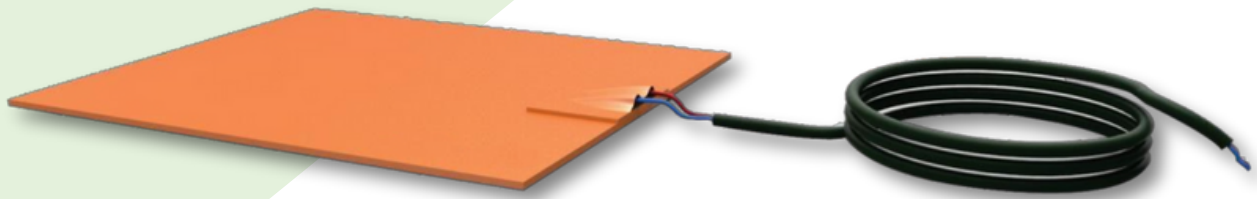




Heating Technologies

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### Silicon Rubber Heater :

are incredibly flexible and thin, and they can be made in any shape to suit on practically any kind of contour. Their direct bonding to the application and thin design allow for effective and quick heat transfer, which speeds up heating and reduces the need for power. In order to satisfy distributed wattage requirements, silicone rubber heaters' adaptable design allows for larger or lower heat concentration zones. They also have a very high watt density. They are resistant to vibration and mechanical damage and can be pre-formed into intricate shapes. For accurate temperature control, they can also accept RTDs or thermostats. Termination can be offered wherever to facilitate connecting. Depending on the needs, a variety of mounting techniques are available, including Velcro, field-applied adhesive, and pressure-sensitive adhesive. Silicone **Rubber Heaters are available in two types** - Wire wound elements consist of the resistance wire wound on a fiber glass cord for support and stability. Wire wound is recommended and preferred for all large and small sized heaters. **Etched foil** heaters are made with a thin metal foil (.001") as the resistance element. The etched foil heater provides exceptional heat transfer compared to wire wound elements, due to its large flat surface area.

### Construction



1. **The lead wire** consists of high temperature resistance wire wound around a fiberglass core for added support and flexibility. **Silicone rubber** are rugged, moisture and chemical resistant, flame retardant, have high dielectric strength. **Nickel Chromium** Resistance wire for maximum life, evenly wound for even heat distribution.
2. Vulcanization process is used to attach the power leads and cord sets to the heater windings.
- 3.

### Technical Data

- Wattage Tolerance : Wire Wound +5%, -10% Etched Foil + 10%, -10%
- Voltage : 12V to 600V
- Max. Operating Temperature : 230°C
- Maximum size : length 1" to 120"
- Width : 1 to 36"
- Thickness : 0.056" standard, other thicknesses available
- Watt density : 10W/In<sup>2</sup>

### Design Option

Nobleheat Heater offers several design options to meet various application requirements.

### Ground Mesh

For grounding purpose a second layer of insulating material and a conductive grid can be added to the heater. The heater comes with a ground wire

### Silicone Rubber Sponge Insulation

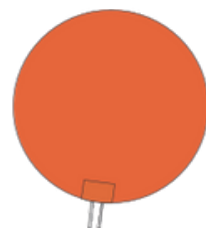
To improve heater efficiency, 1/16", 1/8", 1/4", 3/8" or 1/2" insulation can be bonded to the outside of the heater. Closed cell silicone sponge is extremely flexible and has a Temperature range of "- 75°C to 250°C".

If you have specific design needs or want to discuss a custom project, please reach out to us.



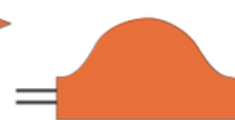
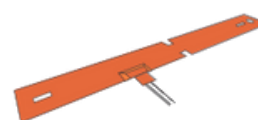
### Round Heaters

Round shapes are also available. Round heaters are best attached to tooling with PSA.



### Various Shapes for Various Applications

Odd shapes are available to fit those hard to heat devices. Holes and cutouts help fit those irregular shaped tools.



### Temperature Controls for Silicone Rubber Heaters:

NOBLEHEAT Heater Silicone Rubber heaters can accommodate pre-set or adjustable thermostats, thermal cut-offs, RTDs and Type J thermocouples. Each has a specific temperature range and maximum amperage capability. The most common type of temperature control are pre-set and adjustable thermostats. They can be mounted to sense the temperature of the surrounding atmosphere or to sense the part temperature. Not recommended for low voltage applications. Thermocouples & RTDs are small and are easily embedded anywhere on the heater.

### Mounting Methods.

**Pressure Sensitive Adhesive :** Here are several options for installation or mounting Silicone Rubber Heaters. An easy mounting method is to peel and stick. PSA is attached directly to one side of the heater. Just peel away the protective liner and attach the heater to the desired tool. PSA is rated to a continuous temperature of 300°F and a maximum intermittent temperature of 350°F. It is not recommended for curved surfaces. The heater should be installed within 6 months of manufacture.

**Factory Vulcanizing :** Another method of installation is to send your tool to the Marathon Heater factory. The tool is placed in a vacuum able and the SRH is vulcanized directly to the tool. This is the strongest bond available.

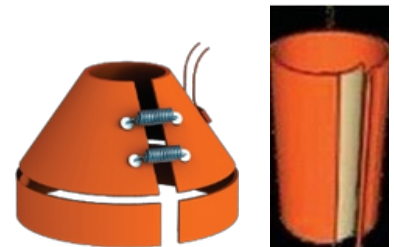
**Field applied adhesive :** SRH may also be attached with field applied adhesive; Marathon Heater will supply the required RTV to adhere the heater to the desired surface. We offer a room temperature curing adhesive. Apply a thin film of RTV on the entire bottom of the heater. After positioning the heater on the part, use a roller to remove all air trapped between the heater and the part. The RTV should be allowed to cure for 24 hours.

### Drum Heaters



NobleHeat Heater Drum Heaters are an easy way to heat up drum contents. Various sizes and lengths allow you to heat up practically any drum, pail or barrel. Uniform heat prevents scorching or degradation of the contents. The silicone rubber band heater is placed below the level of the fluid. The easy spring lock-up provides movement of the band when content levels fluctuate. The band style drum heater can be used on plastic, alloy or just about any material.

**Springs and Grommet :** Each end of the spring is attached to a grommet securing the heater to the tool. Grommets are spaced approximately 2" apart. Velcro : 1" Wide Velcro secure the heater to the tool. Temp range 200°C



### Band Style Drum Heater applications include: •

- Speeding up the flow of liquids •
- Freeze protection
- Viscosity control
- Maintaining product consistency

### Features and benefits :

- Easy installation with spring loaded fastener. 3 conductor cord set.
- Internally grounded.
- Can be wrapped around any object.
- Options thermocouples, RTD's, holes and cutouts.

### Application

Easy installation with spring loaded fastener.  
3 conductor cord set.  
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