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NovaLine Lithography Lasers and EUV Sources

LAMBDA PHYSIK®

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Step into the Future of Deep UV Lithography

Lambda Physik has over 30 years of experience developing and manufacturing more than 10,000 lasers. Our photolithography lasers (available in 248 nm, 193 nm and 157 nm wavelengths) are designed with the customer in mind, incorporating the latest laser technology and matching performance with reliability, ease of operation, and maintenance.

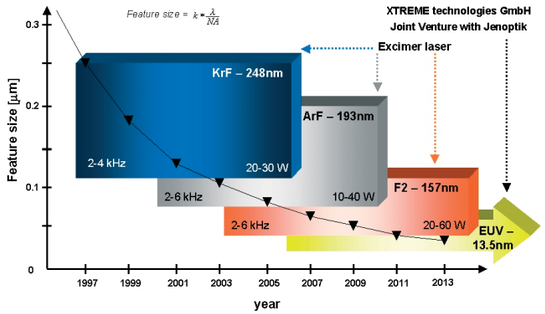
Continual, aggressive research and development, state-of-the-art manufacturing processes, modular component engineering, and some of the most talented engineers and technicians in the industry reflect the commitment of Lambda Physik to our customers and the advancement of microlithography. Our NovaLine, lithography lasers, available in three wavelengths, are built to withstand the stringent requirements of the semiconductor industry.

Step into the future with the global leader in pulsed DUV and EUV light source technology with a choice of four wavelengths: 248 nm, 193 nm, 157 nm and 13.5 nm. Experience the high performance and superior service that will make you a leader in microlithography.

Technology – A Step Ahead

The Lambda Physik litho team produces NovaLine lasers, which are setting new standards of performance, with stable 2 kHz operation at 248 nm (30 W semi line-narrowed, 20 W line-narrowed); 4 kHz operation at 193 nm (40 W semi line-narrowed, 20 W single oscillator ultra line-narrowed - SOUL technology -); and the innovative 157 nm laser with up to 4 kHz repetiton rate and 20 W of output power, enabling optical lithography down to 50 nm. Lambda Physik was the first to produce 193 nm production-quality lasers and was the first to provide an R&D 157 nm litho laser for material testing. These advances in technology are complemented by the NovaLine series unique modular design, incorporating Lambda Physik patented NovaTube, NovaPowerSwitch, and the finest optical elements.

Lambda Physik Lithography Roadmap



Committed to provide leading edge technology for lithography beyond 157 nm, Lambda Physik with Jenoptik LOS has formed the joint venture XTREME technologies – a company specializing in developing and manufacturing extreme ultraviolet (EUV) sources with 13.5 nm radiation for next generation lithography. At XTREME technologies the important technologies of EUV sources - Gas Discharge Produced Plasma (GDPP) sources as well as Laser Produced Plasma (LPP) sources - are investigated for future lithographic applications.

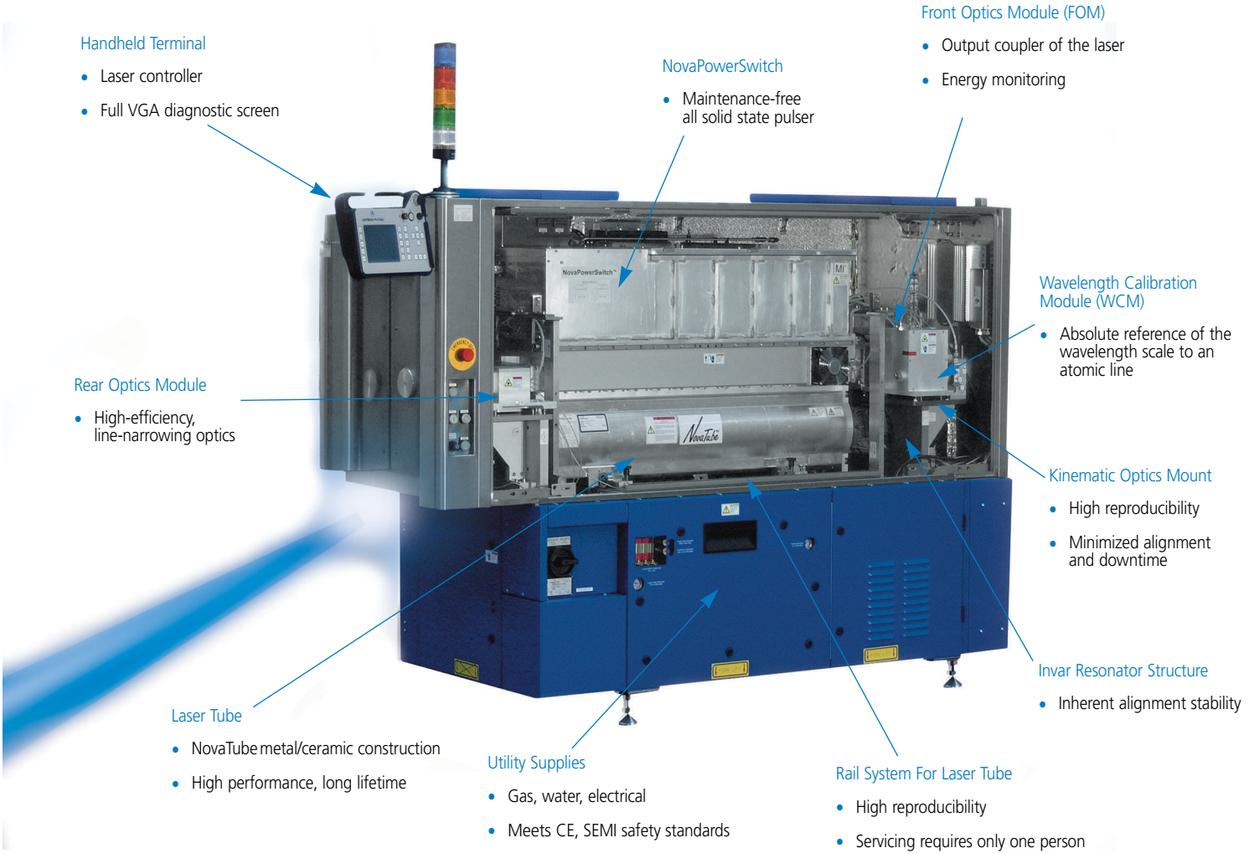
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Driving the Pulse of UV Technology

