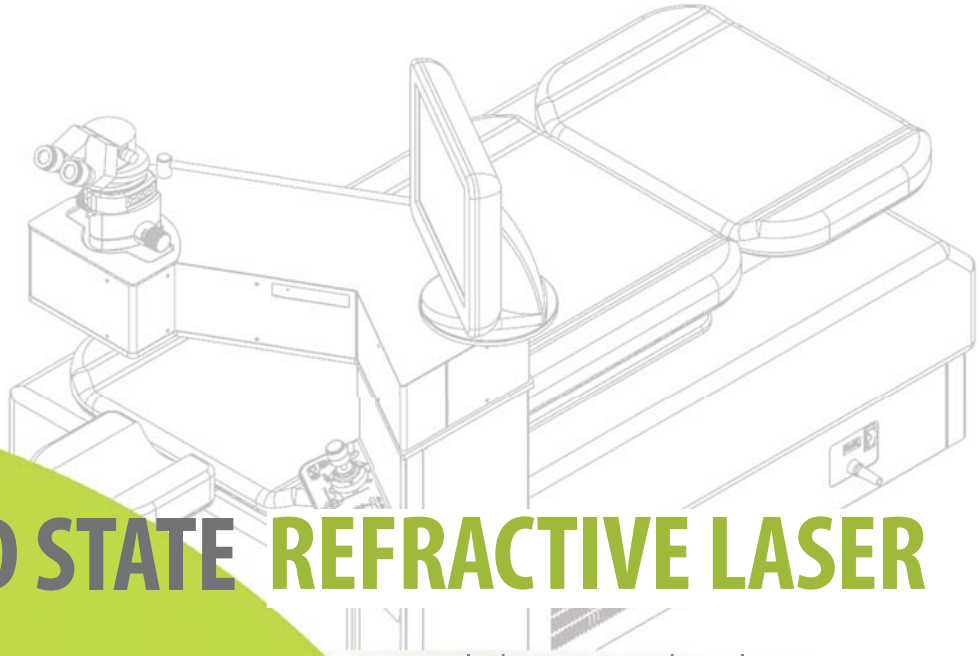
PULZAR™ Z1



SOLID STATE REFRACTIVE LASER

Protect the environment, move to solid state technology

CUSTOMVIS™

- Solid State Reliability
- High Resolution Ablation
- Superior Tracking Technology
- Custom Surgery Solution

www.customvis.com

PULZAR™ Z1: The Future Friendly Technology

The high performance CustomVis™ Pulzar™Z1 solid state refractive laser is a user friendly system and the future of corneal refractive surgery. The Pulzar™Z1 is the only commercially proven solid state refractive laser system and currently installed in many countries across the globe. It offers a cost effective technology allowing truly customised treatment to a large range of vision disorders. By integrating solid state technology with an innovative multidimensional eye tracker, homogenous beam profile and a high repetition pulse rate, the Pulzar™Z1 reaches new heights of reliability, efficiency and customisation.

The Pulzar™Z1 solid state technology generates a small flying spot of 0.6mm with a unique wavelength of 213nm to accurately ablate the targeted area. Ablation of the cornea with the 213nm wavelength of the Pulzar™Z1 is less affected by variations in environmental humidity or tissue hydration, reducing the risk of uneven tissue removal during surgery which in turn avoids the demand for the faster treatment time. When combined with the absence of any measurable thermal effect, these features make the Pulzar™Z1 extremely user-friendly.

The technology's benefits don't end there. Reduced warm-up time, no gas cost, greater patient turnover and minimum down time make Pulzar™Z1 more attractive and affordable in a financially competitive environment. In addition, the Pulzar™Z1 offers a long life span for the laser source, crystals and optics thus making the full project very affordable to any ophthalmic clinic. Hence the CustomVis™ solid state technology is an extremely commercially friendly technology.

