

IMPORTANT CONSIDERATIONS FOR
SILICONE RUBBER HEATERS

TEMPCO

Silicone rubber heaters can be used in a wide variety of applications with many different options, making sure the correct setup is being used on the silicone rubber heater is vital for optimal performance and life of the heater. This article will outline some common misconceptions and mistakes that can occur when designing and using a silicone rubber heater.

GETTING GOOD CONTACT

Possibly the most common failure in a silicone rubber heater is poor contact with the heating surface. With the exception of enclosure style heaters (EHR's), silicone rubber heaters require good surface contact to properly transfer heat onto the target surface. This can be achieved through a pressure plate, pressure sensitive adhesive, or RTV to adhere the heater to the surface. When applying a pressure plate, silicone heaters are rated up to 40 PSI on the main body of the heater (not at the lead patch area). Exercise caution when tightening a plate on top of silicone heaters so not to damage the heating element. For PSA and RTV it is vital to remove any air bubbles that may form when initially applying the heater to the surface. Air bubbles will cause the heater to run noticeable hotter where they're present and can lead to failures. PSA application instructions are available on the QR code that is laser marked on all Tempco heaters with PSA. RTV should be applied in one evenly disturbed layer across the application surface. Lightly rolling the surface of the heater with PSA or RTV after it is applied can ensure that air bubbles are pushed out.

If mounting the silicone heater on a cylindrical surface it is important to provide Tempco with the diameter of the vessel it is being mounted on. Depending on the mounting option selected the overall heater length will vary to accommodate the mounting hardware. For example Tempco's springs and boot hooks option requires a 2" gap, so to properly size the heater, the diameter and mounting option are required. All the gap dimensions are in the Tempco catalog for reference when designing such a heater.

Sensor and thermostat selection can be vital for proper control and safety on silicone heaters especially in higher watt density applications. It is recommended that when operating temperature and watt density are high that a thermostat and/or thermocouple are used to properly control the heater to avoid overheating and possible burnout. Silicone rubber heaters are rated to 500F intermittent and 392F continuous. Intermittent means seconds to a few minutes, while continuous mean hours to days. When PSA is applied the recommended continuous rating is then 300F. Higher watt densities can reach these max operating temperature quickly so it becomes imperative to use some form of sensor or thermostat to control the heater.

WATERPROOF OR WATER-RESISTANT?

One of the most common misconceptions for silicone rubber heaters is that they are waterproof. While these types of heaters are much more resistant to fluids and contamination than others, they are never fully waterproof. Exercising caution when fluid contamination is possible will help prevent any pre-mature failures and guarantee longer heater life. Tempco does offer special features to help improve performance in such conditions.

These are some of the most common areas to consider when designing a silicone rubber heater, however there may be more depending on the specific application. Make sure to provide as much information when working with Tempco's Sales Team and Engineering to ensure that we can make the best possible design for your application.