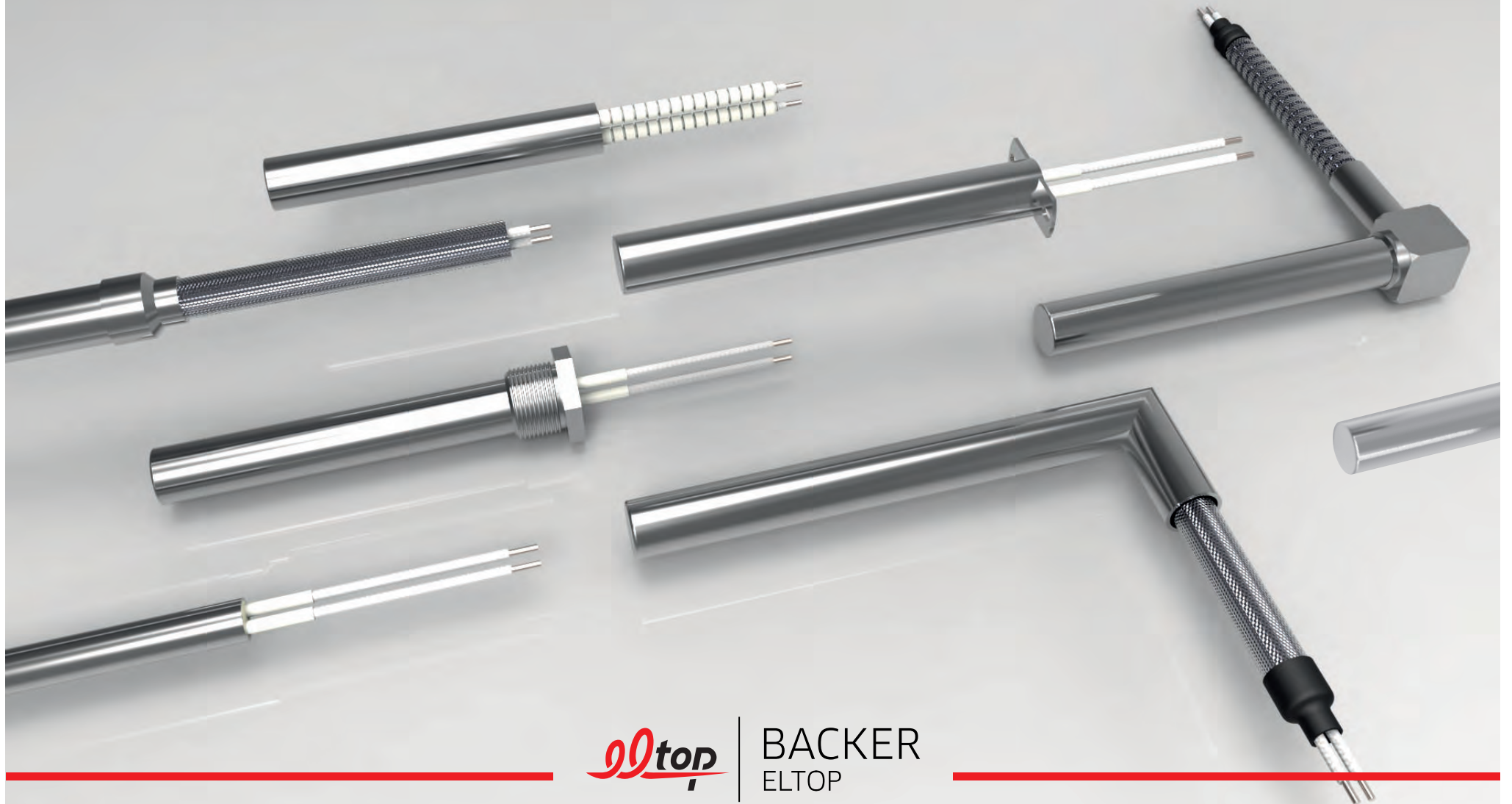


CARTRIDGE HEATERS



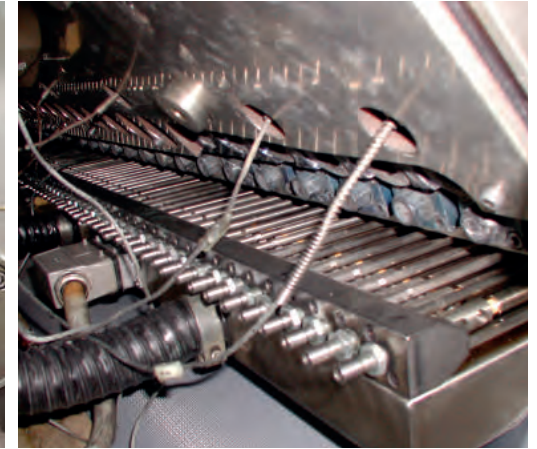
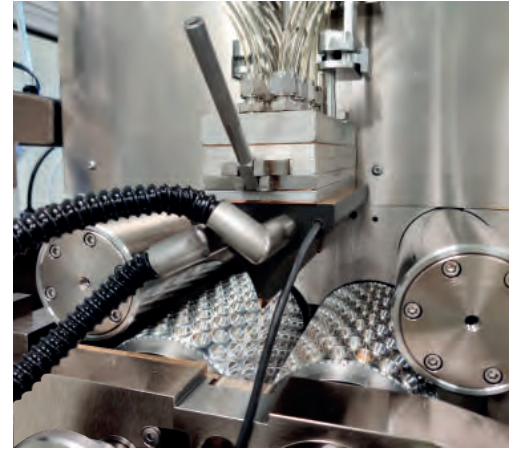
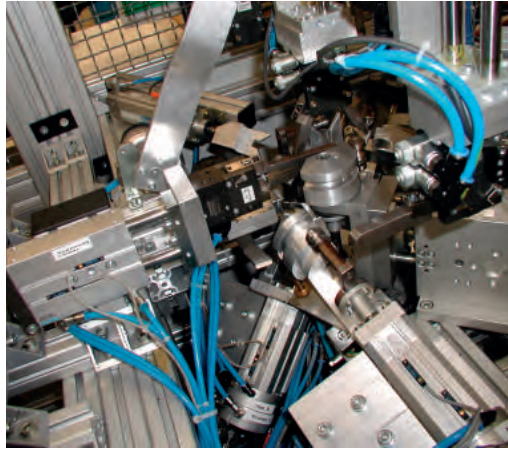
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ELTOP

**ELECTRICAL
CARTRIDGE
HEATERS
ACCESSORIES
ADVICE SERVICE**



Backer ELTOP s.r.o., a Czech company, has many years of experience in the production of cartridge heaters. Such heaters bring a lot of advantages, especially:

■ **INTENSIVE HEATING**

■ **EASY CHANGEABILITY**

■ **VARIOUS DESIGN**

Our high-quality cartridge heaters are manufactured in a recently renovated factory. The heaters meet the requirements of EN 60 335-1 and the high power loaded cartridges meet the special standard DIN 44921-2. Please, observe local regulations for installation and connection to the electric network. If you are interested in these products, do not hesitate to consult with our engineering department to ensure optimal results.



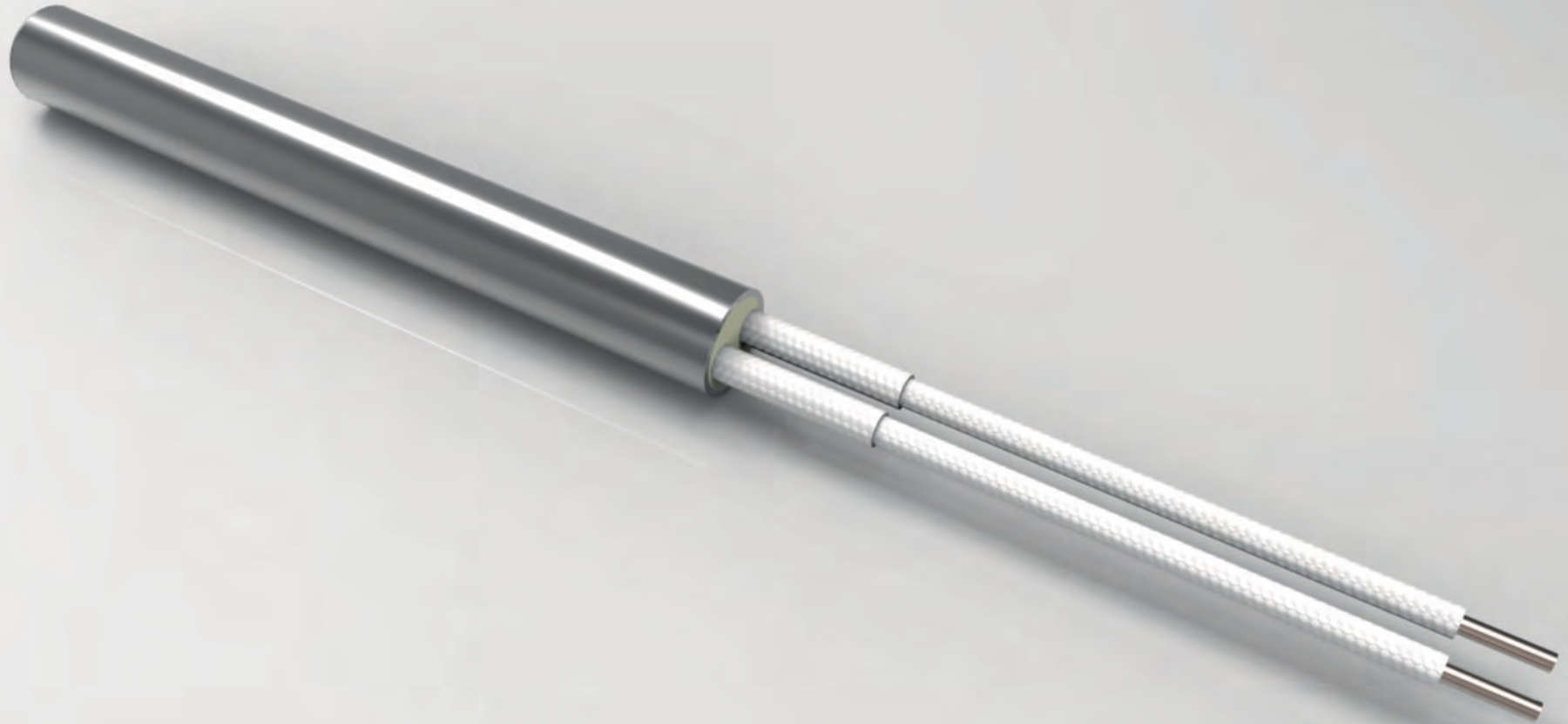
CARTRIDGES WITH VARIOUS CABLE CONNECTION

- 1a Ni-glassfibre cables
- 1b Ni-glassfibre cables
- 2 Cu-silicone cables
- 3 Ni-wires
- 4 Threaded flange
- 5a Two cables, corrugated tube
- 5b Three cables, corrugated tube
- 6a Two cables, flexible metal braid
- 6b Three cables, flexible metal braid
- 7a Angle connection, 2 cables, corrugated tube
- 7b Angle connection, 3 cables, corrugated tube
- 8a Angle connection, 2 cables, braided tube
- 8b Angle connection, 3 cables, braided tube
- 9 Cu-teflon cables
- 10 Glass sealing
- 11 Ni-wires covered by ceramic beads
- 12 Cartridge with built-in thermocouple

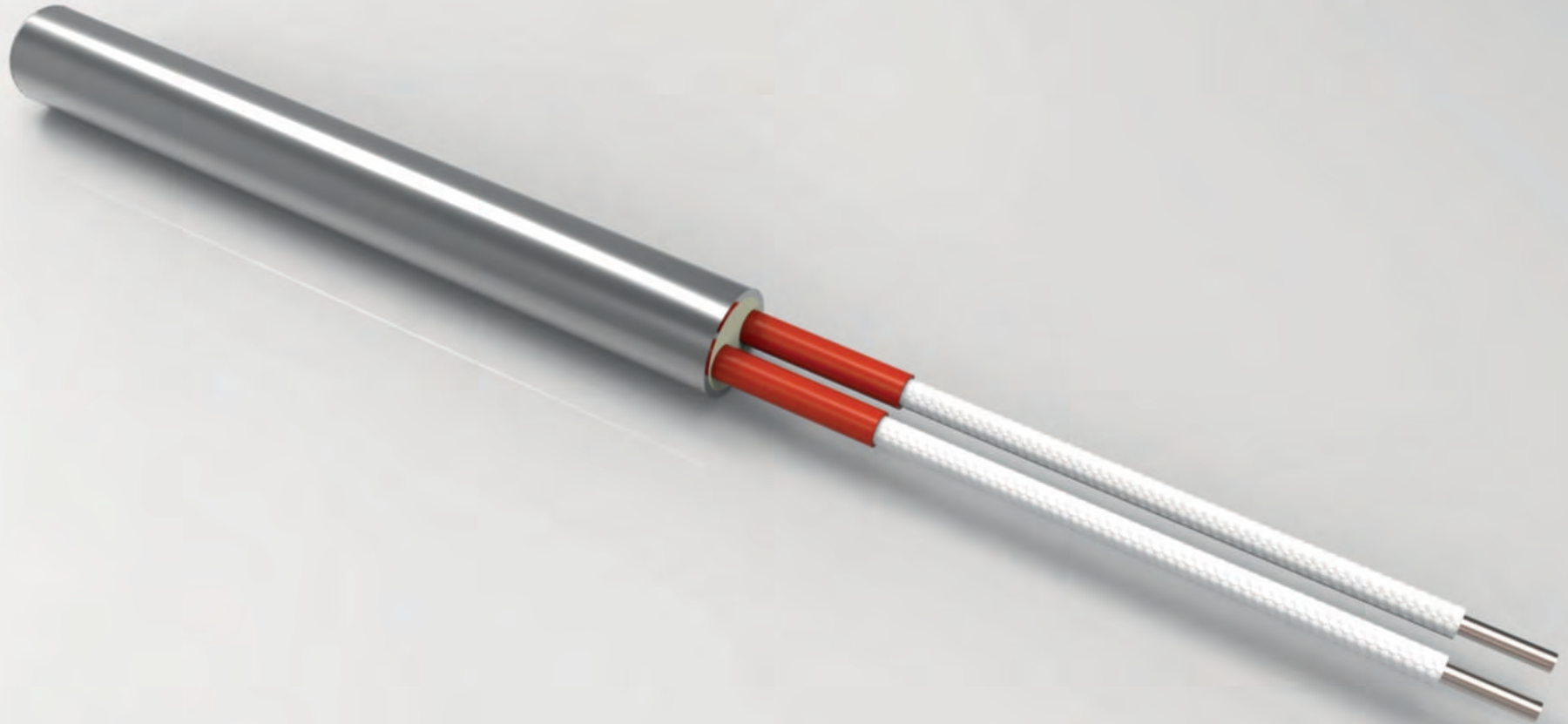
- 13 Cartridge with brass sheath
- 14a,b Special cables connection, 2 cables
- 14c,d Special cables connection, 3 cables
- 15a Silicone cable, 2 cables
- 15b Silicone cable, 2 cables
- 15c Silicone cable, 3 cables
- 15d Silicone cable, 3 cables
- 16a 2 cables protected by flexible metal braid
- 16b 3 cables protected by flexible metal braid
- 17a 2 cables protected by flexible corrugated tube
- 17b 3 cables protected by flexible corrugated tube
- 18 Cartridge with circular flange
- 19 Cartridge with threaded flange
- 20 Cartridge with holder
- 21 Cartridge with double holder
- 22 Cartridge with special drift bottom
- 23 Both sided connection
- 24 Both sided connection, brass
- 25 Single pole connection

- 26 Various power density
- 27 Robust design with thick wall
- 28a Special solution, cables with corr. tube
- 28b Special solution, cables with metal braid
- 29a Special angle solution
- 29b Special angle solution
- 30a Special solution with threaded flange
- 30b Special solution with threaded flange
- 30c Special solution with threaded flange
- 30d Special solution with threaded flange
- 31a Special solution with circular flange
- 31b Special solution with circular flange
- 31c Special solution with circular flange
- 31d Special solution with circular flange
- 32 Cables with silicone-glassfibre hose

