RevoLix®

The RevoLution in Laser Surgery

2micron - the cutting edge in laser surgery
for Urology, Gynaecology, Spine Surgery, ENT, Neurosurgery and Pneumology

LISA LASER PRODUCTS
THE *2micron* COMPANY

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WHAT IS REVOLIX

RevoLix™ - what is the 2micron cw revolution?

For the first time a surgical laser is available for soft tissue surgery which unifies all advantageous properties of existing laser principles in a single unit.

RevoLix combines the cutting and ablation advantages of the well known CO_2 laser - but there is no need for an articulated mirror arm.

RevoLix achieves excellent haemostasis like the Nd:YAG or Diode laser - but there is no risk of deep tissue penetration.

RevoLix provides excellent tissue vaporisation – but unlike the KTP laser without the observed significant decrease in efficiency caused by bleaching of the target chromophore.

RevoLix tissue effect is shallow like the Holmium laser – however there is no trauma produced by the laser and cutting edges are smooth and clean. In open surgery there is no splattering.

RevoLix laser radiation is delivered to the surgical site through multi-use or disposable flexible fibres - ideal for endoscopic, laparoscopic and minimally invasive surgery.

RevoLix – what are the advantages?

Cutting efficiency of soft tissue and haemostasis is superior to any known alternative. Tissue damage is restricted to less than 1 millimetre beneath the cut. *RevoLix* preserves excellent vision to the surgical site. There is no vision impairment due to bleeding, excessive bubble formation, tissue fragments or ruptured tissue.

Unlike KTP the surgical situs is free of any visible laser glare. The colour neutral laser safety eyewear does not generate discolouration. Endoscope lenses remain free from splatter when used in open surgery or in laparoscopy.

RevoLix – what are the benefits?

- less bloodloss
- quick recovery time
- short hospital stay
- less postoperative care
- short catherisation time in BPH treatment

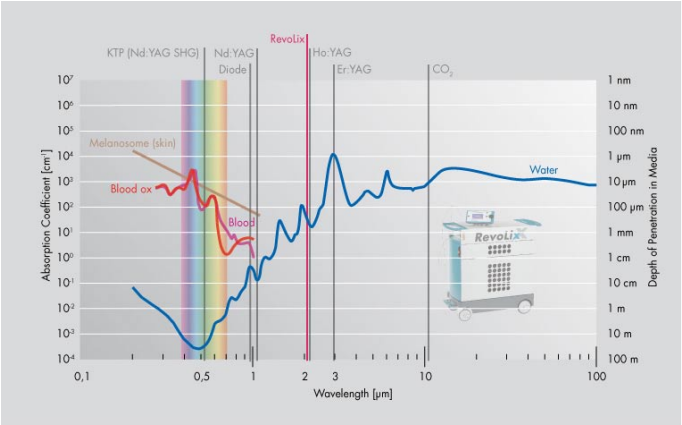
- precise surgery
- no deep penetration
- safe operation
- excellent haemostasis
- treatment of patients under anticoagulant

- less damage to endoscopes and instruments
- reusable and disposable fibres
- colour neutral safety glasses

- multi-disciplinary for minimally invasive surgery

RevoLix™ - why Two Micron continuous wave ?

The *RevoLix* wavelength at 2.0 micron is known for its suitability for resection and ablation, safe application in an aqueous medium and it generates excellent haemostasis. These excellent properties are due to the efficient absorption at this wavelength by water which is ubiquitous in any tissue. At the *RevoLix* wavelength of 2.0 micron the absorption is 2.5 times stronger than at the Holmium wavelength providing even more precise cutting in soft tissue surgery. In soft tissue surgery efficient and even cutting combined with strong haemostasis is required. This is provided by the *RevoLix* laser in an unmatched manner. The *RevoLix* laser operates in a continuous wave mode and cuts and vaporises vascular and white tissue without deep penetration or uncontrolled necrosis. Clean cuts and excellent haemostasis are achieved by moving the beam across the surgical site. Generous laser power capacity allows high vaporisation and resection rates at no bleeding and short theatre time.



Absorbtion spectra of body chromophores

This graph shows the absorption of the most important body chromophores (RED for blood, BLUE for water, BROWN for melanin) at different wavelengths. Depth of penetration is shown at the right. Laser wavelengths are vertical lines.

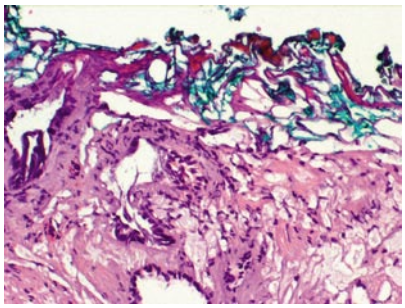
KTP: In the absence of hemoglobin the KTP laser at 532 nm experiences close to no absorption. At the KTP wavelength water as the main body constituent is almost transparent. Under laser treatment hemoglobin bleaches due to the temperature increase in tissue caused by the laser. This explains the ever decreasing ablation efficiency during a KTP treatment.

Diode: At 980 nm neither water nor hemoglobin is a strong absorber. This explains the deep penetration at this wavelength.

RevoLix and Holmium: Both lasers are of similar wavelength which is selectively absorbed by the water molecule. Other than hemoglobin water retains its absorptive properties under the temperature increase in tissue caused by the laser. This explains the everlasting ablation efficiency during *RevoLix* treatment.

