From: Lobo, Deborah

Sent: 12/10/2014 11:29:38 PM

To: TTAB EFiling

CC:

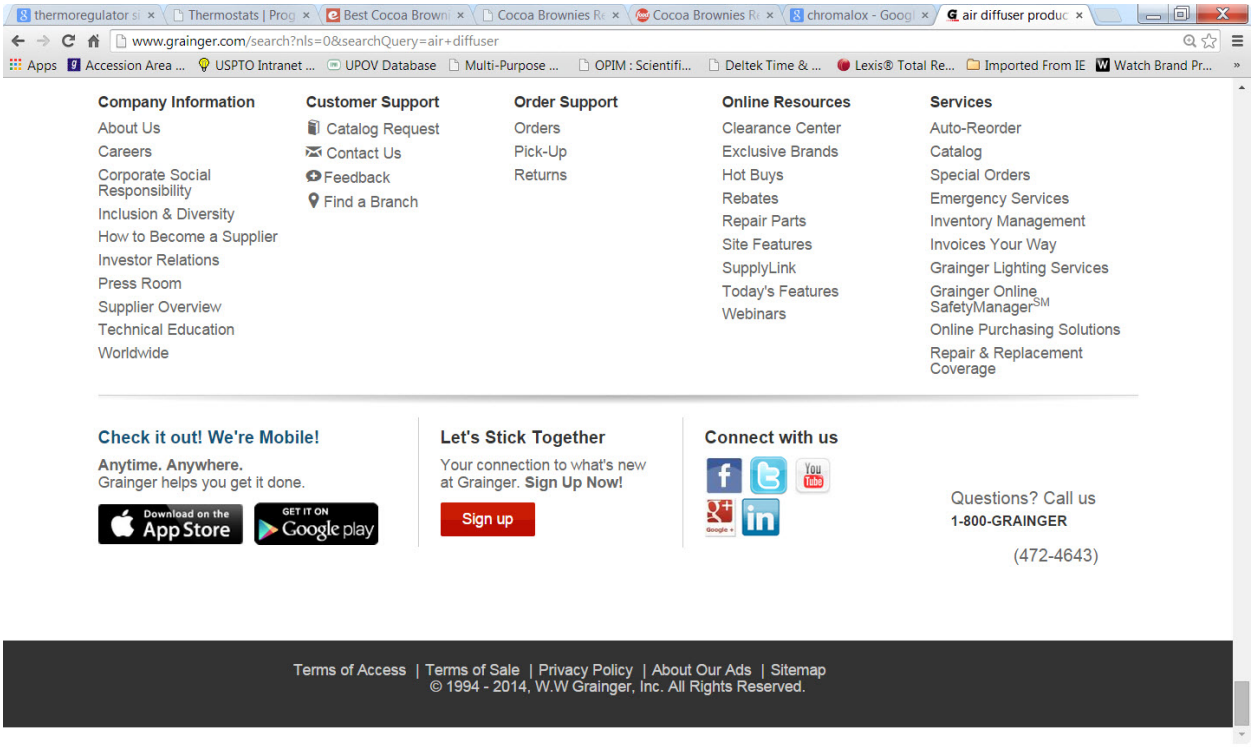
Subject: U.S. TRADEMARK APPLICATION NO. 79124238 - VULCANIC - 06286-T0001A - Request for Reconsideration Denied - Return to TTAB - Message 3 of 7