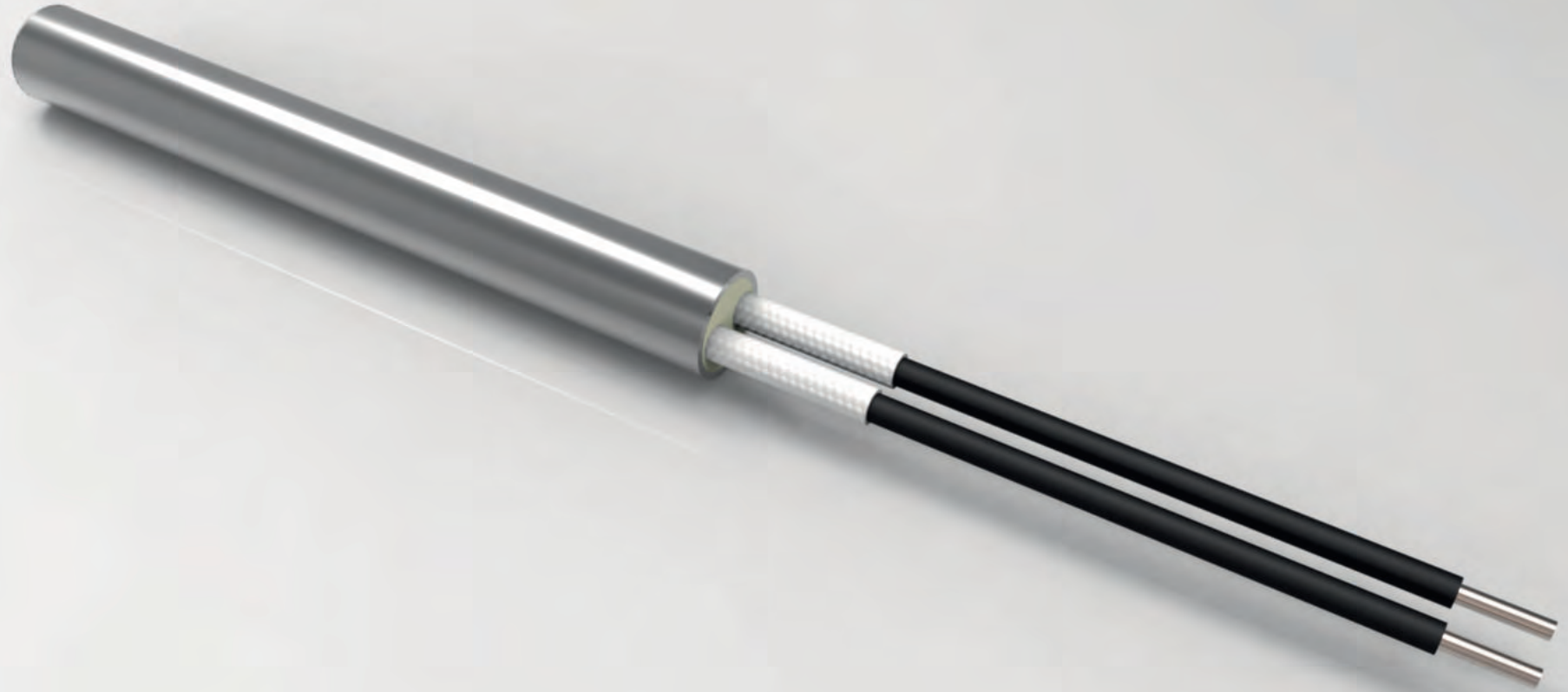
Technical data and characteristics



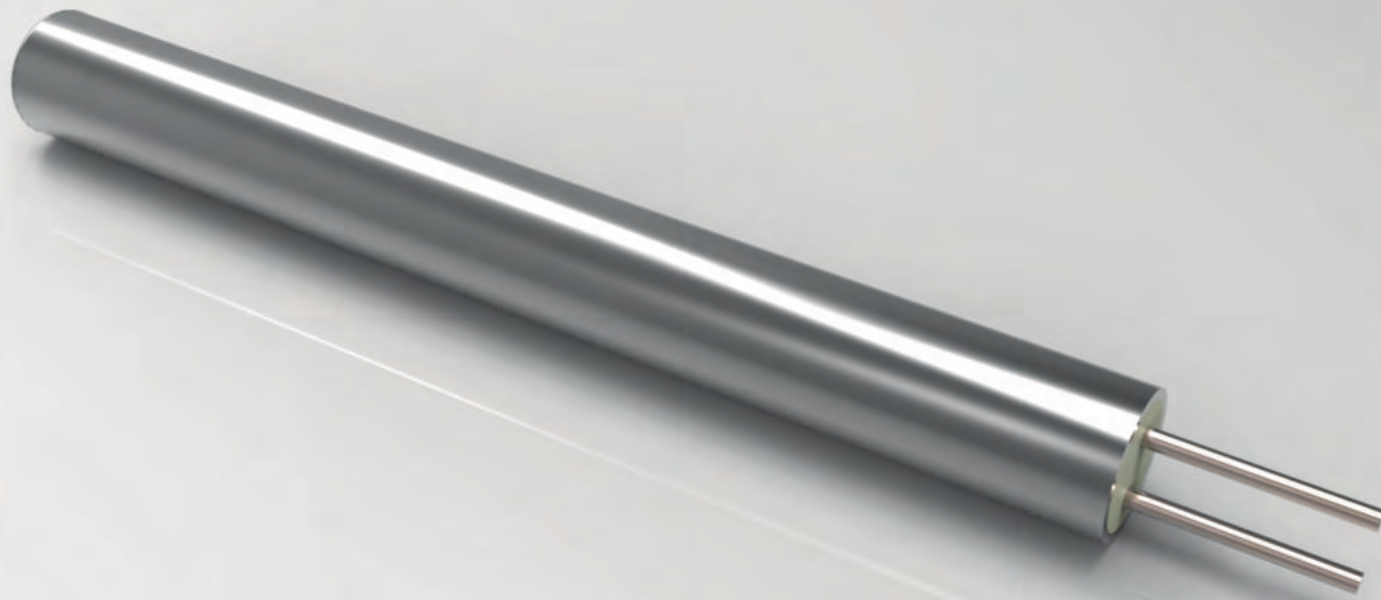
1a CARTRIDGE HEATER
Ni-glassfibre cables (350 - 450°C)



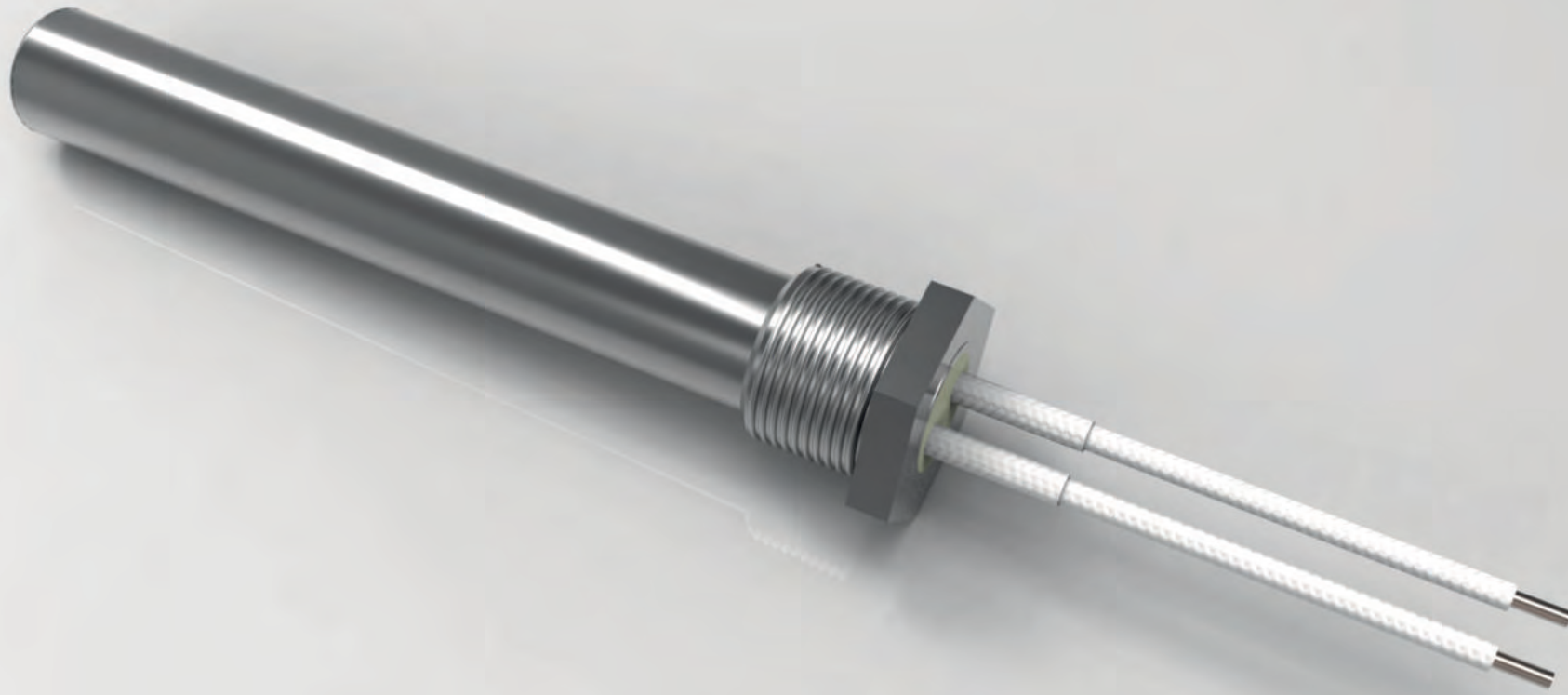
1b CARTRIDGE HEATER
Ni-glassfibre cables (350 - 450°C)



2 CARTRIDGE HEATER
Cu-silicone cables (180°C)



3 CARTRIDGE HEATER
Nickel wires



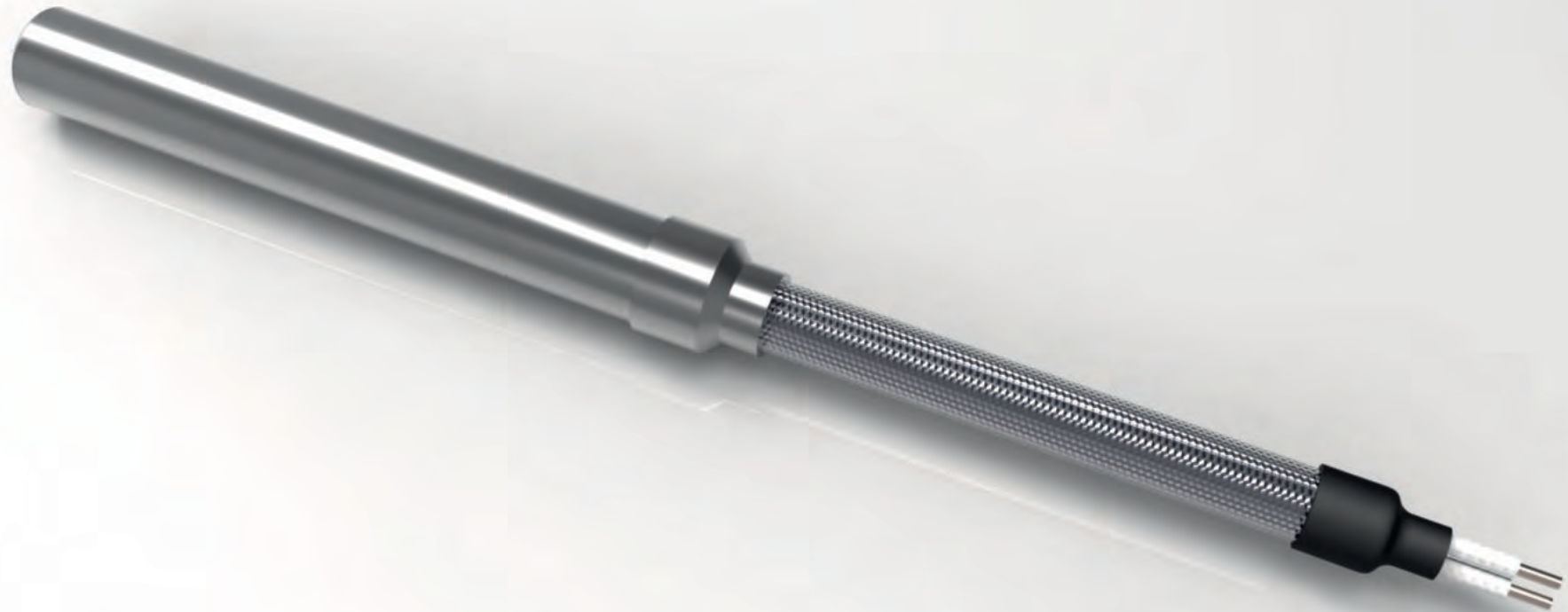
4 CARTRIDGE HEATER
With flange



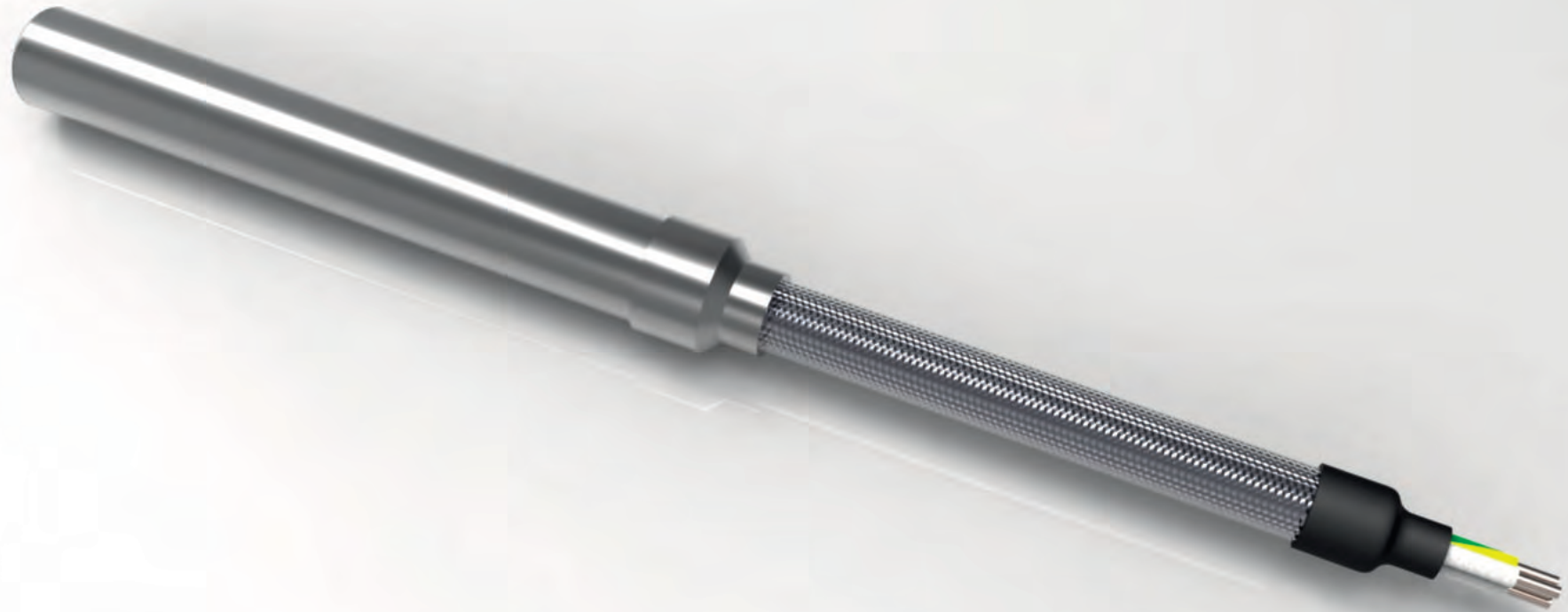
5a CARTRIDGE HEATER
2 cables protected by flexible corrugated tube



