



EXCELSIUS
MEDICAL



MICRON M7 REFRACTIVE EXCIMER LASER

PRECISE, SAFE & COMPACT

 LEADING LIGHT TO THE EYE.


EXCELSIUS
MEDICAL

EXCELSIUS MEDICAL

LEADING LIGHT TO THE EYE.



Who We Are

EXCELSIUS MEDICAL GmbH was founded in 2015 in Ulm, Germany. In early 2019 the headquarter moved to Nuremberg, northern Bavaria into larger premises using the advantage of better connection to international travel, local universities and bio-medical network.

Our team consists of experienced specialists in medical technologies bringing new ideas to advance ophthalmic surgery devices.

Our Goal

Is to develop, manufacture and sell Femtosecond and Excimer Lasers for refractive surgery. By using the latest R&D and production tools, high quality standards and an international network of suppliers for fast transformation of ideas into final products, we aim to take the technology leadership. Short communication lines and direct contact are the key to our success.

At **EXCELSIUS**, we are striving for compact and affordable integrated solutions. Our Excimer Laser has the smallest overall footprint and provides the perfect match to our Femtosecond Laser.

The combination of both **EXCELSIUS** lasers offers our customers the most compact refractive workstation in the industry.

Compact Laser Workstation

- The **MICRON M7** is designed for maximum patient comfort.
- Straightforward optics design for precision and predictability.
- Designed for cost-efficiency and low gas consumption.

Treatment Options

LASIK PRK, TEpi-PRK (Transepithelial PRK) with selectable zone sizes and Depth.
Presbyopia , PTK and optional Topography guided Treatments (planned).

Unique Beam Delivery Philosophy

We have redefined the traditional approach. With the **Micron M7** the patient lies still, microscope and beam applicator moves towards the patient on robotic arms – resulting in small system dimensions, less complex mechanics, large working distance and less dependence on environmental influences.

REVOLUTIONARY

The first laser in refractive surgery leading the light right to the eye via a robotic applicator.

MORE PRECISION

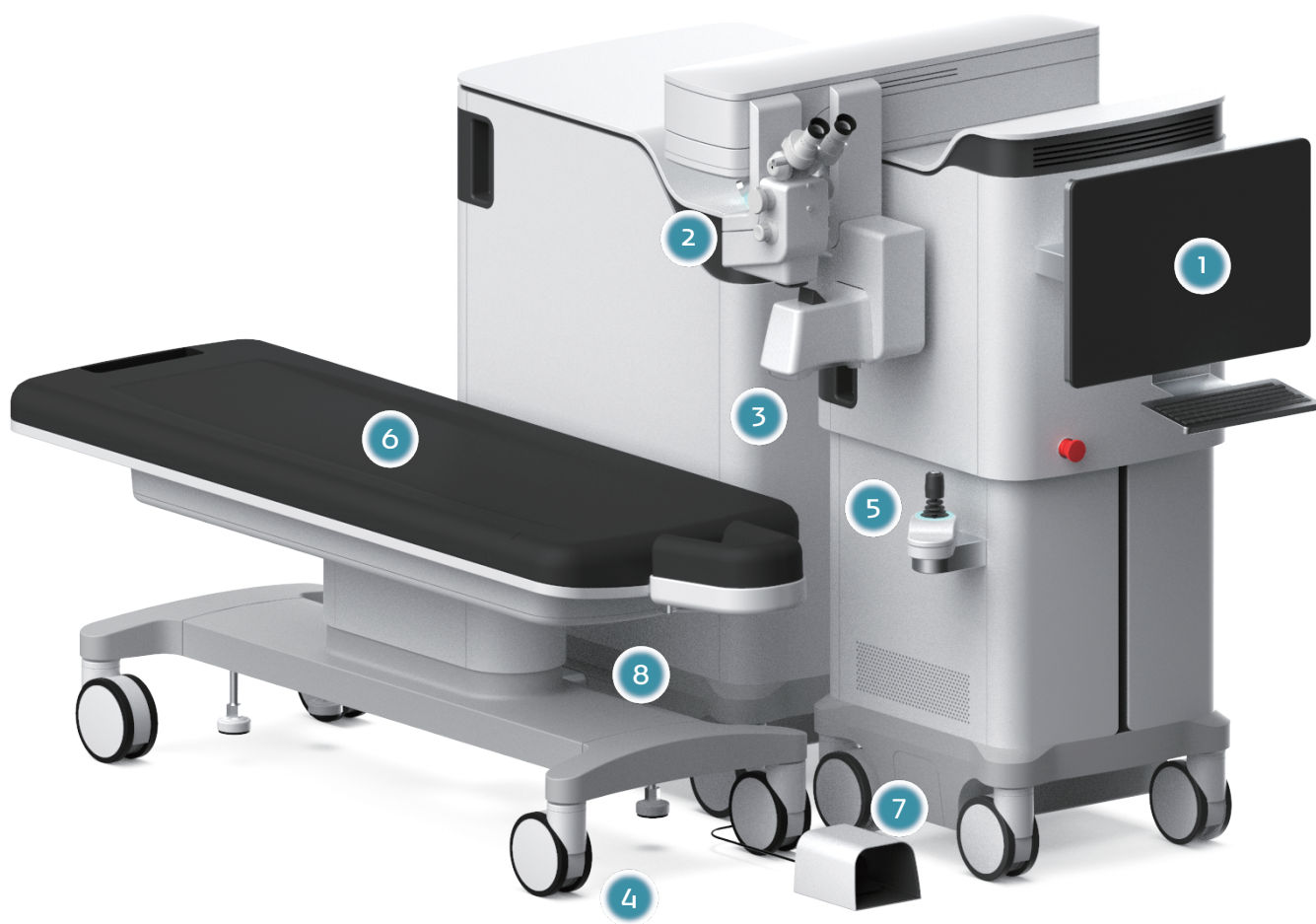
A combination of continuously working video eye-tracker and docking eyepiece tracks eye movements and minimizes fixation saccades.

