

KTP crystals

Main features

- High nonlinearity
- Nonhygroscopic crystal
- Great mechanical stability
- Wide transparency range from 350 nm to 4,5 μm
- Broad angular and thermal acceptance
- Broad type I and II non-critical phase-matching range

Application examples

- Low and medium power frequency doubling of Nd-doped lasers
- KTP OPO and ZGP OPO tandem for mid-infrared generation

Potassium titanyl phosphate (KTiOPO_4 , KTP) crystals are advantageous due to their high nonlinearity, great mechanical stability, high optical quality and transparency range of 350 nm - 4,5 μm . These features determine the wide application of KTP crystals as a nonlinear medium.

It is an excellent solution for frequency doubling applications of Nd-doped lasers, especially for low and medium power applications, both intra- and extra-cavity design.

Besides, these crystals can be used as a nonlinear OPO medium for IR generation up to 4 μm and used as a pump source for mid-IR nonlinear crystal based optical parametric oscillators, such as ZGP OPO. KTP is susceptible to photochromic damage (grey-tracking), which causes deterioration of nonlinear conversion efficiency. Optogama provide high grey track resistance (HGTR) KTP crystals as a solution, which significantly improves the grey-track resistance and overall performance. HGTR KTP crystals extend the use of KTP as a nonlinear medium to high-power applications.

Please request in case you need HGTR KTP crystals for your applications.

Standard specifications

KTP CRYSTALS	
Orientation accuracy	<30 arcmin
Clear aperture	>90%
Face dimensions tolerance	+0,0/-0,1 mm
Length tolerance	$\pm 0,1$ mm
Parallelism error	<20 arcsec
Perpendicularity error	<5 arcmin
Protective chamfers	<0,1 mm at 45°
Surface quality	10-5 S-D
Wavefront distortion	< $\lambda/8$ @632,8 nm
Coatings	AR(R<0,25%)532+1064 nm on both faces
Laser induced damage threshold	>500 MW/cm ² @1064 nm, 10 ns
Mount	Unmounted

Properties

PHYSICAL AND OPTICAL PROPERTIES	
Chemical formula	KTiOPO_4
Crystal structure	Orthorhombic, mm ²
Lattice parameters	a = 12,814 Å, b = 6,404 Å, c = 10,616 Å
Optical symmetry	Positive biaxial ($2V_z = 37,4^\circ$ @0,5461 μm)
Density	2,945 g/cm ³
Mohs hardness	5
Transparency range	350 nm - 4,5 μm @"0" transmittance level
Sellmeier equations (λ in μm)	$n_x^2 = 3,0067 + 0,0395/(\lambda^2 - 0,04251) - 0,01247 \lambda^2$; $n_y^2 = 3,0319 + 0,04152/(\lambda^2 - 0,04586) - 0,01337 \lambda^2$; $n_z^2 = 3,3134 + 0,05694/(\lambda^2 - 0,05941) - 0,016713 \lambda^2$
Refractive indices	$n_x = 1,7404$; $n_y = 1,7479$; $n_z = 1,8296$ @1064 nm

Guidance

Optogama provide guidance and theoretical calculations for particular KTP applications. Contact us and we will help you to configure your crystal.

Standard products

FACE DIMENSIONS	GRADE	LENGTH	THETA	PHI	COATINGS	APPLICATION	SKU
3 x 3 mm	Regular	5 mm	90°	23,5°	AR/AR@532+1064 nm	SHG@1064 nm, type II	7184
	HGTR	5 mm	90°	23,5°	AR/	SHG@1064 nm	36625
	HGTR	10 mm	90°	23,5°	AR/	SHG@1064 nm	36626
	Regular	10 mm	90°	23,5°	AR/AR@532+1064 nm	SHG@1064 nm, type II	7188
5 x 5 mm	Regular	5 mm	90°	23,5°	AR/AR@532+1064 nm	SHG@1064 nm, type II	7189
	HGTR	5 mm	90°	23,5°	AR/	SHG@1064 nm	36627
	HGTR	10 mm	90°	23,5°	AR/	SHG@1064 nm	36628
	Regular	10 mm	90°	23,5°	AR/AR@532+1064 nm	SHG@1064 nm, type II	7193
7 x 7 mm	Regular	5 mm	90°	23,5°	AR/AR@532+1064 nm	SHG@1064 nm, type II	7194
	HGTR	5 mm	90°	23,5°	AR/	SHG@1064 nm	36630
	HGTR	10 mm	90°	23,5°	AR/	SHG@1064 nm	36631
	Regular	10 mm	90°	23,5°	AR/AR@532+1064 nm	SHG@1064 nm, type II	7198