**********

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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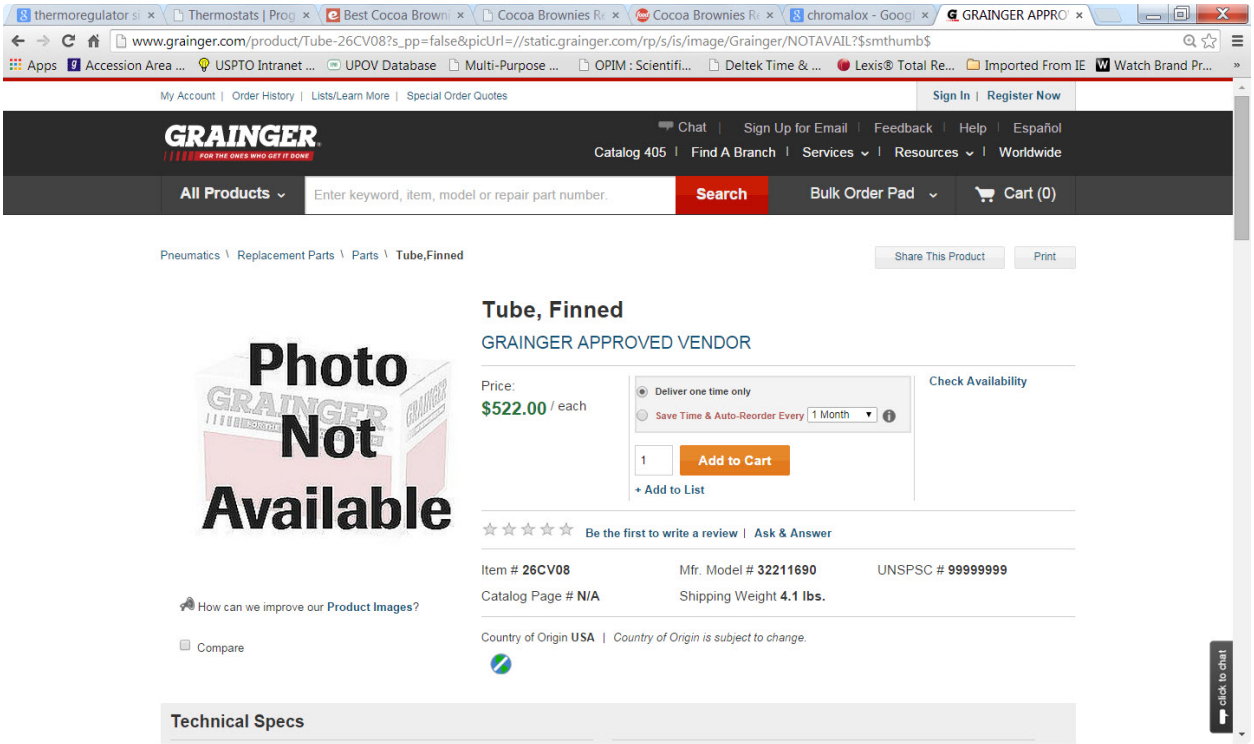
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1
Add to Cart
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Be the first to write a review | Ask & Answer
Item # 26CV08
Mfr. Model # 32211690
UNSPSC # 99999999
Catalog Page # N/A
Shipping Weight 4.1 lbs.
Country of Origin USA | Country of Origin is subject to change.
Technical Specs
click to chat
10:58:02 AM 12/9/2014

