KIGRE

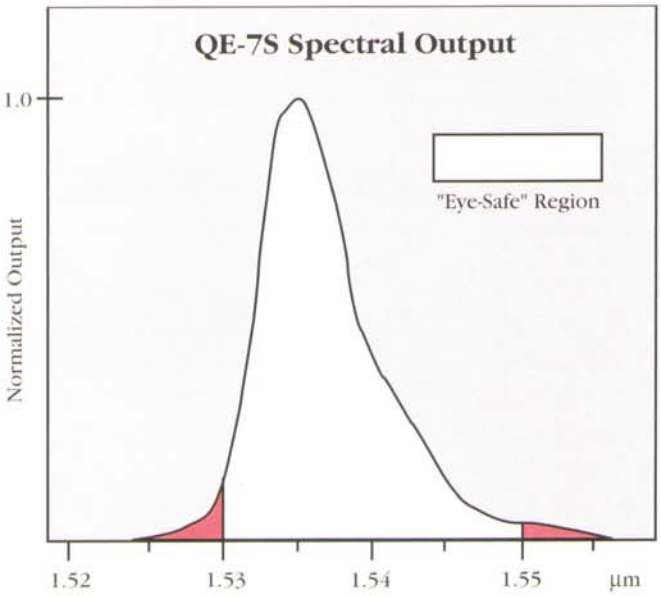
Innovations in Solid-State Laser Technology

QE-7S Erbium-Doped Phosphate Laser Glass

"Eye-Safe" Output Ideal for Medical and Rangefinder Uses

A breakthrough in laser glass development, Kigre's QE-7S sensitized Erbium-doped phosphate laser glass significantly expands the scope of operational laser safety in the near-infrared range of the spectrum.

QE-7S lases at 1.535* microns (see Spectral Output graph), eliminating the hazard to human eyesight exhibited by other laser materials lasing in the infrared spectral region. In addition, the Kigre patented material provides efficiencies in lasing performance up to four times those previously attainable with earlier Erbium-doped silicate laser glass. *See the reverse side of this data sheet for additional technical specifications.*



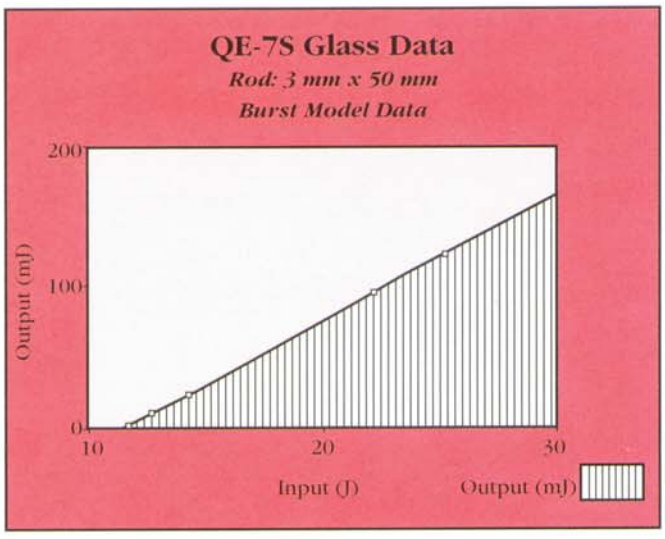
*CDRH specifies a laser classification system wherein lasers defined as Class I are regarded as safe. Generally speaking, allowed output for Class I lasers is limited on the basis of wavelength with the region outside the visible range the least restrictive. Although nearly milliwatt average powers are allowed in the so-called "eye-safe" region beyond 1.4 microns, only in a 0.02 micron-wide slot centered at 1.540 microns is the energy per pulse allowed to exceed 79 microjoules. It is in that narrow band that 7.9 millijoules per pulse is allowed.

Applications

QE-7S is ideal for laser rangefinder applications where field-safe operation is desirable. It is also suitable for medical applications where the need for eye protection may be difficult to manage or diminish or hinder essential visual observation.

Availability

QE-7S is available in rod, clad-rod, slab, and disc configurations and geometries.



Ordering/Information

To order or for further information, contact

KIGRE, INC.

