



Clinical Information and FAQ for Opto Advant 532

Important Note

The information contained within this section is intended to provide Opto Global Distributors and their sales and marketing personnel with an overview summarizing clinical information and Frequently Asked Question (FAQ) relating to the Opto Advant 532 Photocoagulator. The information provided is not exhaustive, nor does Opto Global claim to provide professional clinical advice or recommend treatment procedure. It is intended for personal research only and not for external distribution to including customers, competitors and others outside your company.

The Opto Advant 532 Photocoagulator is designed for use by ophthalmologists who have the expertise and patient consent to choose and perform the most appropriate treatment for each patient.

Opto Advant 532 — the perfect choice

The Opto Advant 532 laser is the one of leading and most cost effective 532nm laser device for photocoagulation and the 532nm wavelength is the choice of most retinal surgeons worldwide. The clinical effects of the 532nm wavelength are superior to Argon lasers, 514nm and comparable to dye-yellow lasers, 577nm. When compared to these lasers, the Opto Advant 532 laser can be acquired by the Ophthalmologists at a much lower cost and offers many important advantages such as portability, improved reliability and greater flexibility.

Superior clinical effects

In order to achieve the best results with maximum safety and efficacy, the ideal laser for retinal photocoagulation must have two main characteristics, namely:

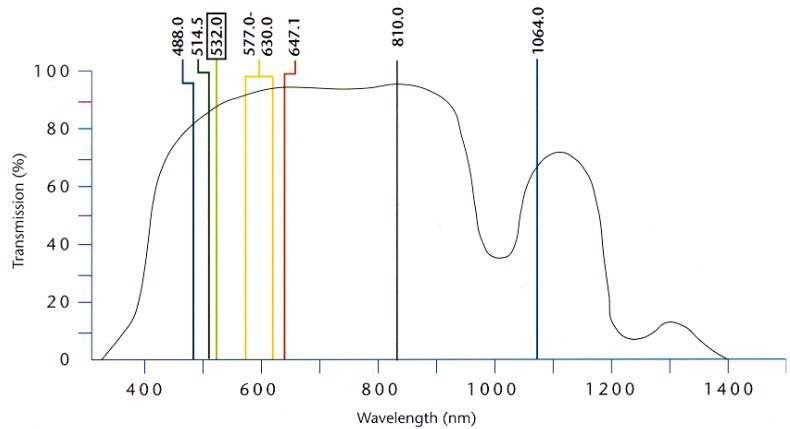
- High absorption by blood and the Retinal Pigment Epithelium (RPE); and
- Low absorption by Xanthophyll (the pigment present in the macula).

The green light is highly absorbed by the Melanin present in the RPE and the 532nm is within 2% of its peak absorption. This means that the conversion of light into heat is optimal, and results in less power required to achieve the desired therapeutic effect. The low absorption by Xanthophyll means that the 532nm has a greater safety margin when compared to lower wavelengths lasers and can be used with higher power in surrounding areas with lower risk of thermal damage to the macula.



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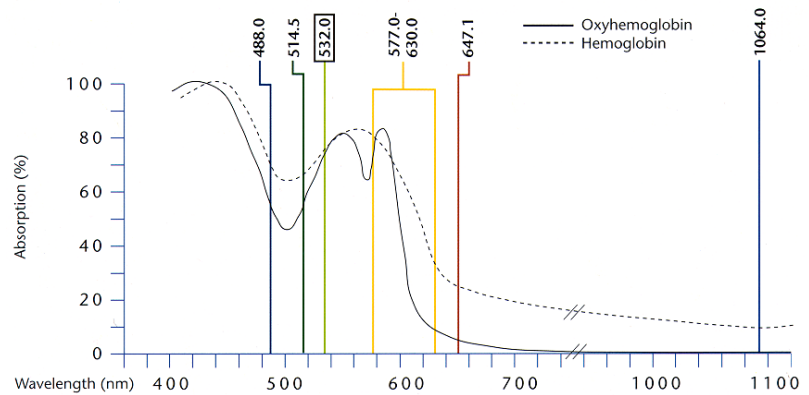
Graph 1



Total Ocular Transmission by Wavelength

Graph1 illustrates the transmission of various laser wavelengths in clear ocular media. The transmission of all visible wavelengths is high with a variation of only +/- 3.5% over the therapeutically useful wavelength range.

