



Glass Products Division

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Business Opportunity: Licensing New Glass Technology

Announcing new oxide glass materials for laser and infrared applications. The REAI™ Glasses are based on **R**are **E**arth **A**luminum oxide. They enable higher power densities, more efficient laser power conversion, broader spectral bandwidths, and increased infrared transmission compared to competing glass products. Applications include infrared optics, power lasers, optical communications and laser surgery instruments. The materials are available exclusively from CRI.

MARKETS

Industrial

- Efficient, high power density infrared lasers
- High index lenses

Communications

- High gain components of PLC devices
- High performance optical amplifiers for new transmission bands

Medical

- Laser sources for 2800-3000 nm waveband
- Waveguides that transmit 2800-3000 nm radiation

Military

- Infrared windows
- Sensors

FEATURES

- Castable in sections up to 1 cm thick
- High solubility (up to 50%) of optically active rare earth ion dopants
- Outstanding thermal, chemical and mechanical stability
- Extended infrared transmission comparable to sapphire
- Homogeneous chemical composition
- High refractive index and low dispersion
- Long fluorescence lifetimes at high dopant concentrations



◀ REAI™ Glass as-cast button and rod.

REAI™ Glass is available in a variety of forms including rods, slabs, disks and fibers. The composition and properties can be optimized for specific power laser applications with dopant concentrations as high as 50 %.

Properties of REAI™ Glass

Property	Range of values
Major components	Al ₂ O ₃ , RE ₂ O ₃ *, 0-35 mole % SiO ₂
Solubility of rare earth oxides	Up to 50 mole % RE ₂ O ₃
Infrared transmission	4000 to 5000 nm
Fluorescence lifetime of Yb ³⁺	0.7-0.8 ms
Refractive index (n _D , λ = 589 nm)	1.7-1.8
Abbe number	40-60
Hardness	800-1000 Vickers
Devitrification temperature	1000-1100 °C
Thermal expansion coefficient	~10 x 10 ⁻⁶ /°C
Thermal conductivity	0.01 W/cm.K
Density	3.4-4.1 gram per cm ³
Young's modulus	110-135 GPa
Chemical stability (in water at 90 °C)	Excellent, dissolution <1 x 10 ⁻⁸ g/cm ² /min

*Oxides of elements: Sc, Y, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu.
U.S. Patent No. 6,482,758 issued November 19, 2002.

REAI™ Glass is available exclusively from CRI

Additional Information

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