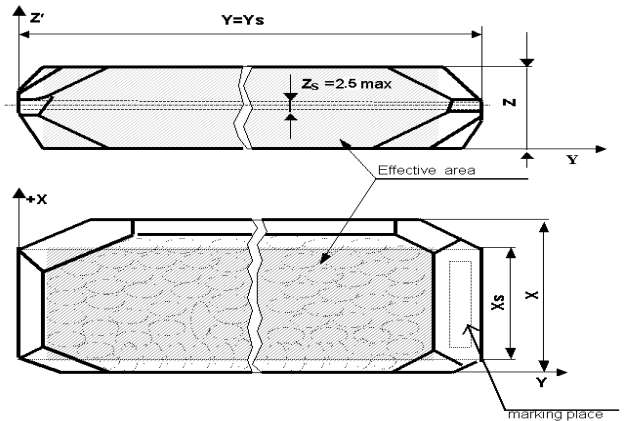


# As Grown Bar for Crystal Industry



P/N : GB-AGZ-002



Specification		Test result	Requirements of IEC758 Standard	IEC758 Grade
1. Q – value (infrared quality indication)	$\alpha$ -3500	< 0.041	< 0.060	Grade C ( $Q \geq 2.0 \cdot 10^6$ )
	$\alpha$ -3585		< 0.069	
	$\alpha$ -3410		< 0.114	
2. Inclusions density ( $\text{cm}^3$ )	30-70 $\mu\text{m}$	< 4	< 4	Grade I
	70-100 $\mu\text{m}$	< 2	< 2	
	>100 $\mu\text{m}$	< 2	< 2	
3. Dimensions along axes (mm)	Y (mm)	205 $\pm$ 5		
	ZZ' (mm)	$\geq$ 19		
	XX' (mm)	> 76		
4. Etch channel density ( $\text{cm}^3$ )		< 100	< 100	Grade 3
5. Seed dimensions	Y (mm)	200 $\pm$ 5		
	ZZ' (mm)	$\leq$ 2.5		
	XX' (mm)	$\geq$ 67		
6. Dimensions along axes (mm) Z-surface to Y		00°00' $\pm$ 00°30'		
7. Other requirements		Right Hand (RH)		

# Standard Values for Synthetic Quartz- IEC758

## 1. Inclusion density

Inclusion density for each grade shall not exceed the figures in any required size range for that grade listed in the table below.

Grade / Size Range ( $\mu\text{m}$ )	Densities per $\text{cm}^2$			
	10-30	30-70	70-100	>100
I a	2	1	0	0
I b	3	2	1	1
I	6	4	2	2
II	9	5	4	3
III	12	8	6	4

Users requiring a grade in only one or more of the size ranges may designate their requirement as the grade followed by the appropriate size range.

## 2. Infrared quality indication, $\alpha_{3500}$ , $\alpha_{3585}$ , $\alpha_{3410}$

An infrared extinction coefficient value ( $\alpha$ -value) if synthetic quartz shall be as listed under the appropriate heading for  $\alpha_{3500}$ ,  $\alpha_{3585}$ ,  $\alpha_{3410}$  in the following table for the various grades:

Grades	Maxima			Pre-1987 Q $\cdot 10^6$ units
	$\alpha_{3500}$	$\alpha_{3585}$	$\alpha_{3410}$	
Aa	0.026	0.015	0.075	3.8
A	0.033	0.024	0.082	3.0
B	0.045	0.050	0.100	2.4
C	0.060	0.069	0.114	1.8
D	0.080	0.100	0.145	1.4
E	0.120	0.160	0.190	1.0

These Q-values were obtained from  $\alpha$ -measurements and empirical correlation, and were in common usage prior to 1987, These are included here as the previous labels to maintain continuity through the change in emphasizing  $\alpha$ -labels. A is the physical measurement now used to control and specify quality in synthetic quartz.

The test limits above either correspond to or are unchanged (except in the cases of grades B and D) from the  $\alpha_{3500}$  limits that correspond to the Q-value grades listed in the first edition of IEC758. This earlier publication designated some of the same grades in terms of minimum indicated Q's in  $10^6$  units, as follows:

A=3.0; B=2.2 (basis used herein), Changed from 2.4 in the earlier publication;

C=1.8; D=1.4(revised); E=1.0 (the same as the earlier D-grade).

## 3. Etch Channel Density, $\rho$

When required, the etch channel density,  $\rho$ , per  $\text{cm}^2$ , for each grade shall comply with the listings in the following table:

Grade	Maximum number $\rho$ per $\text{cm}^2$
1	10
2	30
3	100
4	300
5	600