

Laser Crystals

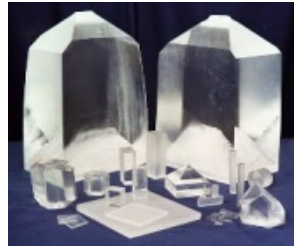
NLO Crystals

Birefringent Crystals

AO and EO Crystals

## KDP and DKDP(KD\*P)

### Introductions



Potassium Dihydrogen Phosphate (KDP) and Potassium Dideuterium Phosphate (DKDP or KD\*P) are among the most widely-used commercial NLO materials, characterized by good UV transmission, high damage threshold, and high birefringence, though their NLO coefficients are

relatively low. They are usually used for doubling, tripling and quadrupling of a Nd:YAG laser at the room temperature. In addition, they are also excellent electro-optic crystals with high electro-optic coefficients, widely used as electro-optical modulators, such as Q-switches, etc.

### Basic Properties

Items	KDP	KD*P
Chemical Formula	$\text{KH}_2\text{PO}_4$	$\text{KD}_2\text{PO}_4$
Transparency Range	200-1500nm	200-1600nm
Nonlinear Coefficients	$d_{36}=0.44\text{pm/V}$	$d_{36}=0.40\text{pm/V}$
Refractive index (@ 1064nm)	$n_o=1.4938, n_e=1.4599$	$n_o=1.4948, n_e=1.4554$
Electro-optical Coefficients	$r_{41}=8.8\text{pm/V}$ $r_{63}=10.3\text{pm/V}$	$r_{41}=8.8\text{pm/V}$ $r_{63}=25\text{pm/V}$
Longitudinal half-wave voltage	$V_{\pi}=7.65\text{KV}$ ( $\lambda=546\text{nm}$ )	$V_{\pi}=2.98\text{KV}$ ( $\lambda=546\text{nm}$ )
Absorption	0.07/cm	0.006/cm
Optical damage threshold	>5 GW/cm <sup>2</sup>	>3 GW/cm <sup>2</sup>
Extinction ratio		30dB

#### Sellmeier equations of KDP

$$n_o^2 = 2.259276 + 0.01008956 / (\lambda^2 - 0.012942625) + 13.00522\lambda^2 / (\lambda^2 - 400)$$

$$n_e^2 = 2.132668 + 0.008637494 / (\lambda^2 - 0.012281043) + 3.2279924\lambda^2 / (\lambda^2 - 400)$$

#### Sellmeier equations of DKDP

$$n_o^2 = 1.9575544 + 0.2901391\lambda^2 / (\lambda^2 - 0.0281399) - 0.02824391\lambda^2 + 0.004977826\lambda^4$$

$$n_e^2 = 1.5005779 + 0.6276034\lambda^2 / (\lambda^2 - 0.0131558) - 0.01054063\lambda^2 + 0.002243821\lambda^4$$

We supplies high quality KDP and KD\*P crystals in large quantities for these applications. Because their polished surfaces are easier to be moistened, however, the user is advised to provide a dry condition (<50%) and the sealed housing for preservation. For this purpose, we also provide polishing and sealed housing services for the KDP family crystals. Our engineers will serve you to select and design the best crystal, according to the laser parameters you provide.

KDP and DKDP (KD\*P)

Crystal

KDP 01