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NovaLine Modules for Dependable, Easy Operation

Lambda Physik lasers have an advanced modular design that reduces the need for replacement parts, decreases the cost of consumables, and provides exceptional reliability for industrial operation. All mechanical, electronic, and optical modules offer easy maintenance and integration for microlithography applications. Maintenance access is on one side of the NovaLine unit, allowing a smaller footprint to provide more valuable cleanroom floor space and easy servicing. NovaLine has an internal computer that provides all the necessary diagnostic information required to ensure highly stable, trouble-free operation.



NovaTube Technology for the Highest Tube Lifetime

The NovaTube has been redesigned in order to stabilize operation at high repetition rates up to 4 kHz. In particular, the gas flow system has been optimized to ensure sufficient gas clearing in the discharge at the highest repetition rate. The energy stability of the laser tube, which is measured to be only 1% sigma at 4 kHz confirms the superior gas flow dynamics of the NovaTube. The capacity of the heat exchanger has been adapted for the high power operation and together with an improved temperature stabilization of the laser tube, a perfectly stable operation is ensured over the entire operating range. A corona discharge is utilized for preionization, significantly reducing electrode wear. Lambda Physik has patented metal/ceramic technology that delivers unsurpassed tube lifetime, high operation consistency, and the lowest operating costs. Tube lifetimes of more than 12 billion laser pulses have been demonstrated and exceptional reliability is reported from the field. The gas circulation fan in the NovaTube has an effective MTBF of more than 120,000 hours. Over the years, Lambda Physik has produced more than 3,500 NovaTube laser tubes with an outstanding yield of more than 99 percent.

Maintenance-Free NovaPowerSwitch

All NovaLine lasers utilize the NovaPowerSwitch solid state pulser that delivers consistent, high MTBF performance. To adapt the laser discharge unit for the demands on power and a 4 kHz repetition rate, a redesign of the solid state pulser has been completed. The new solid state pulser provides very high transfer efficiency and optimized heat management. The result is stable performance over the complete repetition and voltage range. The NovaPowerSwitch is maintenance-free and demonstrates such exceptional reliability that it has a lifetime guarantee. The NovaTube and NovaPowerSwitch, which together make up the Laser Discharge Unit (LDU), are factory-mated and synchronized. This unique design makes tube changing faster, which saves vital production time.



Line-Narrowing Optics for Wavelength and Bandwidth Stability

NovaLine lasers feature high-precision, line-narrowing optics to achieve stable laser bandwidth and exact wavelength stability, maintaining the optimal focus that is critical for microlithography applications. High mechanical stability is achieved by an ultra-stable resonator construction using INVAR rods. NovaLine optics modules are pre-aligned and fully purged by nitrogen. The modules are precisely positioned in the laser so that time-consuming alignment procedures are not required after routine maintenance. Lambda Physik has been active in working with suppliers for the critical optics in the laser resonator. This is of particular importance for the 193 nm and the 157 nm wavelengths which cause new material issues for quartz and CaF_2. Today we have reached a status where the rear and front optics modules of our 193 nm lasers exceed expectations and reach lifetimes of 5 billion pulses.

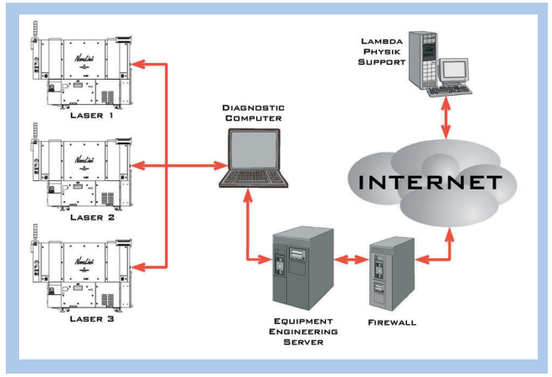
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E-Diagnostics

New approaches to support the operation, maintenance and optimize uptime of complex tooling are becoming the standard. These concepts include the use of new media such as on-line connectivity. On the machine level, this requirement demands a design which permanently monitors performance and tracks all incidents. It must also provide a suitable means to exchange this information with the outside world; such as the local support, the Equipment Engineering System (EES), or the remote factory support center. E-diagnostics is one important factor of our effort to reduce the overall Cost of Ownership (CoO) and optimize system availability.

