

AN07 Quartz Crucibles for Single Crystal Silicon Growing for PV application

Czochralski methode is used for growing a single crystal from a silicon melt at about 1450°C. This method is also used for Gallium Arsenide. A wide range of high purity crucibles for the photovoltaik industry is supplied, meeting the quality standards required by this state of the art technology. These crucibles enable users to achive superior performance with reduced start-up time and improve pulling yields.

AN07 electric-arc fused quartz crucible has a clear inner surface and a sandy opaque outer surface. Its inner surface is visually excellent with nearly no bubbles. The raw material quartz sand, coming from the US, has stable chemical composition and high purity of SiO₂≥99.998% (IOTA-CG; outer layer) respectively SiO₂≥99.999% (IOTA-5; inner layer).

1. Chemical Composition

unit: ppm

	AL	Li	K	Na	Ca	Fe	Ti	Mg	Cu	B
AN07 outer layer	16.2	0.7	1.1	1	0.7	0.3	1.3	<0.05	<0,05	0.08
	OH	SiO ₂								
	50	99.998%								

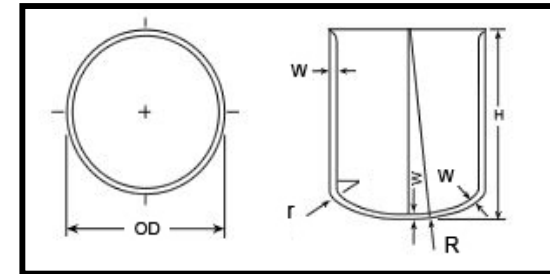
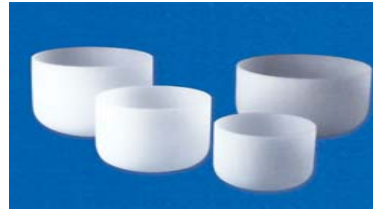
	AL	Li	K	Na	Ca	Fe	Ti	Mg	Cu	B
inner layer	8.6	0.3	0.1	0.4	0.2	0.2	1.4	<0.05	<0.05	0.04
	OH	SiO ₂								
	50	99.999%								

2. Typical Size

O-Diameter	OD Tolerance	Wall	W Tolerance	Height	H Tolerance	Radius	Radius	N. W.	G.W.	Package(L×W×H)
(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	R (mm)	r (mm)	(kg)	(kg)	(mm)
455 (18")	± 3.0	10.0	± 2.0	323	± 2.0	500	120	10.2	12.3	520×520×410
503 (20")	± 3.0	10.0	+3-1	353	+2-3	510	90	14.5	16.6	600×600×500
558 (22")	+2-4	12.0	+2-2.5	387	+3-2	558	90			
608 (24")	+2-4	12.0	+3-2	387	+3-2	610	120			

3. Crucible OD vs. Wafer Diameter

Crucible OD	Wafer Diameter
12-14"	4"-5"
15-18"	5"-6"
20"-24"	6"-8"
28"-32"	8"-12"



Remarks:

18" Crucible, the size of R=450mm + r=90mm is also available

Appearance

Appearance of Specification are shown as follows.

Appearance is inspected under over 1500 lux light.

- | | |
|---------------|---|
| a) Crack | no crack |
| b) Chipping | no chipping |
| c) Scratch | no scratch; for dia 20" and 22" no scratch which is over 50mm length and over 0.25 mm width |
| d) Adhesions | no adhesions without gloze, no adhesions of silica particle |
| e) Depression | no depression which is over 20mm diameter and 1mm depth |
| f) White spot | no cristobalite particle at inner surface(Devitrification)
no white spot over ϕ 6mm, limit number is 13pcs under ϕ 6mm |

- g) Black spot no black spot in transparent layer
 no black spot exposed at inner surface
 the limit number of black spot is shown in Table.
- h) Bubble no opening bubble at inner surface
 the limit number of bubble is shown in Table.
 (opaque and transparent layer)
- i) stain no stain

	$0.5 < X \leq 1.0 \text{mm}$	$1.0 < X \leq 1.5 \text{mm}$	$1.5 < X \leq 2.0 \text{mm}$	$2.1 < X < 2.5 \text{mm}$
Black spot	55	17	5	1
Bubble	30	18	2	0

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