The Nd:YAG diode pump laser source of Pulzar™Z1 has a low power consumption as well as zero use of toxic gases. There is no longer a requirement to store or dispose of toxic gas bottles or exhaust gas residuals from the operating rooms. In addition the Pulzar™Z1 provides much quieter surgical procedures proving this technology truly is friendly to the environment.

> *"I began using the solid state laser more than eight years ago to treat complex irregular astigmatism that could not be treated by any excimer laser system available at that time. The results of the Solid state laser were so good that I stopped using the excimer laser and now treat all patients with a Pulzar™Z1 Solid State Laser. I feel that the results are more accurate because the laser fluence is not affected by fluid on the cornea or dehydration of the cornea during treatment."*
>
> ***Dr Ian Anderson, Australia***

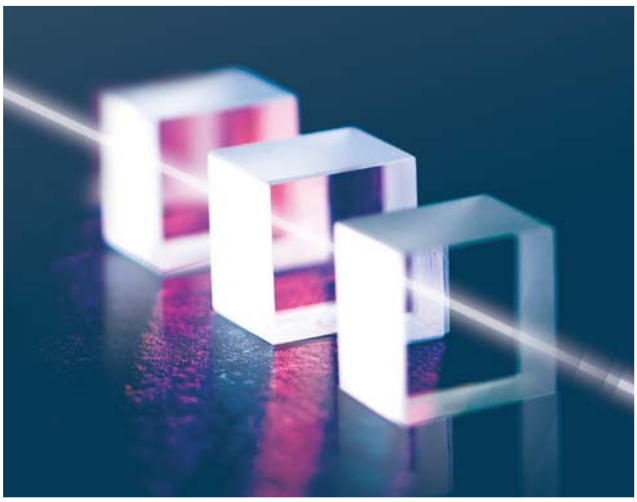
SOLID STATE TECHNOLOGY

The Pulzar™Z1 solid state technology incorporates a diode pumped Nd:YAG laser (1064nm) and three non-linear crystals to create a stable and reliable 213nm wavelength. This eliminates the need of poisonous gases and other issues associated with conventional excimer gas lasers, such as having to replace or refurbish the laser gas cavity after only few years of use. Replacing the gas cavity can be a very expensive especially for low volume clinics. The solid state laser requires lower power consumption and decreases the start time as compared to most excimer lasers. Solid state technology offers you the freedom to use the laser when and as often as you want with minimal start and running cost making ***the Pulzar™Z1 a very competitive and low per procedure cost system.***

The CustomVis™ patented solid state technology represents superior reliability and predictability that contributes to excellent surgical outcomes.

The solid state technology laser source offers:

- Stable homogeneous beam energy
- Very long laser source and crystal lifetime
- Improved reliability and efficiency
- Low power consumption
- Improved beam quality
- Fast and easy start up process



During corneal refractive surgery, the fluid layer on the corneal surface has proven to be a barrier to ablation for the 193nm wavelength of the excimer laser. There is no significant absorption of the 213nm wavelength by 0.9% NaCl and/or BSS so surgery can be performed on a wet or irregularly hydrated cornea without concern. Fluctuations in cornea hydration or environmental humidity are hence unlikely to impact on the corneal ablation when using the solid state laser.

The benefits of the 213nm wavelength include:

- Less dependence on tissue hydration
- Production of a clean and smooth ablated surface
- Reduced thermal effect and collateral damage
- More efficient tissue ablation
- Longer lifetime of the optics

"I have used many different excimer lasers over the years and more recently have used the Pulzar™Z1 solid state laser. I have noticed that the results are better with the Pulzar™Z1: more consistent, even in complex prescriptions and very high levels of astigmatism. The small spot size and accurate eye tracker I am sure contributes to this and has helped to obtained excellent results with less pain and haze in surface treatments. I am so impressed with the results that I use two Pulzar™Z1 in Jersey/United Kingdom and am looking at a third."

