KLS martin GROUP

Limax®

The diode-pumped Nd:YAG laser

www.klsmartin.com

"The use of KLS Martin Limax® lasers represents an important step forward in the resection of pulmonary metastases. As healthy tissue can be preserved to a great extent, the patient's post-operative quality of life is enhanced significantly. Moreover, the tissue-preserving resection of metastases with the Limax® laser ensures that patients can be reoperated in case of need.

From an economic point of view, using the laser method makes a lot of sense, too, as the tissue-preserving resection of metastases with the Limax® laser allows the treatment of patients who previously had to be classified as inoperable. Besides, the laser simply eliminates high costs for consumables such as staplers."

University lecturer Dr. Thomas Graeter, M.D.
Chief Physician of the Clinic
for Thoracic and Vascular Surgery,
Loewenstein, Germany

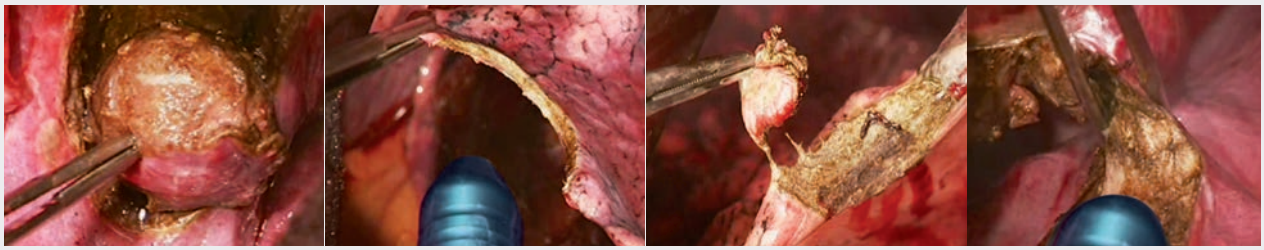
The diode-pumped Nd:YAG laser **Limax®** satisfies the highest demands for treatment quality and operating convenience

With the launch of the new diode-pumped Nd:YAG laser Limax®, surgeons have a laser system at their disposal which offers a triple advantage, combining the excellent beam quality of solid state lasers with an extremely high output power for faster interventions and a wavelength specially optimized for use on parenchymal tissue.

The use of lasers with a wavelength of 1,320 nm has gained more and more ground in recent years, especially for the resection of multiple metastases. The optimal coefficients of absorption in both water and hemoglobin – exclusively attainable with the 1,320-nm wavelength – are just perfectly suited for cutting, coagulating and sealing parenchymal tissue.

Apart from its clinical advantages, this new laser is a great economic solution as well. It not only saves you a lot of money on consumables, but also boosts the number of patients eligible for laser therapy.

Reliable resecting, coagulating and sealing while preserving healthy tissue to the greatest possible extent



The wavelength of 1,320 nm enables precise resection in parenchymal tissue. Thanks to its optimal ratio of absorption in water and hemoglobin, this wavelength lets you achieve excellent sealing results. In other words, precise lesion resection with maximum preservation of healthy tissue.

Bronchoscopy is another field where selecting the right wavelength is of primary importance. Due to their low absorption in hemoglobin, wavelengths above 1,320 nm cannot produce the intended coagulation effect, but primarily lead to tissue desiccation instead. The 1,320-nm wavelength is different because of its first-rate absorption in hemoglobin. It therefore prevents unwanted side effects such as dreaded edemas. Besides, the pulsed operating mode allows it to be used for gentle, tissue-preserving endobronchial applications as well.

The surgical advantages of the Limax® system at a glance:

- Greatest possible preservation of healthy tissue
- Maximum precision – even the most difficult localizations can be treated
- Flexible, yet mechanically strong coagulation zones allow for visceral pleura sutures for increased safety
- Dry (hemorrhage-free) and fistula-tight resection surfaces
- Intervention can be repeated in case of recidivation
- Significantly increased life expectancy with almost no loss in the quality of life

Limax® – the surgical laser and its fields of use

Application examples for open thoracic surgery:

- **Metastatic surgery**
- Parenchymal bridge transection
- Pulmonary vesicle resection
- Open pulmonary biopsies
- Removal of benign tumors

Application examples for endobronchial surgery:

- Tumor ablation
- Removal of stenoses
- Vaporization of pathologic tissue
- Hemostasis

Application examples for thoracoscopic surgery (VATS):

- Metastatic surgery
- Pulmonary vesicle ablation and thermal pleurectomies in cases of spontaneous pneumothorax
- Air vesicle ablation in pulmonary emphysema cases
- General hemostasis and fistula sealing
- Partial resection of lung tissue
- Recurring pneumothorax
- Adhesiolysis
- Pleurodesis