## 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 ›

**Idler Arm Assembly**

Item # 21GZ91

DYNABRADE

**Hose Reel Swivel, Use w/2Z862,2Z863,3VE25**

Item # 1GYJ8

REELCRAFT

**Oil Filter, For 50-100 HP Compressors**

Item # 2CEN9

INGERSOLL-RAND

**Framing Tool Fuel Cartridge**

Item # 31EE19

PASLODE

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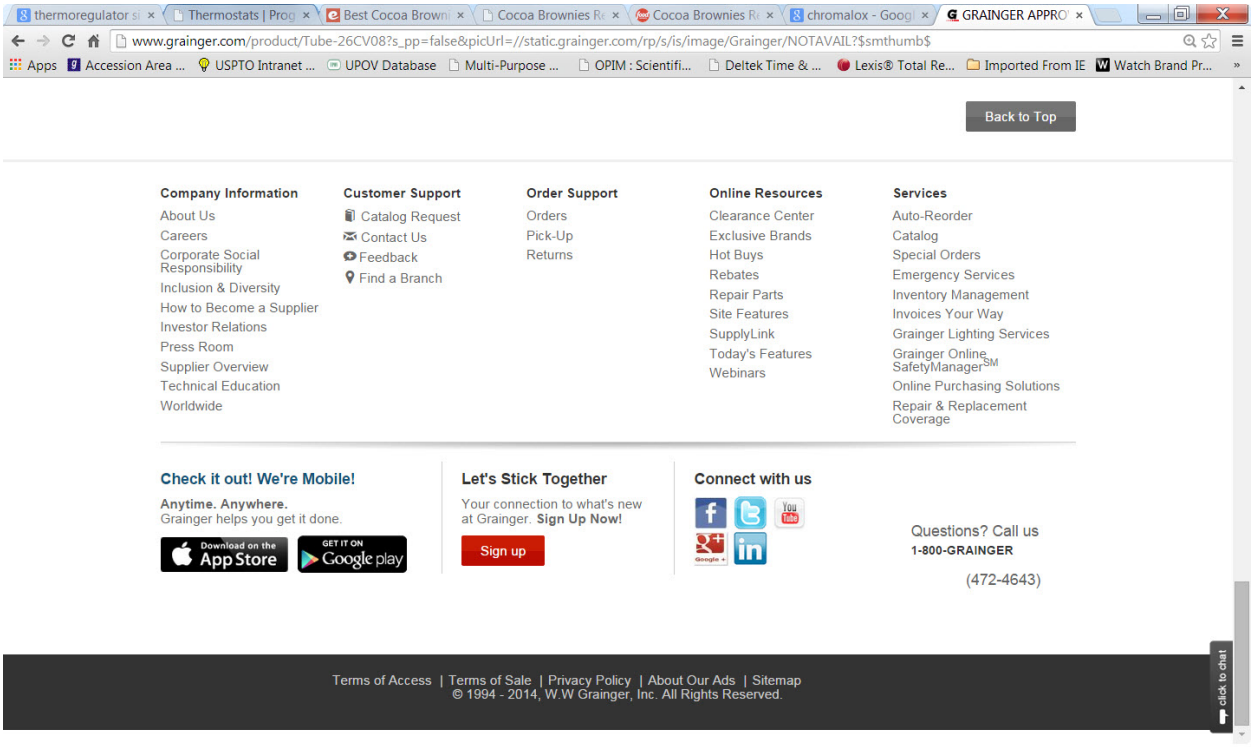


