



## Alexandrite

**710-800 nm**

**Available Rod Lengths** 3 mm - 152.4 mm

**Available Rod Diameters** 2 mm - 12.7 mm

### Applications

Medical, Cosmetic, Spectroscopy, Industrial Ordering Options and Specifications

### Ordering Options and Specifications

%Cr Concentration	0.13% (0.10% to 0.20% available)
Wavefront Distortion (per inch of rod length)	$\lambda/2$
End Face Parallelism	<30 arc seconds

### Material Properties

Formula	Be (Al <sub>1-x</sub> Cr <sub>x</sub> ) <sub>2</sub> O <sub>4</sub>
Crystal Structure	Orthorhombic
Unit Cell Dimensions (Å)	5.476(a) x 9.404(b) x 4.427(c) per ASTM 10-32
Thermal Expansion (x 10 <sup>-6</sup> °C <sup>-1</sup> )	5.9(a) x 6.1(b) x 6.7(c)
Index of Refraction (at 750 nm)	1.7367(a) x 1.7241(b) x 1.7346(c)
Melting Point	1870°C
Vickers Hardness	2000 kg mm <sup>-2</sup>
Density	3.7 g/cm <sup>3</sup>
Thermal Conductivity	0.23 W cm <sup>-1</sup> K <sup>-1</sup>
Young's Modulus	469 GPa
Thermal Shock Resistance	35-74 W/cm
dn/dT	8 x 10 <sup>-6</sup> K <sup>-1</sup>

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Alexandrite is the leader of a class of tunable solid-state laser materials. Enhanced by several years of research and development, it features a broad wavelength tuning range of 710 - 800 nm with the capability to store and efficiently extract multijoule pulses of energy. It is one of the most robust solid-state laser materials available with a thermal shock resistance five times that of Nd:YAG.

Alexandrite's unique combination of properties offer application in such areas as dermatology, lithotripsy, spectroscopy, atmospheric lidar, testing of fiber optics and photodetectors, materials processing, pumping of dye lasers, non-linear optics studies and annealing of semiconductors.

### Structural & Mechanical Properties

Formula:	Be (Al <sub>1-x</sub> Cr <sub>x</sub> ) <sub>2</sub> O <sub>4</sub>
Crystal Structure:	Orthorhombic
Unit Cell Dimensions: (contains four formula units)	a = 5.476 Å per ASTM 10-32 b = 9.404 Å c = 4.427 Å
X-Ray Density:	3.7 g cm <sup>3</sup>
Melting Point:	1870°C
Thermal Expansion:	a 5.9 x 10 <sup>-6</sup> K <sup>-1</sup>   b 6.1 x 10 <sup>-6</sup> K <sup>-1</sup>   c 6.7 x 10 <sup>-6</sup> K <sup>-1</sup>
Thermal Conductivity:	0.23 W / cmK
Hardness (Vickers):	2000 kg mm <sup>-2</sup>
Young's Modulus:	469 GPa
Fracture Stress:	0.457 - 0.948 GPa
Thermal Shock Resistance:	35 - 74 W / cm

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