

■ EKSMA社製非線形光学結晶 KTP結晶

PHYSICAL PROPERTIES	
Crystal structure	orthorhombic
Point group	mm ²
Space group	Pna2 ₁
Lattice constants, Å	a = 6.404, b = 10.616, c = 12.814, z = 8
Density, g/cm ³	3.01
Melting point, °C	1172
Transition temperature, °C	936
Mohs hardness	5
Thermal expansion coefficients, °C ⁻¹	a _x = 11×10 ⁻⁶ , a _y = 9×10 ⁻⁶ , a _z = 0.6×10 ⁻⁶
Thermal conductivity, W/m*K	13
Not hygroscopic	

OPTICAL PROPERTIES		
Transparency	350–4400 nm	
Refractive indices	at 1064 nm n _x = 1.7404 n _y = 1.7479 n _z = 1.8296	at 532 nm n _x = 1.7797 n _y = 1.7897 n _z = 1.8877
Thermooptic coefficients in 0.4 – 1.0 μm range	$\partial n_x / \partial T = 1.1 \times 10^{-5} \text{ (K)}^{-1}$ $\partial n_y / \partial T = 1.3 \times 10^{-5} \text{ (K)}^{-1}$ $\partial n_z / \partial T = 1.6 \times 10^{-5} \text{ (K)}^{-1}$	
Wavelength dispersion of refractive indices	$n_x^2 = 3.0067 + 0.0395/(\lambda^2 - 0.04251) - 0.01247 \cdot \lambda^2$ $n_y^2 = 3.0319 + 0.04152/(\lambda^2 - 0.04586) - 0.01337 \cdot \lambda^2$ $n_z^2 = 3.3134 + 0.05694/(\lambda^2 - 0.05941) - 0.016713 \cdot \lambda^2$	

NONLINEAR PROPERTIES	
Phase matching range for:	
Type 2 SHG in x-y plane	0.99+1.08 μm
Type 2 SHG in x-z plane	1.1+3.4 μm
Type 2, SHG@1064 nm, cut angle θ=90°, φ=23.5°	
Walk-off	4 mrad
Angular acceptances	Δθ = 55 mrad * cm Δφ = 10 mrad * cm
Thermal acceptance	ΔT = 22 K * cm
Spectral acceptance	Δν = 0.56 nm * cm
Up to 80% extracavity SHG efficiency	
Effective nonlinearity	
x-y plane	d _{oee} = d _{oee} = d ₁₅ sin ² φ + d ₂₄ cos ² φ
x-z plane	d _{oee} = d _{oee} = d ₂₄ sinθ d ₃₁ = ± 1.95 pm/V d ₃₂ = ± 3.9 pm/V d ₃₃ = ± 15.3 pm/V d ₂₄ = d ₃₂ d ₁₅ = d ₃₁
Damage threshold	>500 MW/cm ² for pulses λ=1064 nm, τ=10 ns, 10 Hz, TEM ₀₀