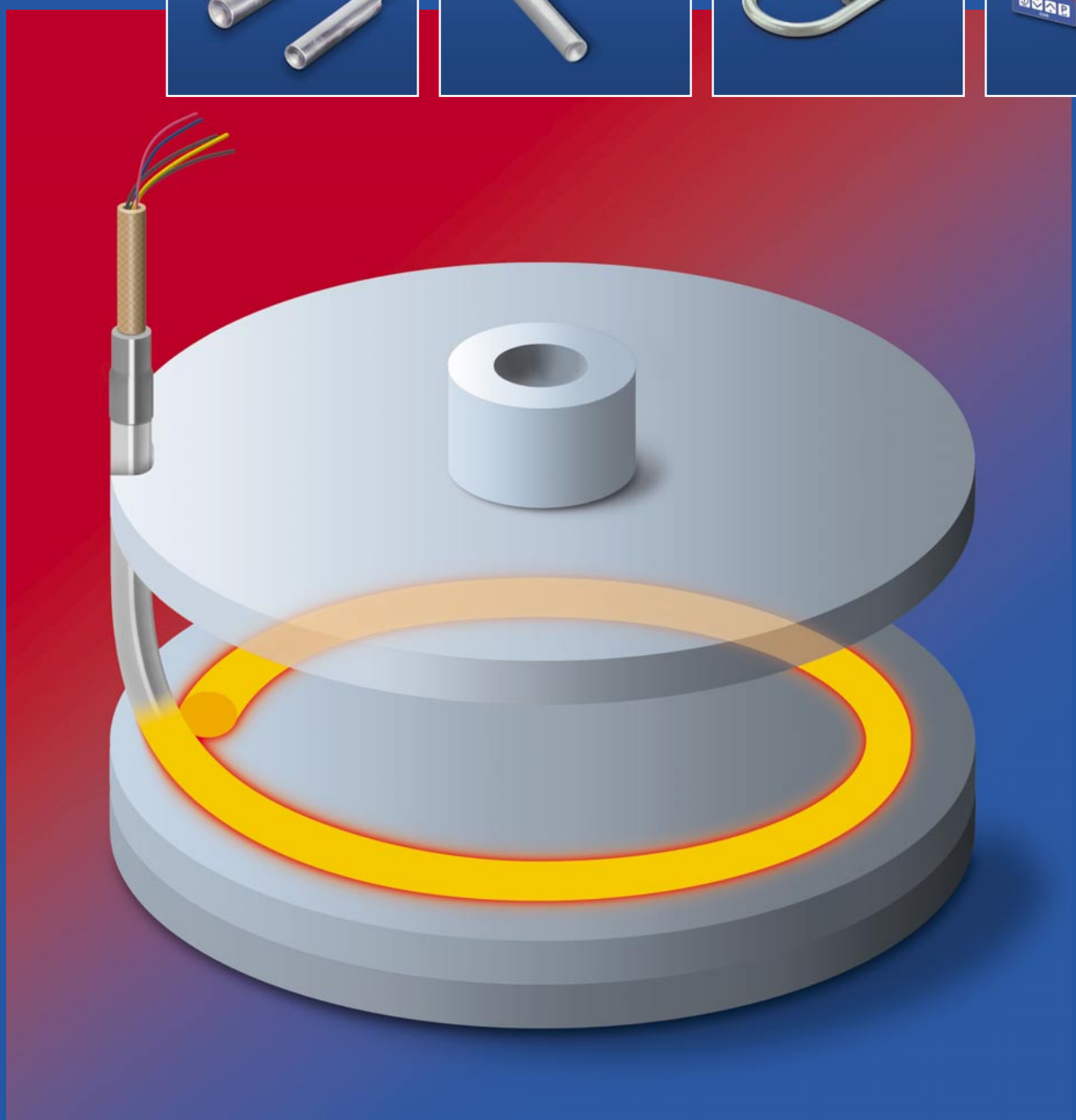
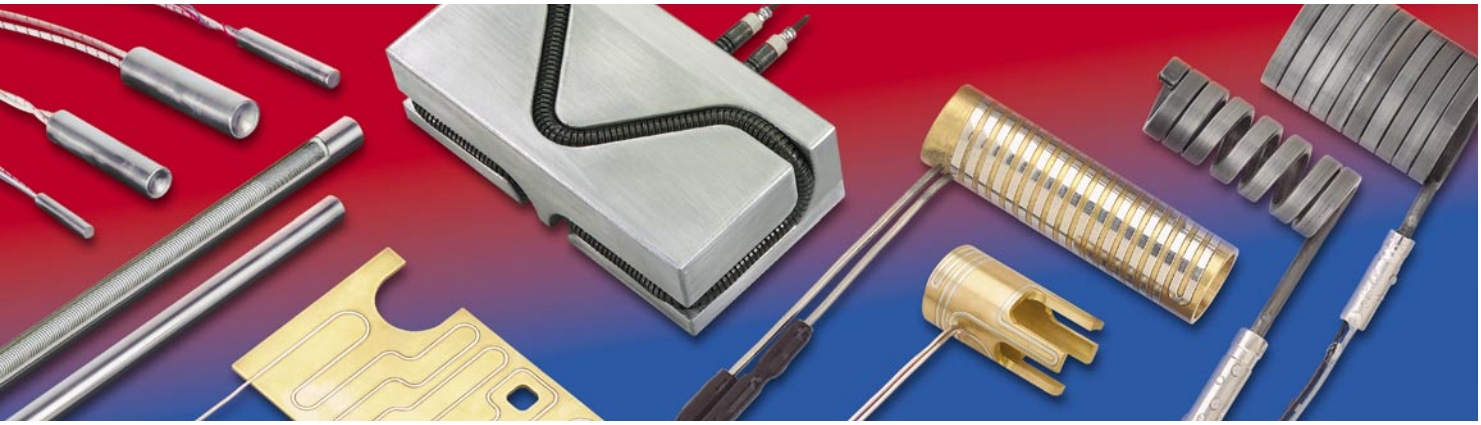
Heating elements for the packaging industry

