

Radiant heaters

Basic values:

| Parameter | Value |
|------------------|---------------------|
| Dimensions | 210 x 14.5 x 4.4 mm |
| Heated area | 180 x 14.5 x 4.4 mm |
| T _{max} | 1 000 °C |

Details of with sensor hole Ø1.5 mm:

Description

Heating elements made of silicon nitride are very suitable as radiation heaters. The almost black silicon nitride used for the heating elements is a long-wave infrared radiator with a maximum radiation emission ($\epsilon > 0.8$) between 8 and 11 μm at 1 000 °C. Thus, a wide variety of materials can be heated effectively by radiation: Sheet metals to be selectively heated or held at temperature for subsequent re-forming processes, as well as plastics where the weld edges are to be melted for a subsequent sealing process. In addition, plastics can be selectively "glued", or sharp edges can be rounded or thermally deburred by radiant heat. Radiation heaters with the dimensions 210 mm x 14.5 mm x 4.4 mm are available in a large number of different power ratings. However, they can also be equipped with sensor boreholes for thermocouples, in order to be able to precisely control the temperature of the heating element. The robust design of these heating elements, in conjunction with the good oxidation resistance of the silicon-nitride ceramics, ensures a long service life - both during continuous operation and during cyclic demand.

The heating element has a blind hole, into which a temperature sensor with Ø1.5 mm, for example a mantle thermocouple, can be inserted.

* The actual power depends on resistance, temperature and voltage.

| Parameter | Value | | |
|-----------------------|---------------------------|---------------------------|--------------------------|
| Article no. | GLZ 100 267 | GLZ 100 272 | GLZ 100 271 |
| Resistance @ 20 °C | 132,25 $\Omega \pm 15 \%$ | 105,80 $\Omega \pm 15 \%$ | 83,97 $\Omega \pm 15 \%$ |
| Nominal voltage | 230 V | 230 V | 230 V |
| Nominal power @ 20 °C | 400 W* | 500 W* | 630 W* |
| Continuance | ... | ... | ... |
| Article no. | GLZ 100 268 | GLZ 100 269 | GLZ 100 270 |
| Resistance @ 20 °C | 66,13 $\Omega \pm 15 \%$ | 52,90 $\Omega \pm 15 \%$ | 42,32 $\Omega \pm 15 \%$ |

| Parameter | Value | | |
|-----------------------|--------|----------|----------|
| Nominal voltage | 230 V | 230 V | 230 V |
| Nominal power @ 20 °C | 800 W* | 1 000 W* | 1 250 W* |

Basic Material

| Parameter | Scale unit | Si ₃ N ₄ |
|---|----------------------------------|--------------------------------|
| max. temperature (T _{max}) | °C | 1 000 |
| thermal conductivity (l) | W/mK | 40 |
| temperature shock resistance (ΔT) | K | 500 |
| emissivity (1 100 °C) (ε) | - | 0.96 |
| Young's modulus (E) | GPa | 320 |
| bending strength (δ _{BB}) | MPa | 400 |
| compressive strength (δ _D) | MPa | 2 000 |
| coefficient of thermal expansion (α) | 10 ⁻⁶ K ⁻¹ | 3 |
| density (g) | g/cm ³ | 3.21 |
| specific heat (c _p) | J/kgK | 750 |
| porosity (100 - % t.D.) | % | 0 |
| critical stress intensity factor (K _{IC}) | MPa m ^{1/2} | 6 |
| Weibull - modulus (m) | - | 7.9 |