5b CARTRIDGE HEATER
3 cables protected by flexible corrugated tube



6a CARTRIDGE HEATER
2 cables protected by flexible metal braid



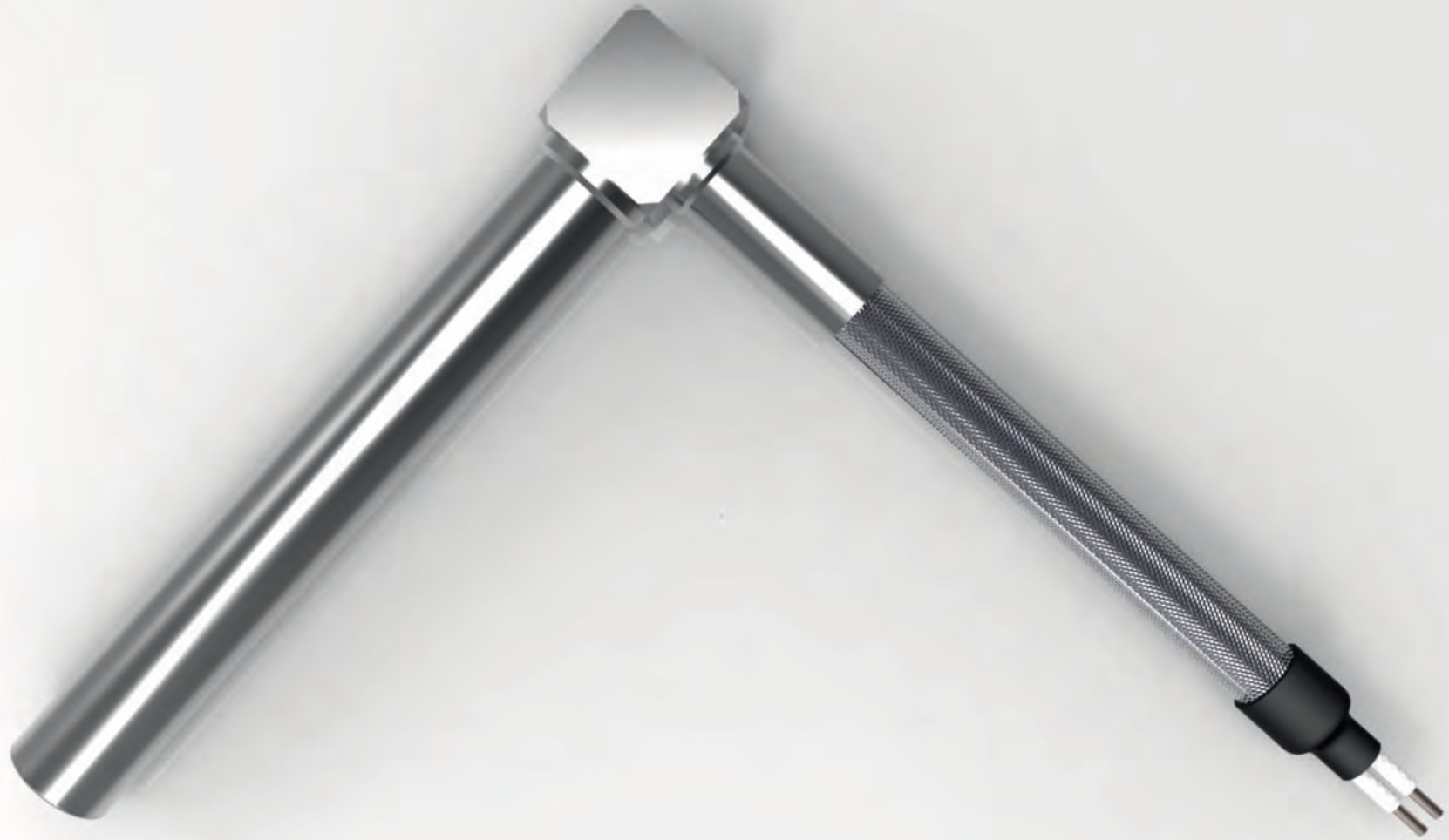
6b CARTRIDGE HEATER
3 cables protected by flexible metal braid



7a CARTRIDGE HEATER
Angle connection, 2 cables protected by flexible corrugated tube



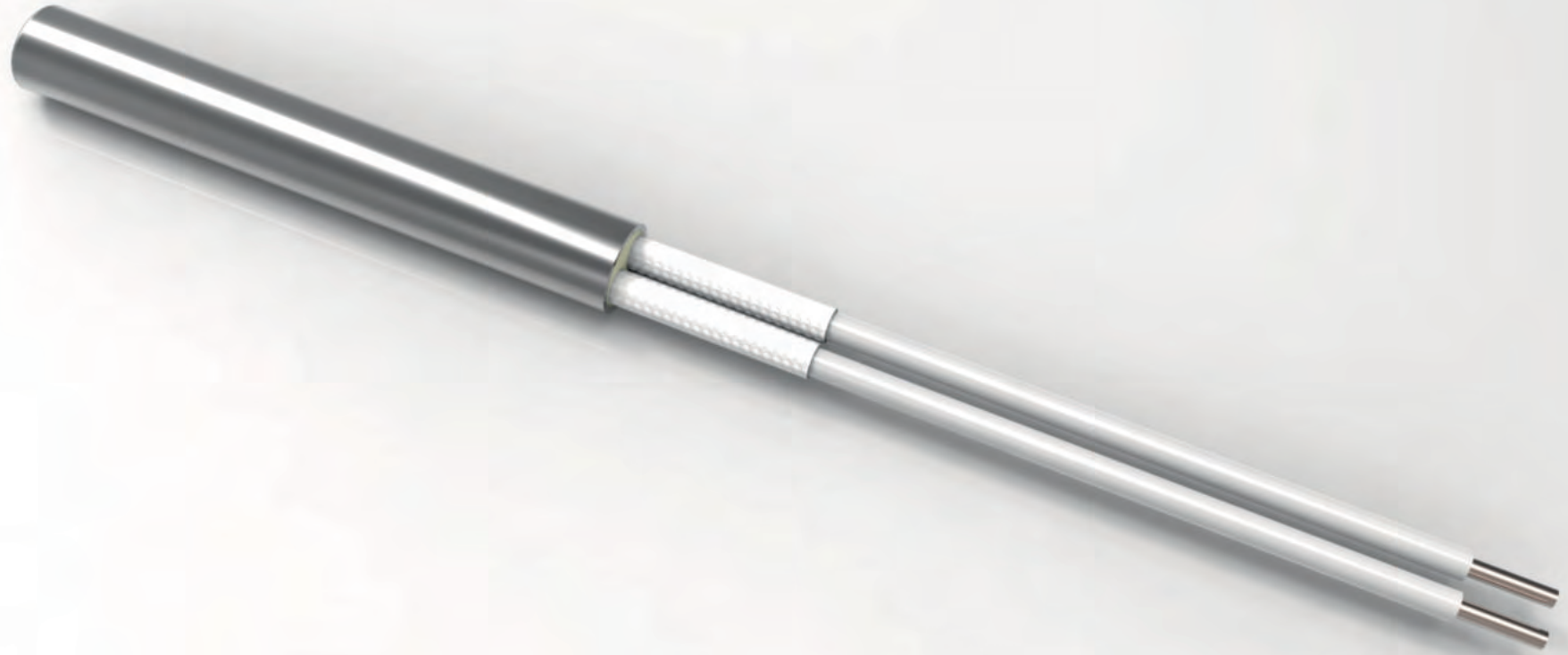
7b CARTRIDGE HEATER
Angle connection, 3 cables protected by flexible corrugated tube



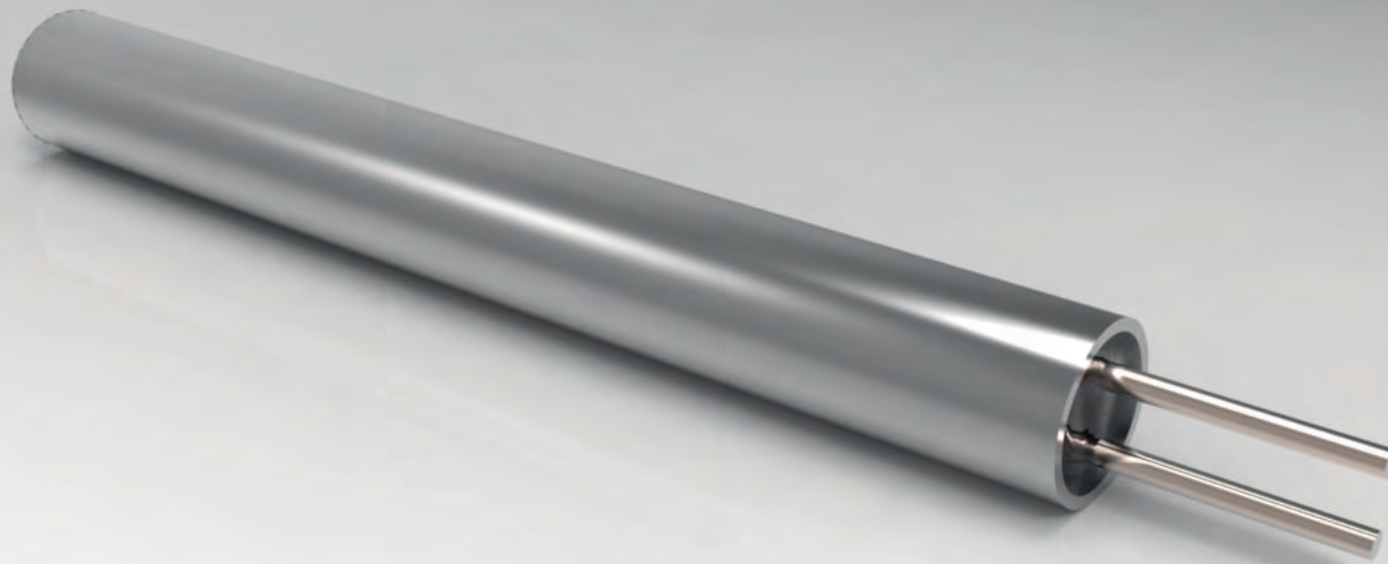
8a CARTRIDGE HEATER
Angle connection, 2 cables protected by flexible metal braid



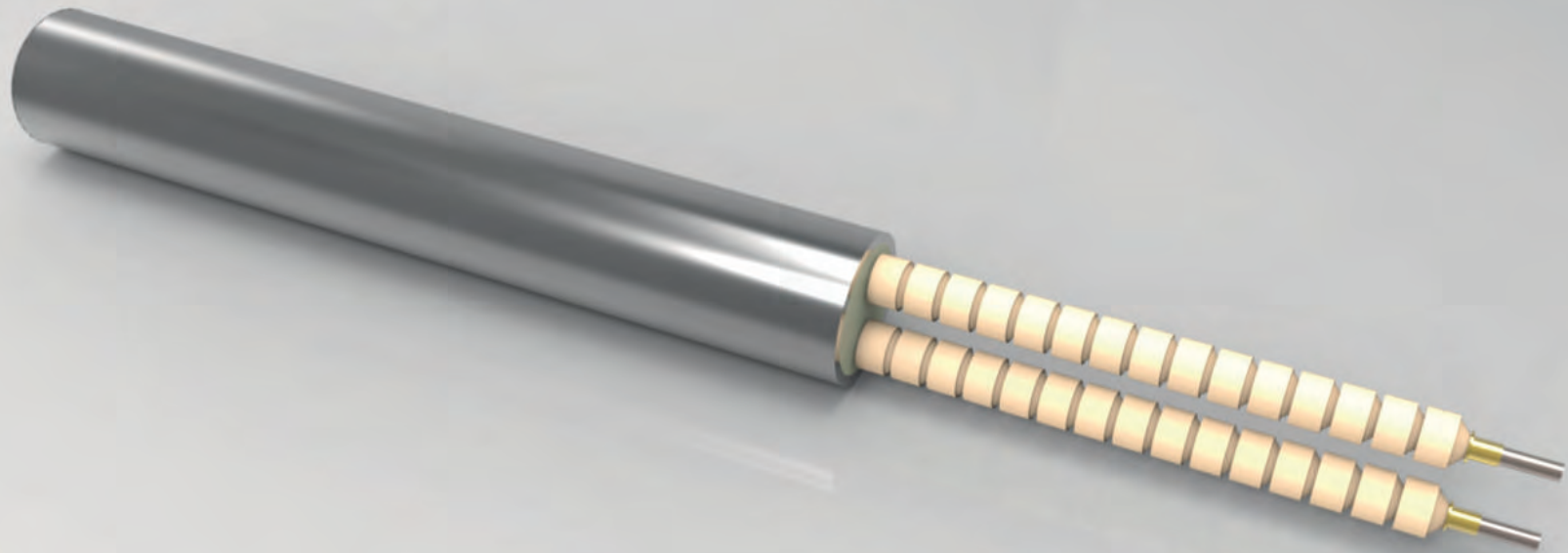
8b CARTRIDGE HEATER
Angle connection, 3 cables protected by flexible metal braid



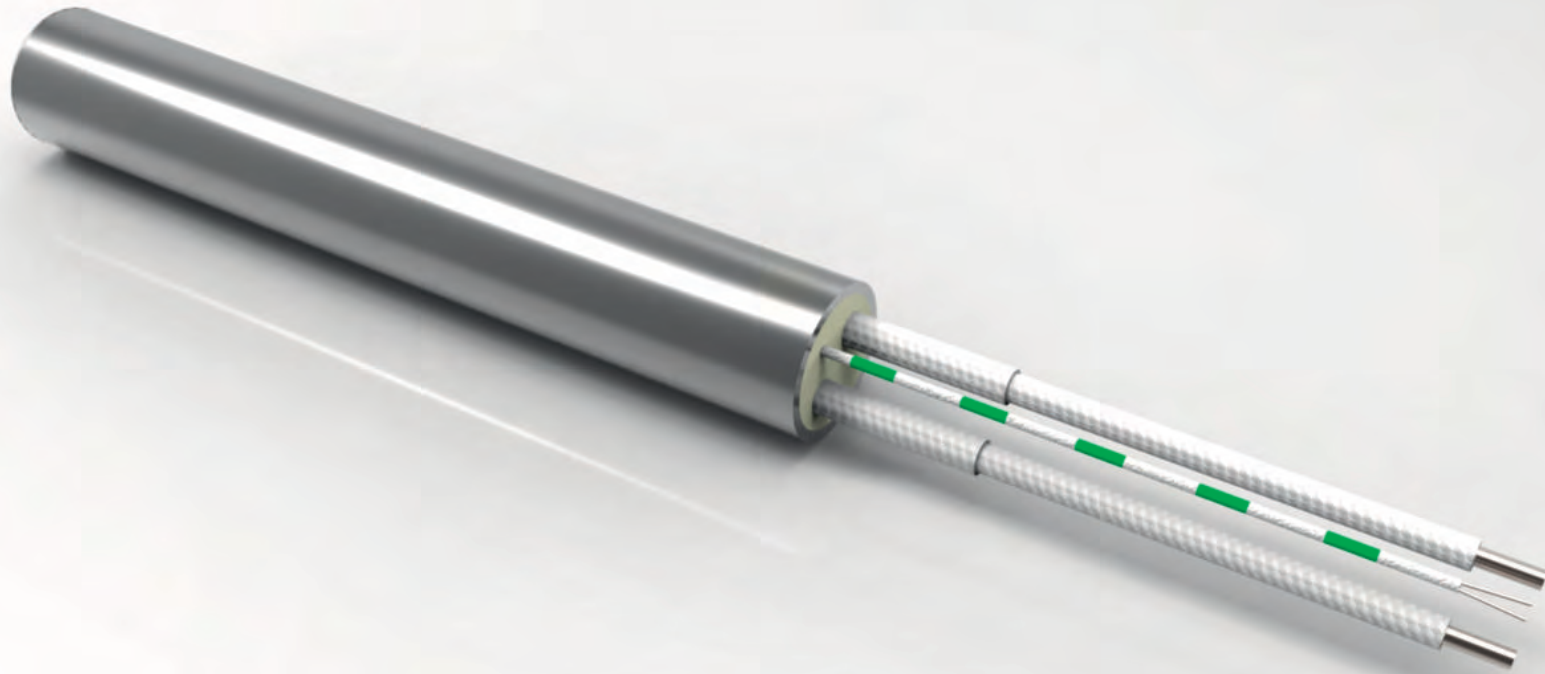
9 CARTRIDGE HEATER
With teflon cables (220°C)