MICRON M7 Controls and Components

- 1 LARGE TOUCHSCREEN MONITOR and KEYBOARD for easy user interaction.
- 2 MICROSCOPE including LED ILLUMINATION and auxiliary beams on a robotic arm. Large working distance and natural colour LED for easy patient preparation and surgery control.
- 3 The UNIQUE ROBOTIC APPLICATOR moves down after FLAP CREATION either by mechanical microkeratome or Femtosecond Laser. It delivers the laser beam close to the eye to minimize environmental influences.
- 4 SMALL FOOTPRINT, LIGHT and MOBILE.
- 5 JOYSTICK CONTROL for a simple docking procedure and automated for patient eye centration.
- 6 COMFORTABLE PATIENT BED. Free viewing area minimizing the patients claustrophobic feelings.
- 7 FOOTPEDAL to start laser treatment and activate smoke plume removal for predictable laser beam delivery and elimination of unpleasant odors during laser operation.
- 8 SMART OPTICS DESIGN and LASER ENERGY MANAGEMENT minimizes operating costs and gas consumption.

MICRON M7

REFRACTIVE EXCIMER LASER



PRECISE, SAFE & COMPACT

Robotic Arms

EXCELSIUS MEDICAL is presenting the most compact Excimer Laser platform. We have eliminated the need for a motorized patient bed. Instead we are leading the laser light to the eye via a specially designed mobile applicator which is attached to a robotic arm.

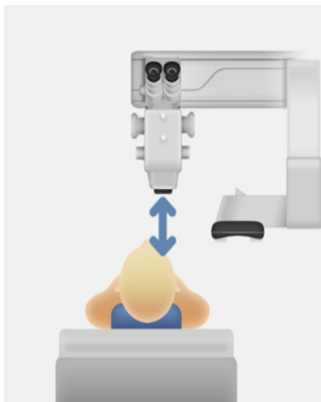
The main advantage of this approach is the large working distance during patient preparation and a small distance during treatment, minimizing environmental influences.

Auto Centration

Our video eyetracking system is connected to the controls of the robotic arms. Once the pupil is detected, the system automatically locks itself on the center of the patient's pupil, following the movement within tracking range.

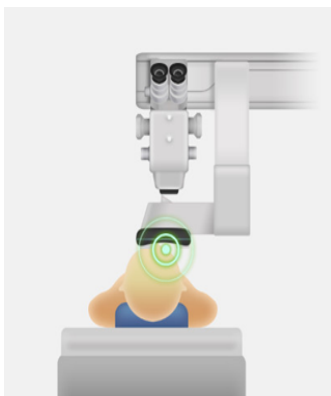
In case the eye moves out of eyetracking range during surgery, a re-centration just by pressing the center button can be achieved quick and easy.