Prof. Sunil Shah, UK

HIGH RESOLUTION ABLATION

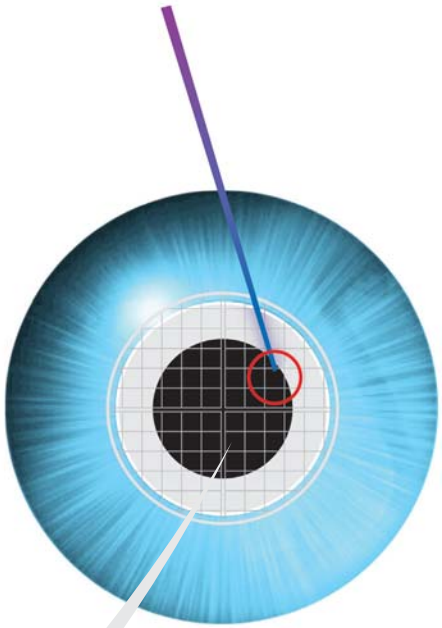
The solid state Pulzar™Z1 generates an accurate beam spot and permits good control of spot characteristics such as energy, shape and size. The small spot of less than 1mm is required to correct the finest and most complicated irregularities on the cornea critical for customised surgery, the smaller the spot size, the higher the resolution of the laser treatment. The small spot beam size can also prevent the formation of steep central islands attributed to the non-homogeneity of the large beam or fluid accumulated during ablation.

"I have been performing laser vision correction surgery for the last 15 years. More than 20000 surgeries have been performed with excimer laser at my centre. I bought my first CustomVis™ Pulzar™Z1 solid state laser in 2006 and the results were so good as compared to the excimer lasers that I now have CustomVis™ lasers at three different centres."

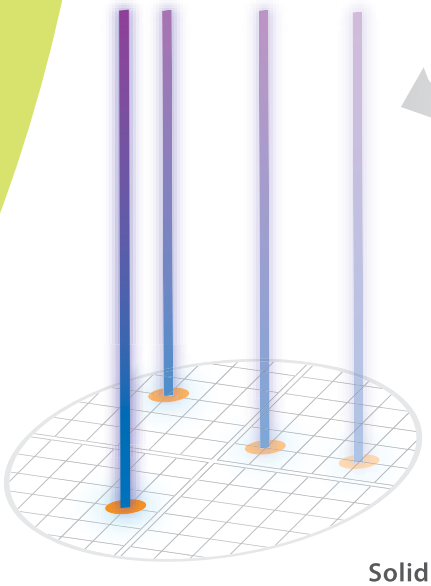
Dr Amit N Shah, India

The Pulzar™ Z1 has a 0.6mm quasi-Gaussian shaped flying spot, which is one of the smallest spot sizes on the market for refractive surgery, permits fine sculpting of corneal tissue resulting in smooth ablation surfaces. The flying spot also ablates the cornea in a non-sequential pattern to avoid the effects of laser plume and enables tissue thermal relaxation.

The small beam size with the high repetition rate provides the Pulzar™Z1 the best combination to treat any correction with high resolution. Since the ablation rate using the 213nm wavelength is unaffected by tissue hydration, there is no longer the need for faster treatment times as required with excimer laser systems. The treatment requirements of each patient are different so CustomVis™ has developed the proprietary ZCAD™ software to individually treat your patient.



0.6 mm Flying Gaussian Beam Profile



Solid State Scanning Technology

The intelligent ZCAD™ system is an advanced surgical planning application, which incorporates information on the preoperative condition of each individual eye. Information from various sources, including topography, wavefront analysis, pupil size, pachymetery and refractive data is integrated to determine the patient's customised treatment plan.