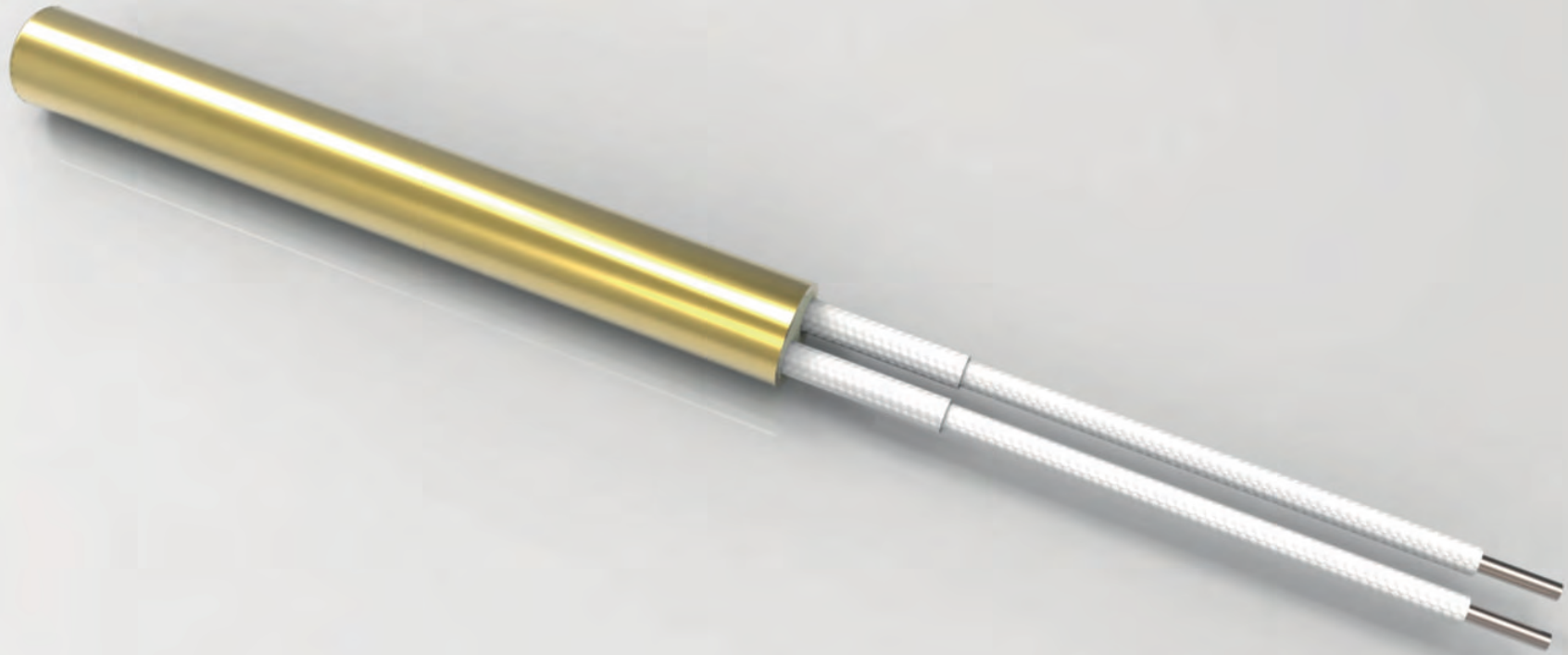
10 CARTRIDGE HEATER
GQ - glass sealing



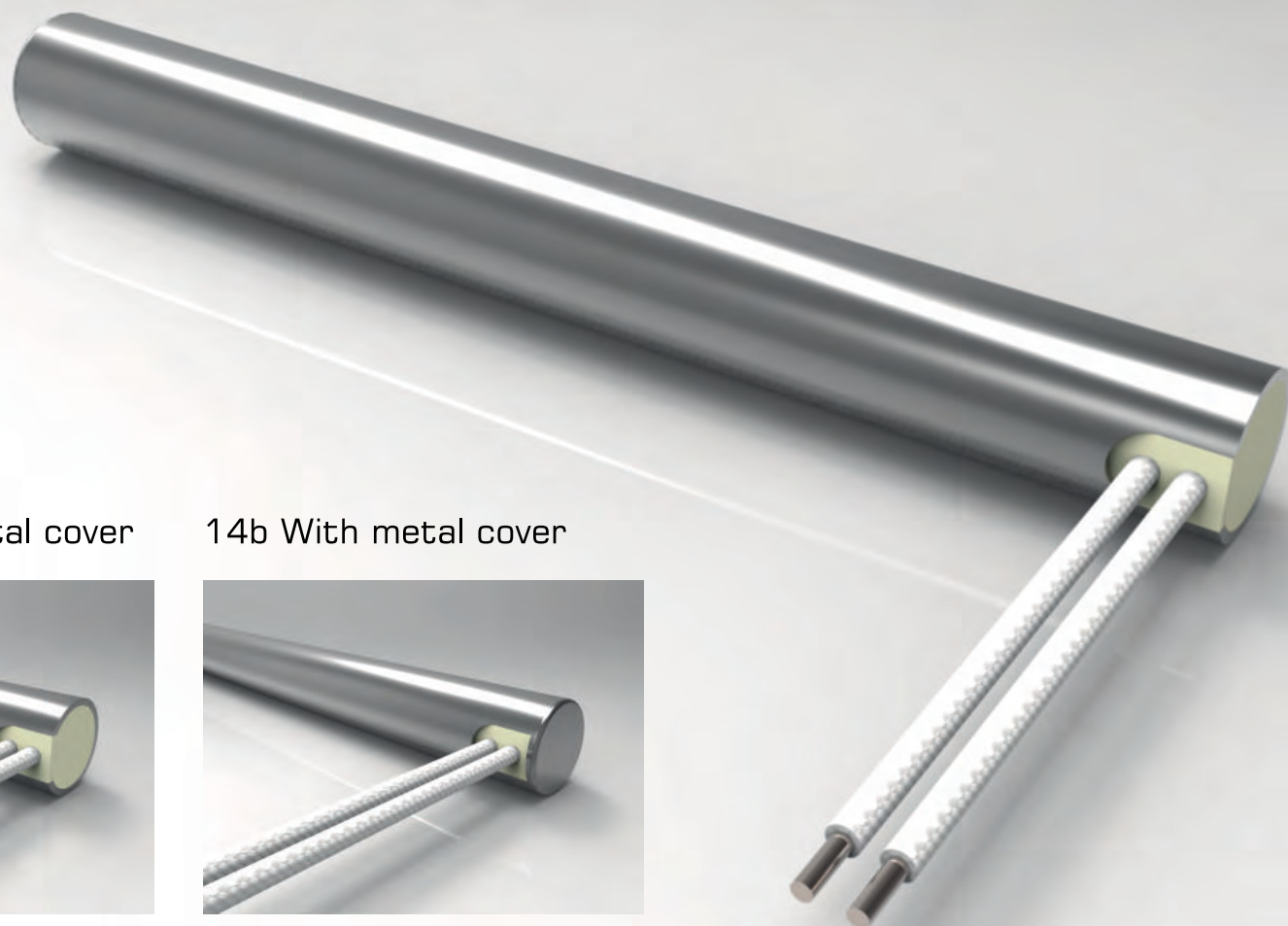
11 CARTRIDGE HEATER
Ni wires covered by ceramic beads (500°C)



12 CARTRIDGE HEATER
With thermocouple

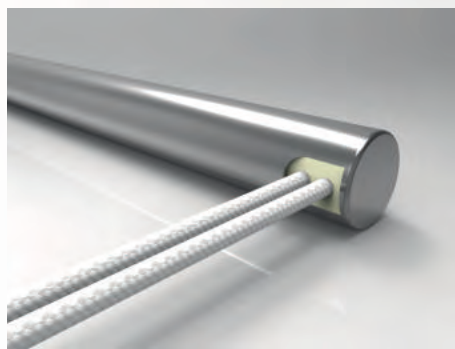
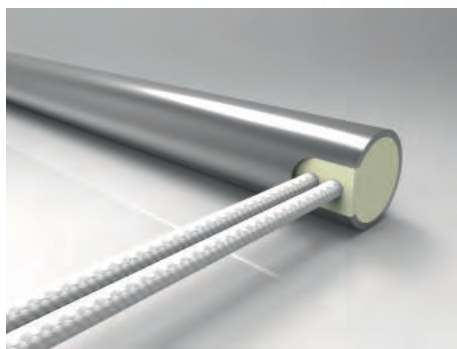


13 CARTRIDGE HEATER
Brass sheath

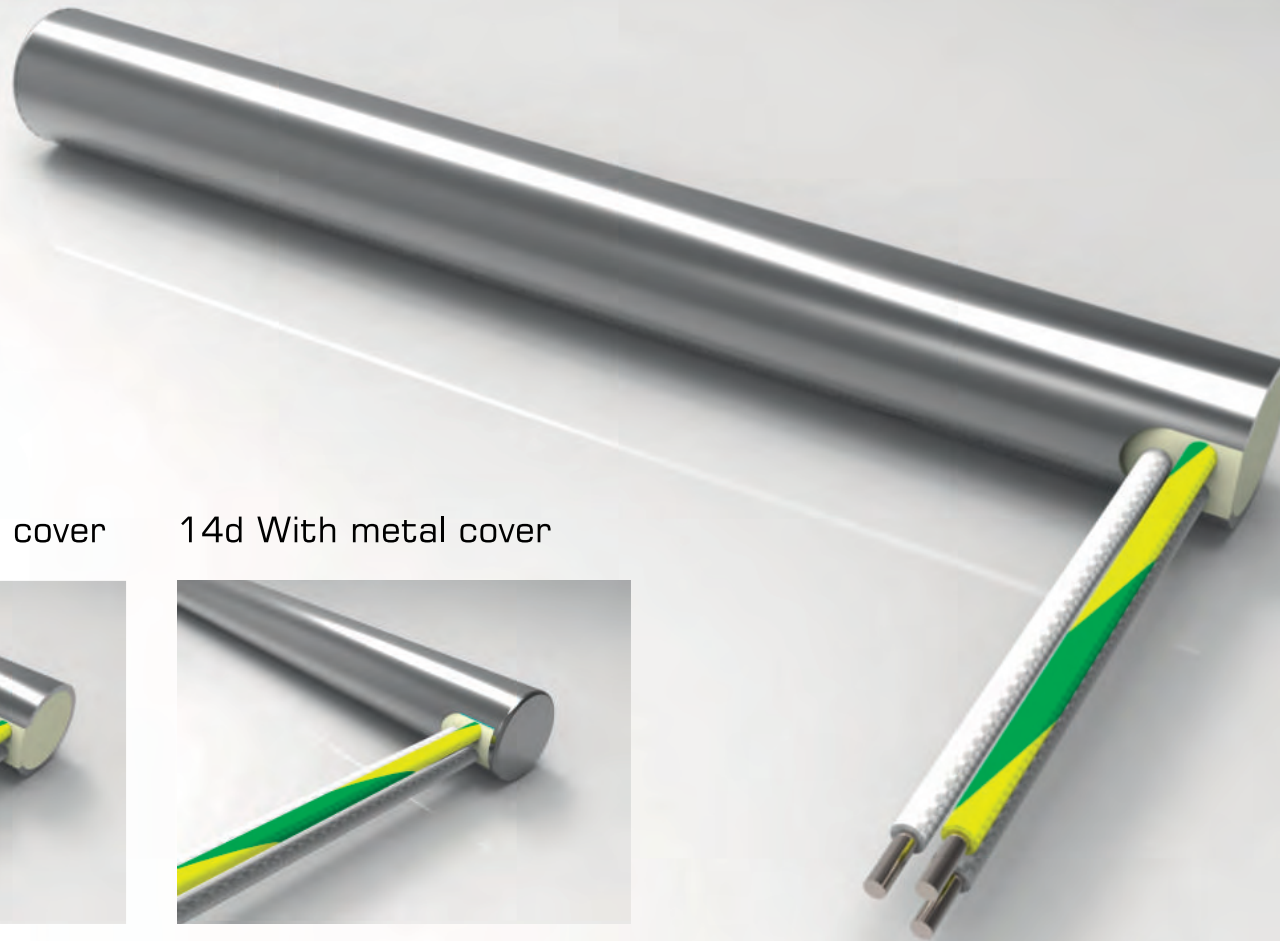


14a Without metal cover

14b With metal cover

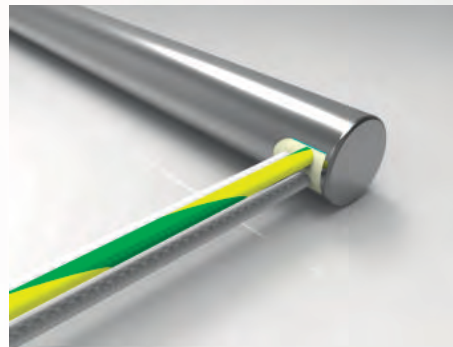
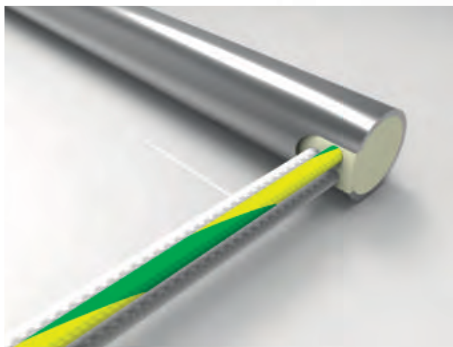


