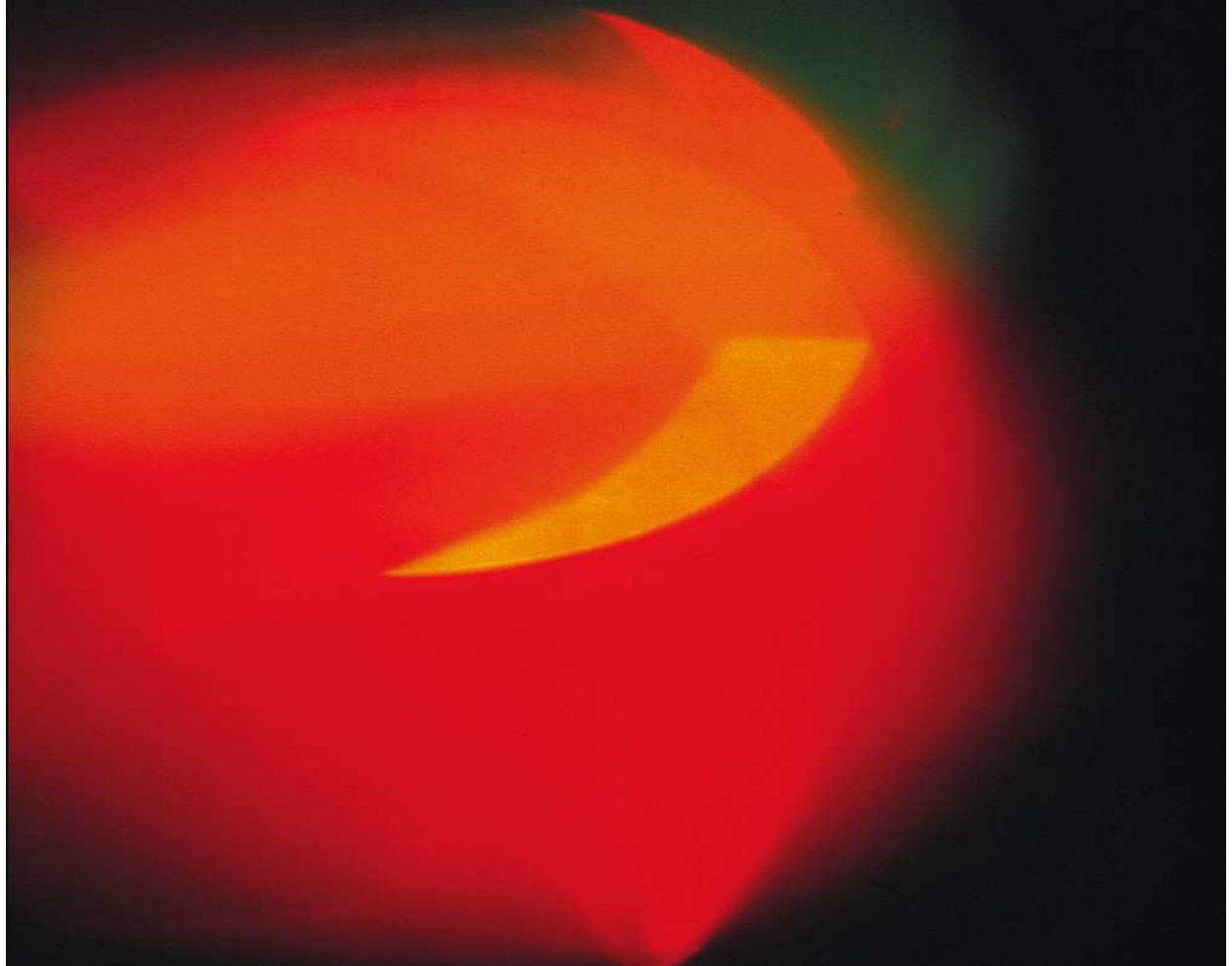




Prang+Partner AG

**The future is flexible
heating elements**



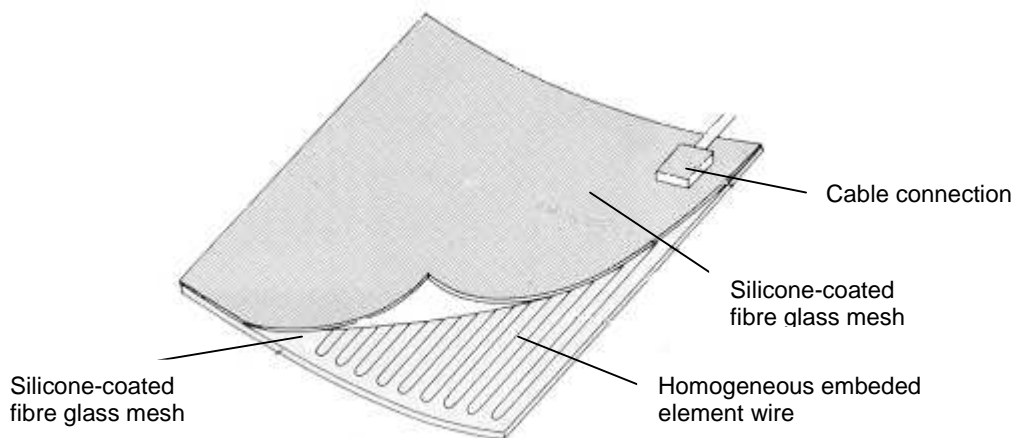
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HOTSIL flexible heating elements