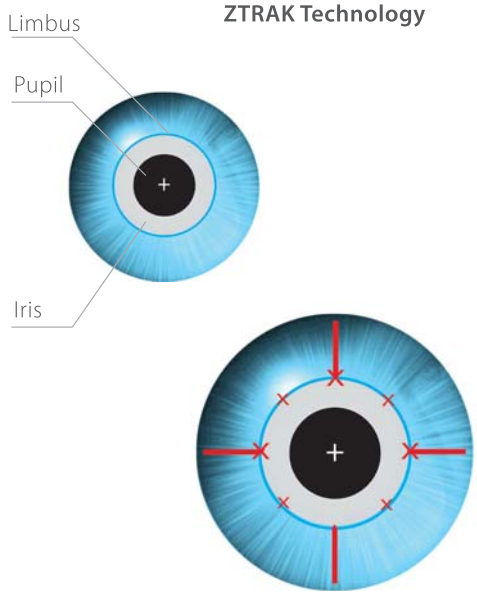
The CustomVis™ Pulzar™Z1 registers the wavefront and topography maps both to the limbal and corneal position. This perfect registration is maintained throughout the surgery by limbal tracking.

SUPERIOR TRACKING TECHNOLOGY

A fundamental requirement for refractive surgery is a fast and accurate eye tracking technique for precise treatment positioning. The CustomVis solution to this challenge is the combination of three closed loop tracking systems, ZTRACK™, CRYSTALSCAN™ and GAZETRACK™. Pulzar™Z1 solid state technology tracks and compensates for any possible eye movement during the treatment.

The Pulzar™Z1 is equipped with SAFE™ CRYSTALSCAN™ ultra high-performance solid state technology which has the following advantages:

- Allows much faster response time to eye movement
- Underlies fast closed loop eye tracking (1kHz)
- Allows true flying spot scan patterns and complex custom surgery without increasing treatment time.
- Co-axial scan path eliminates ablation errors due to elevation misalignment of the eye.



ZTRAK Technology

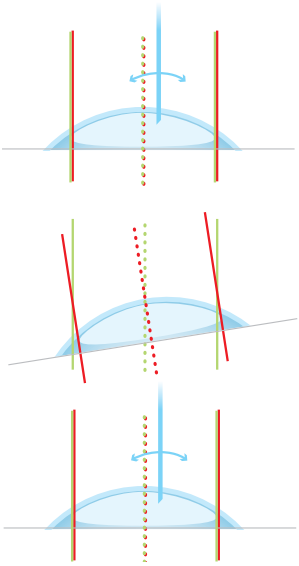
Conventional Technology

ZTRAK™ is a limbus based eye tracking system sharing the digital and analogue tracking with CRYSTALSCAN™ for a rapid response time of 1kHz. Tracking on the limbus doubles the accuracy compared to tracking the pupil under the LASIK flap. Unlike a conventional pupil tracking system, which does not compensate for the pupil centre movement, as the pupil diameter changes, ZTRAK™ – a limbus constant point based tracker – maintains an accurate reference point during the corneal ablation. This is critical for accurately registering custom surgery treatment maps. ZTRAK™ also eliminates the need for the pupil dilation hence no possible decentration as a result.

"The Pulzar™Z1 has given me very stable and excellent results over the last six years. The ablation is much smoother than any excimer laser that I have used. The results for very high mixed astigmatisms are also better with the Pulzar™Z1. Patients benefit from a very fast recovery giving me a very happy practice. I can say that right now my preference is to use the Solid State Pulzar™ Z1 refractive laser."

Dr Gabriel Marin, Colombia

GAZETRACK™ is a unique tracking system that monitors the angle of the patient's gaze and automatically deactivates the laser as patient's gaze angle shifts until the gaze direction is restored. Surgery without GAZETRACK™ can lead to laser beam misplacement resulting in sub-optimal refractive and visual outcomes. With GAZETRACK™, the Pulzar™Z1 prevents an inadvertently decentred ablation allowing for more predictable and reliable refractive outcomes.