14a,b CARTRIDGE HEATER
Special cables connection, 2 cables

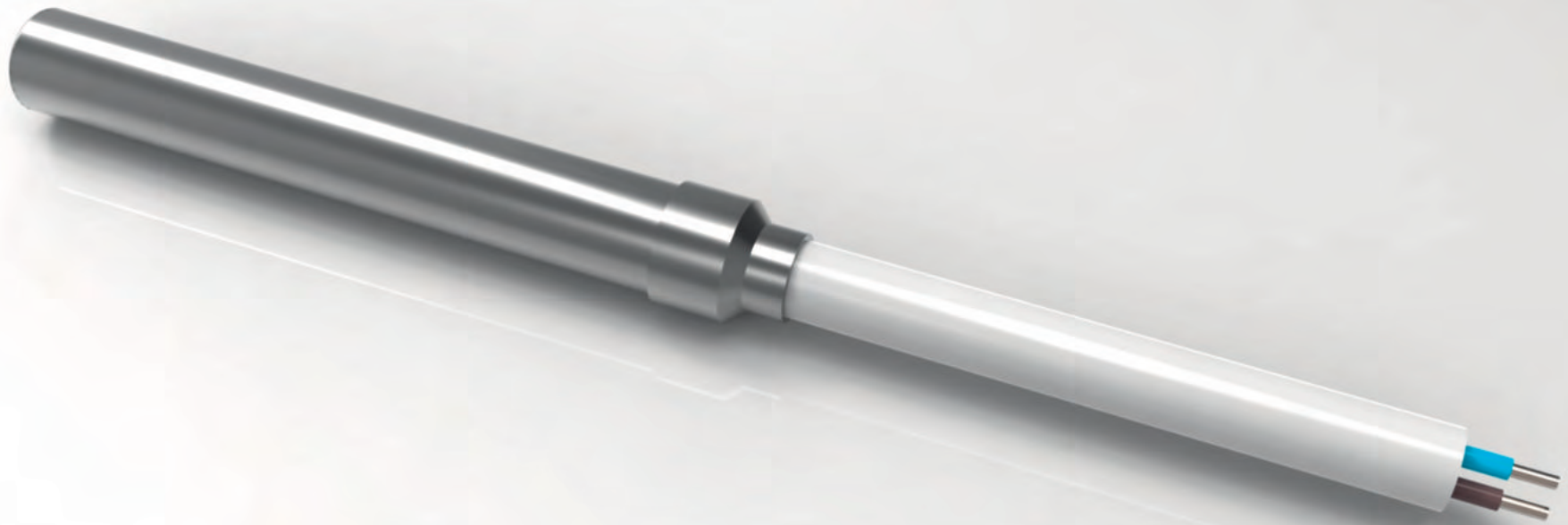


14c Without metal cover

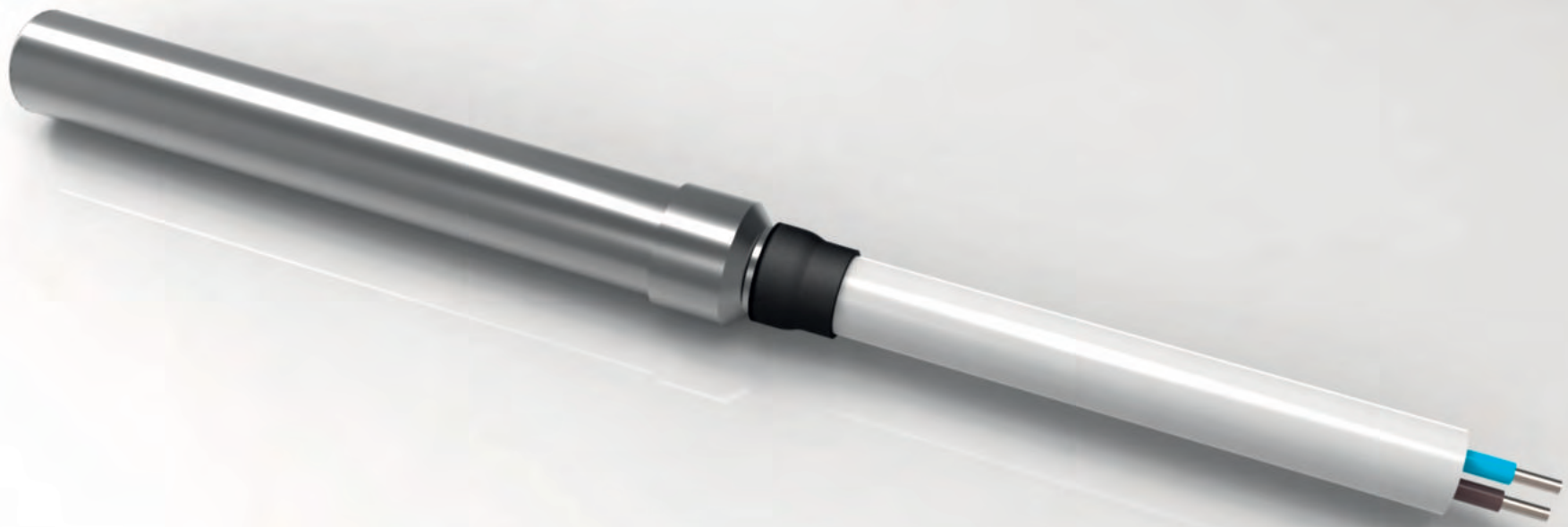
14d With metal cover



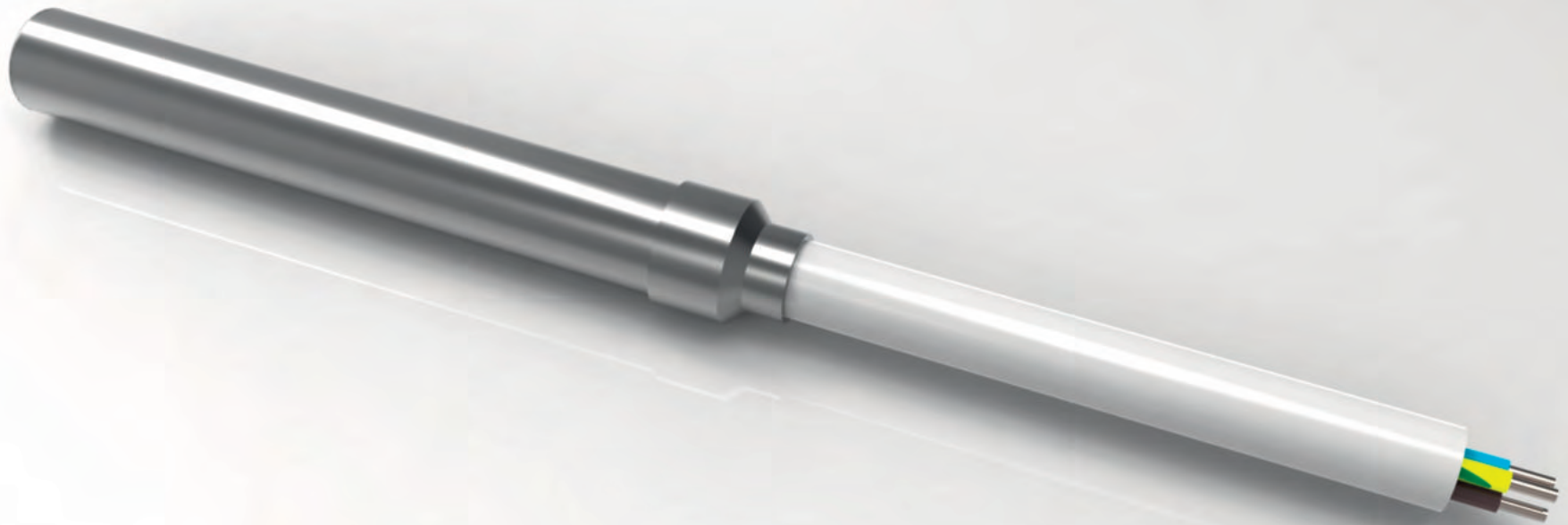
14c,d CARTRIDGE HEATER
Special cables connection, 3 cables



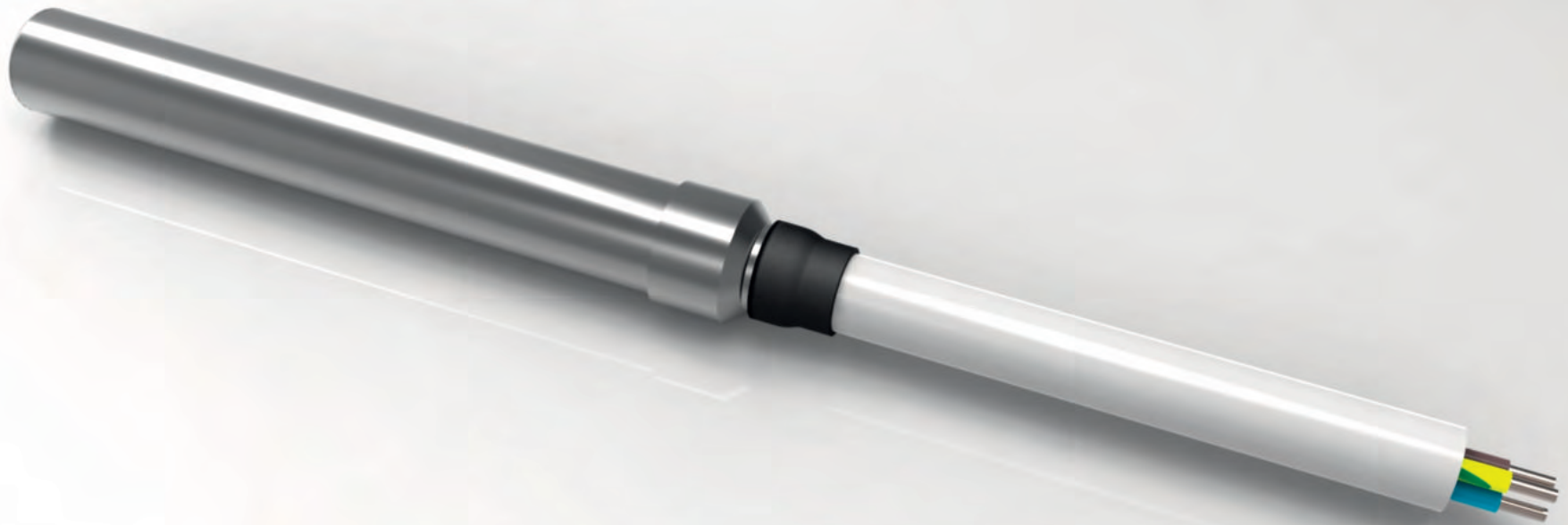
15a CARTRIDGE HEATER
With silicone cable, 2 cables (180°C)



15b CARTRIDGE HEATER
With silicone cable, 2 cables (180°C)



15c CARTRIDGE HEATER
With silicone cable, 3 cables (180°C)



15d CARTRIDGE HEATER
With silicone cable, 3 cables (180°C)



16a CARTRIDGE HEATER
2 cables protected by flexible metal braid



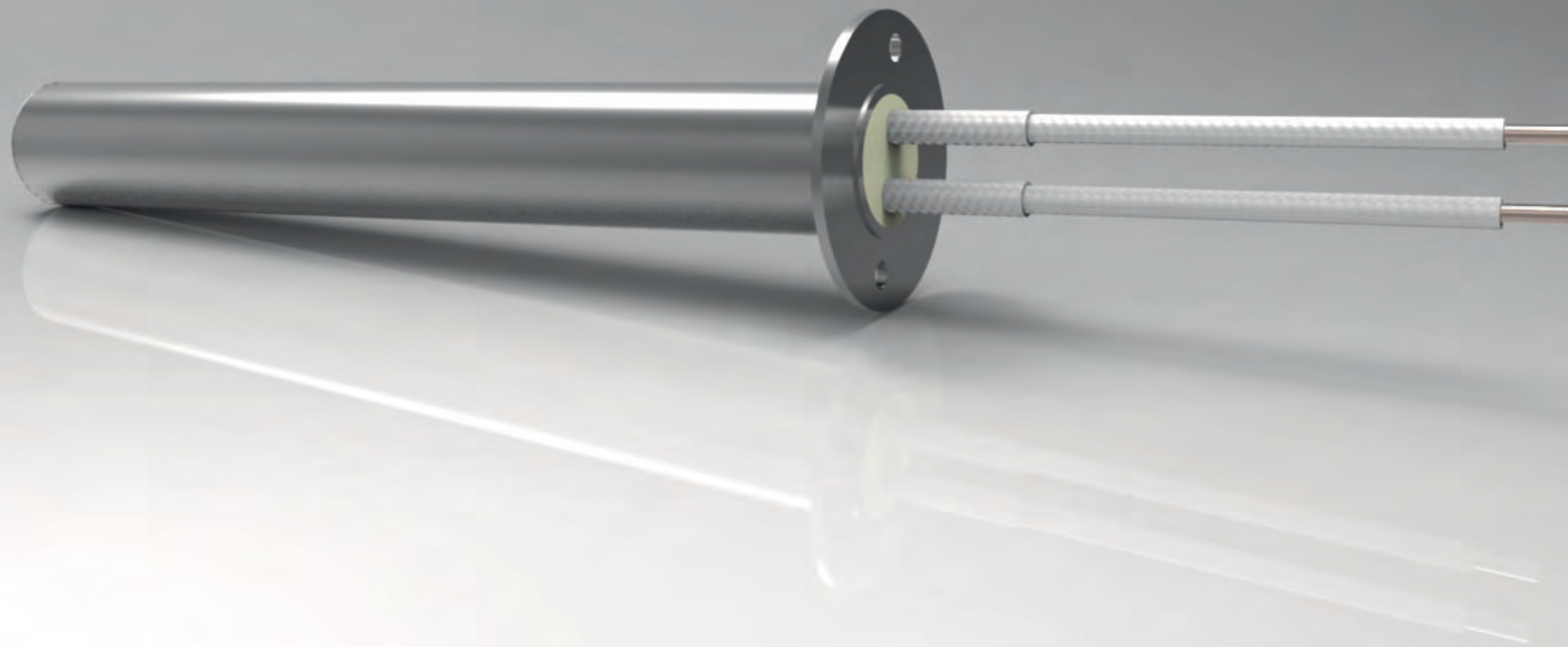
16b CARTRIDGE HEATER
3 cables protected by flexible metal braid



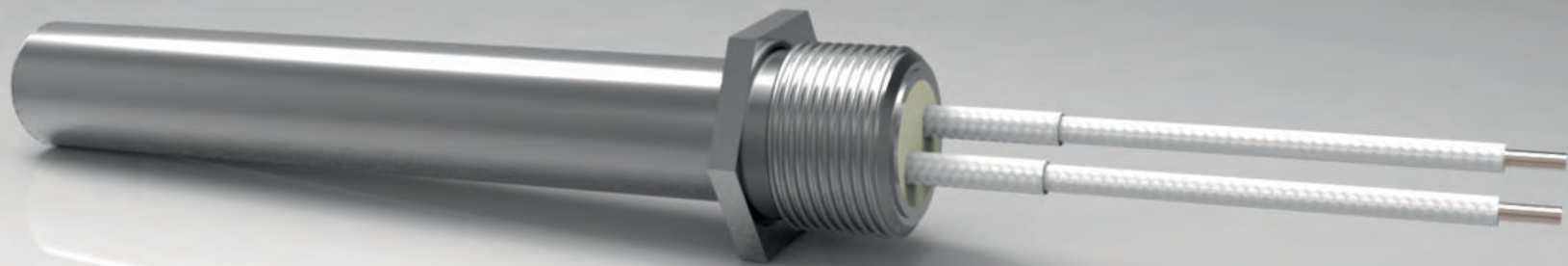
17a CARTRIDGE HEATER
2 cables protected by flexible corrugated tube



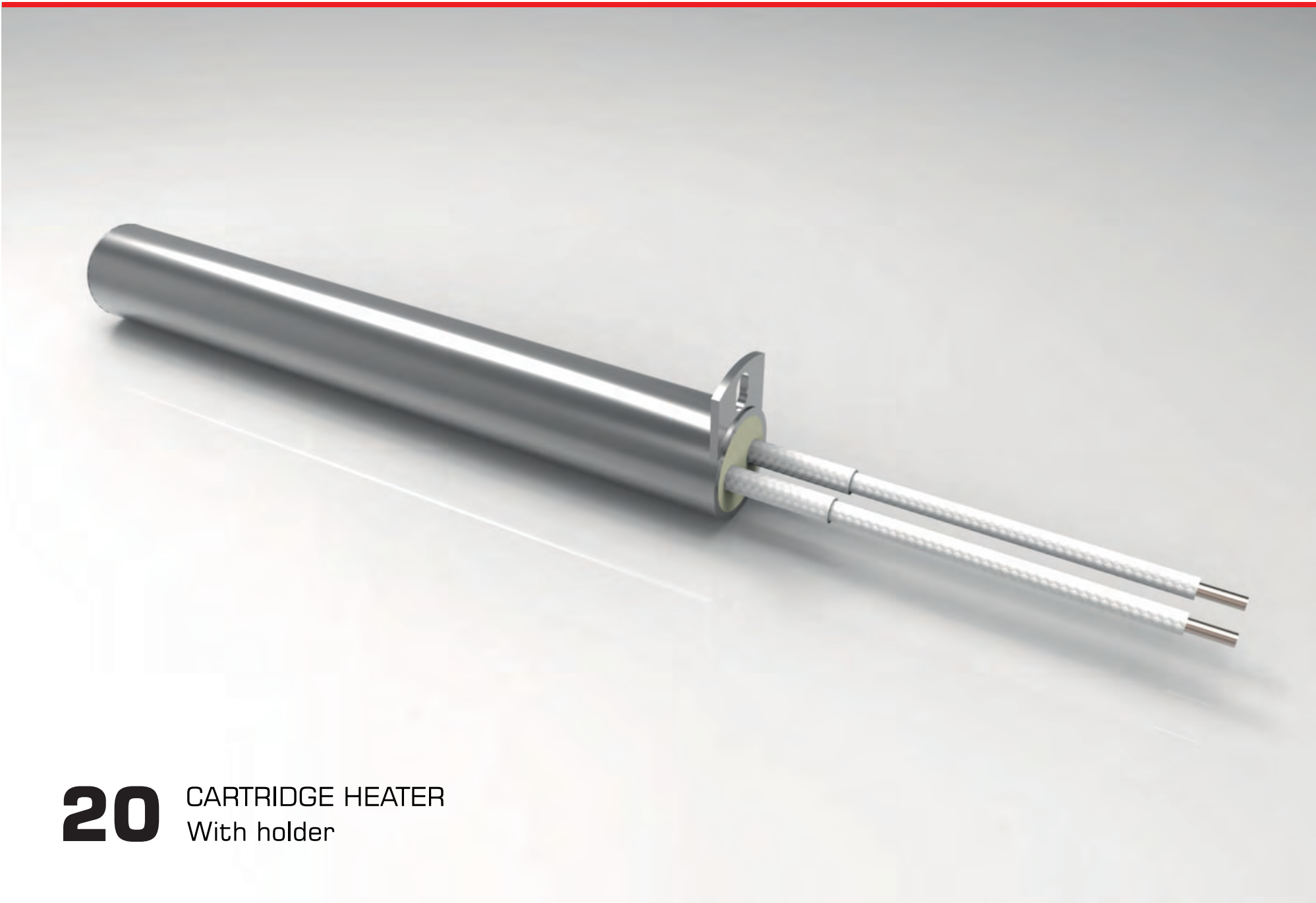
17b CARTRIDGE HEATER
3 cables protected by flexible corrugated tube



