ZnGeP2 crystals

ZGP crystals possessing large nonlinear coefficients (d36=75pm/V), wide infrared transparency range(0.75-12μm), high thermal conductivity(0.35W/(cm·K)), high laser damage threshold (2-5J/cm2)and well machining property, ZnGeP2 crystal was called the king of infrared nonlinear optical crystals and is still the best frequency conversion material for high power, tunable infrared laser generation.

We can offer high optical quality and large diameter ZGP crystals with extremely low absorption coefficient α < 0.05 cm-1(at pump wavelengths 2.0-2.1 μm), which can be used to generate mid-infrared tunable laser with high efficiency through OPO or OPA processes.

Dimensions:

Standard cross sections are 6 x 8mm, 5 x 5mm, 8 x 12mm. Crystal length range from 1 to 50 mm. Custom sizes are also available on request.

Orientation:

The standard ZGP crystal orientation is for type I phase matching at an angle of θ= 54° , which is suitable for use in OPO pumped at wavelengths between 2.05um and 2.1um to generate mid-infrared output between 3.0um and 6.0um. Custom orientations are available on request.

ZnGeP2 crystals

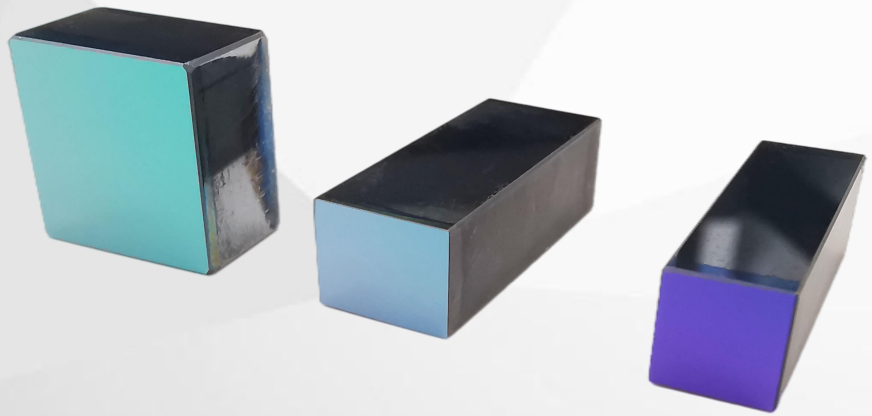
C-ZGP & YS-ZGP

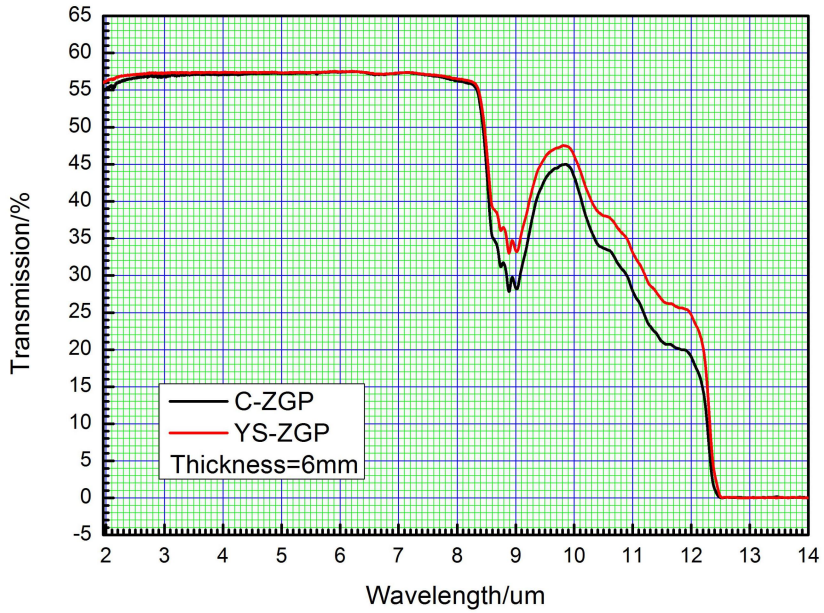
We provide two types of ZnGeP2 crystal, C-ZGP and YS-ZGP.
The main differences listed below:

• YS-ZGP shows lower absorption at 2090nm than C-ZGP.
C-ZGP absoprtion coefficient at 2090nm <0.05cm-1
YS-ZGP absoprtion coefficient at 2090nm <0.03cm-1

• C-ZGP grew by vertical meathod while YS-ZGP grew by horizontal meathod.