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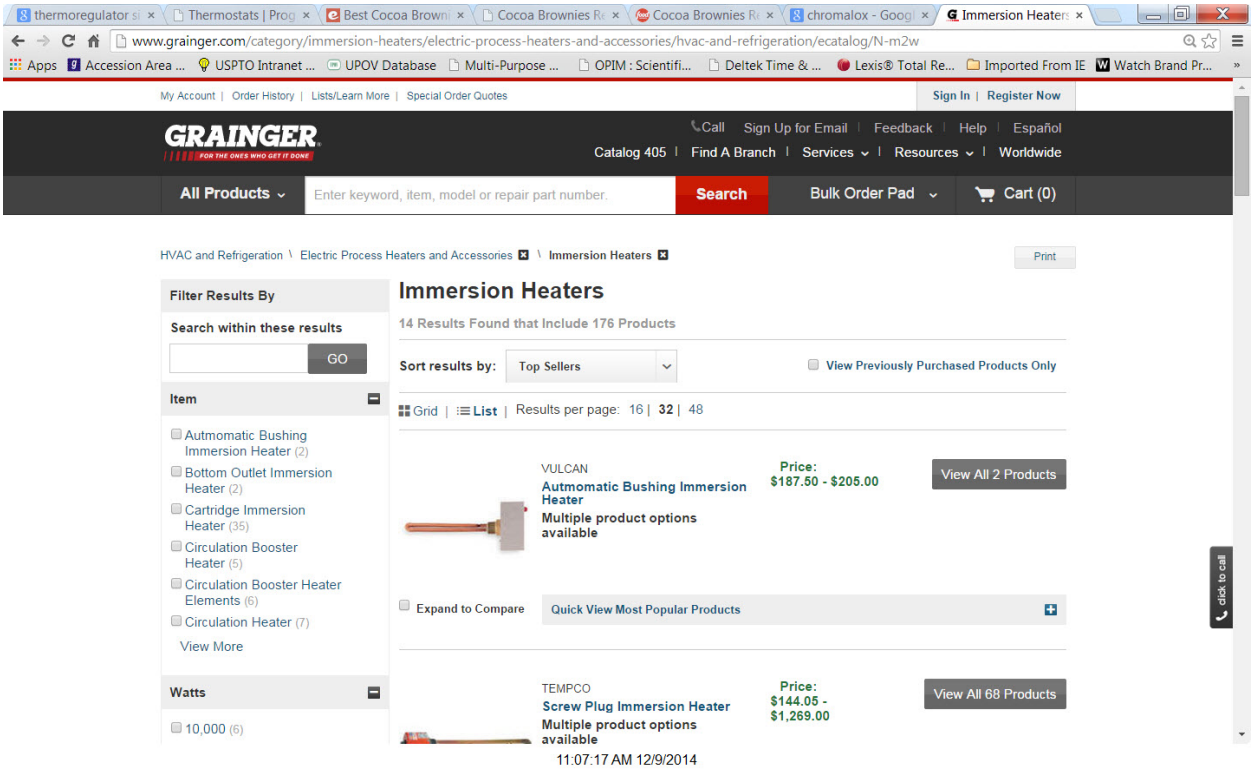
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Immersion Heaters
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UPOV Database
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Search within these results
GO
Item
Autmomatic Bushing Immersion Heater (2)
Bottom Outlet Immersion Heater (2)
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
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Grid | List | Results per page: 16 | 32 | 48
VULCAN
Autmomatic 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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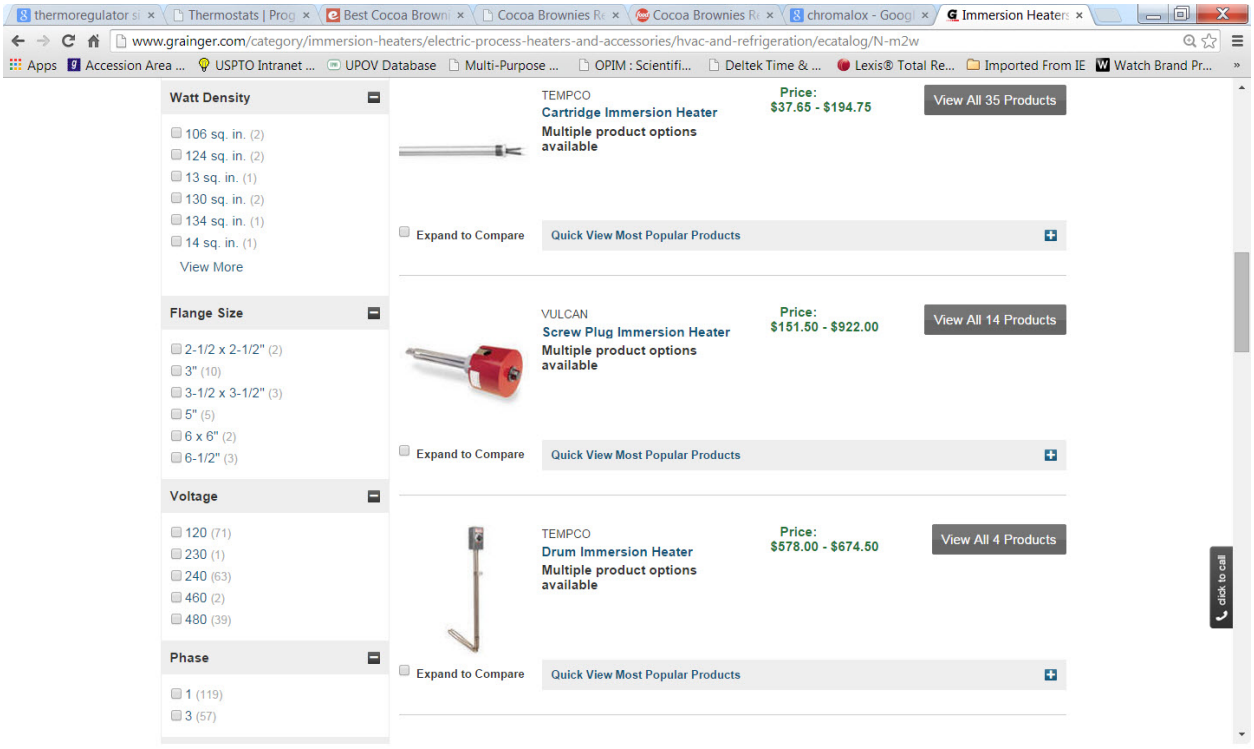


