

Flat heating elements

Basic values:

Parameter	Value
Dimensions	14 x 14 x 4.5 mm
Heated area	14 x 14 x 4.5 mm
T _{max}	500 °C

Details of Standard:

Description

With the heating elements of the type CLB, highest surface performances and heating rates are achievable. The design in relation to Art. No. FLE 100 303 has a rated power of more than 230 W - with only 14 mm x 14 mm of base area! With this output capacity, the heating element can heat at more than 150 K/s. In this case, it is especially important to use appropriate control technology where the control speed can keep up with the heating element. Our control engineering experts will gladly advise you on this.

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

Parameter	Value	
Article no.	FLE 100 034	FLE 100 303
Resistance @ 20 °C	15 Ω ±25 %	10 Ω ±25 %
Nominal voltage	48 V	48 V
Nominal power @ 20 °C	153.6 W*	230.4 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

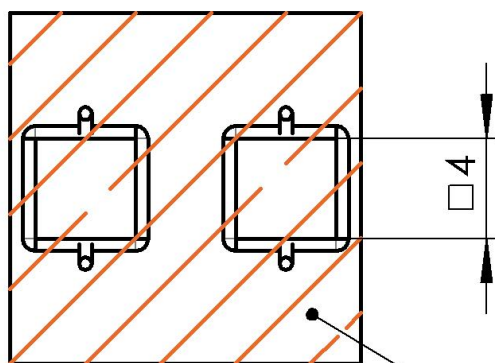
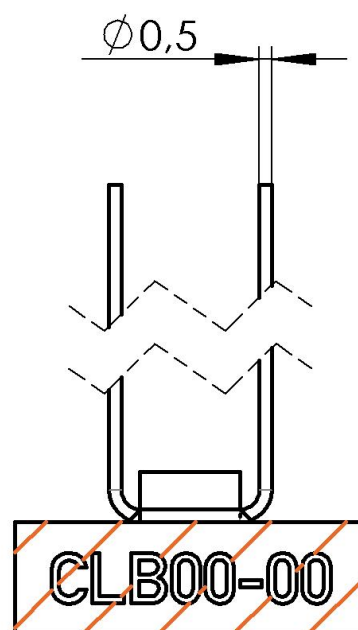
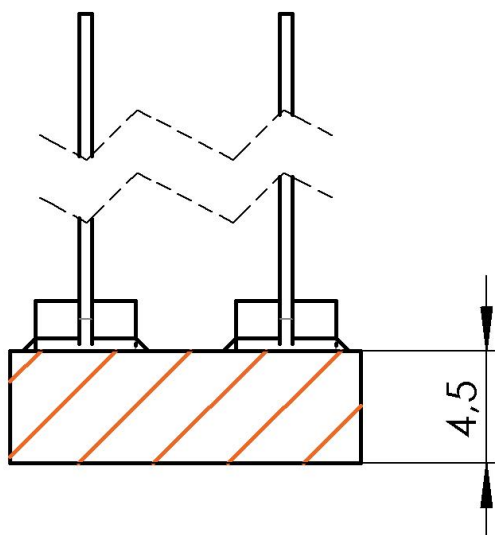
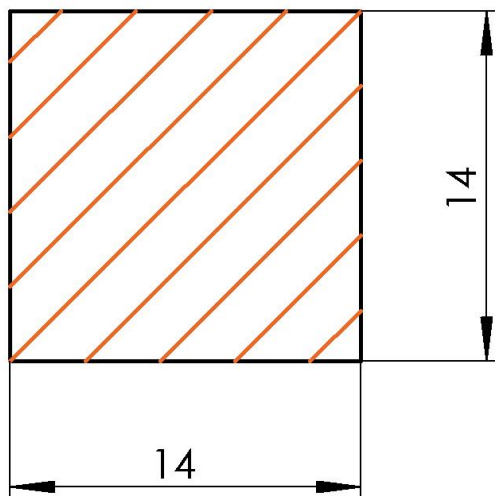
The thermal shock resistance depends on the geometric shape of the heater.

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.



max. 500 °C

