

## Er:Glass

Erbium and ytterbium co-doped phosphate glass has a broad application because of the excellent properties. Mostly, it is the best glass material for 1.54μm laser due to its eye safe wavelength of 1540 nm and high transmission through atmosphere. It's also suitable for medical applications where the need for eye protection may be difficult to manage or diminish or hinder essential visual observation. Recently it is used in optical fiber communication instead of EDFA for its more super plus. There is a great progress in this field.

**EAT14** is Erbium Glass doped with Er 3+ and Yb 3+ and suited to applications involving high repetition rates (1 - 6 Hz) and being pumped with 1535 nm laser diodes. This glass is available with high levels of Erbium (up to 1.7%).

**Cr14** is Erbium Glass doped with Er 3+, Yb 3+ and Cr 3+ and suited to applications involving xenon lamp pumping. This glass is often used in laser range finder (LRF) applications.



Item	Units	EAT14	Cr14
Transformation Temperature	°C	556	455
Softening Temperature	°C	605	493
Coeff. of Linear Thermal Expansion (20~100°C)	10 <sup>-7</sup> /°C	87	103
Thermal Conductivity (@ 25°C)	W/m. °K	0.7	0.7
Chemical Durability (@100°C weigh loss rate distilled water)	ug/hr.cm2	52	103
Density	g/cm2	3.06	3.1
Laser Wavelength Peak	nm	1535	1535
Cross-section for Stimulated Emission	10 <sup>-20</sup> cm <sup>2</sup>	0.8	0.8
Fluorescent Lifetime	ms	7.7-8.0	7.7-8.0
Refractive Index (nD) @ 589 nm		1.532	1.539
Refractive Index (nD) @ 589 nm		1.524	1.53
dn/dT (20~100°C)	10 <sup>-6</sup> /°C	-1.72	-5.2
Thermal Coeff. of Optical Path Length (20~100°C)	10 <sup>-7</sup> /°C	29	3.6

### Standard Doping for EAT14

Variants	Er 3+	Yb 3+
Er:Yb:Glass	$1.3 \times 10^{20}/\text{cm}^3$	$10 \times 10^{20}/\text{cm}^3$

### Standard Doping for Cr14

Variants	Er 3+	Yb 3+	Cr 3+
Er:Yb:Cr:Glass	$0.16 \times 10^{20}/\text{cm}^3$	$12.3 \times 10^{20}/\text{cm}^3$	$0.129 \times 10^{20}/\text{cm}^3$
Er:Yb:Cr:Glass	$1.27 \times 10^{19}/\text{cm}^3$	$1.48 \times 10^{21}/\text{cm}^3$	$1.22 \times 10^{19}/\text{cm}^3$
Er:Yb:Cr:Glass	$4 \times 10^{18}/\text{cm}^3$	$1.2 \times 10^{19}/\text{cm}^3$	$4 \times 10^{18}/\text{cm}^3$

