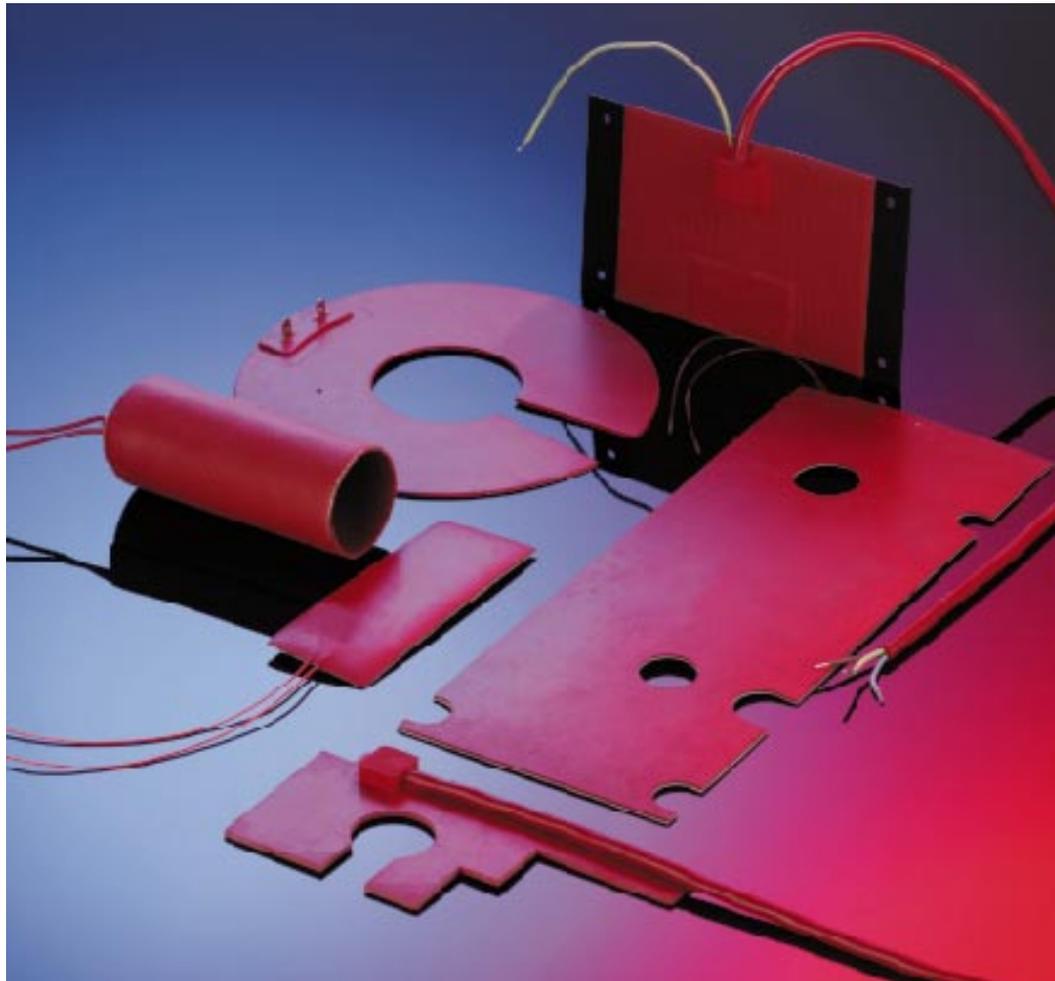




# hotform<sup>®</sup>

## Silicon Heating Elements



## hotform<sup>®</sup> silicon heating elements

hotform<sup>®</sup> silicon heating elements from **hotset** — the ideal heating solution for any application, where rigid heating elements come to their extreme point due to their construction. For example, everywhere where geometric unusual shapes are required and a uniform distribution of the heating power is necessary.

Whether for heating of hydraulic cylinders or in textile or packaging machines, in apparatus construction or in the electronic industry — due to their flexibility and the possibility of unusual cuttings, hotform<sup>®</sup> silicon heating elements are best suitable for the uniform heating of plains.

hotform<sup>®</sup> silicon heating elements consist of silicon-coated fibreglass fabric with a homogeneous embedded heating conductor. This construction allows the

precise adjustment of the heating element to the required application: The flexibility can be increased and the mechanical steadiness can be improved through the insert of different glass fabrics; the connections can be freely placed.

On the one hand, the temperature control of the heating element is made by the corresponding laying out of the resistance values. On the other hand, the direct installation of thermocouples with a connection to an external temperature controller is also possible.

