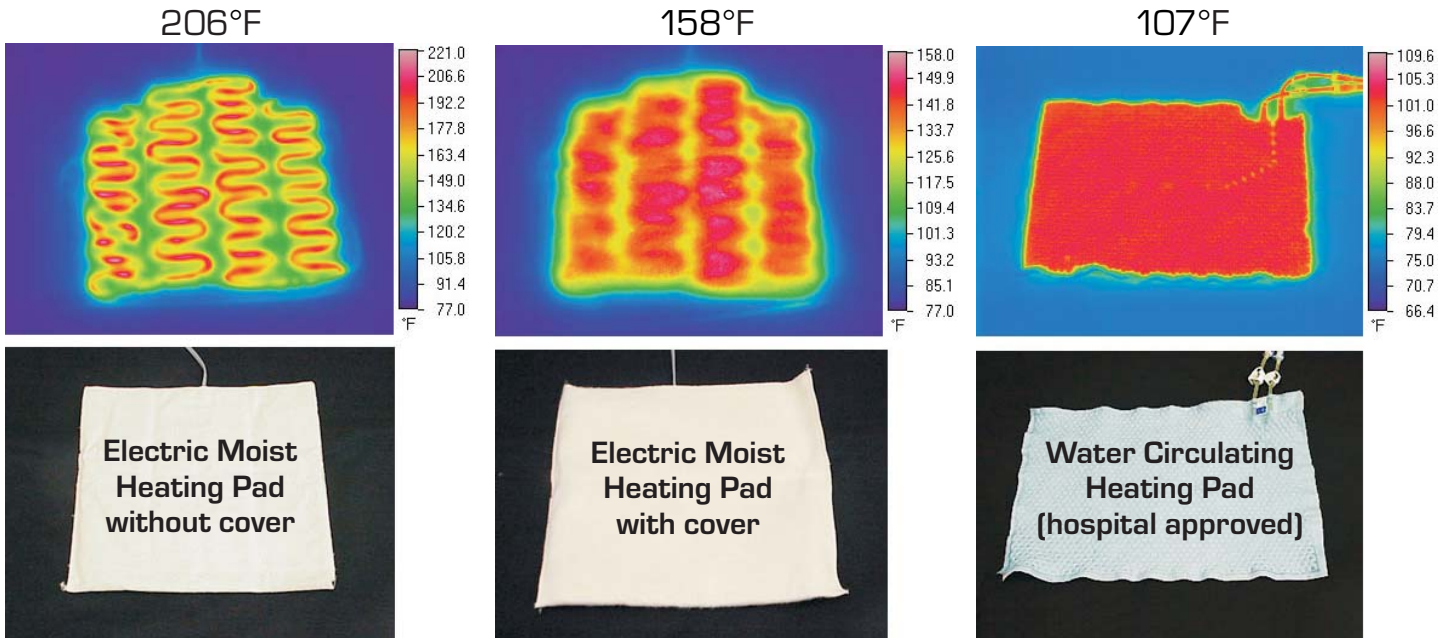


# Powered Heat Therapy



## Comparison of Electric Heating Pads to Water Circulating Systems



**Top Left and Middle:** Infrared photography reveals that electric moist heating pads are extremely hot with and without the protective cover. **Top Right:** Water circulating systems maintain a safe temperature incapable of burning patient skin and approved by the FDA for continuous use with routine observation.

Electric heating pads and water circulating heat therapy pads are not the same. While both are used to provide localized pain relief, the similarity ends there. Differences between these modalities center primarily on safety, but also include temperature control, length of use and approved applications. In addition, hospital grade water circulating systems sell for hundreds of dollars and are not available without a prescription. On the other hand, electric heating pads can be purchased without a prescription for as little as \$15.

Clinical research has provided established guidelines as to what constitutes thermal safety and at what temperatures irreversible skin injury begins. The FDA has also adopted temperature parameters from research and will not, for example, approve thermal regulating systems used in operating rooms that have a surface contact temperature in excess of 110°F. In 1995 the FDA issued a public advisory warning of the risk of injury from electric heating pads and acknowledged that water circulating systems can be used "more safely". Further, most if not all US hospitals prohibit the use of electric heating pads due to the inherent risk of shock, burn, fire and potential interference with other medical equipment that may be present (i.e. oxygen).

Contact Surface Temperature		Maximum allowable time above each temperature			Time above each temperature	
°F	°C	sec	min	hr	sec	min
110.3	43.5	10,000	166.7	2.8	1,100	18.3
111.2	44.0	6,000	100.0	1.7	940	15.7
112.1	44.5	3,300	55.0	0.9	760	12.7
113.0	45.0	1,990	33.2	0.6	600	10.0
113.9	45.5	1,000	16.7	0.3	435	7.3
114.8	46.0	650	10.8	0.2	300	5.0
115.7	46.5	350	5.8	0.1	80	1.3
116.6	47.0	225	3.8			
117.5	47.5	110	1.8			
118.4	48.0	80	1.3			
119.3	48.5	60	1.0			
120.2	49.0	38	0.6			
121.1	49.5	28	0.5			
122.0	50.0	22	0.4			
122.9	50.5	17	0.3			

**FACT**  
Temperatures above 110°F can cause irreversible tissue damage in 18 minutes or less.

Electric heating pad warnings are numerous. Their use is generally limited to no more than 30

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## Comparison of Electric Heating Pads to Water Circulating Systems

minutes. They cannot be sat on, laid on, slept on or folded. Neither can they be used on persons who are immobile, unconscious, have poor circulation or infants. The reason for these limitations are the extreme temperatures that electric heating pads can achieve in a matter of minutes. The thermal images at the beginning of this document show that a electric pad can heat to 158°F with its protective sleeve, and up to 206°F without the sleeve. To use an electric heating pad safely for back pain, the user is advised to lay on their stomach and place the pad over the treatment area; this is not a practical task for someone who has chronic back pain, but it underscores the risk of injury or fire if high heat were to be trapped between the back and a mattress. Some electric heating pads are equipped with a spring trigger on/off switch that requires the user to hold the trigger in order for the pad to heat; again, not a practical task for someone with arthritis, but necessary due to the risk of burns or fire. In February 2007 one maker of electric heating pads recalled nearly 300,000 units due to the risk of fire.

Water circulating systems are on the other hand approved by the FDA for continuous use with patients of all types, granted the skin is checked frequently. Hospitals use water circulating heating pads in patient rooms and in the presence of oxygen equipment. Patients are also allowed to sleep on these types of heating pads in their beds. The pads can be folded and configured for use anywhere on the body without the concern of heat buildup or heat entrapment. A patient with back pain does not have to lie on their stomach to use a water circulating heating pad.

New studies concerning the use of low level heat therapy systems and the duration of their therapeutic value are underway. It has already been claimed in some studies and suggested in others that several hours of low level heat can produce therapy that lasts overnight or through the next day. Therefore, controlled low level heat therapy systems that can be applied on a continual basis offer hope for drug free therapy for persons with chronic pain or circulation issues; such that cannot be achieved with electric heating pads, particularly those without accurate temperature control or integrated safety features to prevent shock, burns or fire.

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