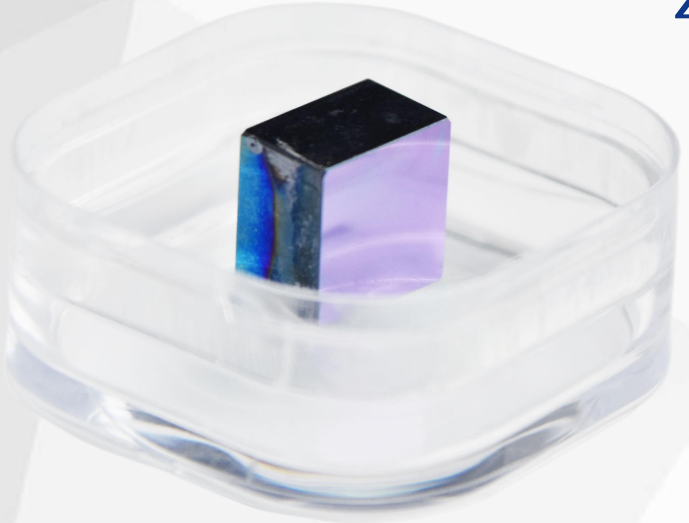
• In application, YS-ZGP shows better homogeneity and output efficiency as well.





C-ZGP transmission compare with YS-ZGP

ZnGeP2 crystals



Applications:

• Second, third, and fourth harmonic generation of CO2-laser.

• Optical parametric generation with pumping at a wavelength of 2.0 μm.

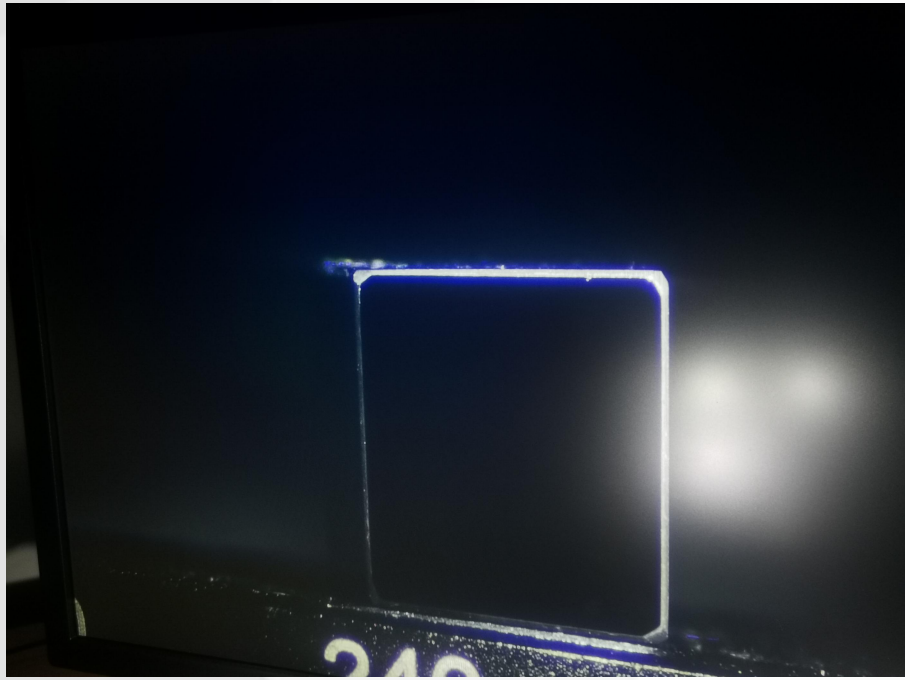
• Second harmonic generation of CO-laser.

• Producing coherent radiation in submillimeterrange from 70.0 μm to 1000 μm.

• Generation of combined frequencies of CO2- and CO-lasers radiation and other lasers are working in the crystal transparency region.

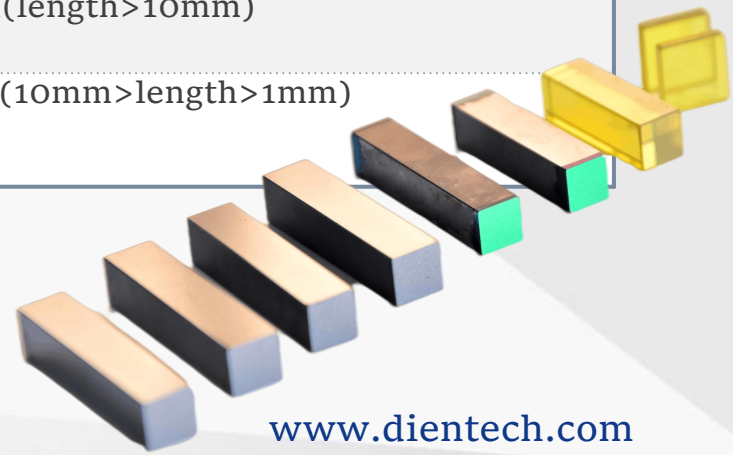
Basic Properties	
Chemical	ZnGeP2
Crystal Symmetry and Class	tetragonal, -42m
Lattice Parameters	a = 5.467 Å
	c = 12.736 Å
Density	4.162 g/cm3
Mohs Hardness	5.5
Optical Class	Positive uniaxial
Userful Transmission Range	2.0 um - 10.0 um
Thermal Conductivity @ T= 293 K	35 W/m·K (⊥c)36 W/m·K (// c)
Thermal Expansion@ T = 293 K to 573 K	17.5 x 106 K-1 (⊥c)15.9 x 106 K-1 (// c)