The NovaLine lasers have been designed to support these concepts:

- **Predictive / Preventative Maintenance**
  The lifetime of consumables is predicted by tracking usage and actual performance. Using the analysis software on the diagnostic PC provides automated management of consumables. Clear indications to schedule maintenance and avoid downtime are generated.
- **Proactive Monitoring**
  Performance data is continuously stored in the logbook and history files to track the performance and provide the input for proactive countermeasures. The performance data is permanently screened by the analysis software to identify trends in performance and flag out-of-boundary conditions.
- **Reduce MTTR (Mean Time To Repair)**
  Using the complete track record of the laser performance, service activities and troubleshooting efforts are optimized. Seamless documentation of the performance prior to an event is achieved by the pulse recorder which then gives all information at hand for direct diagnosis of events. Automated performance checks and set-up procedures minimize the downtime of each of the exchange procedures.
- **Data Collection for Continuous Improvement Program (CIP)**
  Lambda Physik has a continuous improvement program, utilizing e-diagnostics, which supports the exchange of the lasers' statistical performance data. The laser database provides the reports on MTBF and MTTR tool performance according to SEMI E10 and contributes to the progress in the continuous improvement programs.
- **Remote Connectivity**
  The concept of our lasers enables on-line connectivity according to SEMATECH guidelines. The connection of the diagnostic PC back to Lambda Physik support facilities provides all information at hand for the maintenance and service aspect, and transfers relevant data back to the laser.

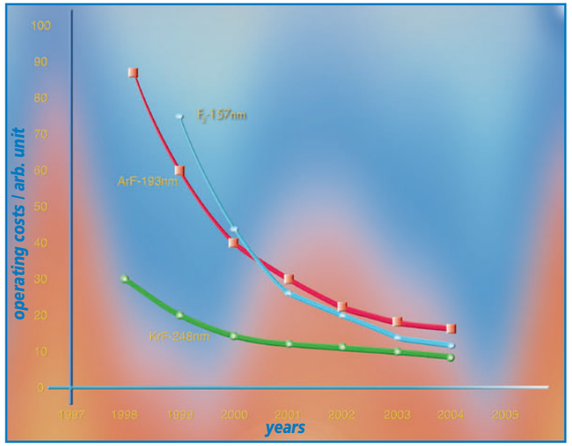


The advantage of using an external diagnostic PC is that the interference with the main laser controller can be limited to providing the essential data. The merit is that the laser operation will continue while tasks such as data analysis, preventative maintenance scheduling, etc. are performed using the diagnostic PC. Utilizing the data on the equipment engineering server provides means for statistical process control. This concept enables high data security.

SuperCop Program

Our leadership in lithography lasers is not limited to technical innovations. In order to provide the most comprehensive product to you, Lambda Physik has developed the most cost-effective spare parts, consumables and support program available today. The Lambda Physik SuperCop Program minimizes your CoO and maximizes your system availability. Our program provides a guaranteed cost per billion pulses, on-site consignment stock and local Lambda Physik support. The SuperCop approach eliminates CoO cost fluctuations by linking laser per pulse costs to your revenue stream (wafers out).

Lambda Physik was the first to offer a guaranteed cost per billion pulses. Although others have adopted the concept, Lambda Physik is still the only laser manufacturer willing to provide a guarantee. A secondary benefit is a clear and predictable cost that is relational to your revenue stream.



SuperCop Guarantees a Fixed Cost of Ownership.

On-site consignment stock provides a level of comfort to the FAB managers that is unmatched by any other logistics concept available today. Parts and consumables are stored and controlled locally by Lambda Physik. This control provides direct links to our regional, continental and factory part procurement and distribution network.

Local Lambda Physik support is the final caveat to this all-inclusive program. Automated data collection, e-diagnostics and training are great tools in supporting complex equipment. It often comes down to local expertise to finally resolve the situation.

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On the Job Around the Clock

Our global, professional support team is always ready to provide you with training, technical assistance, and maintenance support; wherever and whenever required.

Service and Technical Support Keep You in Step with Production Demands

Lambda Physik is continually expanding its continental support centers and adding additional service technicians to meet the growing needs of our customer base. Well-established continental support centers are located in Fort Lauderdale, Florida, USA; Goettingen, Germany; and Yokohama, Japan. Additional local offices are strategically located around the world to support specific customer requirements. Trained technical specialists are available at these locations to troubleshoot and service NovaLine lasers. Lambda Physik service technicians receive extensive training at our manufacturing facility to ensure that they are experienced in all areas of laser maintenance. Lambda Physik is equipped to handle all of your service needs, providing dependable, comprehensive support you can expect from the leader in DUV lithography, including rapid, on-site support, 24/7 telephone support, spare parts, and consumables. We welcome the opportunity to structure a service program that will meet your unique production requirements.



Well-Trained Personnel are the Key to Your Success

In addition to on-site service and support, Lambda Physik offers special laser training courses for those customers and OEM/representatives that want to become more skilled in the operation and maintenance of their Lambda Physik NovaLine lasers. Our long established tech school is located in Goettingen, Germany. Lambda Physik also offers its customers a choice in training locations. The training classes offer comprehensive classroom and hands-on training at various levels of expertise.

In order to accommodate the needs of today's marketplace, our training program has been tailored to optimize the training process and adapt to the technical changes applicable to our laser systems. Courses can be presented in English, German or Japanese languages. The maximum class size is four. All trainers are highly experienced and knowledgeable with Lambda Physik laser systems. Most of our trainers hold degrees in electronics and/or physics, and receive ongoing educational training to improve their teaching techniques. To be selected as a trainer at Lambda Physik, it is necessary to have gained considerable experience in R&D, final testing or field service.