Proven solutions for packaging!





Since the foundation in 1973 hotset has developed and produced heating elements and since then they have been on an expansion course. Oriented by customer demands hotset solves heating tasks for industrial applications.

With production plants in Lüdenscheid and on Malta hotset offers high production knowledge and innovation force for the future.

Starting with a large stock range via simple standard heating elements up to customer-specific developments: no matter whether hotrod® cartridge heaters, hotspring® coil heaters or innovative products such as hotflex® or hotslot® as well as excellent customer service, hotset offers the right solution – also customer-specific!

Thus, hotset can prove its high level of innovations and can offer heating elements which are of high quality, fully developed and are suitable for different applications.

In Germany and in more than 30 countries worldwide hotset is for its customers "always one step ahead".

Motivated and qualified employees take care that hotset stands for proximity to customers, innovation, competence and reliability also in future.

You will see and experience it – promised!

Content

Application examples

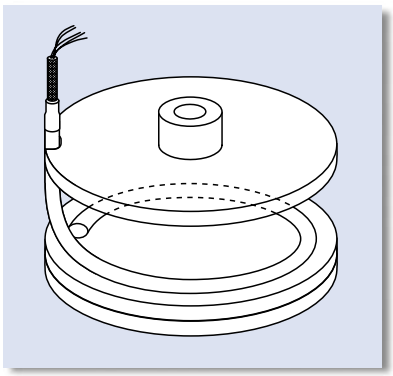
In the packaging industry the temperature window for thermal processing of materials becomes more and more closer. Complex packaging materials require an even temperature control on an exact temperature level so that constant product quality can be guaranteed.

hotset offers numerous heating elements which are specially aligned to the requirements of the packaging industry. For example hotrod® cartridge heaters (type HHP) with individual power distribution and integrated thermocouple for heating welding bars or shapeable outline heating which have extreme short unheated end zones by a special inner construction.

