

Flat heating elements

Basic values:

Parameter	Value
Dimensions	10 x 4.0 x 4.0 mm
Heated area	10 x 4.0 x 4.0 mm
T _{max}	500 °C

Details of Standard:

Description

With more than 40 W of rated power, the heating element of the type HR is a powerful miniature heater. The square array of width and height of the heating element makes it possible to also use the side surfaces for heat transfer. Thus, the type HR is ideal for partially recessed installation, for example when requiring space-saving and targeted heating of machine parts with high performance output, such as in plastics injection moulding machines or packaging machines.

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

Parameter	Value
Article no.	FLE 100 219
Resistance @ 20 °C	14 Ω ±25 %
Nominal voltage	24 V
Nominal power @ 20 °C	41 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.