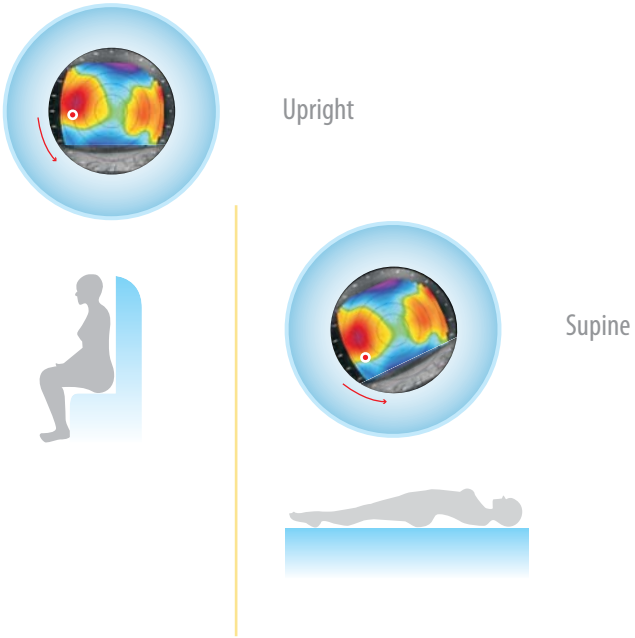
Acceptable Range

Outside of Acceptable Range

Back Within Acceptable Range

CYCLOROTATION

An intelligent 'Pattern Recognition Technique' is used to determine the patient's cyclorotation angle between the pre-operative upright position and supine position. This technique uses a combination of iris and limbal blood vessel pattern matching to compare a pre-operative upright reference image taken with the wavefront with a pre-operative sample supine image. The treatment is appropriately rotated to compensate for any cyclorotation between the two states relative to the patient's eye for accurate ablation of the corneal surface.



"Our group had acquired Pulzar™ Z1 Solid State refractive lasers for our two centres. The machines have performed and continue to perform well, delivering extremely good results and more importantly, satisfied patients. As testament to this, we have just acquired a third solid state laser machine."