RevoLix - why is it safe ?

In an aqueous medium the laser effect to tissue is restricted to less than 2 millimetres in front of the tip of the fibre. Any tissue further afield is shielded of by the medium. The same mechanism



is protecting tissue and organs adjacent to the cut. Any tissue more distant than 2 millimetre is unaffected by the *RevoLix* laser. Opposed to KTP this property eliminates the risk of unintentional tissue damage during laser surgery.

Literature:

Bach T., Herrmann T.R., Ganzer R., Burchardt M., Gross A.J.; "RevoLix™ vaporesection of the prostate: Initial results after 54 patients with an one-year follow-up"; World J. Urol., June 2007, Vol. 25 (3), 257-262

Xia S.J., Zhuo J., Sun X.W., Han B.M., Shao Y., Zhang Y.N.; "Thulium Lasers versus Standard Transurethral Resection of the Prostate: A Randomized Prospective Trial"; European Urology, June 4, 2007, Epub ahead of print, Printed Version: European Urology January, 2008, Vol. 53, 382-390

How does *RevoLix* match with your theatre?

The laser is extremely user friendly. *RevoLix* does not cause noise strain to theatre personnel. Large castors allow easy handling of the small footprint laser system. Regular theatre utilities are sufficient. The laser operates from standard power outlet. Special installation for cooling water and electrical supply are not required.

The laser has proven its extreme sturdiness during routine transportation between theatres and mobil healthcare services.

RevoLix - operation of the laser

The laser is easy and safe to operate. The menu is easy to understand. Operational modes such as continuous or pulsed (cw intermitted) are selected by push buttons. The power setting is adjusted with a large adjustment wheel. Large characters display the settings on the easy to read display.

RevoLix - delivery systems perfected

LISA offers a wide range of specialised delivery systems. Please refer to the LISA *Medical Laser Accessories* brochure for various front and side firing fibres, laser applicators and reconditioning tools.

Reusable front firing fibres are stripped and cleaved in preparation for the next case. Disposable front firing fibres are available for the treatment of BPH. All fibres match with the surgical instrumentation recommended and approved by LISA laser products.

RevoLix - superior economics

Depending on your theatre infrastructure either reusable or disposable fibres may be economical advantageous. For the *RevoLix* laser both of these options are available to your choice.

Beyond a straight purchase of a *RevoLix* laser there are billing schemes on offer which are based on your personal usage pattern. Please contact your local LISA laser products distributor for further details and opportunities.

RevoLix - Join us on the crest of the continuing *2nicron* wave.

RevoLix - what are the applications?

The *RevoLix* laser system has demonstrated its superiority in surgical disciplines such as Urology, Neurosurgery, Gynaecology, Pneumology, Spine Surgery and ENT. In Urology *RevoLix* gains much attention for its superior performance in vaporisation and resection of the prostatic adenoma (BPH), outpatient treatment of reoccurring bladder tumours, opening of strictures and incisions and tissue preserving excisions.

Urology

VapoResection of prostate
Vaporisation of prostate
Resection of prostate
Enucleation of prostate
Bladder neck incision
Opening of strictures
Vaporisation and excision of bladder tumours
Partial nephrectomy
Laparoscopy


VapoResection of prostate


Vaporisation of prostate


Excision of kidney tumour

Haemorrhoids

Gynaecology

Excision of polyps
Endometriosis
Hysterectomy
Adhesiolysis
Conisation
Condylomata
Myomectomy


Adhesiolysis

Neurosurgery

Fenestration of cysts
Ventriculocysternosomy
Catheter recovery
3rd ventriculostomy
Tumour resection
Haemostasis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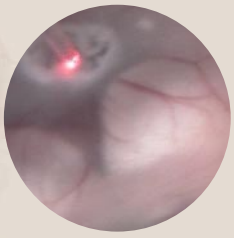
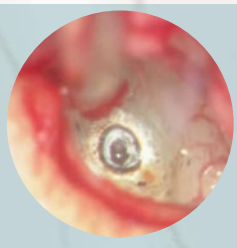

Ventriculostomy

ENT

Excision of tumours
Excision of granulomas
Tonsillectomy
Stapedectomy
UVPP


Stapedectomy


Excision of tumour

Pneumology

Bronchoscopy
Airway recanalization
Desobstruction
Tissue coagulation


Airway recanalization

General Surgery

Technical Specifications RevoLix®

	50 Watt Laser	70 Watt Laser	120 Watt Laser
Laser system	continuous wave DPSS laser		
Wavelength	2.0 micron		
Power at tissue	adjustable, 5 to 50 W	adjustable, 5 to 70 W	adjustable, 10 to 120 W
Chopped mode	adjustable ON-time, 50 msec to cw		
Beam delivery	wide range of flexible silica fibres		
Aiming beam	635 nm, bright red, 1 mW, adjustable		
Utilities	230 VAC, 1~, 50/60 Hz, 2.4 kVA		
Cooling	integrated		
Weight	150 kg		
Dimensions	H 950 x W 420 x L 890 mm (height w/o display)		

Safety Standards: IEC 60601
CE acc. Council Directive 93/42/EEC

U.S. federal law restricts this device to sale by or on the order of a physician.

Specifications are subject to change without notice.
Made in Germany 2008-09 V06

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