

Radiant heaters

Basic values:

Parameter	Value
Dimensions	260 x 84 x 5.0 mm
Heated area	210 x 84 x 5.0 mm
T _{max}	1 000 °C

Details of Standard:

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.

- surface as fired

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

Parameter	Value
Article no.	FLE 100 480
Resistance @ 20 °C	40 $\Omega \pm 25\%$
Nominal voltage	230 V
Nominal power @ 20 °C	1 322 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.



