

## PbWO4 crystal quality specifications

Parameter	Unit	NPS Required	NPS Acceptable	CMS Limit	PANDA Limit	COMCAL /FCAL	Inform. Source
Light Yield (LY) at RT (for all sides polished crystals)	pe/MeV	≥15	≥10	≥8	≥16	≥9.5	Test with γ-source
LY uniformity between blocks	%	10%	20%				Test
LY(100ns)/LY(1μs)	%	>95	>90	>90	>90	>90	Test
Longitudinal Transmission							Optic. Measure.
at λ=360 nm	%	≥35	≥35	≥25	≥35	≥10	
at λ=420 nm	%	≥60	≥60	≥55	≥60	≥55	
at λ=620 nm	%	≥70	≥70	≥65	≥70	≥65	
Transverse Transmission and LY uniformity along crystal	%	10	15				Optic. Measure.
Inhomogeneity of Transverse Transmission Δλ at T=50%	nm	≤5	≤10	≤3	≤3	≤6	Optic. Measure.
Induced radiation absorption coefficient Δk at λ=420 nm and RT, for integral dose >100 Gy	m <sup>-1</sup>	<1.0	<1.5	≤1.6	≤1.1	<1.5	Test
Mean value of dk	m <sup>-1</sup>	≤0.75	≤1.0	≤1.5	≤0.75		Test
Tolerance in Length	μm	≤±100 -	≤±150	+0., -100	±50	+0., -100	Measure.
Tolerance in sides	μm	≤±50	≤±100	≤ ±50	±50	+300, -0.	
Surface polished, roughness Ra	μm	≤0.02	≤0.05	≤0.02			Company
Tolerance in Rectangularity (90°)	degree	≤0.1	≤0.2	≤0.12	<0.01		Measure.
Purity specific. (raw material)				5N-6N			Company
Mo contamination	ppm	<10		<10	<1		Company
La, Y, Nb, Lu contamination	ppm	?		≤100	≤40		Company