and Seals | <input type="checkbox"/> Sheath/Fin Material | <input type="checkbox"/> Bulkhead Fittings |
| <input type="checkbox"/> Sheath Diameter | <input type="checkbox"/> Bend Formations and Dimensions | <input type="checkbox"/> Mounting Flange |
| <input type="checkbox"/> Wattage and Voltage | | |

Single-Ended Tubular Heaters



The Single-Ended Tubular Heater manufacturing and design process is similar to that of the double ended tubular heater. Single ended tubular heaters are made strictly per customer request, providing an economical alternative to cartridge heater applications, simplifying wiring and installation for applications requiring localized heat. Flanges, bulkhead and NPT fittings can be attached to the sheath for mounting or immersion heating applications.

Specifications

Diameters: .315", .430", .475", .490", .625"

Material: 304SS, 316SS, Steel Copper Clad, Monel, Steel

Min. Sheath Length: 11"

Max. Sheath Length: 96"

Termination: Lead Wires

Max. Volts: 277 Vac

Max. Amperage: 30 Amp

Ordering Information Single-Ended Tubular Heaters

- Please Specify the following:
- | | | |
|-------------------------------------------------------|------------------------------------------------------|--------------------------------------------|
| <input type="checkbox"/> Sheath Material and Diameter | <input type="checkbox"/> Heater Length and Cold Ends | <input type="checkbox"/> Bulkhead Fittings |
| <input type="checkbox"/> Wattage and Voltage | <input type="checkbox"/> Terminations and Seals | <input type="checkbox"/> Mounting Flange |

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Printed Thick Film Heating Elements

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Tempco's flexible [Thick Film Heating Elements](#) offer a wide range of design options for OEM applications. By utilizing printed thick film technology, the heaters can more efficiently spread the heat across the surface, and are more cost effective systems when compared to comparable etched foil or wire elements.



The design incorporates printed thick film technology as the active heat source. The ink can be designed in various patterns and densities, concentrating power exactly where it is needed. The element traces can be widened or narrowed to allow for cutouts and

the surface to be heated, ensuring excellent thermal transfer.

Cooler Operating Temperature

By spreading the heat trace over a larger percentage of the surface of the element, a Tempco element will also operate at a cooler operating temperature due to the lower watt density in a given area. Low thermal mass also allows the heat to be transferred more quickly to the surface to be heated. Both characteristics enhance the safety and overall life of the element.

Controls and Sensors

More exacting control is available for the heaters as well. Thermostats and temperature sensors can be mounted directly on the heaters for direct temperature control. Thermal fuses/TCO's are available for overtemperature/runaway condition protection.

Resistive Inks

The elements, due to the resistive inks used, exhibit a slight PTC effect, or positive temperature coefficient. As the temperature of the elements increase, the resistance also increases, lowering current draw and wattage output. This further enhances the safety of the element, and allows for full power when needed at cooler temperatures, while conserving energy consumption at higher

The elements can be designed for either AC or DC variable input voltages up to 277 VAC, with UL/CSA recognized component watt densities of up to 25 W/sq. in. The technology lends itself well to both small and large designs, with current products ranging from 5/8" x 1-1/4" to 24" x 98". Round, oval and other non-linear shapes and designs are easily accommodated. Elements can also be designed to allow elements to

the element, and allows for full power when needed at cooler temperatures, while conserving energy consumption at higher temperatures.

98". Round, oval and other non-linear shapes and designs are easily accommodated. Elements can also be pre-creased to allow elements to be wrapped around the surface to be heated, minimizing concerns about film memory and potential delamination.

Rigidity or Abrasion Resistance

Various laminates, such as foam, mica, FR-4 board and metal can be applied to further enhance thermal efficiency and add rigidity or abrasion resistance where needed.



Tempco's printed thick film heaters offer a cost effective and thermally efficient method of delivering heat to your product. The element's adaptability to the many challenges of effectively delivering heat make it an ideal solution for many thermal problems.

Specifications

- **Maximum Temperature: 900°F** [Pressure Sensitive Adhesives -](#)

Specifications

• **Maximum Temperature:** 900°F (482°C)

- Substrate Materials - Maximum Ratings**
- **Polyester:** 221°F / 105°C
 - **Polyethylene:** 221°F / 105°C
 - **Polyvinyl Chloride (PVC):** 221°F / 105°C
 - **Thermoset Laminate:** 284°F / 140°C
 - **Polyethylene Naphthalate (PEN):** 320°F / 160°C
 - **Polyimide (Kapton®):** 392°F / 200°C
 - **Silicone Rubber:** 392°F / 200°C

- Pressure Sensitive Adhesives - Maximum Ratings**
- **Acrylic:** 221°F / 105°C
 - **High Temperature Acrylic:** 300°F / 149°C
 - **Silicone:** 392°F / 200°C

- Dimensional Limits**
- **Minimum Width:** 0.25" (6mm)
 - **Maximum Length:** 30" (508mm)

Dielectric Strength
Each element is 100% tested to the greater of 1500Vac or the typical approval agency recommendation of 2x input voltage plus 1000 volts for dielectric integrity.

How To Order

Custom Engineered / Manufactured Heaters
Understanding that an electric heater can be application specific, Tempco will design and manufacture a Thick Film Heater to meet your requirements. Print a copy of the form [Flexible Heater Quote Request](#), fill it out, and fax it in to Tempco to receive a quote.



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Electrical Resistance Heating Tape - Adhesive Backed

[Applications](#) | [Engineering Information](#) | [Standard Sizes and Ranges](#) | [Accessories](#) | [How to Order](#)

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
- De-fogging, de-icing, fuel line

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