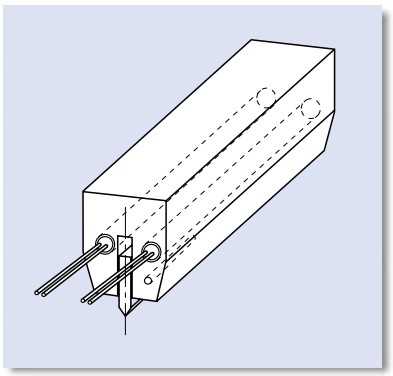
Nearly all used heating elements in the packaging industry are application-specific solutions which vary in their parameters according to application.

Concerning your individual application please contact the hotset sales persons who have specialised themselves in solving heating tasks for the packaging industry.

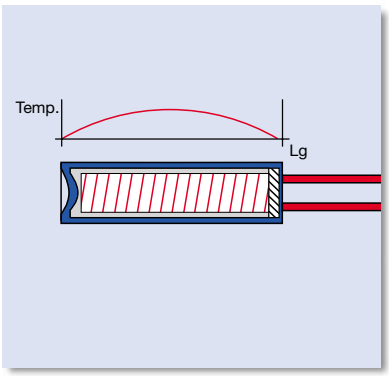
for the use of hotset-heating elements in the packaging industry



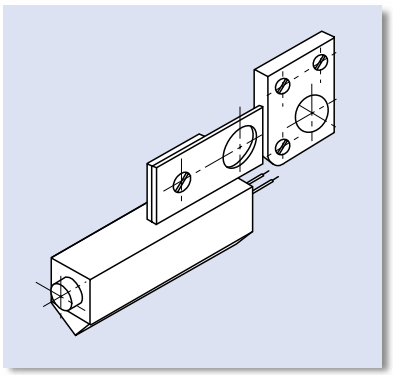
hotrod® (type HHP)
Heating of sealing tools



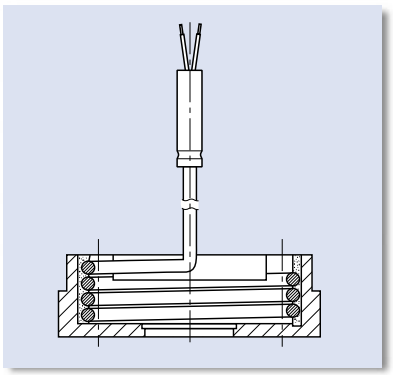
hotrod® (type HHP)
Heating of welding bars



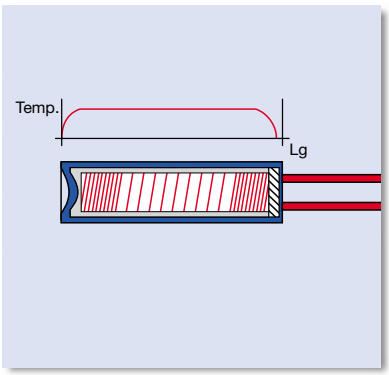
hotrod® (type HHP)
Power distribution



hotrod® (type HHP)
Heating of cutting knives



hotspring® (type WRP)
Heating of sealing tools



hotrod® (type HHP)
Power distribution

Paper board containers, paper or blister packages will be sticked together.

Heating elements are used for warming up and application of glues.

When cutting, punching or welding plastic bags (jelly babies, chips, sweets) heating elements are used in cutting knives or welding rulers.

Furthermore heating elements can also be used in the food processing when temperature is necessary.

Driving quality!

hotrod® cartridge heaters (type HHP)

Application-specific power distributions, integrated thermocouples, numerous connection options and a wide range of accessory enable the individual adjustment of the hotrod® cartridge heater to nearly each application.

Together with the customers hotset develops innovative products.

