

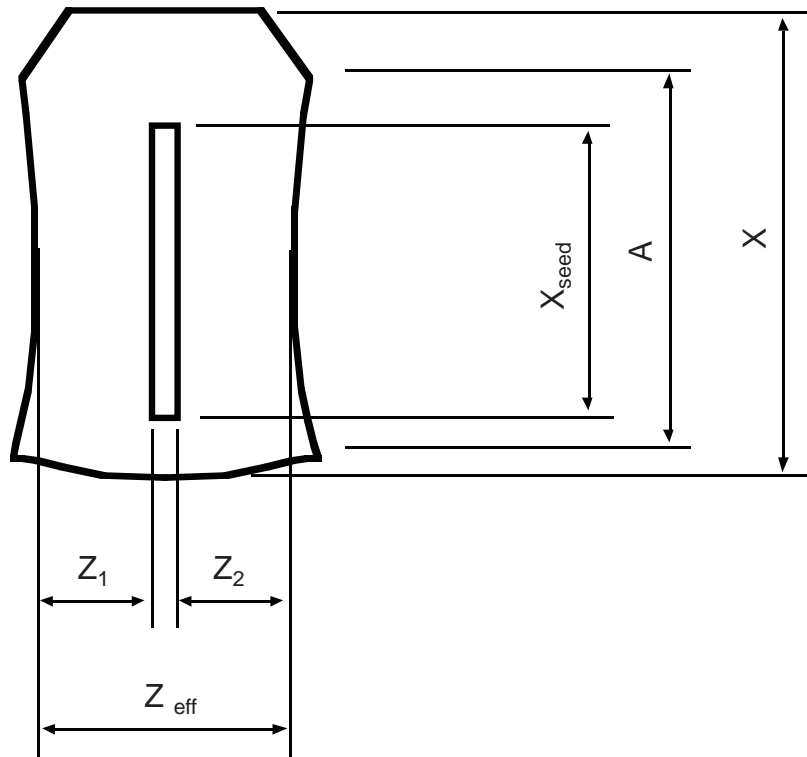
DATA SHEET

AS GROWN PURE Z FOR MECHANICAL PROCESSING

General

This document provides typical specifications for as-grown single crystal cultured quartz material grown on a Z-plate seed. These crystals are suitable for lumbering into multiple bars for AT-cut blanks or for lumbering into single pure-Z bars for further fabrication using mechanical wafer processing techniques.

Section Drawing



References

International Electrotechnical Commission Standard, CEI/IEC 758, Second edition, 1993-04.

Institute of Electrical and Electronic Engineers Standard on Piezoelectricity ANSI/IEEE Std 176-1987.

Mechanical Characteristics

	Units	Typical Values	Tolerance
Z_{eff}	mm	22 or 38	± 4
Distribution of Z_{eff}		Customer specified	
X	mm	$X_{\text{seed}} + 15$	± 2
Y	mm	165, 175, or 200	± 3
Centricity of seed $ Z_1 - Z_2 $	mm	1.0	maximum
Z taper in useful volume $ Z_{\text{max}} - Z_{\text{min}} $	mm	1.5	maximum
A	mm	$> X_{\text{seed}}$	
Cracks in useful volume	count	None	
Condition of -X-surface	qualitative	Smooth	

Material Characteristics

Handedness		Right	
Twins in useful volume	count	None	
Infrared α (3500 cm^{-1})	α -units	Grade B: 0.045 Grade C: 0.060	maximum
Inclusions (diameter)		Grade II	Grade I
25-75 μm	cm^{-3}	5	4
75-100 μm	cm^{-3}	4	2
> 100 μm	cm^{-3}	3	2
Etch channels	cm^{-2}	Grade 4: 300	maximum
Filaments	qualitative	150	maximum

Seed Characteristics

X_{seed}	mm	39.0, 54.0, or 65.0	-0.0 +0.5
Z	mm	2.0	-0.5 +0.2
Orientation of Z-surfaces @ X-axis	arc minutes	0	15
Orientation of Z-surfaces @ Y-axis	arc minutes	0	30
Orientation of X-surfaces @ Z-axis	arc minutes	0	15
End chamfer $ X_{\text{seed}} - X_{\text{seed min}} $	mm	2.0	maximum

Marking Requirements

Location	-X surface
Information	Batch, supplier identification, and orientation (Z-surfaces around X-axis)
Method	Ink stamp

Packaging Requirements

- Bars are classified into 1 mm groups based on Z_{eff} . Each carton contains only bars within one size group.
- Bars are packed in individual cells within double wall cardboard boxes containing approximately 25 kg.
- The size group and batches contained are marked on the exterior of the carton.
- Cartons are appropriately marked for export purposes and firmly affixed to wooden pallets suitable for sea shipment.

As-Grown Pure Z

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