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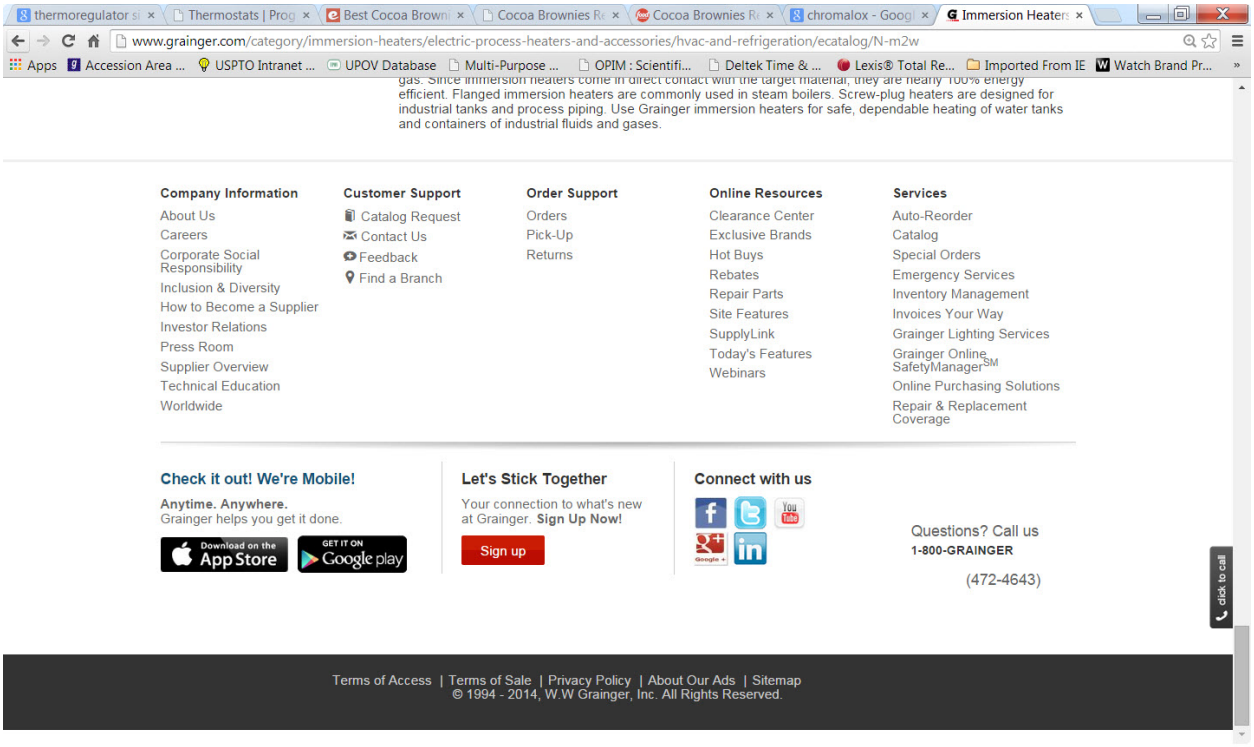