The rigid form of conventional electric heaters has set certain limits on the application of electric heat, particularly when the objects are of irregular shape. In such cases it would be convenient to have flexible heating elements which could be matched accurately to the application in terms of shape, size and heating power. HOTSIL® heating elements, which are made of a silicone-coated fibre glass mesh, satisfy these requirements completely. They can be produced in all shapes and sizes and they distribute the heat over the entire surface of the object.



Some typical examples

HOTSIL® heating elements can be used almost anywhere due to their flexibility and adaptability. Some successful applications:

Pipe heating



Problem: Pipes are usually wrapped in heating tape; the large gap between turns results in poor efficiency.

Solution: The tightly attached heating sleeve with fine-distributed heating wires ensures very high efficiency.

Water heaters



Problem: Conventional water heaters employ immersion heaters which are subject to severe corrosion and scaling and therefore short-lived.

Solution: HOTSIL® heating elements strapped to the outside. Lower surface temperatures, less scaling, long life, no corrosion.

Wall heaters



Problem: Uniform low temperature in the side wall and floor, to gain space for more seats and comfort for passengers, easy to install.
Solution: HOTSIL heating elements, installed under the floor and between the outside and inside wall, protection from vandals.

Electronics



Problem: Conventional rigid heaters are inefficient due to the unusual shapes.
Solution: HOTSIL® flexible heating elements can be adapted to the shape; heat is applied exactly where it is needed

Heating power and surface temperatures

The surface temperature of the heating elements must not exceed 200°C in continuous operation, although temperatures up to 250°C are permissible for brief periods. A temperature over 270°C will damage the silicone.

There are two methods of limiting the surface temperature:

- The temperature can be limited by a thermostat.
- The resistance of the element can be rated to give precisely the required surface temperature.

The table below shows the relationship between surface temperature and heating power without control at 20°C ambient temperature.

Specific heating power Watt / cm ²	Surface temperature T2 in °C	Specific heating power Watt / cm ²	Surface temperature T2 in °C	Specific heating power Watt / cm ²	Surface temperature T2 in °C
0,050	40	0,550	200	1,10	280
0,075	60	0,575	205	1,15	285
0,100	70	0,600	210	1,20	290
0,125	80	0,625	215	1,25	295
0,150	90	0,650	220¹	1,30	300
0,175	98	0,675	225	1,35	305
0,200	105	0,700	230	1,40	310
0,225	113	0,725	234	1,45	315
0,250	121	0,750	238	1,50	320
0,275	128	0,775	243	1,55	325
0,300	135	0,800	247	1,60	330
0,325	143	0,825	250	1,65	335
0,350	150	0,850	253	1,70	340
0,375	157	0,875	256	1,75	345
0,400	164	0,900	259	1,80	350
0,425	171	0,925	262	1,85	355
0,450	176	0,950	265	1,90	360
0,475	182	0,975	268	1,95	365
0,500	188	1,00	270	2,00	370
0,525	194	1,05	275		

¹ Under practical conditions the heat dissipation is substantially better than in the worst case test conditions. Experience has shown that a heating power of 0,65 W/cm² will not cause the maximum temperature to exceed 200°C.

For further information please contact us: info@prang.ch

A design checklist for HOTSIL® heating elements

It is normal practice for HOTSIL® heating elements to be tailored accurately to specific applications. Our engineers are happy to face each new challenge and work out the optimum solution.

The following checklist is an aid to achieving the best results

1. Task

- Description (enclose sketch if necessary)
- Present method?

2. Heating requirements

- Continuous heat
- Heating-up time
- Maximum temperature required
- Surface area or volume to be heated
- Material and wall thickness of vessel / object to be heated
- Medium to be heated – static or flowing (state l / min)
- Thermal insulation – material / thickness / k value

3. HOTSIL® heating element

- AC or DC
- Voltage
- Heating power
- Rated current
- Temperature control with / without controller, type
- Electrical connection: separate leads / flat connector/ terminals / cable length
- Attaching of element: vulcanizing / adhesive / strapping / screwing
- Vulcanized temperature sensor pocket yes / no

4. Ambient conditions

- Exposure to chemicals
- Mechanical stress, nature and magnitude
- Immersion in liquid – what kind?