A manual reposition of the bed by using the joystick is not necessary anymore.



Preparation

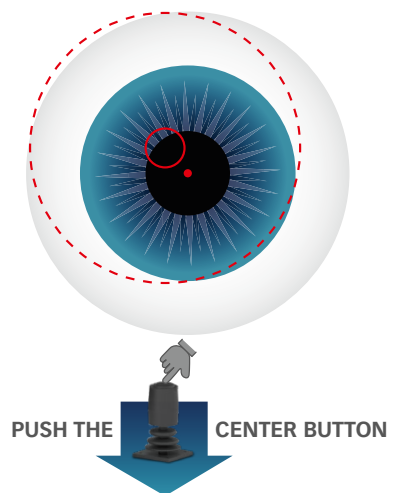
Comfortable draping and flap creation



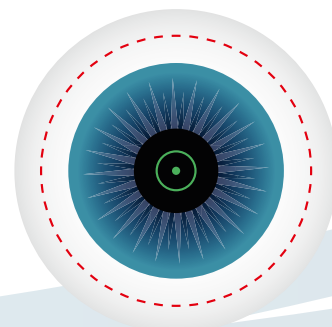
Treatment

Close distance for maximum control and precision, excluding environmental influences.

Pupil, slightly decentered, within Eyetracker Range



Delivery Arm moves to Pupil Center and Eyetracker works within Tracking Range determined by the green inner Ring



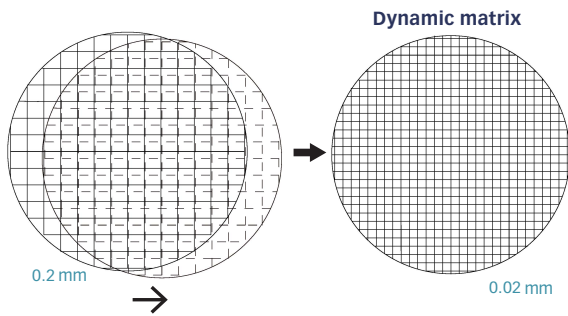
Safe and Fractional Ablation

With the Excelsius **Micron M7**, we are using the innovative dynamic matrix pulse setting to improve the ablation pattern resolution around 0.02mm that makes laser ablation very smooth and precise when the Topo-guided treatment is applied. Fractional ablation is our approach of treating the whole treatment zone in a combined spherocylindrical pattern from the beginning, increasing the refractive correction over time.

The randomized flying spot pattern distributes the individual laser pulses across the whole treatment zone from the beginning. Thus spreading the thermal impact on a larger area and minimizing the temperature increase on the stroma. This will reduce the risk of haze on surface ablation techniques such as PRK, EpiLasik or related treatment techniques.

As an additional advantage, any unintended surgery interruption poses less risk. The surgery can later be finished in a second session similar to re-treating an undercorrection.

Dynamic matrix algorithm



EXCELSIUS Dynamic matrix

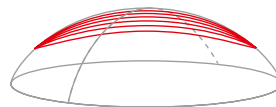
The innovative dynamic matrix pulse setting of laser ablation pattern improve the resolution from 0.2mm to 0.02mm.

Fractional Ablation

EXCELSIUS Fractional Ablation

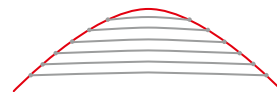


Full optical zone – fractional correction

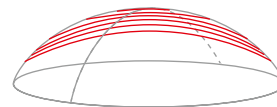


Wide area increasing refractive power over time. Large spot distribution for lower thermal impact.

Traditional Technology

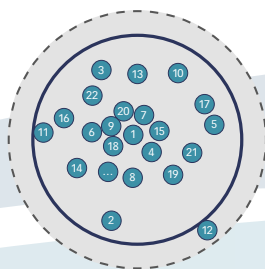


Small optical zone – Full correction



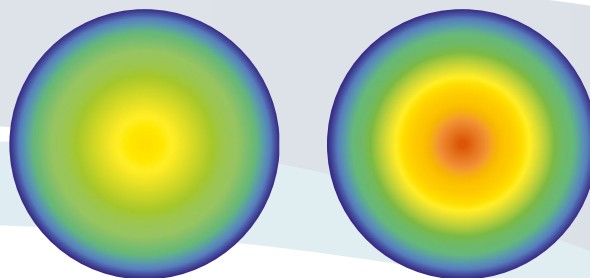
Small area, full refractive power, increasing corrected zone over time. Higher thermal impact.