Resistant against ageing and weather, non-poisonous, resistant against chemicals and biodegradable — due to the used materials, hotform<sup>®</sup> silicon heating elements offer a big spread of application variants. This is continued by the fastening possibilities: vulcanize on or

stick on (with special adhesive), screw on or lace on — the application case determines the individual fastening option.

**hotset** advises and supports you at any state of projecting the best suitable hotform<sup>®</sup> silicon heating element.

### kinds of fastening

vulcanize on

- fast compound between the hotform<sup>®</sup> silicon heating element and the part which has to be heated; for operation temperatures from -60 up to +200 °C.

stick on

- by attached self-adhesive foil for flat or cylindrical shapes; for operation temperatures from 0 up to +100 °C ;
- with special hotform<sup>®</sup>-adhesive (cold-vulcanite, available as accessory from **hotset**) for any shape; for operation temperatures from -60 up to +180 °C.

strain on, lace on

- for cylindrical shapes by fixed tension springs or integral loops and hooks; for operation temperatures from -60 up to +200 °C.

press on

- for flat assembling plains with the help of screw connections or pressure plates; for operation temperatures from -60 up to +200 °C.

### temperature control

- without external controller system by the self-resistance of the heating coil;
- by bimetal-controller, -watcher or -liminator;
- with thermocouples or resistance sensors and corresponding temperature controller;
- by barsensor, capillary tube sensor etc. in fixed sensorcases and corresponding temperature controller.

Ask **hotset**, which kind of temperature control is the best for your heating task.

### connection options

The electrical connection of the hotform<sup>®</sup> silicon heating elements will be fixed according to safety precaution and application specific issues.

- simple insulated connection wires;
- double insulated connection wires;
- simple insulated double leads;
- connection leads with or without mechanical protection;
- connection leads with polished earth for metal parts;
- flat connector;
- connection with strain relief and bending connection.

The thermal and mechanical properties of the silicon make many individual solutions possible, which can not all be mentioned above.

## technical data, heating power and surface temperature

### standard

- operating voltage: 24 - 250 V AC/DC
- nominal wattage: up to 6500 W
- specific power density: see table below
- thickness: 1.5 - 5 mm
- max. length: 2.5 m
- max. width: 1.0 m
- max. heating area: 2.5 m<sup>2</sup>
- bending radius: R 50 mm
- connection option: silicon insulated leads, flat vulcanized

- wattage tolerance: ±10%
- temperature resistance: -60 up to +200 °C, shortly +250 up to +300 °C
- heat conductivity at +100 °C: approx.  $15 \times 10^{-4}$  W/cm K
- dielectric strength: 12 KV/mm
- licenses: VDE 0700 part 1, DIN EN 60335

### option

- operating voltage up to 750 V AC/DC on request
- other measurements
- smaller bending radius
- other connection options and protection of the connection
- temperature control

### heating power and surface temperature

The surface temperature of the hotform<sup>®</sup> silicon heating elements should not exceed +200 °C in continuous operation. Exceeding up to +250 °C is briefly allowed. Temperatures over +300 °C will destroy the silicon.

The right table mentions the attainable surface temperature at corresponding surface power without regulation. The limit values for the maximum possible surface load are:

- 0.60 W/cm<sup>2</sup> at limitation with self-resistance depending on application;
- 2 W/cm<sup>2</sup> at limitation with thermostats or temperature controller (higher surface load on request).

The values shown in the table have been ascertained under the following conditions:

- flat hotform<sup>®</sup> heating element
- test position horizontal
- surrounding temperature +20 °C (calm air)
- measured in steady position

specific heating power wattage/cm <sup>2</sup>	surface temperature in °C
0.050	40
0.075	60
0.100	70
0.125	80
0.150	90
0.200	105
0.250	121
0.300	135
0.350	150
0.400	164
0.450	176
0.500	188
0.550	200
0.600	210
0.650	220
0.700	230
0.750	238
0.800	247
0.850	253
0.900	259
0.950	265
1.000	270
1.100	280
1.200	290
1.300	300

specific heating power wattage/cm <sup>2</sup>	surface temperature in °C
1.400	310
1.500	320
1.600	330
1.700	340
1.800	350
1.900	360
2.000	370

### Checking-list for projecting

For laying out the hotform<sup>®</sup> silicon heating elements, please state the following details:

- application (device, medium, special functions)
- measurements (possibly sketch)
- nominal voltage
- heating power
- temperature values (temperature control, limit values, insulation)
- kind of fitting
- electrical connection (arrangement, cross section, kind of leads, wattage length)
- number of pieces

hotset — in Germany and 30 other countries all over the world:



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- Czech Republic
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- Greece
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- Korea
- Netherlands
- New Zealand
- Philippines
- Poland
- Portugal
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- South Africa
- Spain
- Sweden
- Switzerland
- Taiwan
- Turkey
- USA