Technical data

- Profile Ø [mm] (for stock hotrod®):
  6.5; 8.0; 10.0; 12.5; 16.0; 20.0
- Profile Ø ["]: 1/4; 3/8; 1/2; 5/8
  (others on request)
- Maximum total length:
  Ø ≥ 6.0 mm (grinded) 1500 mm
  Ø ≥ 6.0 mm (ungrinded) 3000 mm
- Sheath material: stainless steel
- Cartridge heater sheath temperature:
  max. 750 °C
- Heating conductor material: NiCr 8020
- High voltage proof
  (cold in extended condition)
  with nominal voltage ≤ 24 V: 500 V-AC
  with nominal voltage > 24 V: 1500 V-AC
- Insulation resistance (cold):
  ≥ 5 MΩ at 500 V-DC
- Maximum leakage current (cold):
  ≤ 0.5 mA at 253 V-AC
- Length tolerance: ± 1.5 %, min. ± 1 mm
- Power tolerance (cold): ± 10 %
- Diameter tolerance:
  metric -0.02/-0.06 mm
  inch ± 0.02 mm/± 0.08 mils
- Maximum supply voltage: 480 V,
  for stock hotrod® 230 V (Standard)
- Thermocouple: Fe-CuNi (type J/standard),
  optional Fe-CuNi (type L) up to 300 °C
  operating temperature or NiCr-Ni (type K)
  up to 750 °C operating temperature,
  potential-free,
  measurement points: at the bottom or central
- Connection option:
  e. g. 1000 mm continuous glass silk
  insulated Ni-leads rigit wires
  1000 mm PTFE-insulated Ni-leads
  (multistranded) crimped-on
  1000 mm silicon insulated Ni-leads
  (multistranded) crimped-on
  1000 mm glass silk insulated Ni-leads
  (multistranded) crimped-on
  1000 mm continuous PTFE-insulated
  Ni-leads (multistranded), PTFE disc
  application specific power distribution,
  moisture-protected version

Other dimensions and product variants upon request.

Subject to errors and technical changes.

Stock dimensions for hotrod® can be found in the stock range brochure.

Please note the installation and storage instructions.

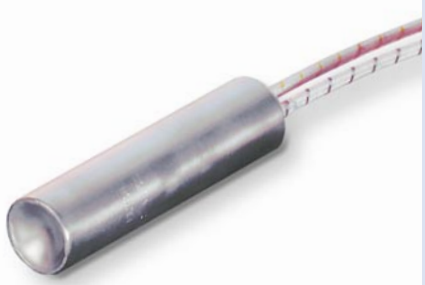
Please talk to our specialists regarding UL/CSA certification.

Order data

hotrod® (type HHP)

Application: .....
+ Article No. (if known): .....
+ Ø: .....
+ Length: .....
+ Wattage: .....
+ Voltage: .....
+ Connection length: .....
+ Connection option: .....
+ Thermocouple: .....
+ Measurement point: .....
+ Quantity: .....

hotrod® (type LHT)



Spiral heaters

Compressed or non-compressed spiral heating elements can be used everywhere where a surface load of 10 W/cm² is sufficient.

In these cases, the simple construction of the spiral cartridge heaters enables cost-effective heating and long durability.

In the low voltage sector, the current can be fed back via the cartridge heater sheath on spiral heating cartridges so that just one connection is required. The spiral cartridge heater connections can also be attached at both ends.

Typical application areas for spiral cartridge heaters are the heating of sealing tools in the packaging industry, cutting of plastic foils or textiles especially with the integral cutting blade, heating of galvanic baths, medical equipment or analytical equipment.

Technical data

- Profile Ø [mm]: 6.5; 8.0; 10.0; 12.5; 16.0; 20.0 with connection at both ends or return via the cartridge heater sheath (others on request)
- Stock Ø [mm]: 10.0; 12.5; 16.0; 20.0
- Maximum total length: 3000 mm
- Sheath material: stainless steel
- Cartridge heater sheath temperature: max. 750 °C
- Maximum sheath surface load: 10 W/cm²
- Heating conductor material: NiCr 8020
- High voltage proof (cold in extended condition) with nominal voltage ≤ 24 V: 500 V-AC with nominal voltage > 24 V: 1500 V-AC (not for return via the cartridge heater sheath)
- Insulation resistance (cold): ≥5 MΩ at 500 V-DC
- Maximum leakage current (cold): ≤ 0.5 mA at 253 V-AC
- Length tolerance: ± 1.5 %
- Power tolerance (cold): ± 10 %
- Diameter tolerance: ± 0.1 mm
- Maximum supply voltage: 480 V
- Connection: 250 mm glas silk insulated Ni-leads from inside

hotrod® cartridge with integrated cutting blade Ø 5 mm
Sheath material: Incoloy

Other dimensions and product variants upon request.

