	Product Specification NOVOSIL Satin quartz tubes	SPEC_Z_LW_18 page 1 of 2
Author: 12.05.2010 Ludwig Stier	Approved: 12.05.2010 Dr. Sigrun Rakus	Released: 12.05.2010 Frithjof Raesch

Introduction:

The main applications are production of all kinds of heaters, sample-takeout-equipments for liquid metals, casting cores for metal melting, sleeves for high temperature processes and equipments for laboratories.

Physical properties:

Linear thermal expansion coefficient	(20-320)°C	[10 ⁻⁶ K ⁻¹]	0.54
Modulus of elasticity		10 ⁴ N/mm ²	7.4
Density		[g cm ⁻³]	2.10
Max. working temperature			[°C]
	permanent		1050
	intermittent		1300
	metal sampling		1650
Electrical resistance	[°C]		[Ω cm]
	at 20		3.2x10 ¹⁵
	at 400		2.0x10 ⁹
	at 800		6.3x10 ⁵
	at 1200		1.0x10 ⁴
Dielectric constant	at 20°C	0...1 MHz	3,7
	at 23°C	9 x 10 ² MHz	3,77
	at 23°C	3 x 10 ⁴ MHz	3,81
Thermal conductivity			low

Transmission properties:


NOVOSIL has a high infrared transmission.

Chemical composition:

SiO ₂	[%]	99.8
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NOVOSIL contains the following typical impurities in ppm:

Al	<175	Li	7	As	<0.01
Ca	30	Mg	15	Au	<0.03
Fe	40	Na	3	Cr	<0.1
K	20	Ti	63	Cu	<0.15
B	0.03	Cl	0.5	Ni	<0.4
Zr	1	OH	150		

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Quality Criteria and Product Properties:

Dimensional characteristics and tolerances:

Outside diameter (OD):	6-20mm	Tolerances	±3%
Wall thickness (WT):	about 10% from OD or 0.8-2mm other wall thicknesses on request.	Tolerances	±15%
Ovality:	3% from nominal OD		
Bow:	3mm/m		
Siding:	max. 10% from nominal WT		
Length:	furnace cut	tolerances ± 10mm	
	fine cut	tolerances ± 1mm	

Cutting irregularities

Type	Definition	Limits
Step cut	Junction of two intersecting cutting planes	1.5 mm
Chipping	Piece of material missing from the surface at the tube end	Depth: ½ wall thickness Length: 3 mm
End protrusions	A protruding point	Max. size: 1 mm

NOVOSIL is inert and resistant to all acids except hydrofluoric acid. The material reacts with phosphoric acid above 150°C.

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