Optimized Flying Spot Technique



Low thermal impact is important. Each individual laser spot position is calculated in such a way, to never overlap with the previous pulses avoiding thermal accumulation.

Schematic thermal Images illustrating the lower thermal Impact



Closed-up Operation & Plume Removal

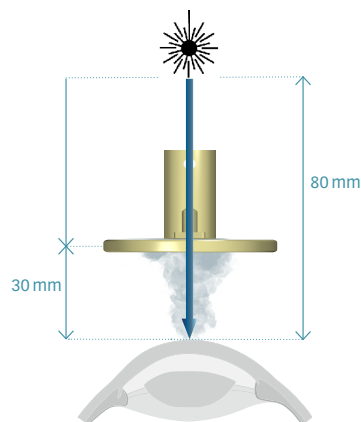
The **MICRON M7** uses patterned closed-up operation design that the applicator is only 80mm away from cornea. A very short and well defined clean operating zone can reduce the unpredicted interference by noisy macro environment. Our eye tracker module is located in applicator, so eye tracker camera is close to the eye for best recognition and optimum IR illumination.

A special eyepiece with an integrated plume removal intake with applicator. It is located at an optimal position in relation to the corneal plane. The smoke plume is removed at the location of its highest density minimizing its influence on the laser beam quality. The plume is removed in such way, that the airflow will not affect the stromal hydration.

The plume removal is just 30mm away from the eye which can still move freely underneath.

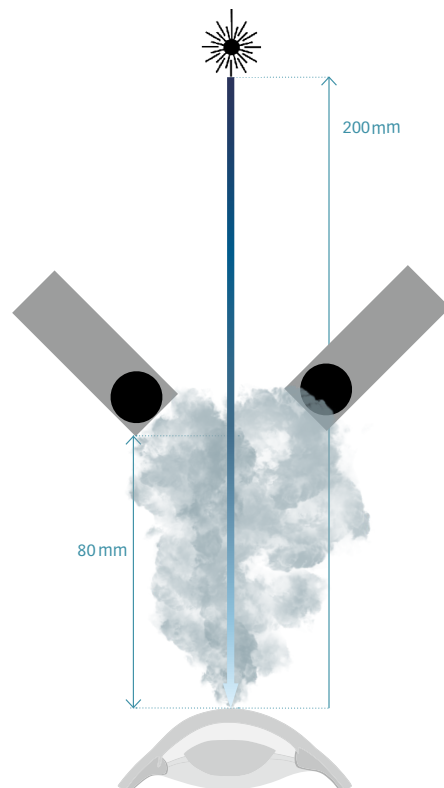
- Plume evacuator close to the eye to remove smoke at the highest density without affecting the stromal bed
- No unpleasant smell of ablation products

Short Operation & Aspiration Distance



EXCELSIUS Plume Evacuation

Laser beam travels short distance through environment and is minimally influenced. Nearly no unpleasant odours.



Traditional Plume Evacuation

Laserbeam affected by dense smoke plume near corneal plane. Still environmental influence. Noticable "burnt tissue" smell.

Patient Comfort

The slidable patient bed provides maximum patient comfort. When preparing surgery, all robotic arms are moved away from the patient. The patient will not experience the feeling of being "blocked and locked into a machine" and lies relaxed during the whole procedure.

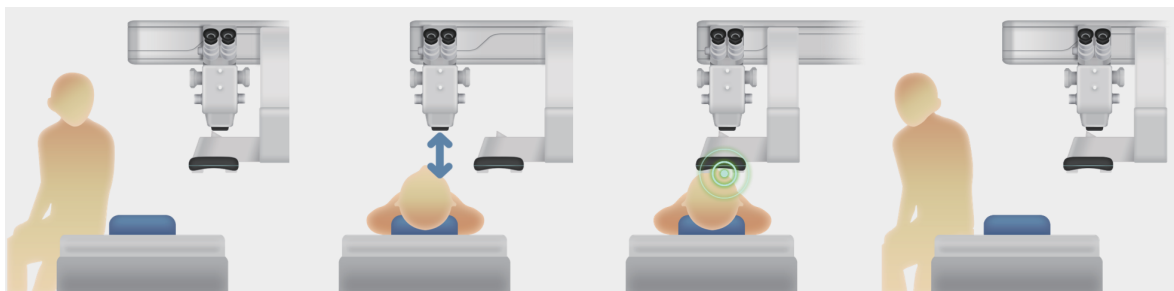
In the case of a femtosecond laser assisted surgery, there is no need to reposition the patient, as the applicator can be moved to the side, the Femtosecond Laser is moved in for treatment, while the microscope can be used for flap management and surgery control.