Subject to errors and technical changes.

Please note the installation and storage instructions.

Order data

hotrod® (type LHT)

Application: .....
+ Article No. (if known): .....
+ Ø: .....
+ Length: .....
+ Wattage: .....
+ Voltage: .....
+ Connection length: .....
+ Connection option: .....
+ Quantity: .....

hotrod® (type LHT)

bendable

Technical data

- Profile Ø [mm]: 6.5 or 8.0
- Maximum total length: 3000 mm
- Sheath material: nickel
- Cartridge heater sheath temperature: max. 700 °C
- Maximum sheath surface load: 10 W/cm²
- Heating conductor material: NiCr 8020
- High voltage proof (cold in extended condition) with nominal voltage > 24 V: 1500 V-AC
- Insulation resistance (cold): ≥ 5 MΩ at 500 V-DC
- Maximum leakage current (cold): ≤ 0.5 mA at 253 V-AC
- Length tolerance: ± 1.5 %
- Power tolerance (cold): ± 10 %
- Diameter tolerance: ± 0.2 mm
- Maximum supply voltage: 480 V
- Connection options: Externally applied glass-silk insulated Ni-leads
- Minimum bending radius: 15.0 mm (internal)

Other dimensions and product variants upon request.

Subject to errors and technical changes.

Please note the installation and storage instructions

Order data

hotrod® (type LHT)

Application: .....
+ Article No. (if known): .....
+ Ø: .....
+ Length: .....
+ Wattage: .....
+ Voltage: .....
+ Connection length: .....
+ Connection option: .....
+ Quantity: .....

hotrod® (type HHP) Ex-protection

Technical data

- Profile Ø [mm]: 8.0; 10.0; 12.5; 16.0; 20.0
- Maximum total length:
  Ø ≥ 8.0 mm (grinded) 1500 mm
  Ø ≥ 8.0 mm (ungrinded) 2000 mm
- Sheath material: stainless steel
- Cartridge heater sheath temperature:
  max. 750 °C
- Heating conductor material: NiCr 8020
- High voltage proof
  (cold in extended condition)
  with nominal voltage ≤ 24 V: 500 V-AC
  with nominal voltage > 24 V: 1500 V-AC
- Insulation resistance (cold): ≥5 MΩ at 500 V-DC
- Maximum leakage current (cold):
  ≤ 0.5 mA at 253 V-AC
- Length tolerance: ± 1.5 %, min. ± 1 mm
- Power tolerance (cold): ± 10 %
- Diameter tolerance:
  grinded -0.02/-0.06 mm
  ungrinded ± 0.1 mm
- Maximum supply voltage: 400 V
- Thermocouple: Fe-CuNi (type J, standard), optional Fe-CuNi (type L) and NiCr-Ni (type K)
- Connection options: mineral fibre insulated Ni-lead, protective earth blank, 1500 mm
- Protective sheath: Stainless steel sleeving (min. 1200 mm)
- Attachment parts: tube 40 mm
- Application areas:
  in potentially explosive areas
  with dust atmosphere
  of category 3 (zone 22)
  (for infrequent or temporary occurrence)

Options (upon request)

- Angular block + tube + stainless steel sleeving
- Right-angle exit + tube + stainless steel sleeving

Notes

- Certification according to EU ATEX 100a Explosion protection guideline (94/9/EU): e.g. Ex II 3 D IP 67, by Physikalisch-Technische Bundesanstalt (PTB)
- IP 67: Moisture protection for occasional immersion – the connection area must also be protected by the user against moisture to maintain the moisture protection.

