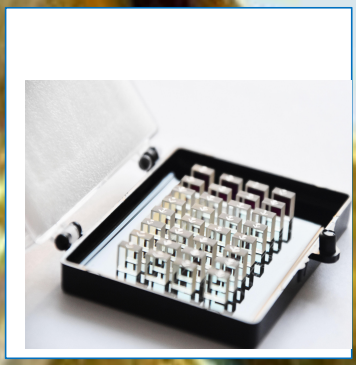
DIEN TECH

成都迪恩光电科技有限公司
CHENGDU DIEN PHOTOELECTRIC TECHNOLOGY CO.,LTD

KTP

Potassium Titanyl Phosphate (KTiOPO4 or KTP) is widely used in both commercial and military lasers including laboratory and medical systems, range-finders, lidar, optical communication and industrial systems.



Main Features of KTP Crystals:

- Efficient frequency conversion(1064nm SHG conversion efficiency is about 80%)
- Large nonlinear optical coefficients(15 times that of KDP)
- Wide angular bandwidth and small walk-off angle
- Broad temperature and spectral bandwidth
- High thermal conductivity (2 times that of BNN crystal)

Applications:

- Frequency Doubling (SHG) of Nd-doped Lasers for Green/Red Output
- Frequency Mixing (SFM) of Nd Laser and Diode Laser for Blue Output
- Parametric Sources (OPG, OPA and OPO) for 0.6mm-4.5mm Tunable Output
- Electrical Optical(E-O) Modulators, Optical Switches, and Directional Couplers
- Optical Waveguides for Integrated NLO and E-O Devices a=6.404Å, b=10.615Å, c=12.814Å,

Basic Properties of KTP	
Crystal structure	Orthorhombic
Melting point	1172°C
Curie Point	936°C
Lattice parameters	a=6.404Å, b=10.615Å, c=12.814Å, Z=8
Temperature of decomposition	~1150°C
Transition temperature	936°C
Mohs hardness	»5
Density	2.945 g/cm^3
Color	colorless
Hygroscopic Susceptibility	No
Specific heat	0.1737 cal/g.°C
Thermal conductivity	0.13 W/cm/°C
Electrical conductivity	3.5x10^{-8} s/cm (c-axis, 22°C, 1KHz)
Thermal expansion coefficients	a_1 = 11 x 10^{-6} °C^{-1} a_2 = 9 x 10^{-6} °C^{-1} a_3 = 0.6 x 10^{-6} °C^{-1}
Thermal conductivity coefficients	k_1 = 2.0 x 10^{-2} W/cm °C k_2 = 3.0 x 10^{-2} W/cm °C k_3 = 3.3 x 10^{-2} W/cm °C
Transmitting range	350nm ~ 4500nm
Phase Matching Range	984nm ~ 3400nm
Absorption coefficients	a < 1%/cm @1064nm and 532nm

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Nonlinear Properties	
Phase matching range	497nm – 3300 nm
Nonlinear coefficients (@ 10-64nm)	d_{31}=2.54pm/V, d_{31}=4.35pm/V, d_{31}=16.9pm/V d_{24}=3.64pm/V, d_{15}=1.91pm/V at 1.064 mm
Effective nonlinear optical coefficients	$d_{eff}(II) \approx (d_{24} - d_{15})\sin^2 q \sin^2 j - (d_{15}\sin^2 j + d_{24}\cos^2 j)\sin q$

Type II SHG of 1064nm Laser	
Phase matching angle	q=90°, f=23.2°
Effective nonlinear optical coefficients	d_{eff} » 8.3 x d_{36}(KDP)
Angular acceptance	D_θ= 75 mrad D_φ= 18 mrad
Temperature acceptance	25°C.cm
Spectral acceptance	5.6 Åcm
Walk-off angle	1 mrad
Optical damage threshold	1.5-2.0MW/cm^2

Technical Parameters	
Dimension	1x1x0.05 - 30x30x40 mm
Phase matching type	Type II, θ=90°; φ=phase-matching angle
Typical Coating	a) S1&S2: AR @1064nm R<0.1%; AR @ 532nm, R<0.25%. b) S1: HR @1064nm, R>99.8%; HT @808nm, T>5% S2: AR @1064nm, R<0.1%; AR @532nm, R<0.25% Customized coating available upon customer request.
Angle tolerance	6' Δθ< ± 0.5°; Δφ< ±0.5°
Dimension tolerance	±0.02 - 0.1 mm (W ± 0.1mm) x (H ± 0.1mm) x (L + 0.2mm/-0.1mm) for NKC series
Flatness	λ/8 @ 633nm
Scratch/Dig code	10/5 Scratch/dig per MIL-O-13830A
Parallelism	<10' better than 10 arc seconds for NKC series
Perpendicularity	5' 5 arc minutes for NKC series
Wavefront distortion	less than λ/8 @ 633nm
Clear aperture	90% central area
Working temperature	25°C - 80°C