

3M™ Silicon Nitride Heater Tubes

3M™ Silicon Nitride Heater Tubes offer extended lifetimes, since they are unaffected by the melt, and are highly thermally conductive with good thermal shock resistance.



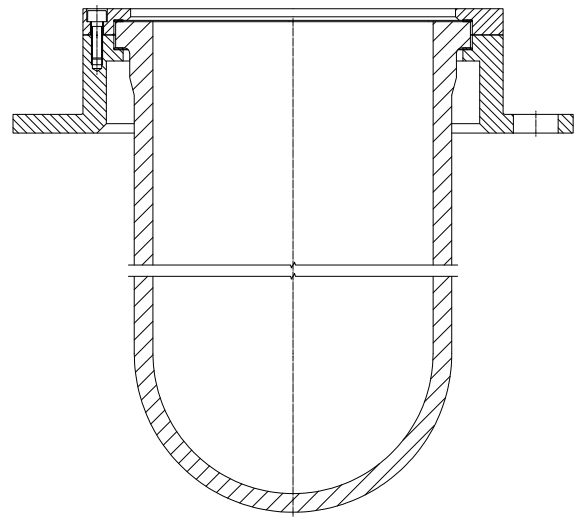
3M™ Silicon Nitride Heater Tube

Advantages

- Gas-tight
- Long life > 12 months
- Unaffected by corrosion
- No melt contamination
- Can be used in melts containing sodium and strontium
- Resists build up of dross
- High temperature resistance up to 1,300 °C
- High thermal shock resistance
- No preheating required at operation temperature below 900 °C
- Easy cleaning of bake-on
- High thermal conductivity
- Suitable for gas burners
- Suitable for electrical heating systems
- Good price performance ratio

Application

Molten aluminium is processed at temperatures between 680 °C and 800 °C. Melts can be kept on temperature with radiant heater tubes. Neither may the tube material be chemically attacked by the melt nor may particles loosen from the tube which can contaminate the melt. Furthermore the radiant heater tube should have a sufficient mechanical stability to withstand the stress during operation.



3M Technical Ceramics manufactures heater tubes with an outer diameter up to 300 mm and a length up to 1,200 mm. The wall thickness depends on the outer diameter. We offer a choice of standard or customised steel flange systems to allow perfect adaption to the furnace.

Specification

Typical material properties		
Phase composition		β -Si ₃ N ₄ , Oxide
Density	g/cm ³	> 3.24
Porosity open	vol %	0
Porosity total	vol %	< 0.5
Flexural strength, 4-pt bending	MPa	800
Compressive strength	MPa	> 2,500
Vickers-hardness HV1	GPa	15
Young's modules	GPa	300
Coefficient of thermal expansion	[10 ⁻⁶ /K]	
25 °C – 500 °C		2.5
500 °C – 1.000 °C		3.9
Thermal conductivity at 25 °C	[W/mK]	27

Product is manufactured and sold by 3M Technical Ceramics, Zweigniederlassung der 3M Deutschland GmbH.

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