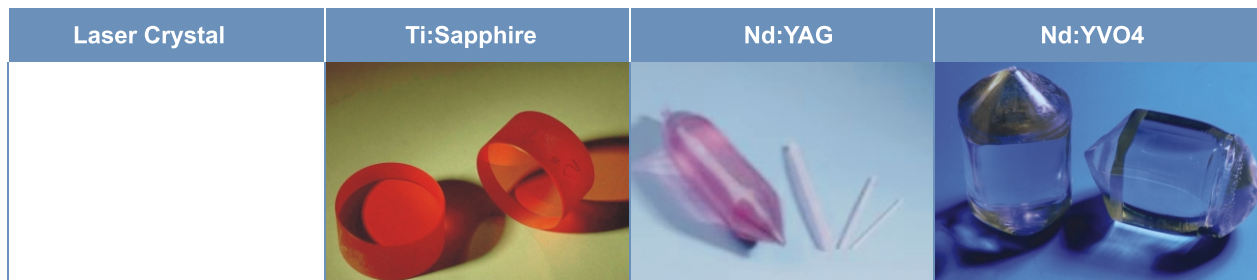


LASER CRYSTAL



Physical and Optical Properties

Chemical Formula	Ti ³⁺ : Al ₂ O ₃	Nd: Y ₃ Al ₅ O ₁₂	Nd:YVO ₄
Crystal Structure	Hexagonal	Cubic	Zircon Tetragonal, Space Group D4h
Melting Point	2050° C	1970° C	
Density	3.98 g/cm ³	4.56 g/cm ³	4.22 g/cm ³
Mohs Hardness	9	8.5	5
Thermal Conductivity Coefficient	0.11 cal/(°C x sec x cm)	14 W/m /K @20° C 10.5 W /m /K @100° C	C: 5.23 W/m/K ^ C: 5.10 W/m/K
Thermal Expansion Coefficient		7.8 x 10 ⁻⁶ /K [111], 0 - 250° C	a _s = 4.43x10 ⁻⁶ /K a _c = 11.37x10 ⁻⁶ /K
Lasing Wavelength	660~1050 nm (795nm)	1064nm	914nm, 1064nm, 1342nm
Absorption Range	400~600 nm (488nm)	lamp pump	808nm
Lattice Constants	a=4.748, c=12.957	12.01	a=b=7.12, c=6.29
Fluorescence Lifetime	3.2 μ sec (T = 300 K)	230msec	90 msec (about 50 m s for 2 atm% Nd doped) @ 808nm
Absorption Coefficient	1.0~7.5cm ⁻¹ @490nm	7.1 cm ⁻¹	31.4 cm ⁻¹ @ 808 nm
Refractive Index	1.76 @ 800nm	1.82 @1064nm	n _o = 1.9573, n _e = 2.1652@1064nm
Polarized Emission	Unpolarized	Unpolarized	Parallel to Optic Axis (C-axis)

Capabilities

Concentration	0.06~0.5 wt% Ti dopant	0.5~1.2 atm% Nd dopant (10% tolerance)	0.2~3 atm% Nd dopant (10% tolerance)
Figure of Merit	100~300		
Aperature	2~50mm	3~14mm	1~20mm
Path Length	2~130mm	1~60mm	0.02~20mm
End Configuration	Flat/Flat or Brewster/Brewster Ends or Specified		

LASER CRYSTAL

Laser Crystal	Ti:Sapphire	Nd:YAG	Nd:YVO4
Orientation	Optical Axis C Normal to Rod Axis	<111> Crystalline Direction (+/-0.5°C)	a-cut Crystalline Direction (+/-0.5°C)
Parallelism	<10 arc seconds		
Surface Quality	Better than 60/40 Scratch/Dig per MIL-O-13830A	Better than 20/10 Scratch/Dig per MIL-O-1380A	Better than 20/10 Scratch/Dig per MIL-O-1380A
Surface Flatness	< λ /10 @633nm	< λ /10 @ 632.8nm	< λ /10 @ 632.8nm
Wavefront Distortion	< λ /4 per inch @ 633 nm	< λ /10 @ 632.8nm for 3~7mm < λ /8 per inch @ 632.8nm for >=7mm	< λ /8 @ 633nm
Perpendicularity	< 5 arc minutes	< 5 arc minutes	< 5 arc minutes
Clear Aperture	Central 90%	Central 95%	Central 95%
Chamfer	0.15x44°	0.15x45°	0.15x45°
Damage Threshold	Over 15J/cm ² (Rods without Coating) over 700MW/cm ² (Coating)	Over 15J/cm ² (Rods without Coating) Over 700MW/cm ² (Coating)	Over 15J/cm ² (Rods without Coating) Over 700MW/cm ² (Coating)
Coatings	AR@700~1100nm	a) AR@1064nm,R<0.1%	a) AR@1064nm,R<0.1%
		b) AR@1064nm,R<0.1%; HT@808nm,T>95%;	b) AR@1064nm,R<0.1%; HT@808nm,T>95%;
		c) HR@1064nm,R<99.8%; HT@808nm,T>95%;	c) HR@1064nm,R<99.8%; HT@808nm,T>95%;
		d) HR@1064nm,R<99.8%; HT@808nm,T>95%; HR@532nm,R>99%	d) HR@1064nm,R<99.8%; HT@808nm,T>95%; HR@532nm,R>99%