		Product Standard Clear Fused Quartz Cylinder ilmasil® PN		
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ilmasil® PN is an electrically fused, clear quartz, manufactured by fusing high purity quartz sand using QSIL's proprietary plasma melting process.

Application: This criteria is applicable to cylinder produced with **ilmasil® PN** clear fused quartz material

1 Visual Characteristics

This specification applies to the specified bulk. The range above the nominal outer diameter and below the nominal inner diameter may not meet the specification. All products are inspected visually at a distance of 0.3 – 0.6 meter from the inspector, under controlled illumination conditions.

1.1. Bubbles

Definition: A spherical void within the bulk.

Limit:

Bubbles ¹ diameter in mm	TBCS ² value mm ² / 100 cm ³	Number per 1000 cm ³
0.1 – 0.3	7.5	-
0.3 – 0.5	-	3
> 0.5 – 1	-	1
> 1 – 2	-	0.1
> 2	-	0

¹ Bubbles smaller than diameter 0.1 mm are disregarded

² TBCS: Total Bubble Cross Section:
The sum of all cross sectional area in specified glass volume.

Bubble clusters:

Definition: A group of bubbles occurring close together

Limit: Not permitted if the whole cluster exceeds the limit of diameter 2 mm

1.2 Inclusions


Definition: Foreign particles found within the glass, causing visible discoloration

Limit:

Inclusions ³ diameter in mm	TBCS ⁴ value mm ² / 100 cm ³	Number ² per 1000 cm ³
0.1 – 0.3	7.5	-
>0.3 – 1	-	0.25
> 1 – 2	-	0.1
> 2	-	0

³ Inclusions smaller than diameter 0.1 mm are disregarded

⁴ Inclusions Ø 0.1 – 0.3 mm are treated as bubbles. The total cross sectional area of all bubbles and inclusions in size 0.1 -0.3 mm may not exceed the value of 7.5 mm² per 100 cm³

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Comment:

This specification applies to cylinder as shipped to the customer (cut segments). Any claims regarding defects must be declared prior to modification. Any section of the cylinder found to be out of specification by QSIL prior to shipment will be clearly marked and deducted from the invoiced length.

2 Dimensional Characteristics

2.1 Outer diameter (OD)

Definition: all outer diameter values of the cross sectional plane along the entire length of the cylinder

Limit: Nominal Outer Diameter +10 / - 0 mm

2.2 Inside Diameter (ID)

Definition: all inner diameter values of the cross sectional plane along the entire length of the cylinder

Limit: Nominal Inner Diameter +0 /-10

2.3 Length (L)

Definition: Distance of the finished cylinder from end to end

Limit: Nominal Length +10/-0

3 Surface Characteristics

Outer surface: Ground
Roughness Limit: not specified

Inner surface: typically firepolished or surface may be ground at manufacturer's discretion
Roughness Limit: not specified

4 Further applicable documents

S-101-01-PN Material Standard: Clear Fused Quartz **ilmasil®** PN