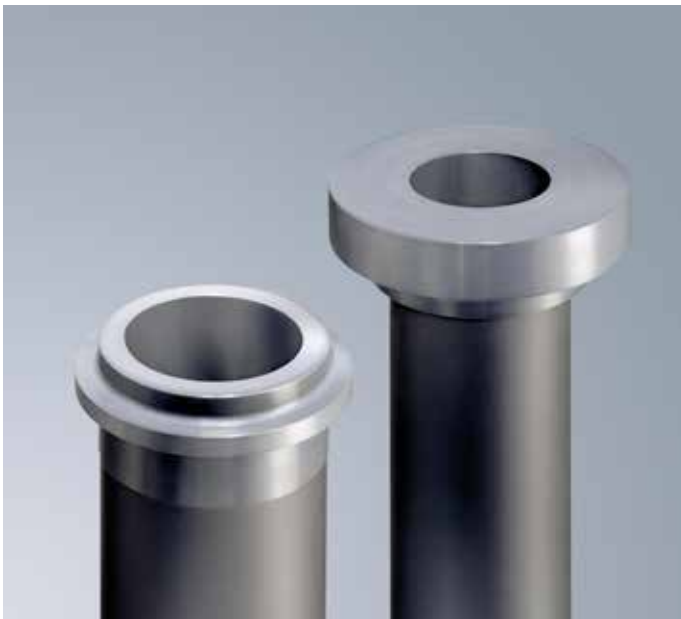


3M™ Silicon Nitride Low Pressure Riser Tubes

For aluminium casting applications. 3M™ Silicon Nitride low pressure riser tubes provide long lifetime, due to good thermal shock resistance and good corrosion resistance.



Flange tubes for systems with steel flange and ceramic flange solutions

Properties

Molten aluminium is processed at temperatures between 680 °C and 800 °C. In low pressure casting the melt flows through a riser tube. 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 riser tube should have a sufficient mechanical stability to withstand the stress during operation.

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
- Good price performance ratio

Comparison of properties of common materials for aluminium low pressure casting

	Chemical resistance	Mechanical resistance	Resistance against bake-on	Life time	Price-performance ratio	Overall estimation
3M™ Silicon Nitride	+++	o	++	+++	++	++
Aluminium titanate	++	---	++	+	+	o/+
Cast iron	---	+++	++	---	---	-
Silicon carbide	o	-	-	-	-	-
Clay graphite	o	--	--	--	--	--/-
Fused silica	o	-	+	o	o	o

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	700
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

Standard sizes

Outside diameter without flange (mm)	Inside diameter (mm)	Max. length (mm)
80	60	1,200
90	70	1,200
110	90	1,200
130	110	1,200

Other sizes available on request.

We offer a choice of standard or customised full ceramic and steel flange systems to allow perfect adaption to the furnace.

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

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