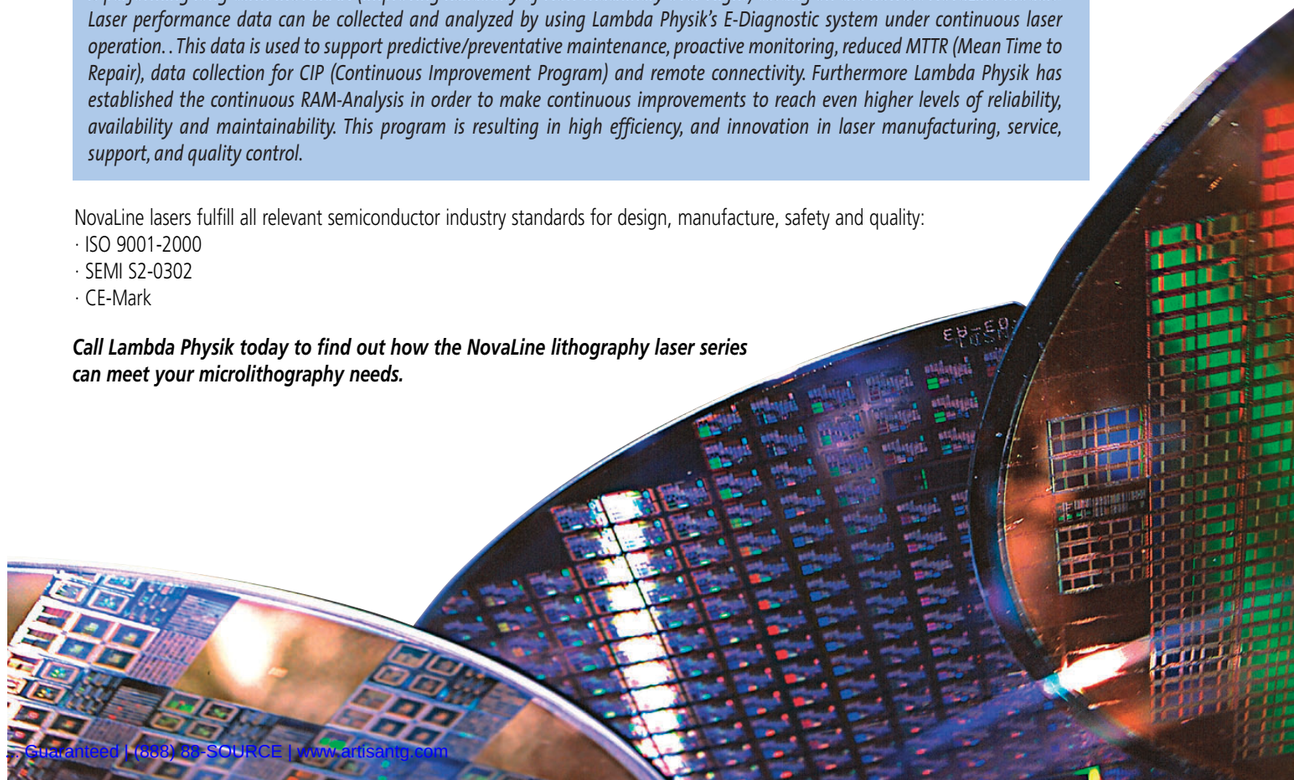
Reliability that Counts

NovaLine lasers are manufactured in volume using advanced technology and dependable modular components. Lambda Physik meets the most stringent demands of microlithography users: on-time delivery and the highest product reliability. Lambda Physik is performing long-term IRONMAN (Improving Reliability of New Machinery over Night) testing on the newest NovaLine models. Laser performance data can be collected and analyzed by using Lambda Physik's E-Diagnostic system under continuous laser operation. . This data is used to support predictive/preventative maintenance, proactive monitoring, reduced MTTR (Mean Time to Repair), data collection for CIP (Continuous Improvement Program) and remote connectivity. Furthermore Lambda Physik has established the continuous RAM-Analysis in order to make continuous improvements to reach even higher levels of reliability, availability and maintainability. This program is resulting in high efficiency, and innovation in laser manufacturing, service, support, and quality control.

NovaLine lasers fulfill all relevant semiconductor industry standards for design, manufacture, safety and quality:

· ISO 9001-2000
· SEMI S2-0302
· CE-Mark

Call Lambda Physik today to find out how the NovaLine lithography laser series can meet your microlithography needs.



