



# General product specification for Arsenic doped Si ingots

**Crystal, a.s.**

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No.	Parameter	Unit	Value	Remark
1	Production method	-	CZ	
2	Diameter	mm	4", 5", 6"	Caliper
3	Orientation	- /deg	(111) $\pm 1,0$ (100) $\pm 1,0$	ASTM F26
4	Conductivity type	---	N	ASTM F42
5	Dopant	---	Arsenic	Purity 6N
6	Resistivity (centerpoint)	$\Omega\text{cm}$	< 0,005 < 0,003	ASTM F84
7	Radial resistivity variation	%	< 25 (111) < 10 (100)	ASTM F81 - PLAN B
8	Oxygen content	ppma	to be determined	
9	Carbon content	ppma	< 0,5	SIMS; see point 24
10	Boron content	$\text{at.cm}^{-3}$	< $1 \cdot E14$	ASTM F1528; see p. 24
11	Dislocation density	$\text{cm}^{-2}$	< 100	ASTM F1725
12	O.S.F.	$\text{cm}^{-2}$	< 100	ASTM F1727
13	Primary flat-length	mm	to be determined	ASTM F671
14	Primary flat-orient.	- /deg	to be determined	ASTM F847
15	Length limitation	mm	to be determined	
20	Crystallographic perfection: Free from grain boundaries, twin boundaries, swirls, slip lines and lineages.			
21	Mechanical damage: Free from visually observed cracks, scratches, blowholes, chips and contamination.			
22	Crystal ingot form: Ground ( $R_a < 1.5$ ) or "as grown" surface. Edge of the front plane ground to max. distance 1 mm. Deflection of the front plane max. 2 mm.			
23	Oxygen content is guaranteed by process capability.			
24	Residual impurities (C, B, P, metals) are guaranteed by usage of virgin polycrystalline silicon Hemlock or Wacker.			
25	Marking: „Y“ + „TOP“ and ingot number on the seed end.			
26	Label: Manufacturer, Spec. no, Ingot no., Conductivity, Dopant, Orientation, Resistivity (spec.), Diameter (spec.), Length, Weight, Production date, Oxygen.			
27	Packaging: Corrugated paper, transport case.			
40	Note: THE PARAMATERS CAN BE CHANGED UPON REQUESTS OF CUSTOMERS.			

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Signature

