



# CATARACT

## **FEMTO-LASER ASSISTED CATARACT SURGERY**

ACHIEVING GOOD EYESIGHT WITH PRECISION





## **LASER PRECISION IN CATARACT SURGERY AND LENS EXCHANGE**

Has your eye doctor recommended that you have the natural lens in your eye replaced with an artificial one due to cataract formation? If so, we have good news for you: Cataract surgery and lens exchange have undergone profound progress in the last few years and can now be performed without using a surgical blade.

### **HELPING YOU SEE**

Using an innovative new laser technology, we achieve ultimate precision and safety in cataract surgery. The following pages will tell you more about this new technology and help you decide if the laser precision method is right for you. As always, ask your doctor if you have specific questions or concerns not covered in this brochure.

## **CATARACT AND LENS EXCHANGE**

Cataract is the most common reason why the eye's natural lens should be replaced with an artificial lens. In most cataract cases, the aging natural lens becomes cloudy, blurring your eyesight and dimming colors. High near- or farsightedness and presbyopia may be other reasons to exchange the natural lens in people who would prefer to stop wearing glasses.

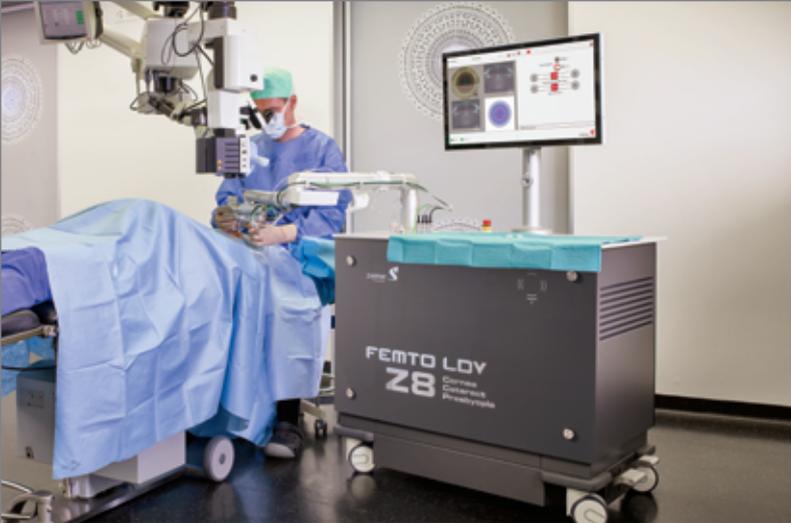
## **RECENT ADVANCEMENT: THE LASER REPLACES THE BLADE**

The femtosecond laser used in cataract surgery and lens exchange precisely separates the different tissue layers and structures in the eye using a powerful light beam. In conventional surgery, the surgeon creates incisions in the eye by hand and uses ultrasonic technology, developed in the 1970s, to break the clouded natural lens apart so that it can be removed before a new lens can be put in. Traditional lens exchange procedures are safe and common but cannot achieve the surgical precision of a procedure performed with a laser.

## **THE FEMTOSECOND LASER**

The laser used in Z-Cataract procedures has an activation period of a few hundred femtoseconds. One femtosecond corresponds to 0.000,000,000,000,001 seconds. The tissue depth at which the femtosecond laser works can be adjusted by the surgeon allowing the laser to work precisely both on the surface of the eye and in deeper layers. The laser power interacts with the tissue only for a tiny fraction of a second which results in a gentle procedure.

The acronym LASER stands for 'Light Amplification by Stimulated Emission of Radiation'. A laser is essentially a light emitter. Unlike incandescent light such as that from a common light bulb, laser light is directed into one focused beam which amplifies its intensity. These days there is a very broad range of applications for laser technology: DVD players, distance measuring instruments, cutting and welding tools as well as many clinical applications.



## THE LASER CATARACT SURGERY PROCEDURE

What can you expect during your femto-laser cataract procedure? First, you will have a preoperative examination where your eyes will be measured so that your doctor can select the proper artificial lens for you by measuring the length of the eye from front to back. This procedure is absolutely painless, doesn't touch your eye and will ensure that you get the perfect lens.

Next, the information gathered will be programmed into the femtosecond laser device so that the surgery is customized to your exact eye anatomy.

Before your surgery, you will be led to a comfortable surgical bed where you will lie down. Your surgical team will disinfect and dress the area around your eye in a sterile fashion. Drops will be put in the eye so that you will not feel any pain during the procedure. Once your eye is anaesthetized, a liquid-filled ring which centers the laser beam path is placed on your eye with a light vacuum so that the laser will be in the perfect position during surgery.