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NovaLine K2000 Series

DUV microlithography has become the process of choice for the mass production of today's advanced chip generations. The DUV scanners have yet to make another step to an even higher numerical aperture (NA), expanding the application of DUV further down to the 130 nm design rule and beyond. Lambda Physik supports the ongoing progress of the DUV scanners by supplying lasers which meet the demands of the semiconductor fabrication industry for optical performance, reliability, and cost effectiveness. Lambda Physik has succeeded in further increasing the NovaLine series efficiency and higher spectral purity with the K2000 Series. As a result, the lifetime of both the laser discharge unit and the optical components are increased, leading to significantly lower operating costs. The NovaLine K2000 Series features:

- **Highest output power available at reliable 2 kHz repetition rate, enabled by NovaTube all-metal/ceramic tube technology to maximize throughput**
- **Highest spectral purity available with less than 0.4 pm bandwidth, FWHM, achieved by our patented resonator to maximize the optical contrast of high-NA imaging lenses**
- **Solid state pulser NovaPowerSwitch delivers high consistency and high MTBF performance and comes with a lifetime guarantee**
- **PowerLok® actively stabilizes the output power; it is enhanced by our solid state pulse power module, and tight exposure control is achieved to optimize exposure latitude**
- **NovaLine features complete data-logging capabilities to schedule maintenance and support e-diagnostics and troubleshooting**



NovaLine K2005
- The Perfect Match for High Numerical Aperture DUV Scanners

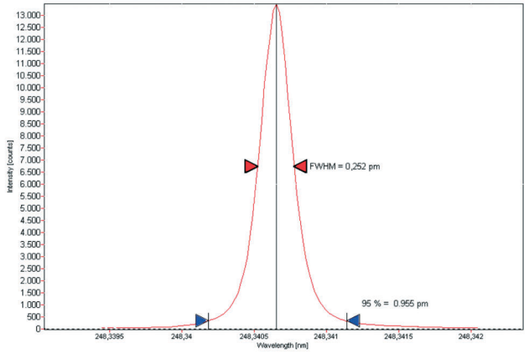
The line-narrowed model K2005 offers extremely narrow linewidth of less than 0.4 pm, FWHM, with 95 percent of the energy within a wavelength interval of less than 1.25 pm. In addition to the width at half maximum (FWHM), the spectral distribution of the laser output determines the contrast of the imaging lens. Based on the patented PCR resonator, the K2005 produces an extremely narrow output spectrum to optimize performance of advanced DUV lithography scanners with numerical apertures as high as 0.8.

NovaLine K2010
- Cost-Effective, Reliable Source for DUV Scanners

NovaLine K2010 lasers are installed in quantities on the manufacturing floor. High reliability and low CoO has allowed Lambda Physik to steadily grow a customer base for this laser. The lasers operate with 2 kHz and 20 W output power. The bandwidth of 0.6 pm makes the K2010 compatible with most OEM DUV scanner systems.

NovaLine K2020
- High Power, Low Operating Cost

The K2020 model has been designed for high throughput DUV scanner systems using a catadioptric imaging lens. This laser system, with a bandwidth of about 50 pm, provides high efficiency and significantly lower operating costs. The resonator is optimized for the relaxed bandwidth requirement. As a result, the output power is increased to 30 W and the overall operating cost of this DUV laser is reduced. Optimization of the NovaTube and discharge circuitry provide highly stable output with a standard deviation of less than 1 percent at 2 kHz repetition rate. PowerLok, a Lambda Physik proprietary energy control system, stabilizes the exposure dose with an accuracy of typically ±0.25 percent.



Output spectrum of the NovaLine K2005 laser measured by a high resolution grating spectrometer.

Laser Model	K2005	K2010	K2020	Units
Wavelength	248	248	248	nm
Spectral Bandwidth (FWHM)	< 0.4	< 0.6	< 100	pm
Spectral Purity (95% Energy Integral)	< 1.25	< 2.0	-	pm
Repetition Rate	2	2	2	kHz
Power	20	20	30	W
Pulse Energy	10	10	15	mJ
Dose Energy Stability	< +/-0.35	< +/-0.5	< +/-0.5	%
Gas Lifetime	> 200 million	> 200 million	> 100 million	Pulses
	7 days	7 days	5 days	Days
Laser Tube Lifetime		> 4 billion		Pulses
Cabinet Size (l x w x h)		1826 x 830 x 1548		mm^3
Weight		1075		kg

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NovaLine A4000 Series *With 4 kHz Repetition Rate*

Lambda Physik has been driving the development of 193 nm microlithography by supplying 193 nm laser technology for the past five years. New products like the A4003 of the A4000 series are well positioned to further extend our market share. The A4000 series of high-power, ultra-narrow-band lasers support the full production requirements of 193 nm tools. The unique A4003 delivers the highest spectral performance with the smallest available bandwidth of less than 0.30 pm, and the highest spectral purity of less than 0.75 pm by using the innovative SOUL™ technology (Single Oscillator Ultra Line-narrowed).

Our 193 nm lasers have become the process of choice for the mass production of today's advanced chip generations. Lambda Physik lasers meet the optical performance requirements for high-NA imaging at high repetition rates, reliability, and cost effectiveness demands of semiconductor fabrication.

- **Output power up to 40 W, enabled by NovaTube all-metal/ceramic tube technology for dependable operation**
- **Operation with up to 4 kHz repetition rate and high-energy stability, achieved by our newly designed high-repetition rate laser discharge unit**
- **An advanced single laser discharge unit combined with highly efficient line-narrowing optics and innovative SOUL technology, produces an ultra-narrow bandwidth of less than 0.30 pm, FWHM, and the highest spectral purity of less than 0.75 pm at 95 percent energy content.**
- **New solid state pulser NovaPowerSwitch optimizes efficiency at 4 kHz repetition rate and delivers high consistency, high MTBF performance, and a maintenance-free lifetime guarantee**
- **PowerLok actively stabilizes the output power. Enhanced by our solid state pulse power module, tight exposure control is achieved to optimize the exposure latitude.**



NovaLine A2005
- The Best Tool for Refractive Imaging with High Numerical Aperture

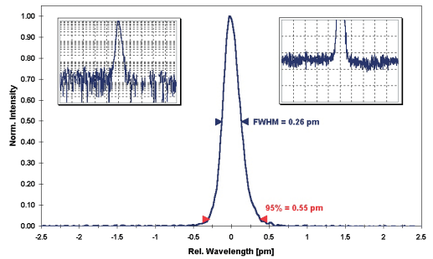
The NovaLine A2005 laser offers an extremely narrow bandwidth of less than 0.35 pm, FWHM, with more than 95 percent of the energy within a wavelength interval of less than 0.95 pm. With this ultra-narrow bandwidth, the A2005 model is suitable for refractive imaging with high numerical aperture.