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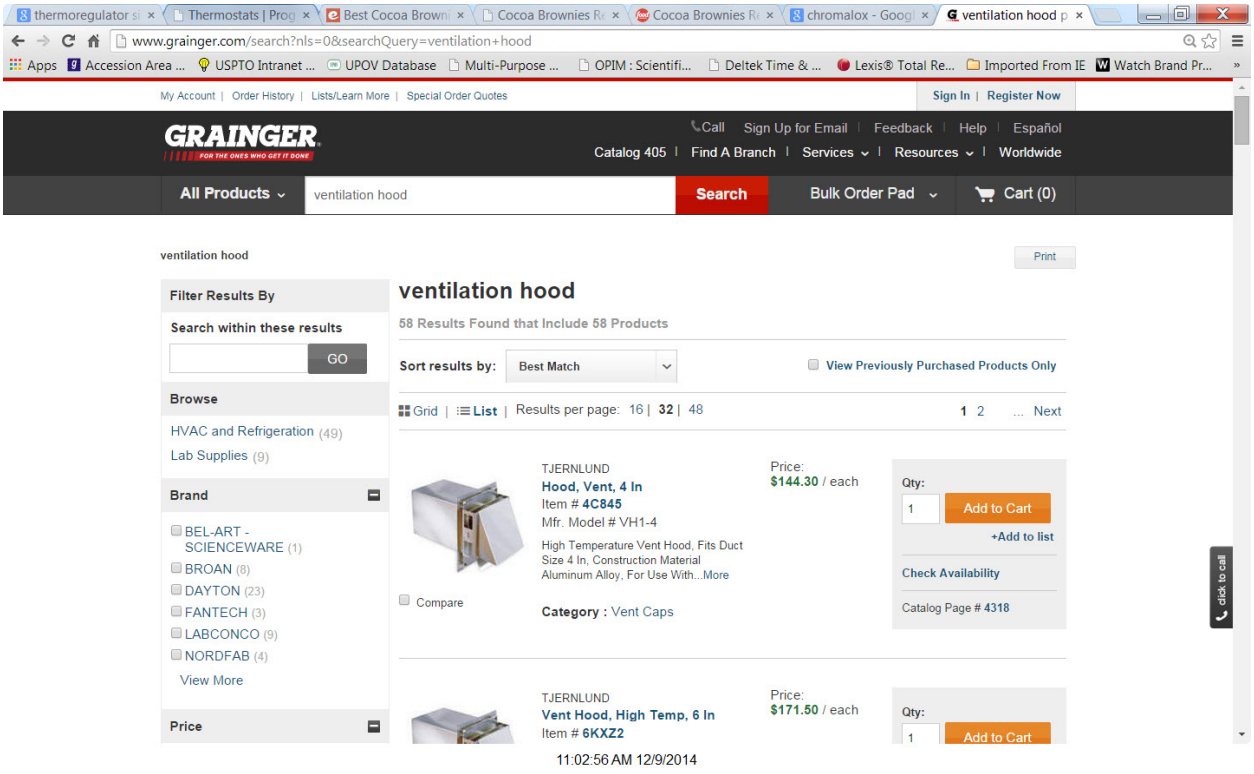
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Price
ventilation hood
58 Results Found that Include 58 Products
Sort results by: Best Match
View Previously Purchased Products Only
Grid | List | Results per page: 16 | 32 | 48
1 2 ... Next
TJERNLUND
Hood, Vent, 4 In
Item # 4C845
Mfr. Model # VH1-4
High Temperature Vent Hood, Fits Duct Size 4 In, Construction Material Aluminum Alloy, For Use With...More
Price: $144.30 / each
Qty: 1
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: 1
Add to Cart
click to call
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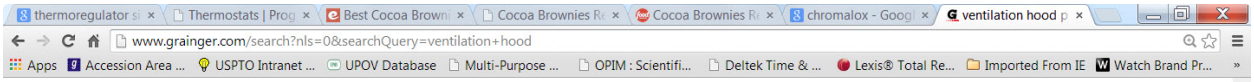


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# AcuAir® Supply Air Diffuser Advantage

## 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*

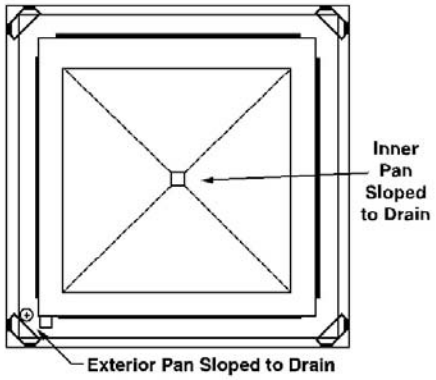
The supply air diffusers are constructed of 304 stainless steel. With fully welded drain pans, AcuAir sanitary diffusers provide a level of hygienic quality similar to that required of other components in the processing area.

### *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.




http://www.johnsoncontrols.com/content/dam/WWW/jci/be/Industrial_refrigeration/downloads/210_200-adv03_acuair.pdf
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# PACKAGED EQUIPMENT

## Heat Exchangers & Pressure Vessels

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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.

FEATURES AND BENEFITS | SPECIFICATIONS | RESOURCES

- Shell and Tube Heat Exchangers
- Flooded, Thermosyphon, 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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        - A350 P Series
        - A350 R Series
        - A350 S Series
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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*

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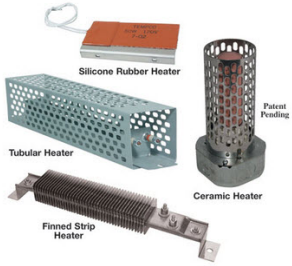
www.tempco.com/Enclosure%20Heaters/CbntEnclosrHtrs.htm
Apps | Accession Area ... | USPTO Intranet ... | UPOV Database | Multi-Purpose ... | OPIM : Scientifi... | Deltek Time & ... | Lexis® Total Re... | Imported From IE | Watch Brand Pr...