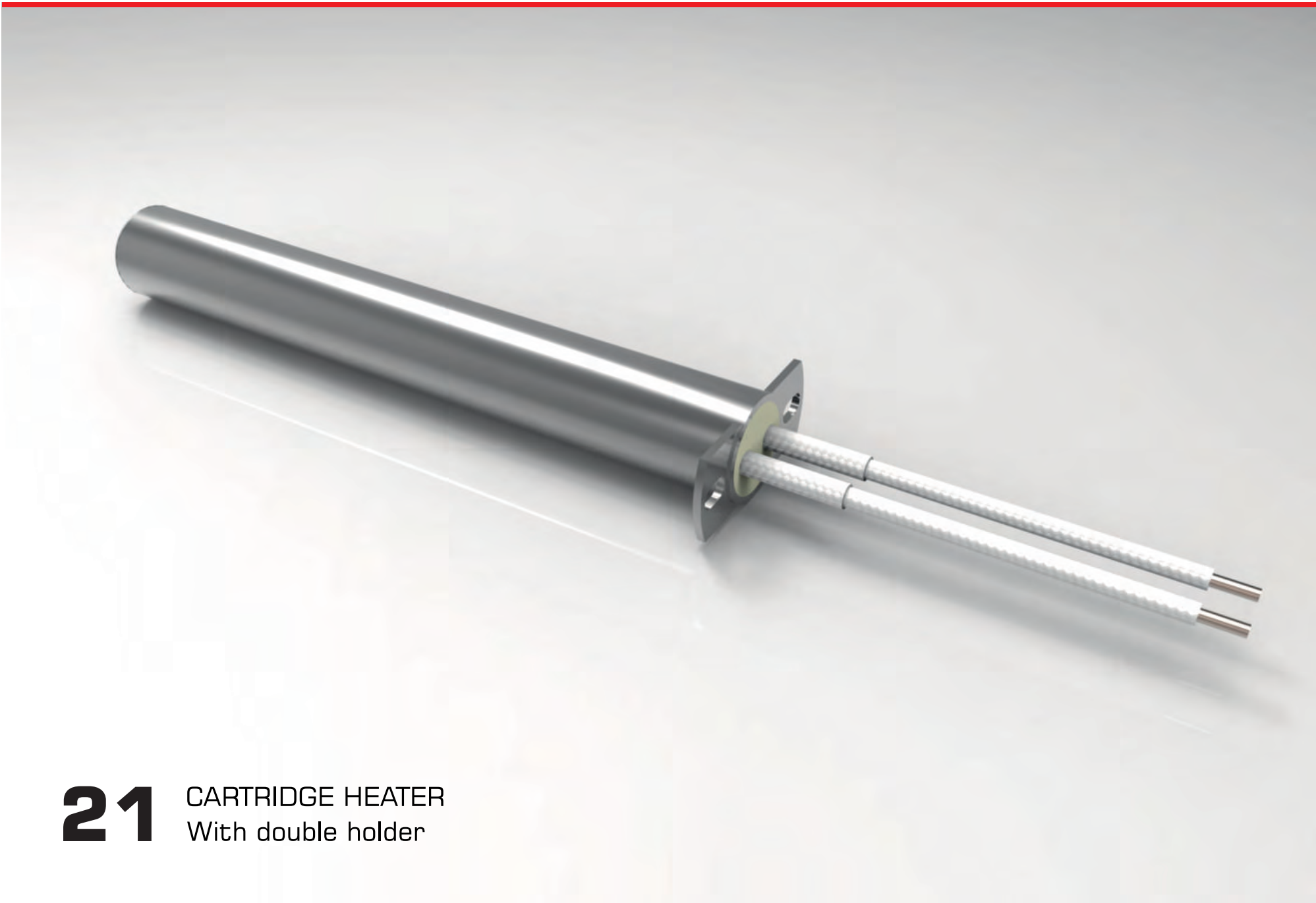
18 CARTRIDGE HEATER
With circular flange



19 CARTRIDGE HEATER
With threaded flange

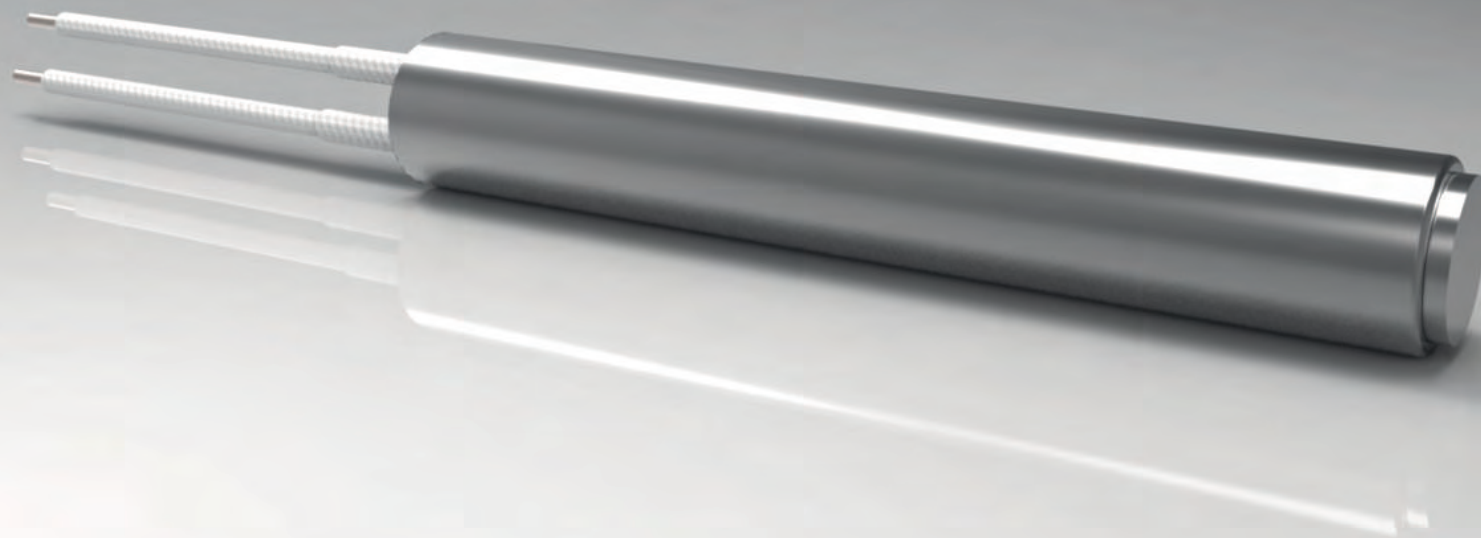


20 CARTRIDGE HEATER
With holder

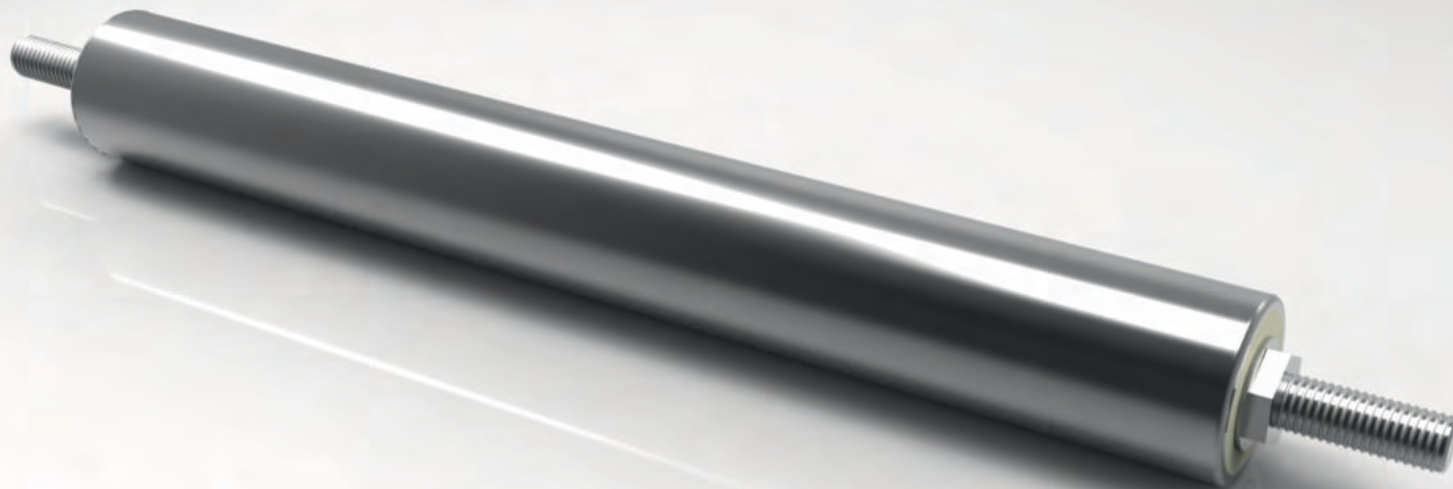


21

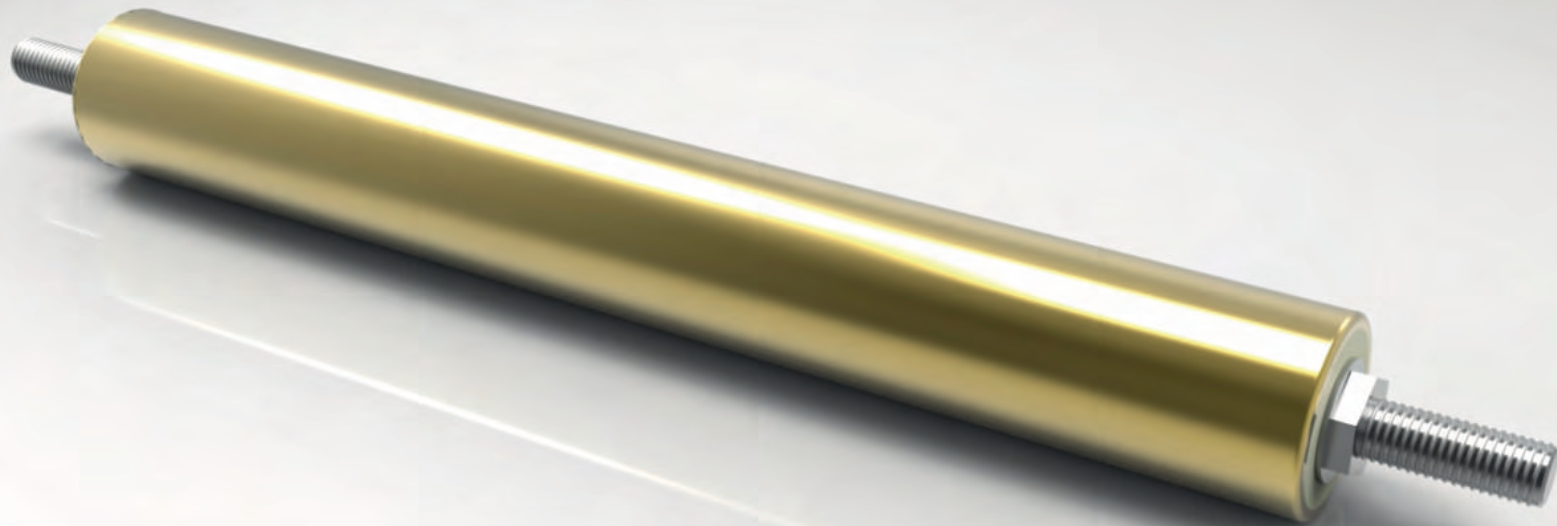
CARTRIDGE HEATER
With double holder



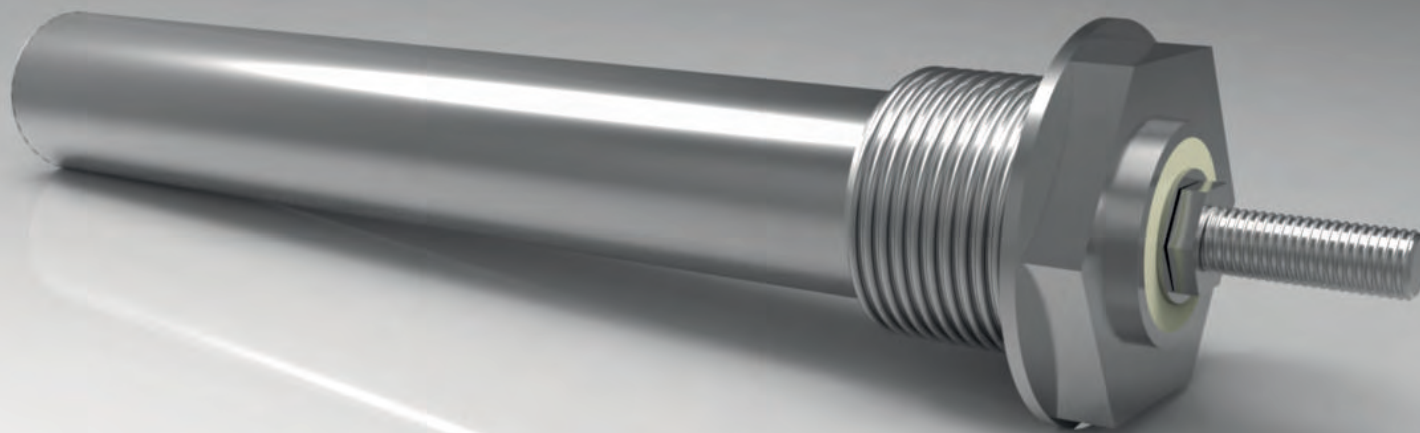
22 CARTRIDGE HEATER
With special drift bottom



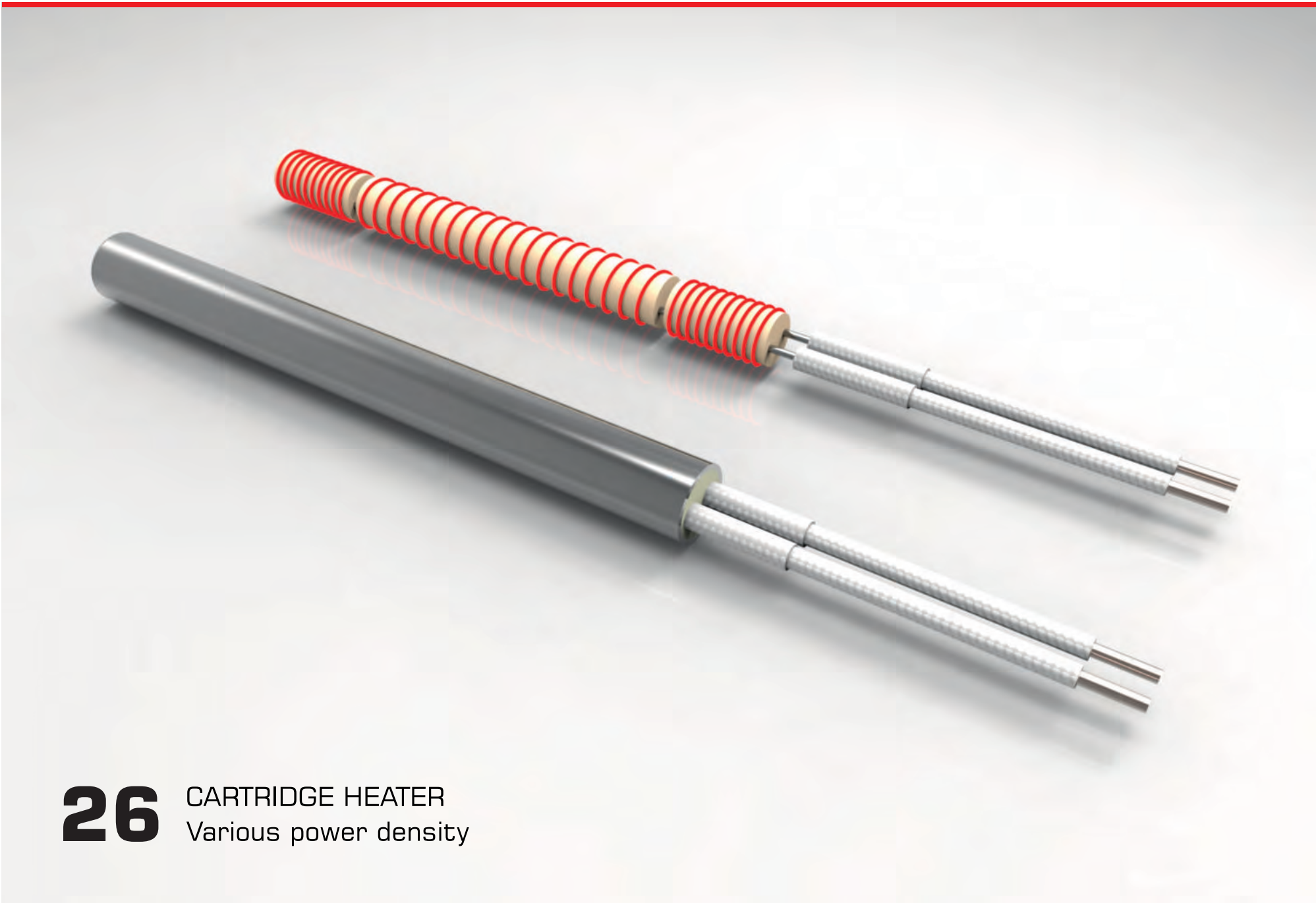
23 CARTRIDGE HEATER
Special design - both sided connection