The economical advantages at a glance:

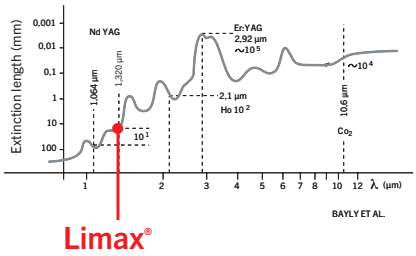
- Savings in expensive consumables (e.g. stapler magazines, fibrin glues)
- Extended interdisciplinary indications in open thoracic surgery, thoracoscopy, endobronchial surgery, visceral surgery and phlebology, therefore more patients can be treated
- The KLS Martin laser Limax® enables the inclusion of patients that were previously considered “inoperable”
- Enhanced hospital reputation due to use of innovative laser technology and advanced methods

Optimal wavelength – superior beam quality, intuitive handling

The diode-pumped Nd:YAG laser Limax® represents a significant step forward in parenchymal laser surgery.

Optimal wavelength

Due to its specific wavelength of 1,320 nm and the high coefficients of absorption in water and hemoglobin associated with it, the Limax® is perfectly suited for combining resection, coagulation and tissue sealing effects for optimal control of the two greatest problems when working on lung parenchyma – hemorrhages and air loss.



Best beam quality

The Limax® system enables the surgeon to work at a constant beam quality with a power of up to 120 W. This allows for fast operations with maximum power densities of >100 kW/cm^2 and fibers with very small diameters of 400 µm.

Intuitive operation
In addition to the laser, the Limax® system integrates a dedicated smoke evacuator and gas irrigation unit into a single, compact platform.

Besides, all the parameters for these components can be controlled intuitively via the Limax® software and stored according to the user's preferences.

The technical advantages at a glance:

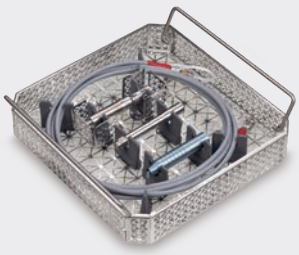
- Optimal wavelength
- Integrated smoke evacuator
- Intuitive handling
- User-customizable standard programs
- No heavy-current connections required
- Low-noise operation
- Best beam quality
- Integrated gas irrigation
- Very comprehensive set of accessories
- Service-friendly design

Autoclavable focusing handpiece

The fully autoclavable focusing handpiece* enables precise laser application on a non-contact basis. High power densities guarantee optimal results when sealing, cutting or coagulating parenchymal tissue.

78-201-10-04	Focusing handpiece Limax®, autoclavable*
79-302-40-04	Supply fiber, 400 µm, autoclavable

* Can be used only with the diode-pumped Nd:YAG laser Limax®



Washing tray	
55-803-72-04	Storage set for autoclavable laser focusing handpiece and autoclavable supply fiber, 24 x 25 x 4 cm, complete, preconfigured, incl. lid
78-215-05-04	Silicone rinsing tube for rinsing the supply fiber

Flexible quartz fibers

- Different diameters
- Single-use and autoclavable versions

79-700-40-04	Bare fiber, 400 µm, disposable, 3 m, pack of 5 External diameter 730 µm (endobronchial surgery)
79-700-60-04	Bare fiber, 600 µm, disposable, 3 m, pack of 5 External diameter 1040 µm (endobronchial surgery)
79-700-61-04	Bare fiber, 600 µm, 3 m, autoclavable External diameter 1100 µm (open thoracic surgery, VATS and endobronchial surgery)

79-700-62-04	Bare Fiber TS , 600 µm, disposable, 3 m, pack of 5 External diameter 920 µm (VATS, open thoracic surgery)
79-700-80-04	Bare Fiber TS , 800 µm, 3 m, autoclavable External diameter 1200 µm (VATS, open thoracic surgery)

79-700-45-04	Gas-irrigated fiber, 400 µm, disposable, 3 m, pack of 5 External diameter 2100 µm (endobronchial surgery)

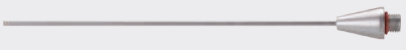
Fiber holder FlexPen 2.0

Modular system comprising handpiece, Tuohy-Borst adapter and attachment tips for all operations in which the laser fiber is applied to the surface of the body or body cavities in the contact process.