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QE-7S Erbium-Doped Phosphate Laser Glass

Technical Specifications

Spectroscopic Properties

Peak Wavelength	1.535 microns
Cross Section	0.8 x 10^{-20} cm^2
Fluorescence Lifetime	8 milliseconds
Radiative Lifetime	8.0 milliseconds
Linewidth	30 nanometers (FWHM)
Loss at lasing wavelength	.02%/cm

Optical Properties

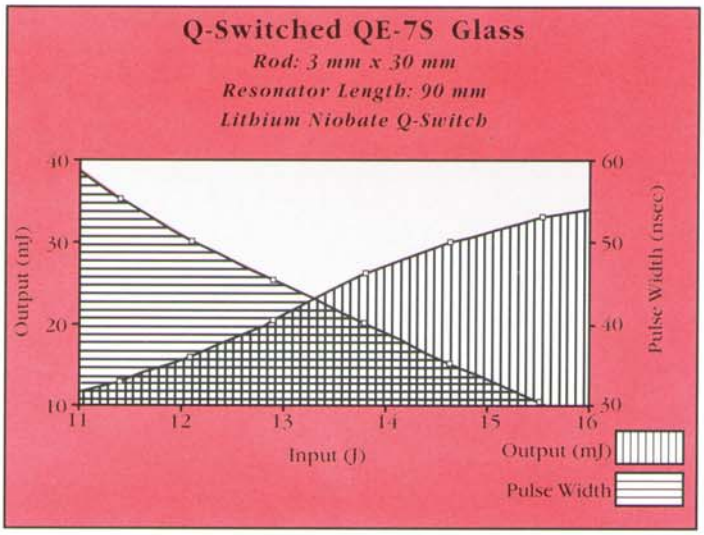
Index of refraction (Nd)	1.542
Index of refraction @ 1.54 microns	1.531
dn/dt (20-40° C)	-63 x 10^{-7}/°C

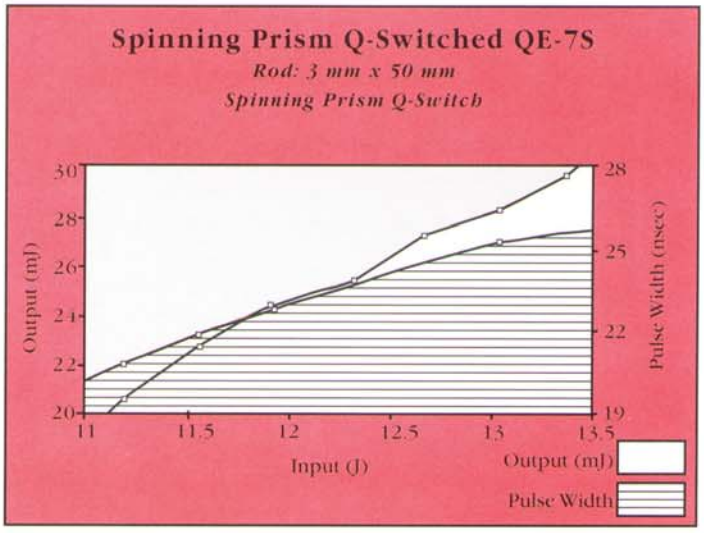
Thermal Properties

Transformation point	462° C
Thermal expansion	114 x 10^{-7}/°C
Thermal conductivity	0.82 W/m°K
Specific heat	0.80 J/g°K
Thermal-optic coefficient (W)	-3 x 10^{-7}/°C

Physical Properties

Density	2.94 grams/cc
Knoop's hardness	556
Young's modulus	7210 Kg/mm^2
Poisson's ratio	0.24
Damage threshold	>25 J/cm^2





Leading the Way in Solid-State Laser Manufacture and Research

Kigre, Inc., while a recognized specialist in laser glass formulation, fabrication, and precision glass machining and polishing, also manufactures complete laser subsystems. Utilizing a variety of solid-state lasing materials, Kigre-built lasers are either fixed Q or Q-switched. Kigre also provides customers with concept-to-finished product design and research support. All good reasons to call on Kigre for all your solid-state laser requirements.

KIGRE, INC.

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