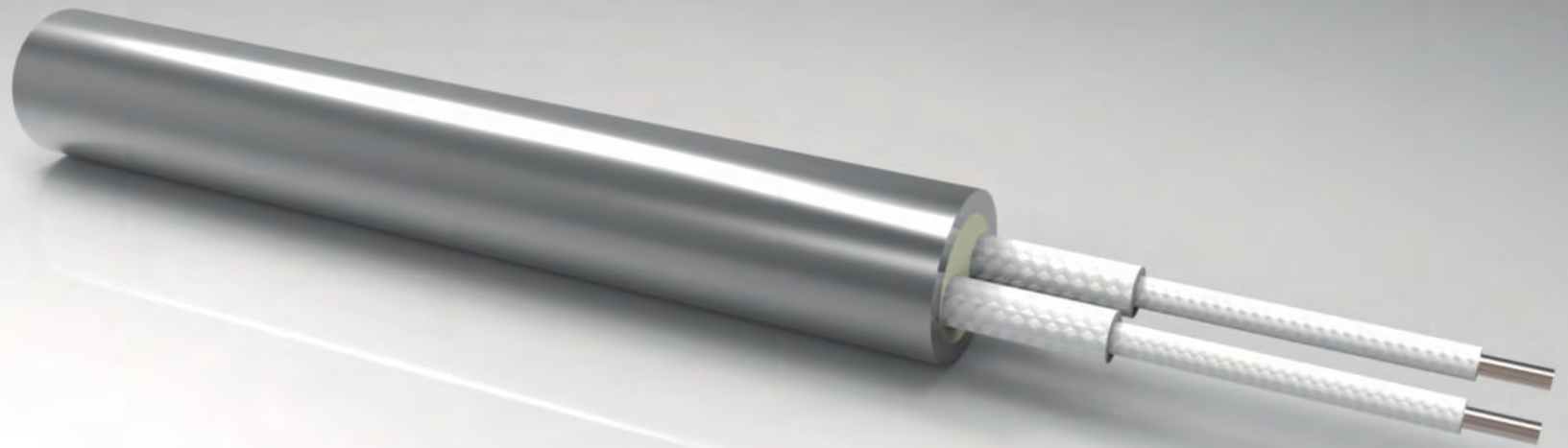
24 CARTRIDGE HEATER
Special design - both sided connection, brass



25 CARTRIDGE HEATER
Single pole connection



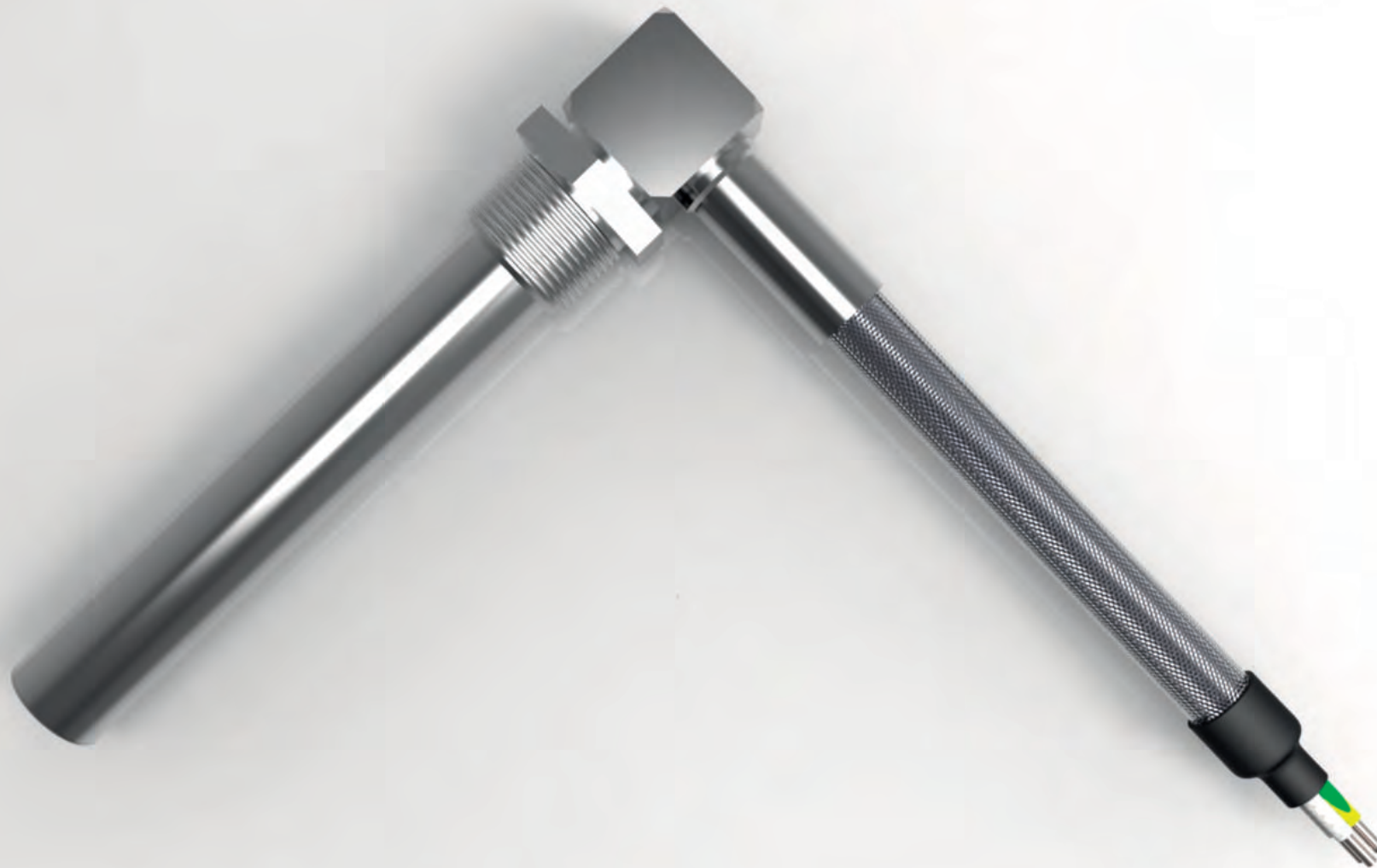
26 CARTRIDGE HEATER
Various power density



27 CARTRIDGE HEATER
Robust design with thick wall



28a CARTRIDGE HEATER
Special design, cables protected by flexible corrugated tube



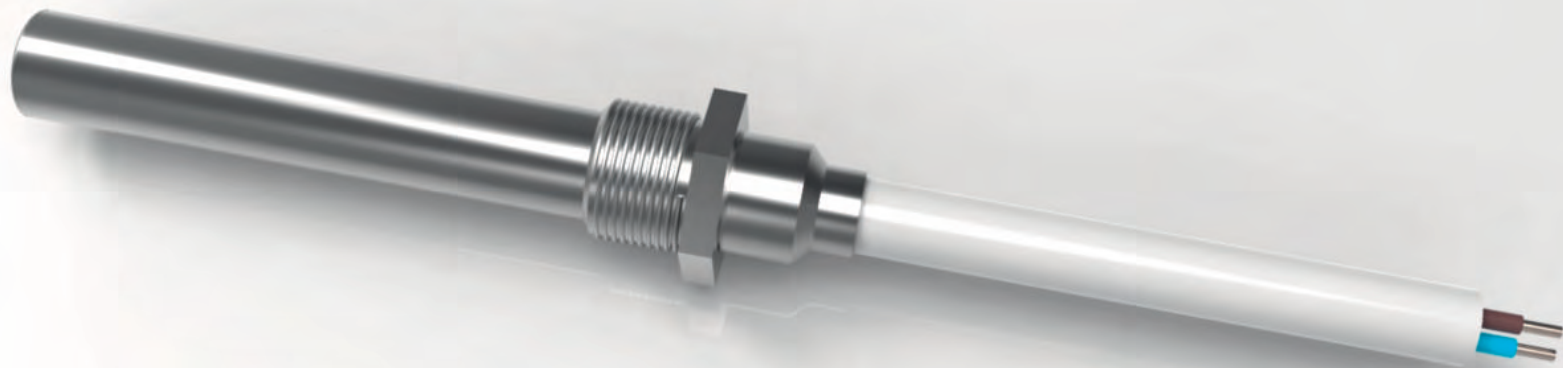
28b CARTRIDGE HEATER
Special design, cables protected by flexible metal braid



29a CARTRIDGE HEATER
Special angle design



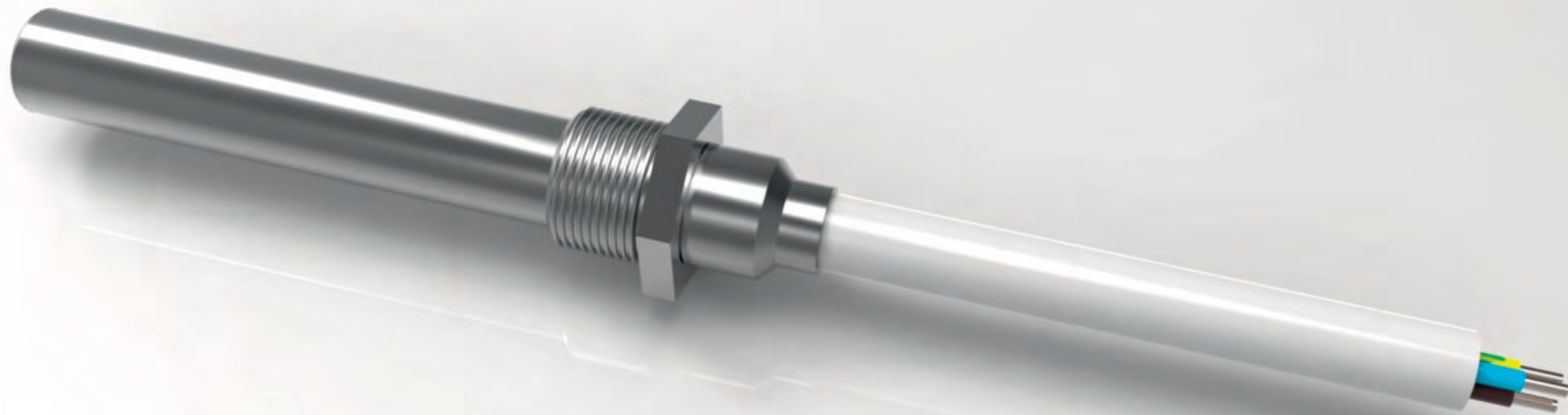
29b CARTRIDGE HEATER
Special angle design



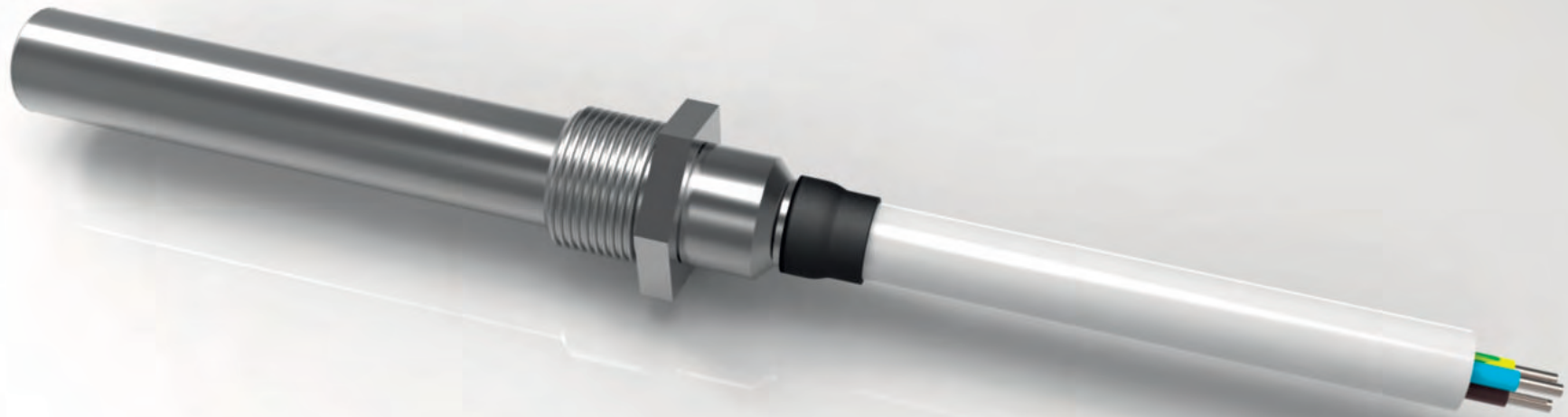
30a CARTRIDGE HEATER
Special design with threaded flange



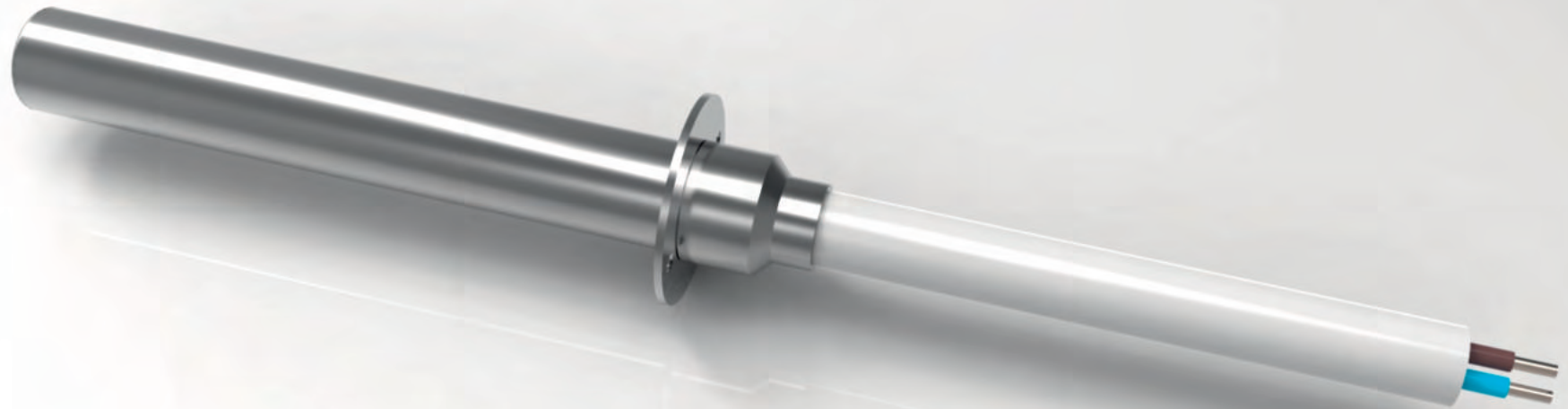
30b CARTRIDGE HEATER
Special design with threaded flange



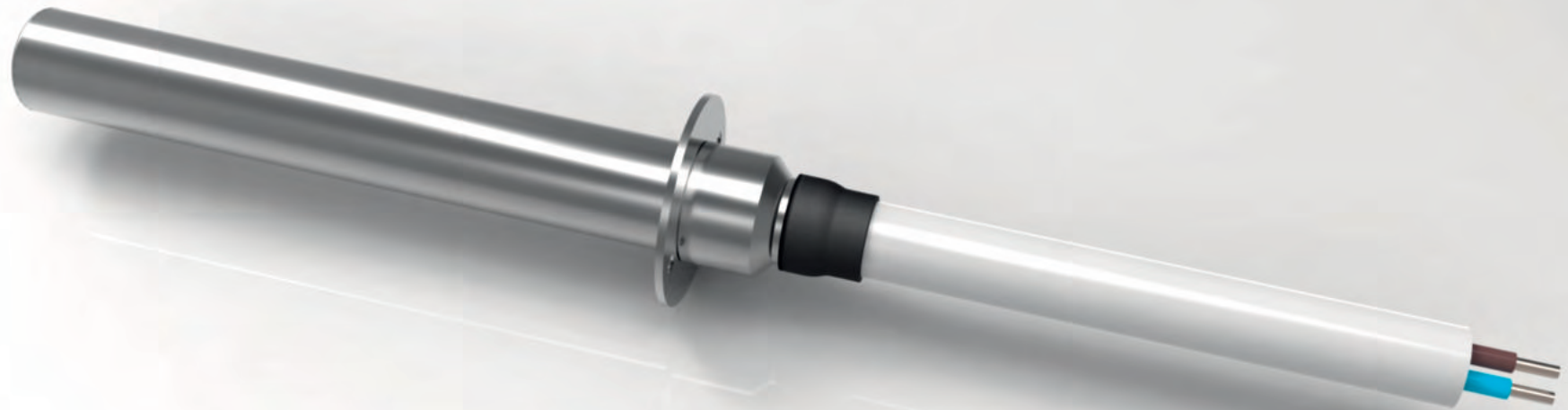
30c CARTRIDGE HEATER
Special design with threaded flange