79-311-00-04 Fiber holder handle FlexPen 2.0

79-311-03-04 Tuohy-Borst adapter (pack of 25, sterile, single use)

79-311-02-04 7-cm attachment tip with suction
(2-piece: suction tube and internal fiber guide tube)



79-311-10-04 10-cm attachment tip (incl. bending mandrel)

79-311-30-04 30-cm attachment tip for waveguide (incl. bending mandrel)

Fiber preparation set

- Autoclavable
- Applicable for 400, 600 and 800 µm KLS Martin bare fibers
- Unrivaled economy

79-111-00-04 Fiber preparation set, autoclavable, complete, consisting of:
Fiber stripper 400, 600, 800 µm
Silicone mat
Knife (can be used only for bare fibers)

55-803-76-04 Storage set for autoclavable fiber preparation set and autoclavable fibers

79-100-56-04 Laser protective goggles, universal
for Nd:YAG laser, CO_2 laser and diode laser
from KLS Martin

Ordering information for **Limax®** and accessories

Ordering data

Limax®	
79-050-00-04	Diode-pumped Nd:YAG laser Limax® 120 with integrated smoke evacuation
80-060-01-04	Main filter unit for smoke evacuator marVac® (ULPA standard)
79-225-02-04	Funnel, flattened on one side, with Ø 22 mm connection, can be autoclaved 50 times at max. 134°C (273°F)
79-225-03-04	Plastic suction tube with cone connection for suction hose Ø 22 mm, can be autoclaved 50 times at max. 134°C (273°F)
79-225-05-04	Prefilter (HEPA standard) Ø 22 mm (m/f), sterile, single use (packaging unit = 50 pieces)
79-225-08-04	Air hose Ø 22 mm, 3.0 m long, multi-use, can be autoclaved 50 times at max. 134°C (273°F)
79-225-10-04	Air hose Ø 22 mm, 1.8 m long, sterile packed (packaging unit = 25 pieces)
80-060-04-04	Air hose, sterile, Ø 10 mm with Luer-Lock connection, 2.5 m long, (e.g. for connection of trocar) (packaging unit = 20 pieces)

For further information please refer to our accessory brochure.

Technical data

Limax® 120 with integrated smoke evacuation		
Laser type	Diode-pumped Nd:YAG laser	
Laser wavelength	1,320 nm ± 10 nm	
Laser output power	5 - 120 W	
Pulse type	Continuous pulse Single pulse: pulse on-time: Pulse train, adjustable: pulse on-time: pulse on-time:	 0.1 s – 10 s 0.1 s – 10 s 0.1 s – 10 s
Pilot laser wavelength	635 nm	
Pilot laser power	5 mW, adjustable 2-100%, pulsating	
Beam delivery	Laser fibers, focusing handpiece	
Laser beam quality	Numerical aperture < 0.22	
Light guide connector	SMA-plus socket, mechanically coded SMA socket	
Control and monitoring	2 microprocessors	
Operation	Rotary pushbutton and membrane keypad, 8.4” color display	
Cooling	Compressor air cooling	
Mains power supply, version E (U)	230 V ± 10%; 50/60 Hz	
Mains current	Max. 16 A (max. 30 A)	
Mains fuses	2 x T 16 A and 2 x T 6.3 A (2 x T 30 A and 2 x T 16 A) [T = slow-blow]	
Power input	3,300 VA	
Laser class	4	
Protection class	I	
Type of protection	IP X1	
Classification acc. to MPG/MDD	II b	
Pilot laser	3R	
Noise level	Neutral/no-load: 51 dB(A); full load: 60 dB(A)	
Smoke evacuator (VAC)	Integrated plug-in unit	
VAC control	CAN bus control via Limax®	
VAC mains power supply	110 – 230 V ± 10%; 50/60 Hz	
VAC mains current	Max. 16 A	
VAC mains fuses	2 x T 16 A (slow-blow)	
VAC power input	400 W	
Dimensions (W x H x D)	50 x 107 x 59 cm	
Weight (laser with integrated VAC)	120 kg	
Environmental conditions for transport and storage (without cooling water)	Ambient temperature: Relative humidity (non-condensing!): Atmospheric pressure:	-15°C to +50°C (+5°F – 122°F) 10% to 80% 700 hPa to 1060 hPa
Environmental conditions for operation	Ambient temperature: Relative humidity (non-condensing!): Atmospheric pressure:	+15°C to +30°C (59°F – 86°F) 30% to 75% 900 hPa to 1060 hPa
EMC Directive	89/336/EEC	
CE-marking	In conformity with 93/42/EEC	
Safety check	Annually	

Subject to technical modifications

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ANDROID APP ON Google play

https://play.google.com/store/apps/details?id=com.klsmartin.energydevices

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