Other dimensions and product variants upon request.

Subject to errors and technical changes.

Please note the installation and storage instructions.

Order data

hotrod® (type HHP) Ex-protection

Application: .....
+ Article No. (if known): .....
+ Ø: .....
+ Length: .....
+ Wattage: .....
+ Voltage: .....
+ Connection length: .....
+ Connection option: .....
+ Thermocouple: .....
+ Connection pieces: .....
+ Quantity: .....

One step ahead, safely!

hotspring® Coil Heaters (type WRP)

With this brochure hotset presents an abstract of the product range of hotspring® coil heaters:

- starting with hotspring®/Micro up to hotspring®/Maxi in different lengths and diameters
- e. g. hotspring® coil heaters casted in brass or with clamping mechanism and screwing as heating elements for different applications.

Already in 1980 hotset had been one idea ahead when they presented the first round hotspring® coil heater (type WRP Ø 3.3). Since then further innovations have been made hotspring®/Mini, flat and square coil heater (hotspring®/F resp. hotspring®/Q), hotspring®/Maxi as well as hotspring®/Micro.

Special product variants are tailor-made for our customers according to their requirements.

The humidity-resistant coil heaters according to IP 65 (hotspring® Ø 3.3, hotspring®/F 2.2 x 4.2, hotspring®/F 1.8 x 3.2, hotspring®/Q 3.0 x 3.0, hotspring® Ø 4.0) emphasize the strict alignment with new challenges.

hotspring® coil heaters (type WRP):
One step already safely!

Further information see brochure hotspring®.

Three dimensional heating!

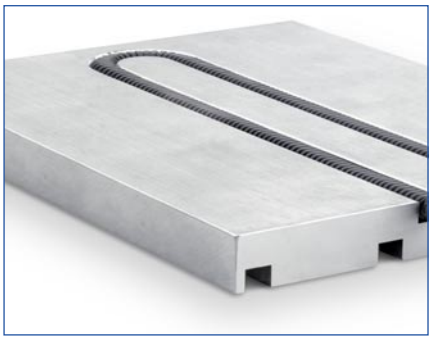
hotflex®
Flexible Tubular Heater

Flexibility is (nearly) everything. In each case, flexibility offers a lot if you want to bend a tubular heater in all directions.

Design and handling are considerably simplified e. g. when heating hot chambers of hot runner systems or heating outlines and the effort is reduced to a minimum: The tools become more and more smaller, short down times, low maintenance sensitivity and easy stockkeeping resp. replacements are the decisive advantages of the three-dimensional hotflex®-heating.

In addition to this, the hotflex®-user is more flexible regarding production and tool modifications.

Considering a minimum bending radius the hotflex® can be manually bent and easily pressed or inserted into a milled groove. Due to the special surface it is absolutely not necessary to additionally cast the hotflex®.

