

VSS Refractive Treatment Ranges:

Refractive Error	Approved Range
Myopia	Up to -10.25 MRSE with or without astigmatism up to -2.75 DC
Hyperopia/Hyperopic Astigmatism	Up to +4.88 MRSE with or without astigmatism up to +1.50 DC
Mixed Astigmatism	The magnitude of cylinder (from 1.00 D to 5.00 D) is greater than the magnitude of sphere and the cylinder and sphere have opposite signs

VSS Refractive Software System Requirements:

The **VSS Refractive** treatment planning software is installable on any desktop or laptop computer. Treatments are programmed with the **VSS Refractive** software and at your convenience the treatment plan is transferred to the **STAR S4 IR** Excimer Laser System via a USB drive.

For successful installation and use of the **VSS Refractive** Off-line Programming Module, your system must meet the following minimum system requirements:

Computer Requirements	
Processor	PC Compatible CPU (1.4 GHz or higher)
Operating System	Microsoft Windows XP x32-bit sp 3; Windows XP x64-bit sp 2; or Windows 7 x32 or x64-bit. Windows Vista not supported.
System Memory	2 gigabytes of RAM (Random Access Memory)
Hard Disk Free Space	10 gigabytes of free disk space (an additional 3 gigabytes of disk space for each 1,000 eye exams stored in the database)
Virus Protection	Commercial anti-virus software must be installed, kept current, and used as recommended by the manufacturer
System Privileges	Install and run the VSS Refractive OPM application with administrative privileges enabled on the system
Input/Output Ports	One available USB 2.0 serial port
Video Display Card	16 or 32-bit 3D video card with a minimum display resolution of 1024 x 768
Media Drive	CD-ROM/DVD drive
STAR S4 IR System Requirements	
STAR S4 IR System	VSS Refractive treatments can only be performed on the STAR S4 IR Excimer Laser System that has been upgraded to Software Version 5.31 or higher.

Laser assisted in-situ keratomileusis (LASIK) can only be performed by a trained ophthalmologist and for reduction or elimination of certain refractive errors indicated in the product labeling. Laser refractive surgery is contraindicated for patients with collagen vascular, autoimmune, or immunodeficiency diseases or abnormal corneal topography; and pregnant or nursing women. Potential side effects may include glare, dry eye, or other visual anomalies. If a microkeratome is used to cut a flap, additional complications may occur.

1. Data from 2010 AMO Clinical Study.
2. Dai GM, Gross E, Liang J. System performance evaluation of refractive surgical lasers: a mathematical approach. *Appl Opt.* 2006;45(9):2124-2134.
3. Probst LE. Compensating for the cosine effect. *EyeWorld Daily Supplement at ASCRS.* 2005:2.

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VSS Refractive Off-line Programming Module Precision in Motion



A New Manifest Refraction-based Procedure

Introducing the **VSS Refractive** procedure, an improved treatment option for your patients who are not eligible for the **Advanced CustomVue** procedure.

This manifest refraction-based LASIK treatment is for use with the **STAR S4 IR** Excimer Laser System. The **VSS Refractive** procedure enables:

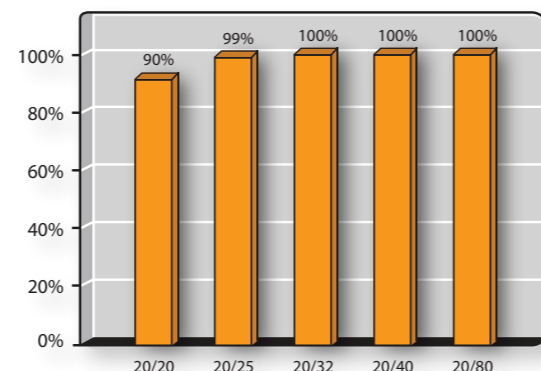
- ▶ Superb Clinical Results
- ▶ Improved Match to Target Ablation Shape*
- ▶ Thermal Balance
- ▶ Adjustable Treatment Zones