ZnGeP2 crystals

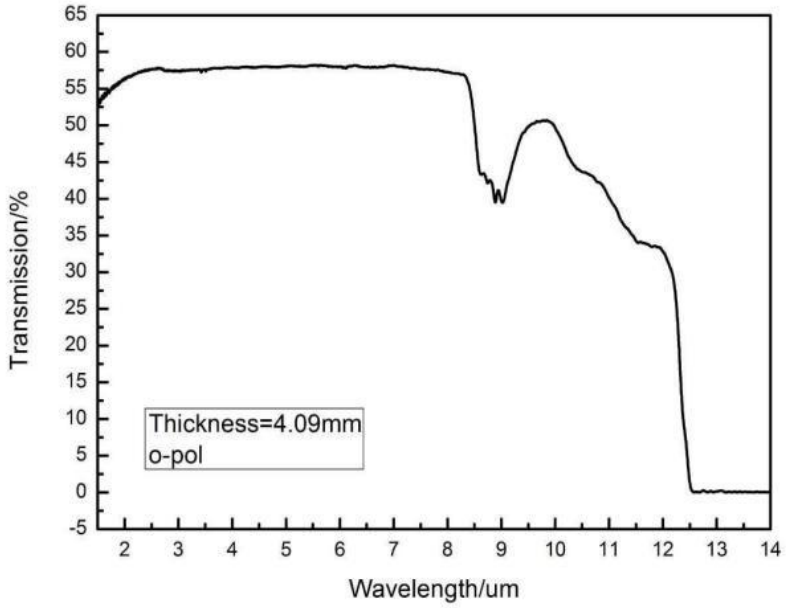


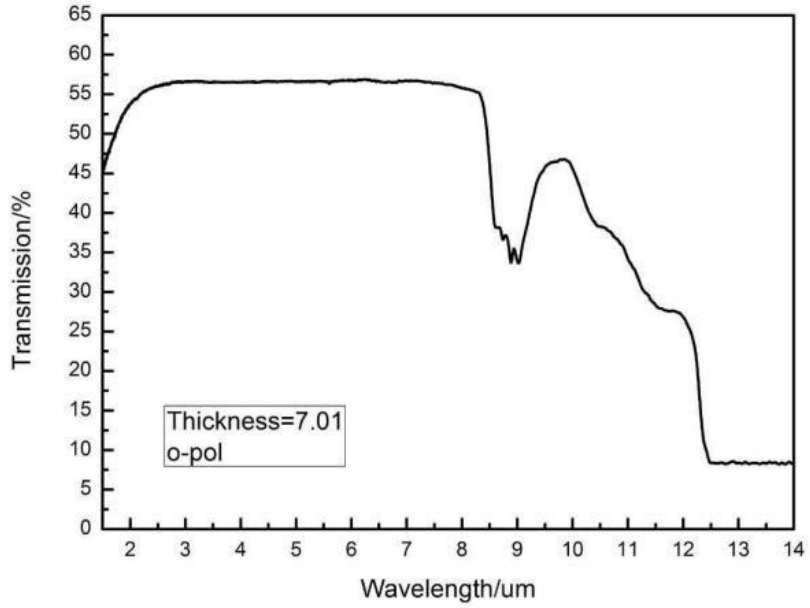
ZnGeP2 crystals' surface quality under 100 times microscope

Technical Parameters	
Surface flatness	PV<λ/4@632.8nm
Surface quality S-D	20-10
Wedge/Parallelism error	<30 arc sec
Perpendicularity	<5 arc min
Transparency range	0.75 - 12.0um
Non-linear coefficient	d_{36}= 68.9 (at 10.6 um), d_{36}= 75.0 (at 9.6 um)
Aperture tolerance	±0.1mm
Length tolerance	±0.5mm(length>10mm)
Length tolerance	±0.1mm(10mm>length>1mm)



ZnGeP2 crystals





Measured transmission curve of ZnGeP2 crystals