

■ EKSMA社製非線形光学結晶 KDP結晶、DKDP結晶

Physical and Optical Properties		
Crystals	KDP Crystal	DKDP Crystal
Chemical formula	KH_2PO_4	KD_2PO_4
Symmetry	42 m	42 m
Hygroscopicity	high	high
Density, g/cm ³	2.332	2.355
Thermal conductivity, W/cm×K	$k_{11} = 1.9 \times 10^{-2}$	$k_{11} = 1.9 \times 10^{-2}$ $k_{33} = 2.1 \times 10^{-2}$
Thermal expansion coefficients, K ⁻¹	$a_{11} = 2.5 \times 10^{-5}$ $a_{33} = 4.4 \times 10^{-5}$	$a_{11} = 1.9 \times 10^{-5}$ $a_{33} = 4.4 \times 10^{-5}$
Transmission range, μm	0.18–1.5	0.2–2.0
Residual absorption, cm ⁻¹ (at 1.06 μm)	0.04	0.005
Measured refractive index (at 1.06 μm)	$n_o = 1.4938$ $n_e = 1.4599$	$n_o = 1.4931$ $n_e = 1.4582$
Sellmeier coeff., λ – wavelength in μm	$n^2 = A + B\lambda^2 / (\lambda^2 - C) + D / (\lambda^2 - E)$	
A n_o	2.259276	2.2409
n_e	2.132668	2.126
B n_o	13.00522	2.247
n_e	3.2279924	0.7844
C n_o	400	126.9205
n_e	400	123.4032
D n_o	0.01008956	0.0097
n_e	0.008637494	0.0086
E n_o	0.012942625	0.0156
n_e	0.012281043	0.012
Nonlinear coeff. d ₃₆ , pm/V (at 1.06 μm)	0.43	0.4
Effective nonlinear coefficient	Type 1 $d_{\text{oe}} = d_{36} \times \sin\theta \times \sin 2\varphi$ Type 2 $d_{\text{oe}} = d_{36} \times \sin 2\theta \times \cos 2\varphi$	

Phase matching angle and bandwidths for SHG of 1064 nm				
	KDP		DKDP	
Type of phase matching	Type 1 oeo	Type 2 eoe	Type 1 oeo	Type 2 eoe
Cut angle θ, deg	41.2	59.1	36.6	53.7
Acceptances for crystal of 1 cm length (FWHM):				
Δθ (angular), mrad	1.1	2.2	1.2	2.3
ΔT thermal, K	10	11.8	32.5	29.4
Δλ spectral, nm	21	4.5	6.6	4.2
Walk off, mrad	28	25	25	25