NovaLine A4003
- The Industry's Highest Numerical Aperture

The newest model of our 193 nm lithography lasers is the A4003 equipped with SOUL™ (Single Oscillator Ultra Line-narrowed). By combining an advanced single laser discharge unit with highly efficient line-narrowing optics, this laser enables superior optical performance with a very narrow bandwidth of less than 0.30 pm (FWHM) and very high spectral purity of less than 0.75 pm for the 95% energy content. The result is the highest contrast imaging at a reduced CoO due to the extended lifetime of the laser discharge unit.

NovaLine A4020 / A4030
- The Highest Power Available for Litho Lasers

The NovaLine A4020, designed for catadioptric imaging optics, operates with 4 kHz repetition rate to deliver 40 W output, the highest power level available for lithography excimer lasers. The NovaLine A4030, specifically designed for 100% duty cycle operation emits the natural emission spectrum of 193 nm laser radiation and delivers an output power of 30 W. With its outstanding high duty cycle performance, the A4030 is especially suited for testing optical materials.



Output spectrum of the NovaLine A4003 laser. The equally distributed background level is indicated by the logarithmic graph (left) and the appropriate magnified area of the picture (right).

Laser Model	A2005	A4003	A4020	A4030	Units
Wavelength	193	193	193	193	nm
Spectral Bandwidth (FWHM)	< 0.35	< 0.30	< 25	natural emission	pm
Spectral Purity (95% Energy Integral)	< 0.95	< 0.75	-	-	pm
Repetition Rate	2	4	4	4	kHz
Power	10	20	40	30	W
Pulse Energy	5	5	10	7.5	mJ
Dose Energy Stability	< +/- 0.4	< +/- 0.3	< +/-0.5	-	%
Gas Lifetime	> 35 million	> 100 million	> 50 million	> 100 million	Pulses
Laser Tube Lifetime	> 3 billion	> 3 billion	> 4 billion	> 4 billion	Pulses
Cabinet Size (l x w x h)	2207 x 830 x 1548				mm
Weight	1400				kg

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NovaLine F_2 Series

Lambda Physik pioneered the development of 157 nm lasers and was the first to achieve 20 W output in single line operation, which was considered unattainable only a few years ago. Our experience with the 157 nm laser is reflected in more than 100 billion pulses accumulated, and a lifetime of more than 3 billion pulses for all major excimer laser modules. Lambda Physik clearly understands what is required to get a pure output spectrum.

- **Shortest available wavelength to extend optical lithography down to 0.05 µm**
- **Single-line output spectrum suitable for microlithography applications**
- **Patented resonator to maximize optical system performance**
- **Reliable high-efficiency output for dependable operation enabled by NovaTube all-metal/ceramic tube technology that virtually eliminates all component corrosion and gas contamination**
- **High-output power for material testing**
- **Highest available repetition rate, 4 kHz, of any F_2 laser worldwide**
- **Up to 20 W output power**



NovaLine F1030
- The Workhorse for Material Research Studies

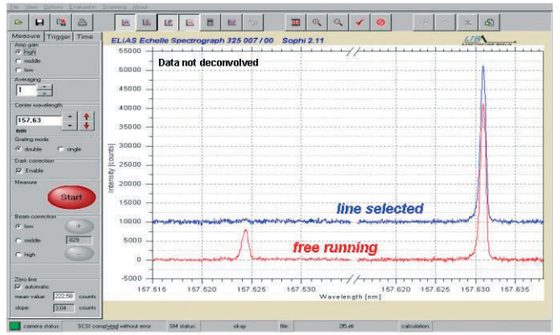
The NovaLine F1030 series is designed for small- to mid-field imaging systems used in feasibility studies of optical lithography at 157 nm. The lasers emit the natural emission spectrum that consists of two lines. Its reliable operation at 1 kHz and high efficiency make the F1030 the workhorse for many applications in material research and qualification.

NovaLine F2020
- With 2 kHz Repetition Rate

The resonator used in the NovaLine F2020 selects a single line from the natural emission of the F_2 transition. As a result, a bandwidth of about 1 pm, FWHM, is realized. This output spectrum is suitable for optical lithography based on catadioptric imaging systems of various types. The resonator design was carefully chosen to maintain high efficiency and obtain the spectral performance and stability demanded by lithographic applications.

NovaLine F4020
- With 4 kHz Repetition Rate

Based on the field proven NovaLine F2020 technology, with outstanding long term reliability of the resonator optics, Lambda Physik now offers the 4 kHz line selected F4020. It comes with the same features as the NovaLine F2020 and is the tailored light source for pilot 157 nm scanner systems.



Natural emission spectrum of a NovaLine F_2 Laser (red) and output spectrum after line selection (blue). By use of the special resonator the secondary line at 157.254 nm is suppressed completely.