**TEMPCO Electric Heater Corporation**
*Process Heaters*



# *Cabinet Enclosure Heaters*

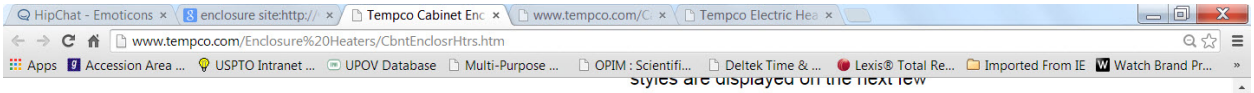
Silicone Rubber Enclosure Heaters | Tubular Enclosure Heaters
Finned Strip Enclosure Heaters | Ceramic Enclosure Heaters
Remote Thermostat for Enclosure Heaters
Cabinet Enclosure Heaters (Catalog PDF)




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 × Width) + (Length × Height) + (Width × 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

HipChat - Emoticons | enclosure site:http:// | Tempco Cabinet Enc | www.tempco.com/C | Tempco Electric Hea
www.tempco.com/Enclosure%20Heaters/CbntEnclosrHtrs.htm
Apps | Accession Area ... | USPTO Intranet ... | UPOV Database | Multi-Purpose ... | OPIM : Scientifi... | Deltek Time & ... | Lexis® Total Re... | Imported From IE | Watch Brand Pr...

enclosure use the formula:
2 [(Length × Width) + (Length × Height) + (Width × 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.

**3.** Determine the number of heaters you need. You can combine multiple heaters to achieve your wattage requirements.

**4.** 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 | TOTAL SURFACE AREA ft² (m²) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| °F (°C) | 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**

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www.tempco.com/Enclosure%20Heaters/CbntEnclosrHtrs.htm
Apps | Accession Area ... | USPTO Intranet ... | UPOV Database | Multi-Purpose ... | OPIM : Scientifi... | Deltek Time & ... | Lexis® Total Re... | Imported From IE | Watch Brand Pr...

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 ft² (m²) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| °F (°C) | 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**

| Temperature | TOTAL SURFACE AREA ft² (m²) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| °F (°C) | 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) | 30 | 40 | 55 | 70 | 80 | 100 | 120 | 135 | 205 | 270 | 335 | 405 | 540 | 670 |
| 40 (22) | 55 | 80 | 110 | 135 | 160 | 200 | 245 | 270 | 405 | 540 | 670 | 805 | 1075 | 1340 |
| 60 (33) | 90 | 120 | 160 | 205 | 245 | 300 | 365 | 405 | 605 | 805 | 1005 | 1210 | 1610 | 2010 |
| 80 (44) | 110 | 160 | 215 | 270 | 325 | 400 | 485 | 540 | 805 | 1075 | 1340 | 1610 | 2145 | 2680 |
| 100 (56) | 135 | 200 | 270 | 335 | 405 | 500 | 605 | 670 | 1005 | 1340 | 1675 | 2010 | 2680 | 3350 |
| 120 (67) | 165 | 240 | 320 | 405 | 485 | 600 | 725 | 805 | 1210 | 1610 | 2010 | 2415 | 3220 | 4020 |
| 140 (78) | 190 | 280 | 375 | 470 | 565 | 700 | 845 | 940 | 1410 | 1880 | 2345 | 2815 | 3775 | 4690 |



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## Finned Tubular Heaters

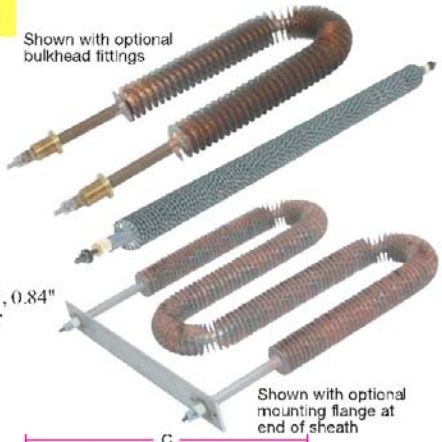
Tempco finned tubular heaters provide rapid heat transfer for natural convection or forced air space heating in industrial process air heating systems.

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

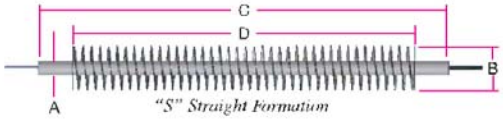
304 Stainless Steel .475" diameter tubular element with 1.12" diameter fin. Copper Clad Steel .430" diameter tubular element with 1.31" diameter fin.