Once the laser has been programmed and started, it's job will be complete in less than one minute. During your treatment, the surgeon will be by your side and supervise every step of the operation. The integrated OCT system enables the surgeon a clear visualization of the eye's surfaces – before, during and after the procedure.

The laser will divide your clouded lens into fragments, like that of a pie, which will then be removed from the eye through a tiny tube that is only a few millimeters wide.

A perfectly circular opening is then made in the lens capsule in order to insert the new artificial lens. The laser performs this step with ultimate precision which is important as the final outcome of the surgery depends upon the precise placement of the artificial lens. Next, the laser creates tiny tubes from the outside of the eye to the lens capsule. The femtosecond laser creates tunnels so small and precise that they do not need sutures and will close on their own, thus preventing infection.

Lastly, the fragmented cloudy lens is aspirated via the tunnel and an artificial lens is inserted in its place.





## **LASER OR BLADE – WHAT ARE THE DIFFERENCES?**

### **Ultimate precision in the micrometre range**

A more precise surgery makes it more likely that the artificial lens will remain stable and provide the best possible vision. Using the femtosecond laser, surgeons can achieve the perfect capsule shape, size and position for lens fragmentation. The high-precision openings created help the surgeon to perfectly align the artificial lens in the eye.

### **Minimally invasive**

The femtosecond laser not only creates precise accesses to the interior of your eye, it also fragments the clouded lens in such a way that it can be ultimately removed with very little or even no ultrasonic power. This means less strain on the sensitive tissues and structures of the eye thereby helping to prevent an inflammatory response.

### **Predictability of important surgical steps**

Your eye is carefully measured and the measurement data programed into the laser. By doing this in advance, the surgeon can plan, supervise and guide your unique and individual treatment from start to finish.

### **Individualized and combined treatment**

We provide treatment specifically made for your eye. The laser's versatility allows us to precisely pinpoint the locations at which it will separate the tissues, ensuring a custom procedure perfectly designed for your eye.

The following table highlights the most important differences between the new femtosecond laser lens implantation surgery and conventional lens implantation surgery.

FEMTOSECOND LASER	CONVENTIONAL
The laser introduces a perfectly circular opening into the lens capsule using laser light	The lens capsule is manually opened, using a metal hook or forceps
The laser fragments the clouded lens into precise sections within seconds	The clouded lens is broken apart with ultrasound which is achieved by inserting an ultrasound wand into the lens capsule
The laser places precisely shaped and positioned tubes in the eye to insert the new lens	The eye is cut with a scalpel or a diamond blade to make an opening for lens insertion
The fragmented lens is removed by aspiration and irrigation	
The artificial lens is inserted with an injector	

## WHY WE DECIDED TO USE THE ZIEMER FEMTO LDV Z8 LASER:

Your safety and wellbeing during and after the surgery are our highest priorities. This is why we chose the Ziemer FEMTO LDV Z8 laser device which offers the following features:

- The laser can be used for many different applications and allows options in surgical planning. Since the laser performs operations with a comparatively low laser pulse power, the surgical intervention may be gentler for the eye.
- Unlike other lasers, the Ziemer Z8 is mobile and can be moved to your bedside instead of you having to go to the laser. This provides more comfort and convenience to you during your surgery.
- The interface attaching the device to your eye was carefully designed to adapt to the shape of your eye. This reduces both eye reddening and the pressure the eye endures during surgery helping keep the procedure safe and you more comfortable.
- The Ziemer Z8 helps the surgeon plan and supervise each unique surgery through special visualization features that enable a live view into the layers of the eye through imaging technology called OCT (optical coherence tomography).

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## TODAY, TOMORROW AND IN THE FUTURE

Technology is rapidly changing and it is important to carefully evaluate your options when it comes to Femtosecond lasers and extremely precise imaging devices.

At Ziemer, our mission is simple: We embrace a strategy that grows with your practice, offering you the latest technology available today, on platforms that are ready for tomorrow.

### Important Safety Information

The FEMTO LDV Z8 Surgical Laser is indicated for use in patients undergoing cataract surgery for removal of the crystalline lens or in patients undergoing other treatments requiring single-plane, multi-plane, partial thickness and full thickness cuts/incisions in the cornea. This procedure is not approved for use on children and infants.

Talk to your doctor if you have had: corneal disease or pathology that precludes transmission of light at the laser wavelength or causes distortion of laser light, Descemetocoele with impending corneal rupture, a corneal implant, hypotony or hypertension, glaucoma, residual, recurrent, active ocular or eyelid disease including any corneal pathology (e.g., recurrent corneal erosion, severe basement membrane disease), a history of lens or zonular instability or other eye issues that your surgeon should review.