

LN Line narrowed Excimers

Ultra narrow 0.08pm

Long gas lifetime

Corona PreIonization

On-Board Vacuum Pump

Long Life Optics

The LN laser is an all metal/ceramic device and uses the most advanced design of any commercial excimer laser.



EX50LN

Tunable Excimer Laser

Narrow linewidth excimer lasers produce outputs with a spectral bandwidth of less than 1pm. The narrow bandwidth and high spectral intensity is useful in lithography and metrology applications. The coherence length of the laser and the spectral intensity are increased by over a factor of 500 from standard free running excimer lasers. Long coherence length, narrow linewidth lasers can be tuned over a wide wavelength range for applications in fluorescence, Raman spectroscopy, LIDAR and FBG.

Line Narrowing

A free running excimer laser with a stable, non selective resonator produces a spectral output with a relatively wide bandwidth. For example free running ArF has a bandwidth of approximately 500pm FWHM. The free running spectral output can be greatly narrowed by inserting wavelength dispersive optical elements into the laser cavity. The narrow band output can also be tuned over a region which is typically close to the free running bandwidth of the laser. With both ArF and KrF, linewidths of less than 1pm can be obtained. Narrow band excimer lasers exhibit exceptional coherence properties.

The EX50LN uses a SUPER INVAR stabilized resonator to give long term stable operation, the EX50LN gives up to 7cm coherence length at 248nm with very high pointing stability, ideal for long coherence length applications such as FBG fabrication. The EX50LN is available in a number of repetition rate models from 250Hz air cooled up to 1000Hz water cooled with up to 10mJ of narrow band energy at 248nm and 6mJ at 193nm. An ultra narrow line tunable system with 0.08pm spectral linewidth is also available.

The laser can be completely controlled from a Windows 9x/2000/XP software package. Software automatically maintains stabilized constant energy output using the internal energy monitor. The software also warns the user if faults occur or if maintenance is required. The laser can operate directly from a PC for remote programming and software upgrades

State of the Art Design

The EX50LN is equipped with all the state of the art technology features of standard GAM Laser products, including corona preionization, total metal/ceramic design and exception static and dynamic gas lifetime. The versatile WindowSM based application software allows complete control over all laser functions.

The EX50LN includes an internal vacuum pump and halogen filter. There are no external vacuum components required. The table top laser operates from a single cylinder of premix gas. Software controlled gas exchange is accomplished in under 1 minute.

Narrowband lasers use intra cavity wavelength dispersive elements to line narrow the free running spectral range of excimer lasers. Linewidths of less than 1pm are routinely obtained in table top systems.

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The EX50LN is available in a number of repetition rate models from 125Hz up to 1000Hz with up to 8mJ of narrow band energy at 248nm and 3mJ at 193nm. Higher energy output is available from an oscillator amplifier line narrowed system which produces up to 100mJ of highly line narrowed 248nm output.

APPLICATIONS

SPECTROSCOPY

SEMICONDUCTOR METROLOGY

OPTICAL TESTING

Specifications

| PARAMETER | F2 | ArF | KrF | XeCl | XeF |
|---|-------------------------|---------|---------|---------|---------|
| Wavelength nm | 157 | 193.3 | 248.35 | 308-311 | 351,533 |
| Energy Max. Broadband mJ | 4 | 15 | 25 | 15 | 10 |
| Energy Max. <1pm FWHM mJ | 1 Line | 3 | 7 | 3 | |
| Tuning Range pm | | 800 | 400 | NA | |
| Average Power @ 125 Hz | | 0.3 | 0.75 | 0.3 | |
| Average Power @ 250 Hz | | 0.6 | 1.5 | 0.5 | |
| Average Power @ 500 Hz | | 1.5 | 2.5 | 1.5 | |
| Average Power @ 750 Hz W | Call | 2.0 | 4.0 | 2.0 | |
| Dynamic gas lifetime Pulses to 50% energy | 15E6 | 20E6 | 30E6 | 50E6 | 30E6 |
| Shelf life approx. to 50% energy | 15 days | 60 days | 90 days | 1 Year | 90 days |
| Window Service | 200E6 | 150E6 | 500E6 | | |
| Pulse Length | 14-18 nS ^b | | | | |
| Beam Size | 8 X 4 mm | | | | |
| Divergence | 1 X 2 mRad ^d | | | | |
| Tube Service | 3 Billion Pulses | | | | |
| Cooling | Air / Water | | | | |

b At Max. Voltage

d Full Width Half Max.

Linewidth Selectable

The EX50LN package also includes a high reflectivity reflector and mount for broadband operation. Polarization in line narrowed mode is >95% linear, and broadband ASE is <5%.

A SUPER INVAR stabilized resonator gives the EX50LN rock solid stability with sub pm spectral output.

Options

- ULTRA NARROW 0.08pm
- High energy 10pm linewidth
- Rep rate versions

Key Benefits

- ◆ **Narrow linewidth in a single table-top package**
- ◆ **High Spectral Intensity**
- ◆ **Optional Ultra-narrow 0.08pm Linewidth**
- ◆ **Tunable deep UV source**
- ◆ **Available Oscillator Amplified line narrowed systems**

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