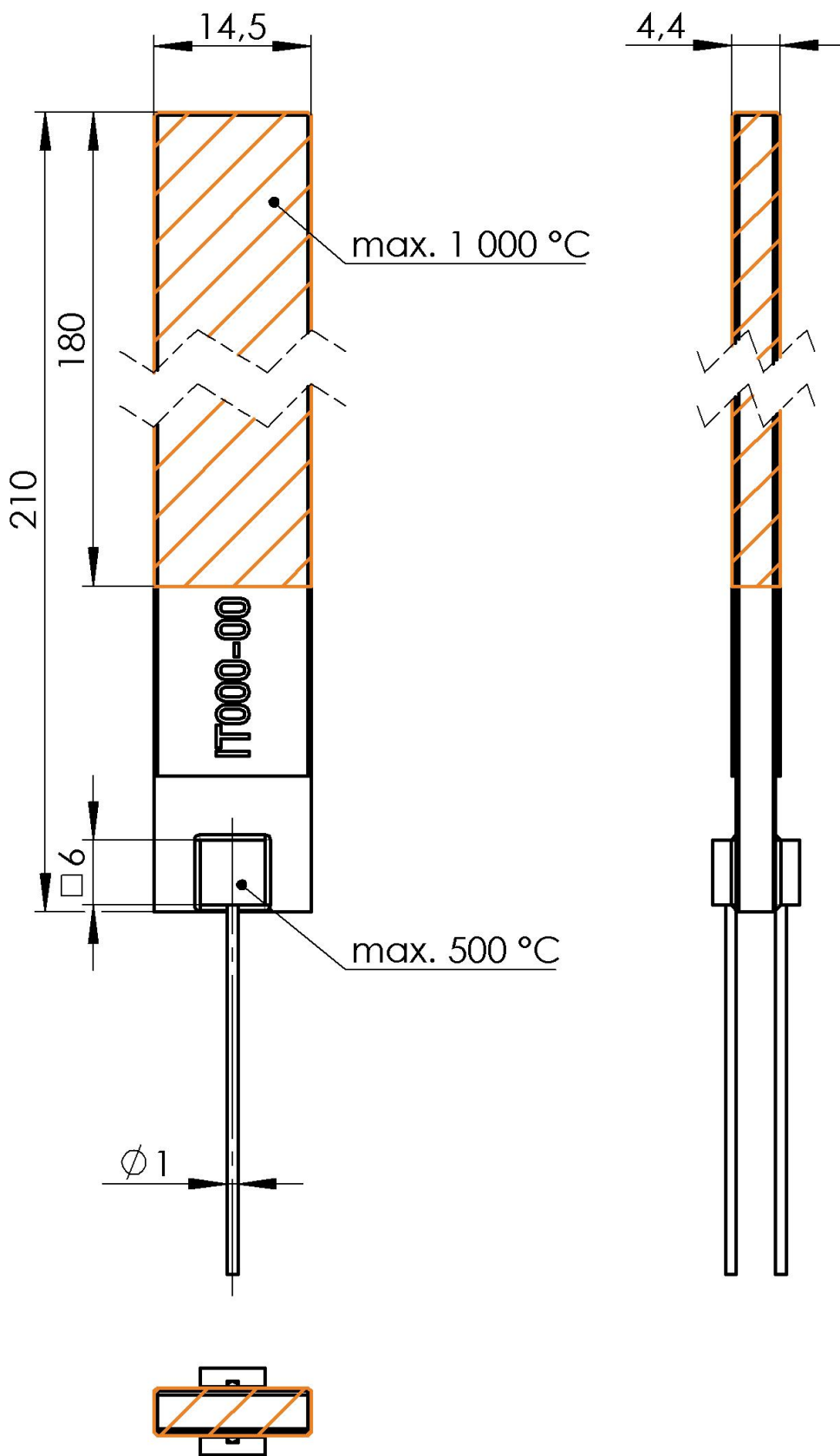
The thermal shock resistance depends on the geometric shape of the heater.