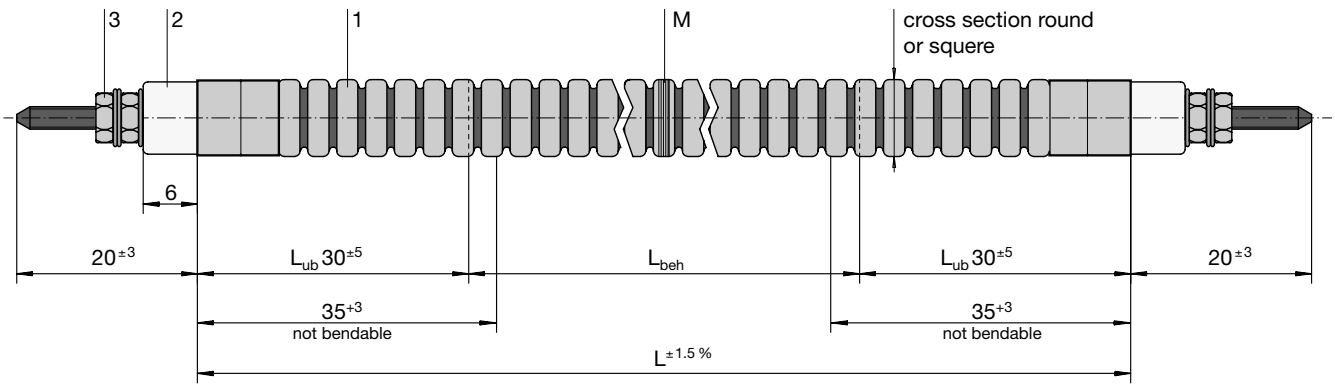


A study of the Technical College “Märkische Fachhochschule Iserlohn” with the title “Temperature technology with hotflex®” confirms the outstanding product advantages: Temperature differences have been reduced with the hotflex® to 1.3 °C (towards 12 °C with a common heating) in a tested duroplast forming.

This study proves a “consistent temperature level, higher and faster crosslinking of the mass” as well as a “reduction of the cycle time of 20 %” when transmitting on a tool for Poly-V pulley.

As per “hotset”-slogan “always one step ahead” hotset immerses with the hotflex® in the heating of the third dimension as first heating element manufacturer.

If you bend the hotflex® several times at the same place you can damage the heater!



1 = Outer sheath stainless steel
2 = Ceramic insulator
3 = Threaded pins M 2.5 with set of nuts and washers of stainless steel

L = Total length
L_{fh} = Flexible heated length
L_{uz} = Unheated zone, not bendable (min. 30 mm)
M = Mark of the mid

measures [mm]

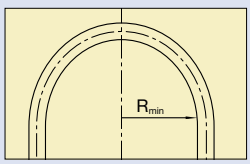
hotflex®
Q 6 x 6/Q 8 x 8

hotflex®
Ø 6.5/Ø 8.5/Ø 8.2/Ø 8.0

Technical data

- Profile hotflex® Q 6x6/Q 8x8:
  6 x 6 mm ± 0.1 mm, 8 x 8 mm ± 0.1 mm
- Diameter hotflex® Ø 6.5/Ø 8.5:
  - 6.5 ± 0.10 mm
  - 8.5 ± 0.10 mm,
    optional 8.0 ± 0.10 mm or 8.2 ± 0.10 mm
- Sheath material: stainless steel
- Sheath temperature of heating element:
  max. 700 °C
- Connection voltage:
  max. 250 V, standard: 230 V
- Wattage tolerance: ± 10%
- High voltage proof (cold):
  1,000 V-AC in straight condition
- Insulation resistance (cold):
  ≥ 5 MΩ at 500 V-DC
- Leakage current (cold):
  ≤ 0.5 mA at 253 V-AC
- Max. total length straight:
  6 x 6 mm, Ø 6.5: 1,500 mm,
  8 x 8 mm, Ø 8.5; Ø 8.2; Ø 8.0 : 2,600 mm
- Extension factors:
  By bending and fitting the hotflex® it becomes slightly longer. This extension is reproduceable.
  You will find a calculation programm for the extension factor on www.hotset.de
- Sheath surface load:
  6 x 6 mm, Ø 6.5: max. 10 W/cm²
  8 x 8 mm, Ø 8.5; Ø 8.0: max. 15 W/cm²
  according to application
  (depending on heated length)
- Minimum bending radius:

6 x 6 mm, Ø 6.5:	8 x 8 mm, Ø 8.5; Ø 8.2; Ø 8.0:
R_{min} = 6.5 mm (internal)	R_{min} = 10 mm (internal)



- Connection options:
  M 2.5 with set of nuts and washers out off stainless steel

Other dimensions and product varieties on request.

We reserve the right to change technical details.