VSS Refractive Procedure Clinical Results¹

VSS Refractive procedure clinical study results have shown:

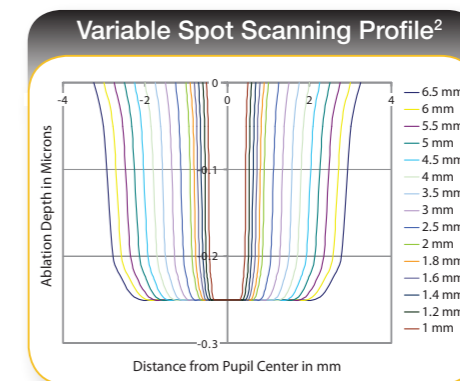
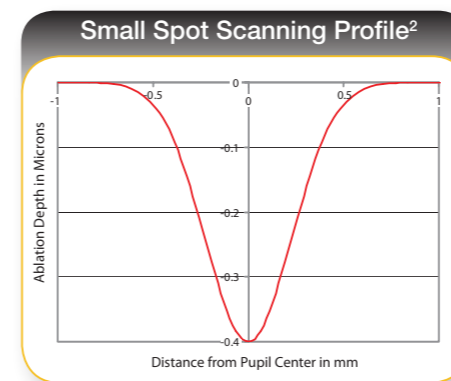
- ▶ 90% of myopes achieved UCVA 20/20 or better (3-months post-op)



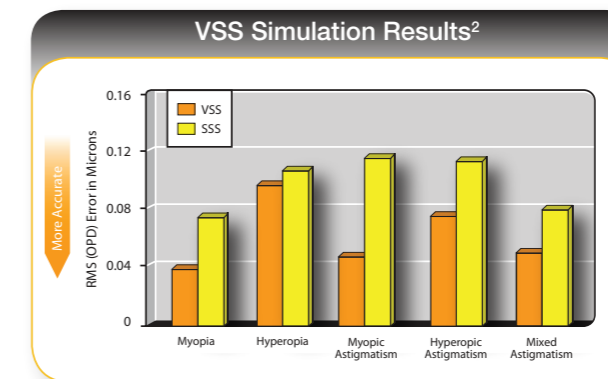
* Improved as compared to AMO Conventional treatment

Improved Match to Target Ablation Shape* and Thermal Balance

- ▶ The **VSS Refractive** procedure ensures an accurate match between the target and ablation shapes using beam sizes ranging from 0.65 mm to 6.50 mm
- ▶ The combination of VSS & VRR technologies provides for tissue removal in a temporally and thermally efficient manner.



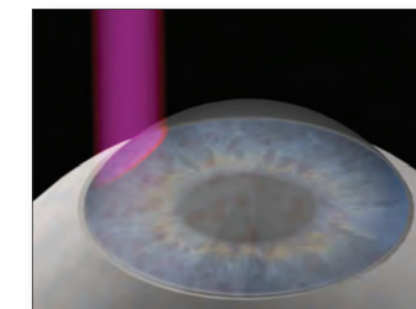
The theoretical simulation shows Small Spot Scanning (SSS) Gaussian beam profile with much higher peak energy, whereas Variable Spot Scanning (VSS) using an edge-smoothed top-hat beam profile shows less peak energy per pulse.



This theoretical simulation of VSS technology, when compared to the alternative SSS ablation, shows improved precision and accuracy, or decreased fitting error, across the above ablation profiles.

- ▶ Enhanced Cosine Effect Compensation³

Peripheral energy loss on a curved surface (the so called cosine effect) is one of the root causes for induced post-operative spherical aberration. The Enhanced Cosine Effect Compensation of the **VSS Refractive** procedure adjusts peripheral pulse distribution according to the individual corneal curvature of an eye.



Adjustable Treatment Zones

The **VSS Refractive** software allows the Minimum Optical Zone and the Ablation Zone to be adjusted

- ▶ Range of Minimum Optical Zone 3.5 to **8.5 mm**
- ▶ Range of Ablation Zone 4.5 to **9.5 mm**