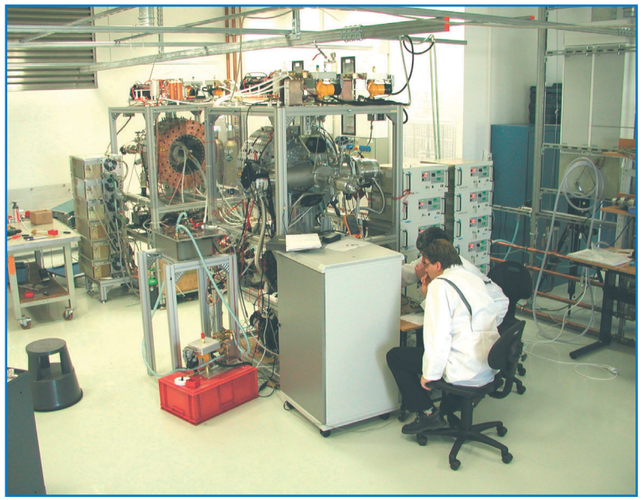
Laser Model	F1030	F2020	F4020	Units
Wavelength	157	157	157	nm
Spectral Bandwidth (FWHM)	–	< 1.2	< 1.2	pm
Repetition Rate	1	2	4	kHz
Power	10	20	20	W
Pulse Energy	10	10	5	mJ
Dose Energy Stability	< +/-0.5	< +/- 0.5	< +/- 0.8	%
Gas Lifetime	> 25 million	> 50 million	> 50 million	Pulses
Laser Tube Lifetime	> 3 billion			Pulses
Cabinet Size (l x w x h)	2244 x 830 x 1548			mm
Weight	1400			kg

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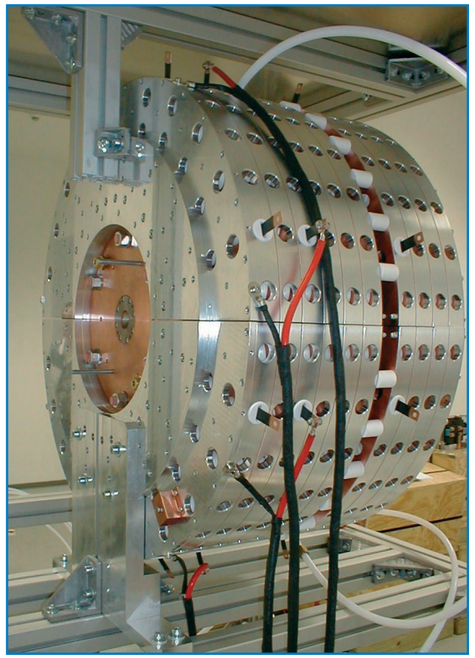
Extreme Ultraviolet (EUV) Sources at 13.5 nm

Lambda Physik and Jenoptik LOS are developing extreme ultraviolet (EUV) radiation sources for the next generation of lithography within the joint venture of XTREME technologies. Two basic technological approaches to EUV sources are considered to match the requirements from our customers – the Gas Discharge Produced Plasma (GDPP) sources and the Laser Produced Plasma (LPP) technology. Together these concepts enable the adaptation of the source characteristics to the versatile requirements of the various lithography applications.

- **Shortest available wavelength for future lithography at 45 nm node and below**
- **Output power up to 10 W of EUV in-band radiation approximately 13.5 nm**
- **Operation up to 2 kHz repetition rate**
- **Customer specific emission characteristics and optical interfacing due to versatile design and GDPP and LPP technologies**



GDPP EUV source test stand at XTREME technologies.



The heart of the GDPP EUV source: The discharge head.

Laser Produced Plasma Source for Metrology

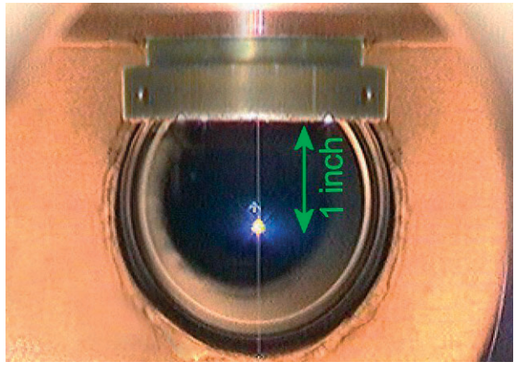
The prototype of the LPP EUV sources works with a 200 W solid state laser and a cryogenic Xenon liquid jet target. EUV radiation into almost 4p sr solid angle is accessible from this source and is emitted from a ball-shaped source with about 150 µm diameter (FWHM). Repetition rates up to 2 kHz are available.

Gas Discharge Produced Plasma Source for Micro Exposure Tool (MET)

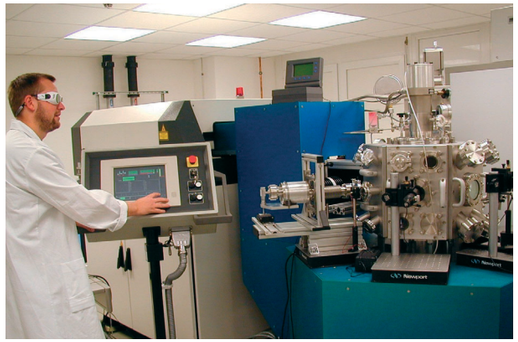
For a micro exposure tool a GDPP source was developed providing EUV pulses with 1 kHz repetition rate in a 10% duty cycle. The accessible emission angle of this source is 1.8 sr or 90 degrees full opening angle of the radiation cone. The radiation is emitted from a plasma column with 500 µm diameter and 2000 µm length (FWHM).