More information can be found in the brochure hotflex®.

hotcontrol®

Temperature controller

Build-in devices
C 248

Build-in devices
C 296

CM 06

CM 12

CM 24

Tabletops C 448
with C 248

Technical data

hotcontrol® Temperature controller C 248 / C 296 (1 zone)

Features

- Temperature controller for
  - Hot runners
  - Plastics processing
  - Packaging industry
  - Furnaces and ovens
  - Food processing
  - Dryers, etc.
- Front: C 248: 48 x 48 mm,
  C 296: 48 x 96 mm
- Mounting in control or front panel, etc.
- Two 4-digit seven-segment display,
  C 248: 5 information/status-LEDs
  C 296: 8 information/status-LEDs
- Membrane keypad with 4 buttons
- One universal input thermocouple (adjustable)/resistance thermometer
- Only C 296: Two inputs
  0/2 ... 10 V-DC / 0/4 ... 20 mA
- Two (C 248)/four (C 296) digital outputs (relay and optical coupler)
- Heater circuit monitoring with external current transformer
- Options
  - Interface: RS485
  - Interface: CAN-Bus
  - Two analogue outputs
    0/2 ... 10 V-DC or 0/4 ... 20 mA
  - Two digital in-/-outputs

Function

- 2-/3-point controller
- Complete standard functional range, e. g.
  - Manual mode
  - Ramp function and automatic ramp function
  - C 248: 2nd set point can be combined (absolute/relative)
    C 296: 2nd./ 3nd./ 4nd. set point can be combined (absolute/relative)
  - Automatic sensor break detection
  - Flexible and adjustable timer function with four timers (e. g. for start up mode)
- Identification: Automatic adaptation of control parameters of the connected zone
- Analogue inputs (only C 296): Configuration e. g. as external set point assignment
- Digital outputs adjustable (control outputs heating/cooling or alarm)
- Function of digital inputs and optional digital in-/outputs adjustable
- Function of analogue outputs adjustable
- Monitoring of actual value, sensor, heat current and the actuator in the heat circuit

the packaging industry

- Information level: display and operation of important process data
- Menu controlled operation on two levels (operation level/system level)
- Remote operation: controller handling concurrently
- Controller overall function such as automatic ramp through networking by CAN-bus
- Digital data interface RS485 and CAN-bus enable communication to other controllers and computers
- Engineering tool WinKonVis: Configuration and parameter settings by RS485 and CAN-bus
- Operating hour meter
- Update of firmware by RS485

hotcontrol® multichannel temperature controller CM

Features

- Control series in compact design
- Up to 30 control zones in 6 zone units
- Easy reading LED display
- Direct operating keys: fast and direct access to all important parameter
- Precise control with self adaptation to process
- Heating current control
- Load shedding for each zone
- Limit value control
- Complete functional range
- Storage of 8 complete parameter sets
- Serial data interfaces RS485 and CAN (option)
- Voltage-free alarm contacts
- Connector configuration on demand user-specific
- Service friendly design

Function

- Automatic adaption during heating up phase
- Consistent heating of all control zones by automatic ramp (adjustable)
- Continuous operation of a zone even with a defective thermocouple
- Controlled heating current (tolerance, short circuit of power controller)
- Sensor check (sensor break, sensor short circuit, sensor reverse)
- Stand by and boost mode
- Temperature tolerance band is adjustable for each zone
- Interface connection to machine or PC

hotcontrol®

Thermocouples and Resistant Sensors

Technical data

Thermocouples and Resistant Sensors

- Thermocouple Fe-CuNi (type L) to DIN 43710
- Thermocouples Fe-CuNi (type J) to DIN EN 60584, NiCr-Ni (type K) to DIN 43710 or DIN EN 60584
- Resistance sensor (Pt 100) to DIN 43710 or DIN EN 60751
- As insert surface, cylindrical, angle, clamping band or surface thermocouple
- In standardized versions or according to customer wish as per drawing or sample
- High measuring accuracy with high mechanic load

Further information can be found in the stock range brochure.

always one step ahead

We are looking forward to cooperating with you!

hotset develops and realises
heating solutions for

- Hot runner technology
- Packaging technology
- Die-casting technology
- Junction technology
- Rubber-, India rubber (caoutchouc), and silicon processing
- Welding mirror manufacturing
- Extrusion technology

As well as all other industrial applications –
fast, individually and competent!

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