Patient Entry

Preparation

Treatment

Patient Exit



1

Easy Entry.

No claustrophobic feelings,
good patient-doctor contact.

2

Comfortable draping
and surgery preparation.

3

Short working distance
of the applicator for safety
and accuracy.

4

Easy Exit.

Cost Efficiency

The **MICRON M7** uses a specially designed laser source with large energy reserves for long active and passive gas lifetime.

The laser head generates a small and homogeneous beam. It is delivered along several small mirrors with a very low fluence. This results in high level of stability, low stress on the optics and long optics lifetime.

The laser startup and time between surgeries only takes a few minutes. This allows an optimized workflow with minimized patient waiting times.

Accepting Walk-In patients during the daily routine now becomes possible.

The small footprint provides the possibility of installing the laser in almost all locations, minimizing the overhead costs of the clinic.

For easier installation or optional mobile use, the **MICRON M7** is designed to be separated into two parts.

Modular design

The **MICRON M7** is a modularized design with a slidable patient bed. The laser system weighs only 370 kg which make it easy to handle and transport.



THE EXCELSIUS PROMISE

At **EXCELSIUS** we understand the importance of effective and direct support once your laser has been installed.

Our worldwide distribution partners are carefully selected. We have chosen them so they can provide top level technical

as well as clinical support for your laser. We at **EXCELSIUS** are keeping their training always at the optimum.

MICRON M7

VERSATILITY

EXCELSIUS Ophthalmic Workstation

The **MICRON M7** Excimer Laser is designed to work in combination with our **Femton F1** Femtosecond Laser as a refractive workstation. This enhances the scope of applications from refractive surface ablation techniques such as PRK all the way to FemtoLaser Assisted Cataract Surgery (planned).

The large working space further enables the use of already present Femtosecond Lasers.

Please contact us for a current list of **MICRON M7** compatible Femtosecond Lasers.



EXCELSIUS also provides direct support helping our local partner for more complex issues.

All our customers are always welcome to contact us directly for any queries, complaints and suggestions.

We are there to help. Contact us anytime at marketing@Excelsius-medical.com



EXCELSIUS
MEDICAL

SPECIFICATIONS

EXCELSIUS MEDICAL GMBH | MICRON M7 EXCIMER LASER

Repetition Rate	800 Hz
Spot Size	0.5 mm ²
Energy Density	90 ~ 180 mJ / cm ² at the Cornea
Pulse Energy	< 1 mJ at the Cornea
Ablation Method	Flying Spot Scanning, Fractional Ablation
Pulse Width	4 ~ 8 ns
Cooling	Air Cooled
Input Voltage	230 VAV, 50 / 60 Hz ±10 %
Input Current	7 A (max)
Dimensions	Tower Box / Laser Box : 855*997 *1480 mm / 911*684*1093 mm (Length* Width* Height) Tower Box / Laser Box : 170 kg / 200 kg

Correction Range *

Myopia	-0.25D ~ -12.0D
Hyperopia	+0.25D ~ +6.0D
Astigmatism	-6.0D ~ +6.0D

Ablation Area *

Myopia	2.0 – 9.0mm Optical Zone 3.0 – 10.0mm Transition Zone
Astigmatism	2.0 – 8.0mm Optical Zone 4.0 – 10.0mm Transition Zone
Hyperopia	2.0 – 8.0mm Optical Zone, 4.0 – 10.0mm Transition Zone

* Note: The actual correction limit and ablation area is determined by the individual patient factors such as central corneal thickness, pupil size etc.

Treatment Methods

LASIK
PRK | Trans-epithelial
PTK | Presbyopia
Topography Guided Treatments (optional)

Thearpeutic Laser

Line Laser

Fixation Laser

ArF Excimer Laser, 193nm <3W Class 4
Red Diode Laser, 652nm, <1mW Class 2
Green Diode Laser, 532nm, <1mW Class 2

