

## Large Diameter Tubes

### Unique electric process (H-Zug)

#### Applications

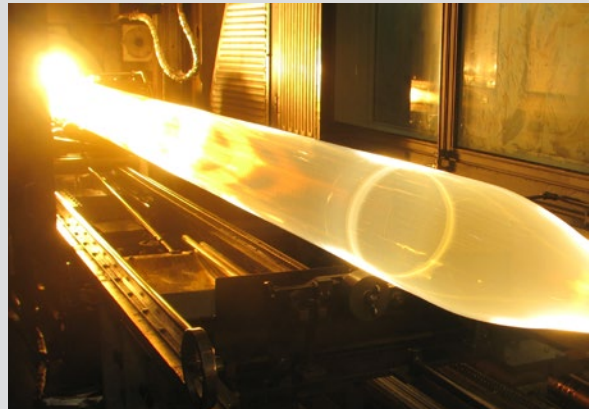
Process chambers tubes and parts for semiconductor and industrial applications

#### Characteristics

- Outstanding visual properties
- Stable diameter and wall thickness
- No waviness and low siding

#### Products

- HSQ300, HSQ330, HSQ330S
- Diameter range: 55 – 470 mm
- Length range: 100 – 5000 mm



#### Dimensions (mm)

Available size range with OD and ID tolerances

Outer diameter OD (mm)	Wall thickness W (mm)	Standard OD Tol± (mm)	Tight OD Tol± (mm)	Super tight OD Tol± (mm)	Inner Diameter ID Tol ± (mm)
55 – 95	2.0 – 10.0	1.00	0.70	0.50	–
> 95 – 100	2.0 – 10.0	1.10	0.70	0.50	–
> 100 – 120	2.0 – 10.0	1.20	0.70	0.50	–
> 120 – 130	2.0 – 10.0	1.30	0.80	0.50	–
> 130 – 160	2.0 – 10.0	1.40	0.80	0.50	–
> 160 – 210	2.0 – 12.0	1.50	0.80	0.50	1.00
> 210 – 240	3.0 – 12.0	1.60	1.00	0.80	1.00
> 240 – 280	3.0 – 13.0	1.60	1.00	0.80	1.00
> 280 – 310	3.0 – 13.0	1.80	1.00	0.80	1.00
> 310 – 340	3.5 – 13.0	2.00	1.00	0.80	1.00
> 340 – 360	3.5 – 13.0	2.00	1.50	1.00	1.00
> 360 – 470	3.5 – 13.0	2.00	1.50	1.00	1.00

## Dimensions (mm)

### Standard and tight wall thickness and siding tolerances

Wall thickness W (mm)	Standard W Tol± (mm)	Tight W Tol± (mm)	Standard Siding* Tol (mm)	Tight Siding* Tol (mm)
2.0 – 3.0	0.50	0.40	0.80	0.40
> 3.0 – 4.0	0.60	0.40		
> 4.0 – 4.5	0.70	0.50		
> 4.5 – 5.0	0.80	0.50		
> 5.0 – 6.0	0.90	0.60		
> 6.0 – 6.5	1.00	0.70		
> 6.5 – 7.0	1.10	0.70		
> 7.0 – 8.0	1.20	0.80		
> 8.0 – 8.5	1.30	1.00	1.00	0.60
> 8.5 – 9.0	1.40	1.00		
> 9.0 – 10.0	1.50	1.10		
> 10.0 – 10.5	1.60	1.20		
> 10.5 – 11.0	1.70	1.20		
> 11.0 – 12.0	1.80	1.30		
> 12.0 – 12.5	1.90	1.40		
> 12.5 – 13.0	2.00	1.40		

Other dimensions and tolerances upon request.

## Chemical purity – typical trace element concentrations (ppm)

Material	Li	Na	K	Mg	Ca	Fe	Cu	Al	OH (ppm)
HSQ® 300	0.5	0.2	0.3	< 0.03	0.5	0.1	0.01	15	< 30
HSQ® 330	0.5	0.1	0.2	< 0.03	0.5	0.1	< 0.01	15	< 30
HSQ® 330S	0.5	0.1	0.2	< 0.03	0.5	0.1	< 0.01*	15	< 30

\* guaranteed maximum level of <0.01

## Visual features

### Outstanding optical properties

- Low amount of voids (closed bubbles, airlines)
  - No voids larger than 5 mm
  - Less than 3 voids per 1000 mm tube length
- No open bubbles
- No hot-reworking marks
- No devitrifications larger than 1 mm

Detailed description upon request.

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