

Non-Linear Optical Crystals

We orientate, polish and coat non-linear crystals for frequency conversion. The frequency conversion is defined by the crystal orientation according to the beam propagation (synchronization angles theta and phi) for a work laser wavelength out of the transparency range of the crystal. The angle theta is defined as the angle between the optical axis of the crystal (z-axis) and the beam propagation direction, whereas the angle phi is the angle between the plane produced by z-axis of the crystal along with the propagation direction of the beam and the x-axis of the crystal. In the table below we summarize the standard non-linear crystals, which we can process. Other sizes, orientations and applications are possible by request.

possible application wavelengths (nm)	crystal	typical applications	standard crystals inclusive appropriate AR/AR- or P/P-coatings
160 - 2600	LBO (LiB ₃ O ₅) Lithium Triborate	SHG@650-1100nm (Cr:Alexandrite) SHG@700-820nm (Ti:Sapphire) SHG@946nm (Nd:YAG) SHG/THG@1020nm (Yb:KYW) SHG/THG@1023nm (Yb:KGW) SHG/THG@1030nm (Yb:YAG) SHG/THG@1047nm (Nd:YLF) SHG/THG@1064nm (Nd:YAG)	3-6x3-6x10-20mm
170 - 1600	KDP (KH ₂ PO ₄) Potassium Dideuterium Phosphate	SHG@700-820nm(Ti:Sapphire) FHG@1064 (Nd:YAG)	10-15x10-15x5-20mm
180 - 2750	CLBO (CsLiB ₆ O ₁₀) Cesium Lithium Borate	SHG/THG@650-1100nm(Cr:Alexandrite) SHG/THG@700-820nm(Ti:Sapphire) SHG/THG/FHG@946nm (Nd:YAG) SHG/THG/FHG/FifthHG@1020nm(Yb:KYW) SHG/THG/FHG/FifthHG@1023nm(Yb:KGW) SHG/THG/FHG/FifthHG@1030nm(Yb:YAG) SHG/THG/FHG/FifthHG@1047nm(Nd:YLF) SHG/THG/FHG/FifthHG@1064nm(Nd:YAG)	3-10x3-10x0.1-6mm
189 - 3500	beta - BBO (β-BaB ₂ O ₄) Beta Barium Borate	400-2300nm(OPO)@355nm(Nd:YAG) SHG/THG/FHG@650-1100nm(Cr:Alexandrite) SHG/THG/FHG@700-820nm(Ti:Sapphire) SHG/THG/FHG@946nm (Nd:YAG) SHG/THG/FHG/FifthHG@1020nm(Yb:KYW) SHG/THG/FHG/FifthHG@1023nm(Yb:KGW) SHG/THG/FHG/FifthHG@1030nm(Yb:YAG) SHG/THG/FHG/FifthHG@1047nm(Nd:YLF) SHG/THG/FHG/FifthHG@1064nm(Nd:YAG)	3-10x3-10x0.1-6mm
200 - 2100	DKDP (KD ₂ PO ₄) Potassium Dideuterium Phosphate	SHG/THG/FHG@1064nm(Nd:YAG)	10-15x10-15x5-20mm

possible application wavelengths (nm)	crystal	typical applications	standard crystals inclusive appropriate AR/AR- or P/P-coatings
280 - 5500	LiIO ₃ Lithium Iodate	SHG@650-1100nm (Cr:Alexandrite) SHG@700-820nm (Ti:Sapphire) SHG/THG@1020nm (Yb:KYW) SHG/THG@1023nm (Yb:KGW) SHG/THG@1030nm (Yb:YAG) SHG/THG@1047nm (Nd:YLF) SHG/THG@1064nm (Nd:YAG) 1.1-2.4µm(OPO)@1064nm(Nd:YAG)	3-10x3-10x0.5-3mm
350 - 4500	KTP (KTiOPO ₄) Potassium Titanyl Phosphate	SHG@1064nm (Nd:YAG) 1.5-3.3µm(OPO)@1064nm(Nd:YAG)	3-10x3-10x5-20mm
350 - 5000	LNB (LiNbO ₃) Lithium Niobate	SHG@OPO@1064nm (Nd:YAG)	size up to dia 100 x 100 mm
350 - 5500	KTA (KTiOAsO ₄) Potassium Titanyl Phosphate	1.5-4.5µm(OPO)@1064nm(Nd:YAG) 1.7-5.0µm(OPO)@1030nm(Yb:YAG) 2.6-5.0µm(DFG)@1.2-2.4µm	3-10x3-10x5-20mm
470 - 13000	AGS (AgGaS ₂) Silver Thiogallate	SHG@10.6µm(CO ₂) SHG@9.2-10.8µm(CO ₂) 1.2-10µm(OPO)@1064nm (Nd:YAG) SHG@1.2-10µm(OPO)@1064nm(Nd:YAG) 2.4-11µm(DFG)@1.2-2.4µm	3-8x3-8x0.4-2mm
620 - 20000	GaSe Gallium Selenide	SHG@10.6µm(CO ₂) SHG@9.2-10.8µm(CO ₂)	by request
710 - 18000	AGSe (AgGaSe ₂) Silver Selenogallate	SHG@10.6µm(CO ₂) SHG@9.2-20.8µm(CO ₂) 2.5-12µm(OPO)@2050nm(Ho:YLF) 1.9-5.5µm(DFG)@1.4-2.55µm	3-8x3-8x0.4-2mm
750 - 12000	ZGP (ZnGeP ₂) Zinc Germanium Diphosphide	SHG@10.6µm(CO ₂) SHG@9.2-10.8µm(CO ₂) 3.5-5µm(OPO)@2050nm (Ho:YLF) 3-10µm(DFG)@2.0-2.95µm	3-7x3-7x5-25mm
800 - 25000	CdSe Cadmium Selenide	9.4-24.3µm(DFG)@1.2-22.95µm	by request