

## SAPPHIRE OPTICAL CRYSTAL

### - 4" STANDARD SAPPHIRE INGOT -

Item	Description	Specification			Remark
		Nominal	Tolerance	Units	
1	Sapphire Materials	High Purity > 99.995%, Monocrystalline Al <sub>2</sub> O <sub>3</sub>			
2	Surface Orientation	C-plane (0001)			
	M-axis Orientation Tolerance	0.0	+/- 0.1	deg.	
	A-axis Orientation Tolerance	0.0	+/- 0.1	deg.	
3	Primary Flat Location, A-plane (11-20)	0.0	+/- 0.15	deg.	
4	Primary Flat Length	30	+/- 0.8	mm	
5	M-axis Tilting Angle	0.0	+/- 0.1	deg.	
6	Ingot Diameter	100.1	+/-0.1	mm	
7	Ingot Length - minimum	60	-	mm	<60mm is also available
8	Ingot Length - maximum	150	-	mm	
9	Circularity	0	+/- 0.02	mm	
10	Edge Chipping/Crack	<3	-	mm	Sum of both facets
11	EPD (Etching Pits Density)	<1000	-	pcs/cm <sup>2</sup>	
12	Length Exclusion (Bubble, defects, etc)	<10	-	%	Marked on ingot
13	M-axis Orientation	parallel to Primary A-Flat			
14	Surface Roughness	Fine ground			Apply to each surface
15	Coloration	No coloration			
16	Crystal Quality Grade	Optical grade 1-3			
17	Polarization Inspection	Perfect crystal			
18	Material Documentation	Traceable Lot ID			

**Remarks:**

1. Length Exclusion: Allowance as noted. Exclusive areas will be identified and marked on individual cores. Exclusive areas will not be billed.
2. Material Documentation: A unique and traceable Lot ID will be marked on each core.
3. Customised specification is available upon customers' requirement.

### INGOT ILLUSTRATION