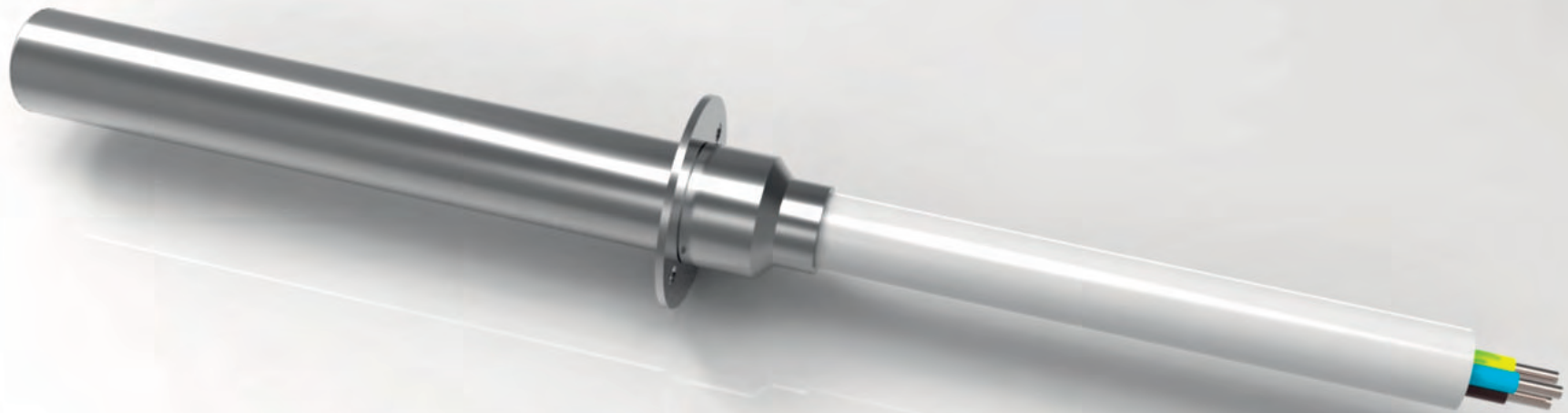
30d CARTRIDGE HEATER
Special design with threaded flange



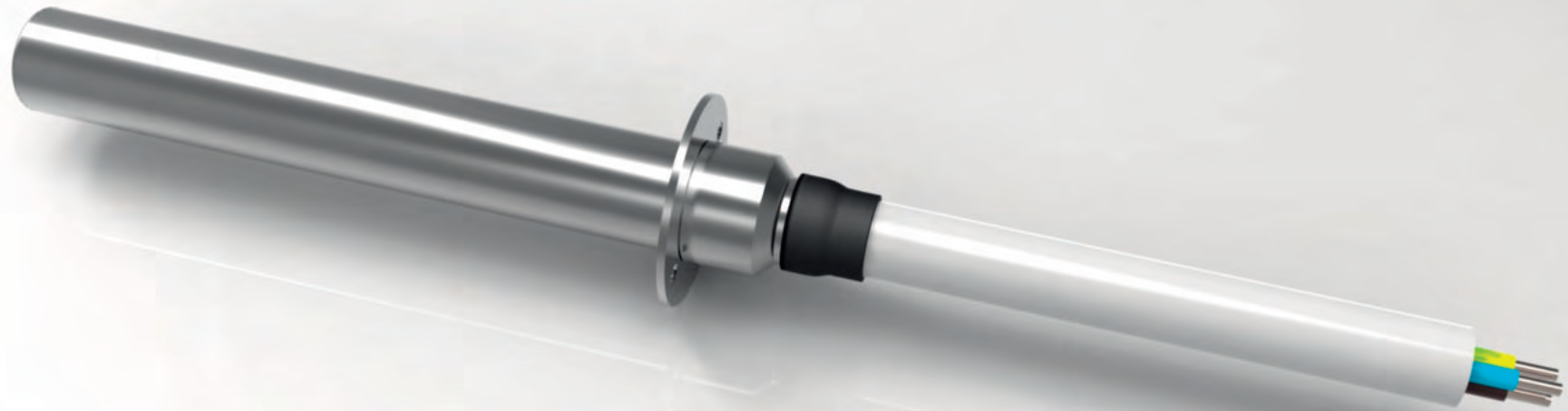
31a CARTRIDGE HEATER
Special design with circular flange



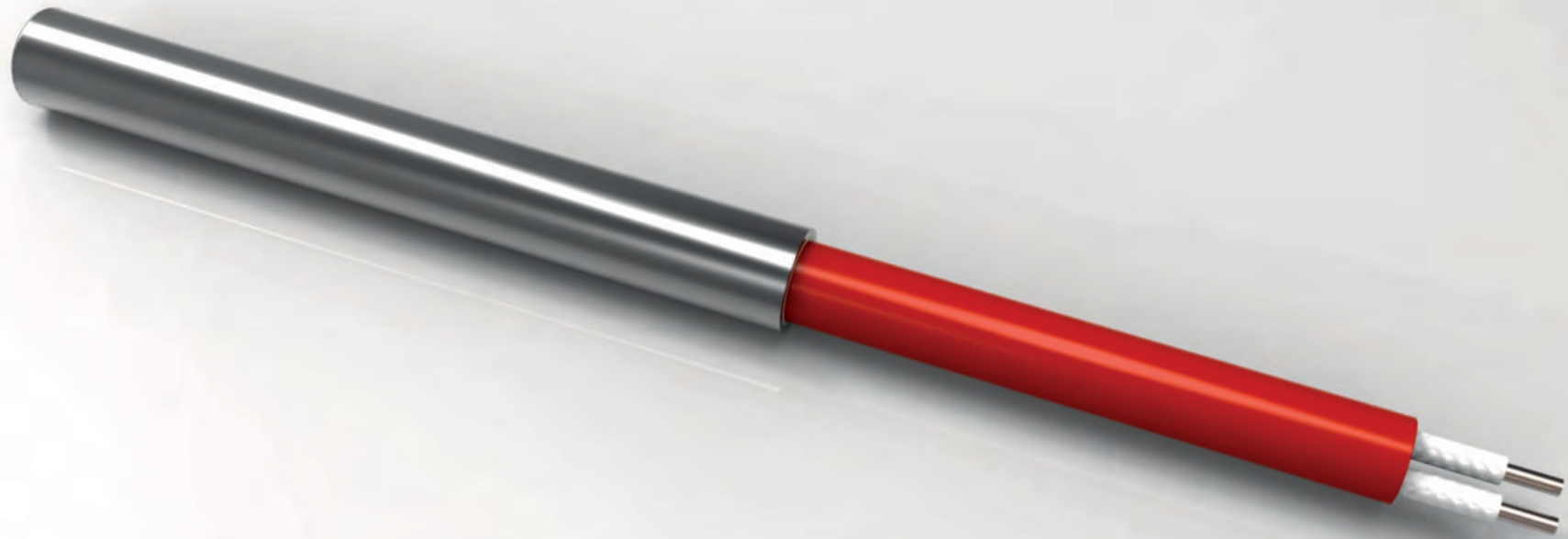
31b CARTRIDGE HEATER
Special design with circular flange



31c CARTRIDGE HEATER
Special design with circular flange



31d CARTRIDGE HEATER
Special design with circular flange



32 CARTRIDGE HEATER
Cables protected by silicone-glassfibre hose (250°C)

TECHNICAL DATA AND CHARACTERISTIC

Cartridge heaters are reliable heating elements that have the maximum rated power to outer dimensions among all kind of electrical resistance heating elements.

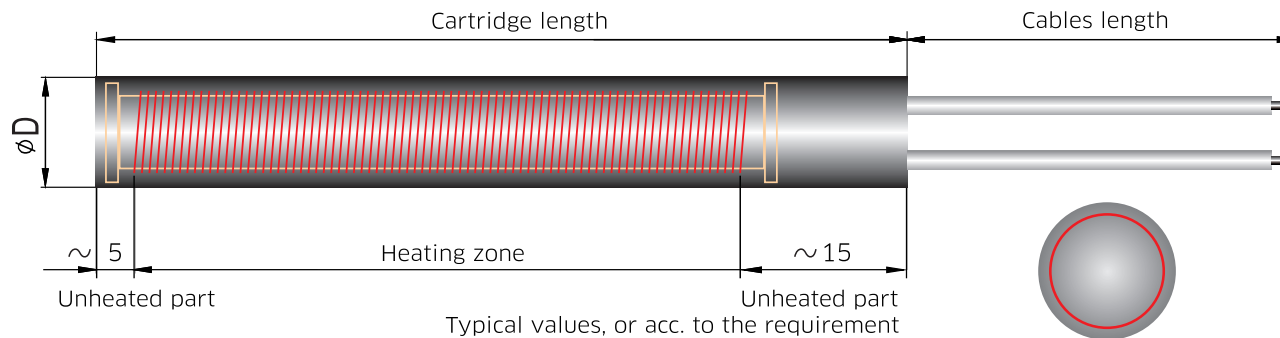
TYPICAL FIELDS OF APPLICATIONS

Heating of moulds for plastic and vulcanization
 Heating of moulds and core boxes for foundry industry
 Heating of plastic welding machines

Heating of markers for thermal marking
 Warming of heating plates and boards
 Packaging industry

Heating of laboratory equipment
 Heating of various liquids
 Heating of machine parts and accessories

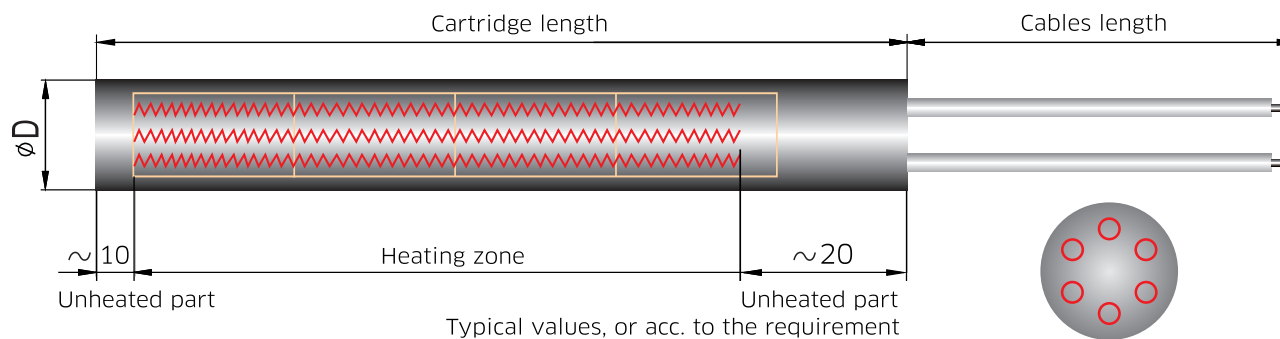
INNER CONFIGURATION



1. HIGH POWER LOADED, FORGED CARTRIDGE

Diameter [mm]	6.0 - 25 / -0.02 -0.08
Length [mm]	35 - 1500
Voltage [V]	12 - 480
Power [W]	+5 / -10%
Power density [W/cm ²]	0.5 - 35, depending on application
Sheath material	AISI 304, AISI 321, AISI 316Ti and other
Max. surface temp. [°C]	50 - 800, depending on application
Heating wire	Nicrothal 80, 80% Ni +20% Cr
Inner thermocouples	J, K

The heating wire is coiled around the inner ceramic part. The distance between the heating wire and the outer sheath is the same along the whole spiral. The spiral is highly sealed with MgO sand by forging. This configuration allows the highest power density in principle.



2. LOW POWER LOADED CARTRIDGE

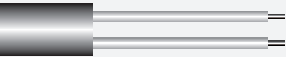

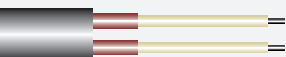

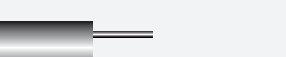
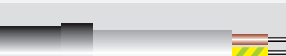


Diameter [mm]	10 - 54 +/-0.2 ... +/-0.3
Length [mm]	40 - 4000
Voltage [V]	12 - 480, 3 x 230, 3 x 400
Power [W]	+5 / -10%
Power density [W/cm ²]	0.5 - 4.0, depending on application
Sheath material	AISI 304, AISI 321, AISI 316Ti and other
Max. surface temp. [°C]	50 - 300, depending on application
Heating wire	Nicrothal 80, Kanthal A, D
Inner thermocouples	J, K

The heating spirals are placed in the axial holes of the ceramic cylinders. The distance between the heating wires and the outer sheath is not the same. The spiral is sealed with MgO sand. This configuration offers a good price-performance ratio in a number of applications where high power is not necessary.

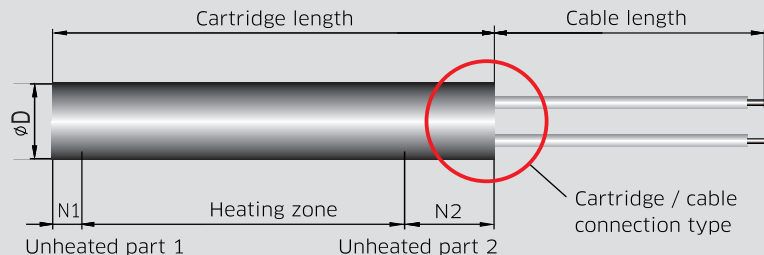
Both cartridge heater configurations meet the EN 60 635-1 standard. Each produced piece is tested according to this standard.

TECHNICAL DATA AND CHARACTERISTIC

TYPES OF CABLES

Connections type / name	Conductor / insulation	Characteristic
 Cables with glass-fibre insulation	Ni / glass-fibre	Thermal resistance 350 °C or 450 °C
 Cables with silicone insulation	Cu / silicone	Thermal resistance 180 °C
 Cables with teflon insulation	Cu / teflon	Thermal resistance 220 °C and chemical resistance
 Nickel wires with ceramic beads	Ni / steatite	Thermal resistance 500 °C
 Nickel wires	Ni	Thermal resistance 450 °C
 Silicone cable	Cu-Ni / silicone	Thermal resistance 180 °C
 Cables in metal braid	Cu-Ni / silicone / Fe-Ni Ni / glass-textile / Fe-Ni	Thermal resistance 180 °C Thermal resistance 450 °C
 Cables in flexible corrugated tube	Cu-Ni / silicone / Fe-Ni Ni / glass-textile / Fe-Ni	Thermal resistance 180 °C Thermal resistance 450 °C

ORDER DATA



Diameter [mm] Length [mm]
 Voltage [V] Power [W]
 Length of cables [mm] Type 1 - 32
 Unheated part 1 [mm] Unheated part 2 [mm]
 Thermocouple Operation temperature [°C]
 Heated surrounding material (metal, air, water, ...) Quantity [pcs]

Other special requirements

RECOMMENDATION FOR USE, MANIPULATION, STORAGE

- The cartridge heater has to be placed in a hole of the nominal diameter with H7 toleration and surface roughness 0.8 max.
- The hole must be at least 2 mm longer than the cartridge heater. Heat-transfer paste is recommended.
- Incorrect cartridge installation may shorten its service life.
- Avoid harsh manipulation with leads - do not pull or bend them sharply, please. Protect them from pollution, humidity and mechanical strain.
- Only use the supply voltage marked on the cartridge coat, or lower.
- Continuous regulation is more suitable than frequent turning on and off.
- During the first use or after a longer break, it is suitable to dry the cartridge heater at 120 °C for at least 12 hours - either by warming in furnace or by cartridge operation at lower power.
- Store cartridges in warehouses with constant temperature and air humidity not exceeding 70%.
- Any new use of cartridge heaters in untested conditions should be first consulted with the manufacturer's technical department.

OTHER PRODUCT LINES OF HEATING ELEMENTS



Tubular elements



Ceramic elements



Transportation



Surface finishes



Band heaters



Industry applications



QUALITY STANDARDS

We focus on delivery of the highest quality products combined with a flexible way of working. It is reflected in the whole process of the sales, product development, manufacturing, customer service and logistics. Eltop delivers products that meet all relevant standards and tests, certifying products according to customer specifications. We also have possibilities to carry out tests in modern labs, constantly improving our product performance and energy efficiency.



Customised solutions



Transportation



Commercial equipment



Energy Environment



Home appliances



Advanced technology



Industrial projects



Innovations