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

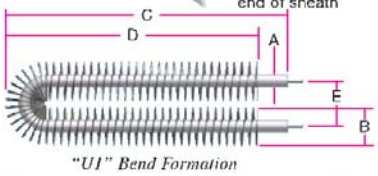



### Specifications

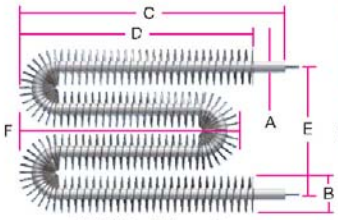
**Diameter:** .315", .430", .475"
**Material:** 304SS, 316SS, Steel Copper Clad, Monel, Steel
**Min. Sheath Length:** 11"
**Max Sheath Length:** 256"
**Fin Diameter:** 1.31", 1.14", 1.12", 0.84"
**Terminations:** All Tubular Heater
**Max. Volts:** 480 Vac
**Max. Amperage:** 40 Amp



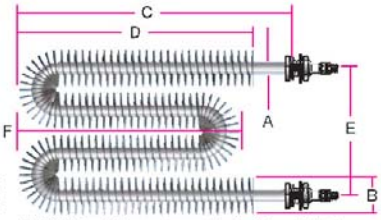
*"S" Straight Formation*



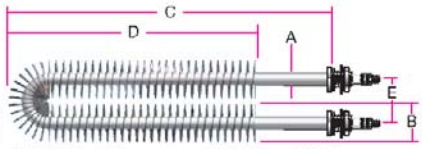
*"U1" Bend Formation*



*"M1" Bend Formation*



*"M2" Bend Formation with Bulkhead Fittings*



*"U2" Bend Formation with Bulkhead Fittings*

### Ordering Information, Finned Tubular Heaters

***Please Specify*** the following:

- ❑ Terminations and Seals
- ❑ Sheath Diameter
- ❑ Sheath/Fin Material
- ❑ Bend Formations and Dimensions
- ❑ Wattage and Voltage
- ❑ Bulkhead Fittings
- ❑ Mounting Flange

## 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:

- ❑ Sheath Material and Diameter
- ❑ Wattage and Voltage
- ❑ Heater Length and Cold Ends
- ❑ Terminations and Seals
- ❑ Bulkhead Fittings
- ❑ Mounting Flange

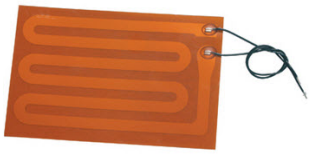
**TEMPCO Electric Heater Corporation**
*Flexible Heaters*

Home | Back to Flexible Heater Selector | Back to Silicone Rubber Main

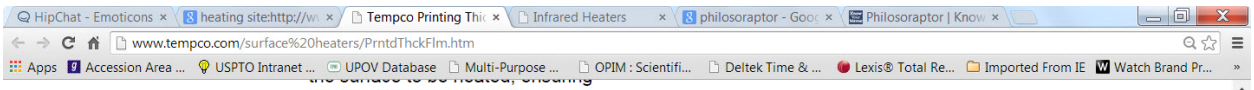
## *Printed Thick Film Heating Elements*

Applications | Laminates | Specifications | How to Order

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




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**

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

**----------**

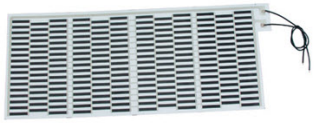
The elements can be designed for either AC or DC variable input voltages up to 277 VAC, with UL/CSA recognized component watt densities of up to 25 W/sq. in. The technology lends itself well to both small and large designs, with current products ranging from 5/8" x 1-1/4" to 24" x 98". Round, oval and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

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.

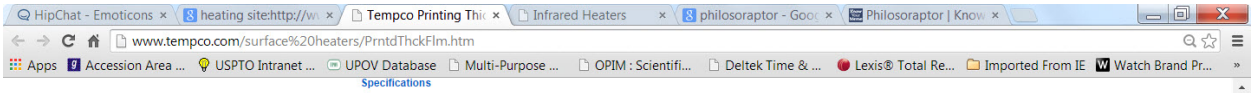


Tempco's printed thick film heaters offer a cost effective and thermally efficient method of delivering heat to your product. The element's adaptability to the many challenges of effectively delivering heat make it an ideal solution for many thermal problems.

**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 Napthalate** (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 2× 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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# TEMPCO Electric Heater Corporation

*Flexible Heaters*



## *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
- De-fogging, de-icing, fuel line