Dr Raymond P Evangelista, Philippines

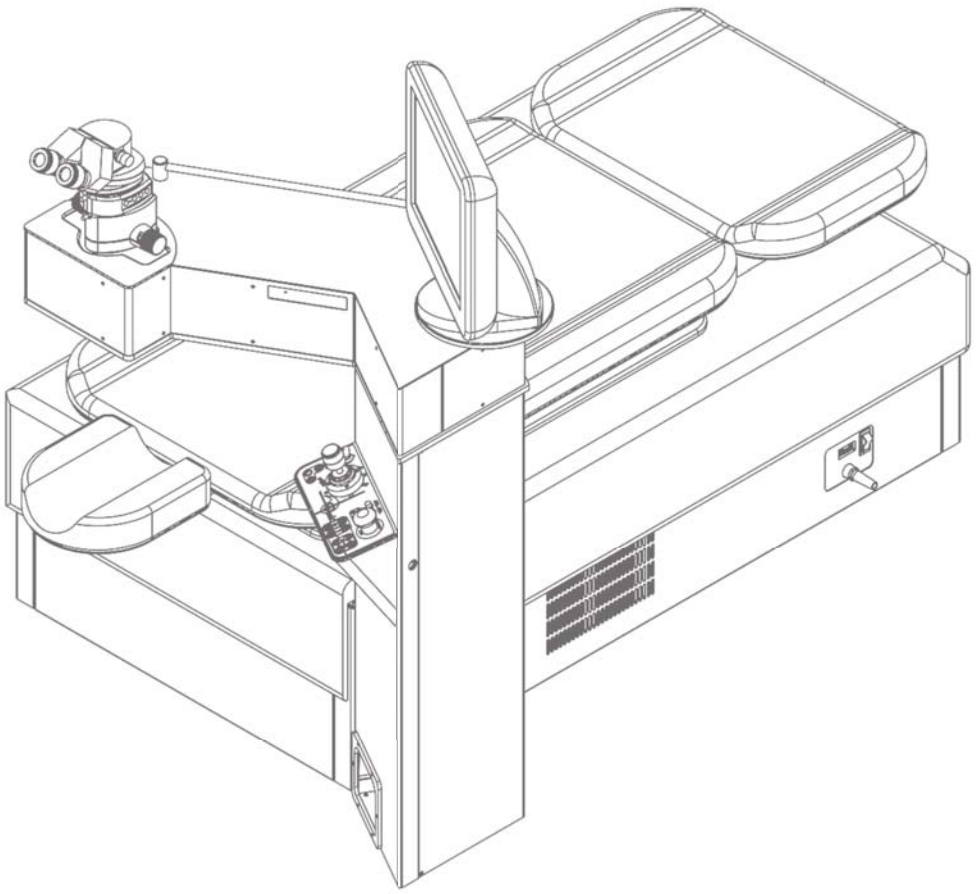
PRESBYOPIA

Presbyopia is the most prevalent of all visual deficiencies, affecting 100% of the population over the course of a normal life span. It is characterised by a progressive, age-related loss of accommodation. The main symptom is blurred vision while attempting to view near objects. The CustomVis™ PresBvis™ software utilises a treatment plan with multi zones. The platform has been developed to provide a smooth transition between the zones with minimal corneal tissue removal. The treatment of the patient is comparable to that of monovision; the dominant eye is treated for distance vision, and the non-dominant eye receives the PresBvis™ treatment.

COMMERCIALY AND ECO FRIENDLY TECHNOLOGY

The Pulzar™Z1's superior technical features translate into significant commercial benefits for the ophthalmic surgeons.

- The Pulzar™Z1 has a much lower running cost than the excimer lasers. It does not require the use of dangerous and expensive toxic gases
- The long term stability of the device means minimal down time
- The Pulzar™Z1 offers an overall faster treatment time creating the ability to treat more patients on a surgery day
- The Pulzar™Z1 is not limited by the fixed gas capacity of excimer lasers, offering the flexibility and cost effectiveness to treat one or more patients on demand
- A longer laser source life time eliminates the refurbishment or replacement cost of the laser cavity in excimer lasers
- A long life span for crystals and optics due to the 213 nm results in lower long term running costs with Pulzar™Z1
- All in all, the Pulzar™Z1's technology helps to reduce clinic costs and keep the environment safe.



"I have experience with both excimer and solid state lasers. I have been using the solid state laser for the past six years and customised results are outstanding as compared to those achieved with excimer lasers. I believe that the future of laser vision correction is Pulzar™Z1 solid state refractive technology."

Dr Frans F H Versteeg, Holland

PRODUCT SPECIFICATIONS*

Laser Type:	Quintupled Nd:YAG Solid State Laser
Wavelength:	213 nm
Pulse Frequency:	300 - 400 Hz
Spot Diameter:	0.6 mm edge to edge
Ablation Zone:	Up to 10.0 mm
Beam Delivery:	Quasi Random Flying Spot (Fixed Size)
Spot Profile:	Quasi Gaussian
Max. Laser Output Energy:	1 mJ
Eye Trackers:	Analogue High Speed Eye Tracker and Video Eye Tracker ZTRAK™ 2.5kHz Sense, 1kHz total response Intra-Operative Gaze Tracker GAZETRAK™ Automatic IRIS/Limbus Registration
Surgery:	Standard Treatment, Topography & Wavefront Guided
Lighting:	Ring and Oblique
Focusing Beams:	2 x Light Slits
Microscope:	Leica (Customised)
Screen:	Touch Screen
Operating System:	Microsoft Windows™
Line Voltage:	220 - 240 VAC Single Phase
Line Frequency:	50 Hz
Electrical Power:	2.4kVA (max)
Mechanical Footprint:	1.8m x 1.1m x 1.5m

*all specifications subject to change without notification

CUSTOMVIS™

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