Gas Discharge Produced Plasma Source for Alpha Tool, Metrology and Material Testing

For the alpha tool, metrology and material testing, a duty cycle of up to 100% is required. For this purpose an efficiently cooled GDPP source has been developed and emits EUV pulses with 1 kHz repetition rate. Also the output power and brightness are higher compared to the MET source.



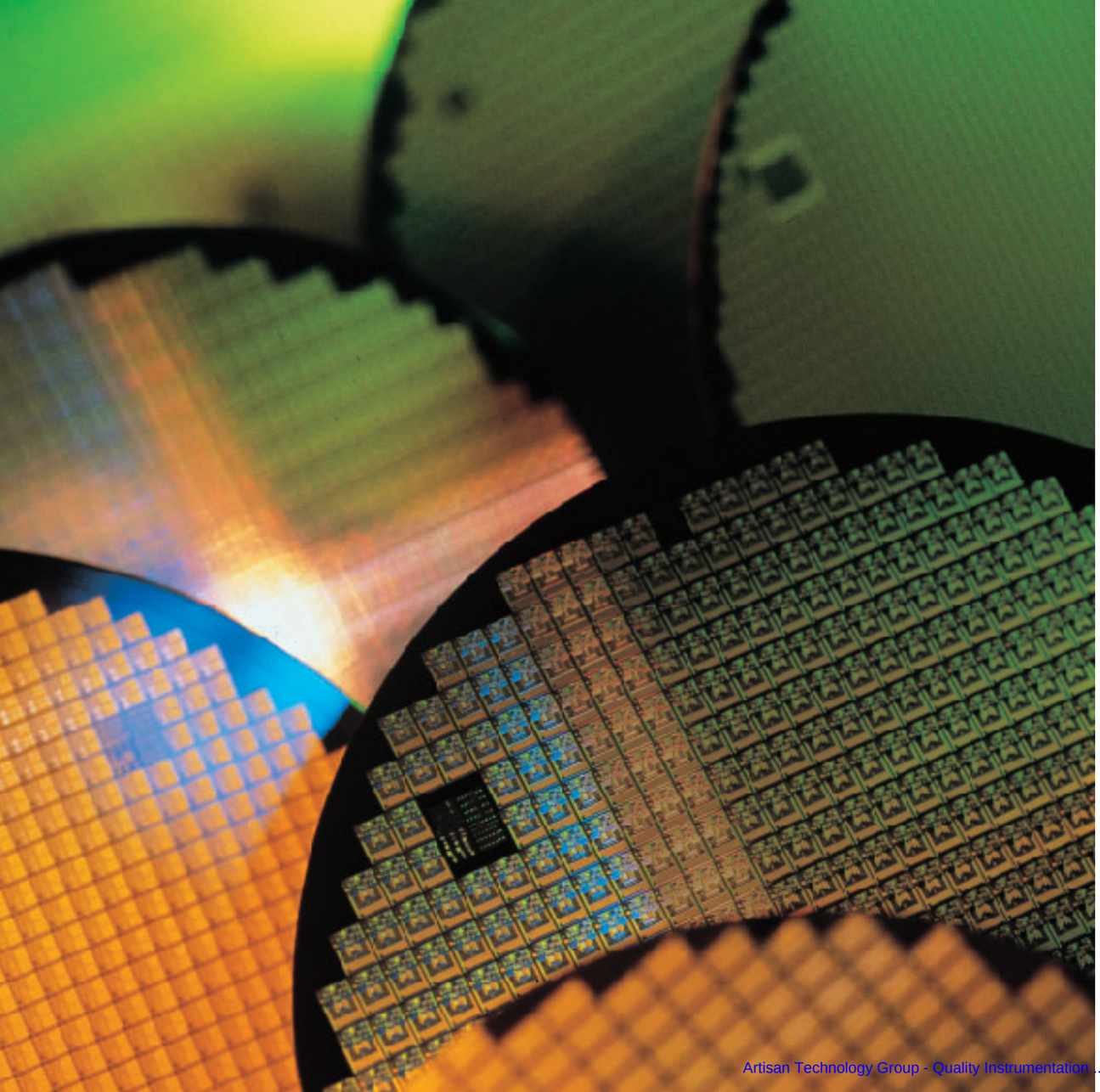
Plasma produced by laser at a cryogenic Xenon filament.



Laser Produced Plasma EUV source test stand in XTREME technologies laboratory.

EUV Sources	LPP	GDPP-MET	GDPP-alpha tool	Units
Usable EUV in band power	0.3 /π	10 /1.8	10 /1.8	W / sr
Pulse Energy	1.5 /π	10 /1.8	10 /1.8	mJ / sr
Repetition Rate	2	1	1	kHz
Duty Cycle	100	10	100	%
Cabinet Size (l x w x h)	3000 x 1500 x 2500	400 x 900 x 900 (head)	400 x 900 x 900 (head)	mm
Weight	2500	300 (head)	300 (head)	kg

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Available in four wavelengths: 248 nm, 193 nm, 157 nm and 13.5 nm

Lambda Physik is the world's largest producer of excimer lasers

Options and further specifications of products in this brochure are available upon request.
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