Litron LPY7000 Series

Beam Profile Information

The LP7000 lasers offer extremely high Q-switched outputs at repetition rates of up to 50Hz. Based around our proven self-supporting invar frame their robust build quality suits them to both industrial and scientific applications.
The lasers are provided in an oscillator, pre-amplifier, main-amplifier arrangement. The oscillator may be configured as a stable-telescopic resonator offering a low order multimode output with a smooth spatial and temporal profile, or as an unstable Gaussian-coupled resonator offering a single transverse mode output with slightly higher peak powers.

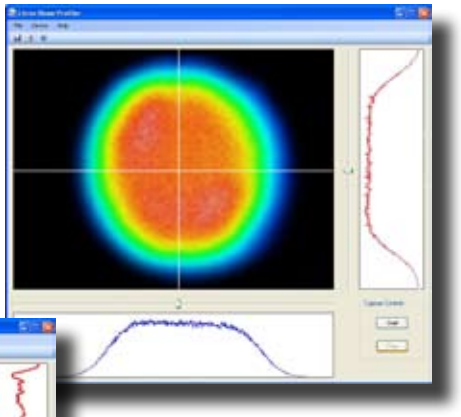
A Gaussian-coupled resonator whilst providing a very low divergence output beam also exhibits significant spatial modulation (ringing). The spatial modulation is due to Fresnel diffraction of the beam by the laser rod. It is significantly worse in Gaussian-coupled resonators due to the relatively high extraction efficiency, and therefore beam intensity, at the periphery of the rod. As the beam propagates the modulation intensity increases to a maximum in the intermediate field and ringing due to diffraction effects is visible in the near, intermediate and to some degree far field. In the far field the beam will resemble a Gaussian containing about 70% of the near field energy, the remaining 30% having been lost due to diffraction. This behaviour is the same for any Gaussian or Super Gaussian-coupled laser from any manufacturer.

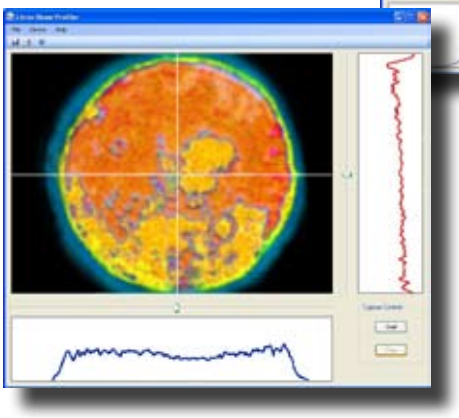
Stable telescopic resonators offer low divergence outputs by the inclusion of an intra-cavity telescope. The use of the telescope is twofold, firstly it reduces the beam diameter in the rear leg of the resonator, having the effect of increasing its diffraction length and consequently lowering the number of transverse modes supported. Secondly it effectively compensates for the thermal lensing of the laser rod. Output beams from telescopic resonators are spatially much smoother than those from Gaussian-coupled resonators and during propagation do not exhibit any high degree of modulation as is seen in beams from Gaussian-coupled lasers. Typically the M^2 from telescopic lasers is approximately 3, and from Gaussian-coupled lasers is about 2. The far field beam energy from a telescopic resonator will contain approximately 90% of the near field energy as opposed to only about 70% from a Gaussian system.

GENERAL FEATURES

- Rugged Industrial Build
- Up to 3.5J @ 1064nm
- Telescopic or Gaussian Resonators
- Full Energy in <5 minutes at All Wavelengths
- Optional Seeder Package
- All Harmonics to 5th Available
- Full RS232 Software Control

LPY7864-30 Telescopic resonator. Beam profile measured at output of laser, giving 2J at 30Hz, 1064nm.





LPY7864G-30 Gaussian coupled resonator. Beam profile measured at output of laser giving 2J at 30Hz, 1064nm

Further information on resonator options can be found in the following Litron technical notes, available on our website.

Different Resonator Options from Litron.
True TEM00 or Not?

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