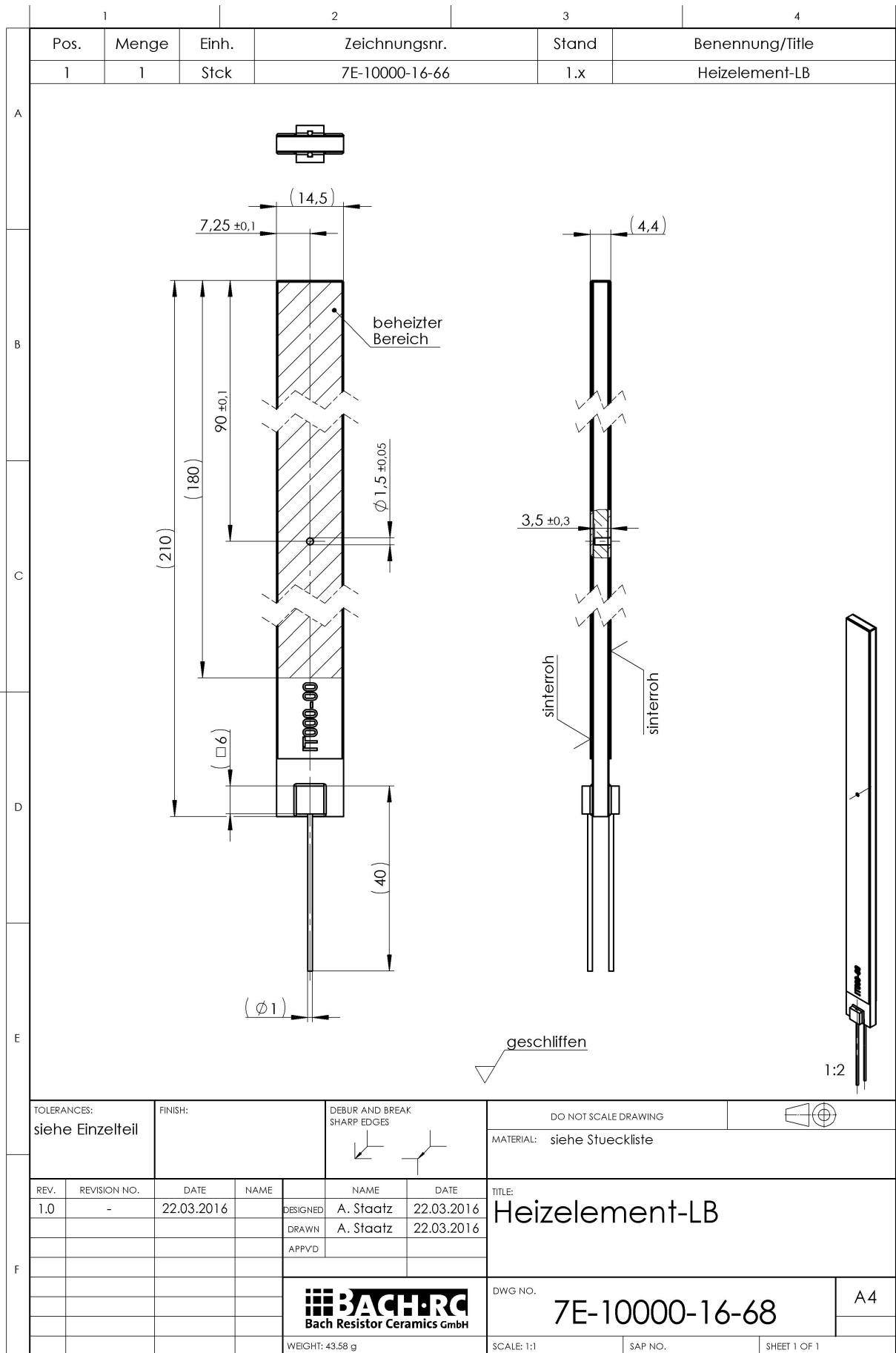
Electrical parameters

| Parameter | Scale unit | Si ₃ N ₄ |
|-----------------------|--------------|---|
| resistivity | Ω cm | 5 · 10 ⁻³ - 5 · 10 ⁻¹ |
| isolation resistivity | Ω mm (20 °C) | 10 ¹³ |
| dielectric strength | kV/mm | 25 |

Emission spectrum

Fully ceramic heating elements are long-wave infrared heaters with a maximum emission of 5 to 10 μm and a radiation coefficient of ε > 0.9.





| | | | | | | | | | |
|---------------------------------|--------------|------------|------|---|------------|----------------------------------|--|----------------------|--|
| TOLERANCES: siehe Einzelteil | | FINISH: | | DEBUR AND BREAK SHARP EDGES | | DO NOT SCALE DRAWING | | | |
| | | | | | | MATERIAL: siehe Stueckliste | | | |
| REV. | REVISION NO. | DATE | NAME | NAME | DATE | TITLE: Heizelement-LB | | | |
| 1.0 | - | 22.03.2016 | | DESIGNED A. Staatz | 22.03.2016 | | | | |
| | | | | DRAWN A. Staatz | 22.03.2016 | | | | |
| | | | | APPVD | | | | | |
| | | | | BACH-RC Bach Resistor Ceramics GmbH | | DWG NO. 7E-10000-16-68 | | A4 | |
| | | | | WEIGHT: 43.58 g | | SCALE: 1:1 | | SAP NO. SHEET 1 OF 1 | |