



Glass Products Division

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Castable infrared transparent glasses with outstanding environmental stability

REAI™ Glass products can be cast near net shape to produce high index, low dispersion lens optics and windows that transmit to ~4500 nm in sections of about 5 mm. CRI is seeking development partners to introduce these new glass products to established markets and expand the range of applications.

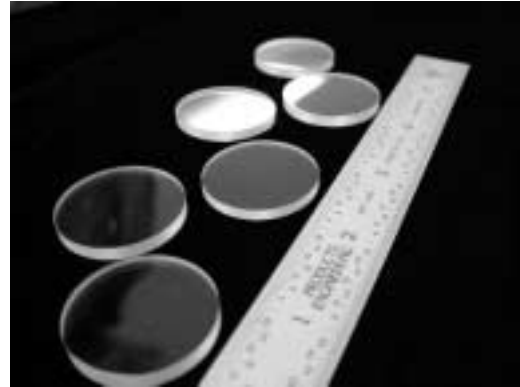
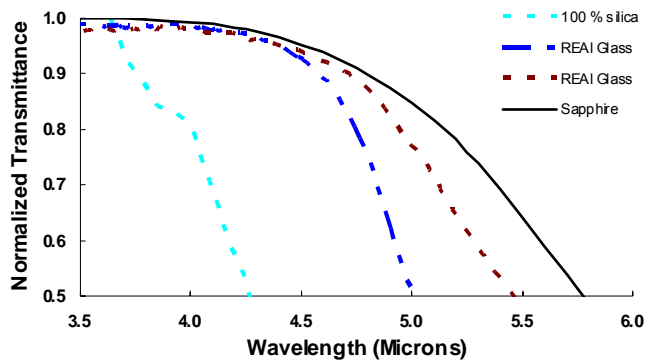
POTENTIAL MARKETS

The customer need addressed by the CRI's technology is to enable low cost castable infrared windows and lens materials. Use of REAI™ Glass can decrease the cost of IR optics and enable increased use of products that currently use single crystal sapphire and expensive alternatives.

FEATURES

REAI™ Glasses offer important technical and economic advantages over conventional crystalline sapphire and other glasses such as fluorozirconates that have poor environmental stability. Specifically, compared to crystalline materials the use REAI™ Glass can enable:

- Cost reduction compared to crystalline materials
- Easy fabrication by near net shape casting
- Use of non birefringent materials
- Durability comparable to crystalline materials
- Expanded applications



Left: infrared transmission of 3 mm thicknesses of REAI™ Glass product family, silica and sapphire for comparison. **Right:** REAI™ Glass disks made by polishing cast glass blanks.

Properties of REAI™ Glasses

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
Optical homogeneity	isotropic
Refractive index (n _D , λ = 589 nm)	1.7-1.8
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.

Products available exclusively from CRI

Additional Information

For more information on infrared transparent REAI™ Glass, contact:
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