Graph 2



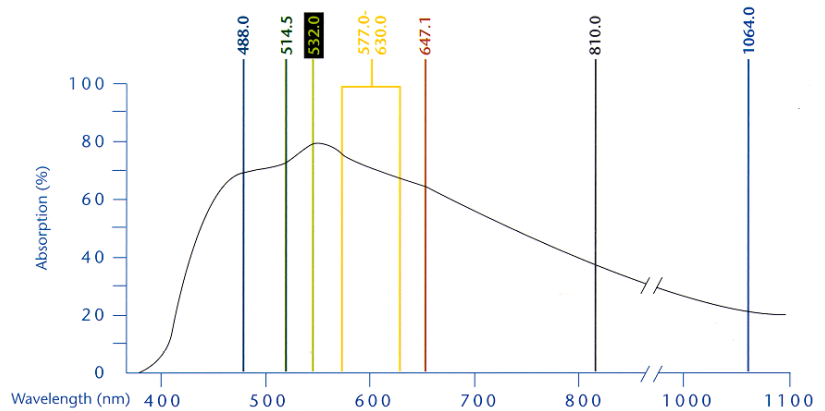
Absorption by wavelength in Haemoglobin and Oxyhaemoglobin

Within the therapeutic wavelength range, the Opto Advant 532 and 577nm Yellow are the most highly absorbed in blood, in both Haemoglobin and Oxyhaemoglobin. The difference in measured absorption of the Opto Advant 532 and 577nm Yellow is only about 3%. Together their absorption is 30% higher than 514.5, the next best laser wavelength.



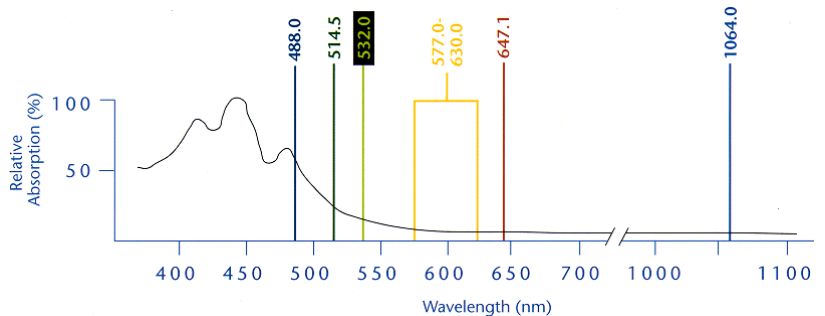
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Graph 3



The primary determinant of retinal tissue reaction is the conversion of laser light into heat by the RPE. The Opto Advant 532 green wavelength is within 2% of the absorption peak of the RPE and therefore has very efficient heating characteristics. This results in the need for lower power levels to achieve the desired treatment effect.

Graph 4



Absorption by Wavelength in Xanthophyll

The use of 488nm laser energy is contraindicated due to the risks posed to practitioner and patient. 50% percent of the total power output of a conventional argon laser is represented by 488nm. Several clinical side effects have been demonstrated using the blue-green argon laser including absorption of its radiation by the inner retinal layers resulting in thermal damage which can stimulate pre-retinal membrane contracture. Power specifications quoted for laser output, most times, include the 488nm wavelength component; however this is filtered out of the 514.5 argon green line reducing the power for treatment. In contrast, the Opto Advant 532 green wavelength exhibits a much greater safety margin because it is not significantly absorbed in Xanthophyll. This means that a full 2.0 watts may be delivered to tissue.



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Opto Advant 532 benefits over Argon Green 514.5nm

The photocoagulation effect of the 532nm wavelength is essentially identical to that of argon green 514.5nm. Lesions produced by either laser, using identical parameters, produce burns similar to appearance ophthalmoscopically and histologically. Both 532nm and 514.5nm produce damage primarily at the level of the RPE and outer retina, and the reparative processes in the retina after coagulation is similar in each case. Longer wavelength 532 is scattered less and may be useful where media opacities are present. The 532nm wavelength is also less absorbed by macular Xanthophyll, which makes it more suitable for treatments in the macula. Additionally, the 532nm wavelength has increased absorption by Oxyhaemoglobin, which makes it more suitable for procedures which require closing of retinal arterioles or in the treatment of sub-retinal neovascular membranes.

Opto Advant 532 benefits over Krypton Red 647nm

532nm is more heavily absorbed by blood than 647nm krypton and produces intense coagulation in vascular tissue by conversion of absorbed energy to heat. Krypton has substantially less absorption in the critical RPE layer. Typical treatment powers are therefore higher with krypton, enhancing the need for retrobulbar anesthesia. Moreover, longer wavelength Krypton 647nm penetrates deeper into the Choroid.

Opto Advant 532 benefits over Multi-wavelength Red, Yellow & Green Lasers

For over 25 years, investigators have been pointing out the importance of selecting the correct wavelength and pulse duration to selectively target localized structures. To achieve highly localized and even sub-cellular selective interactions, not only must the wavelength be chosen to be selectively absorbed, but the pulse duration must be within the microsecond range or less to limit heat flow and burn spread to surrounding areas. Unfortunately, because of the apparent time dependence of the coefficient of thermal denaturation, highly localized thermal damage may be nearly impossible. Why then expend many thousands of \$'s more for equivalent clinical performance when Opto Advant 532 gives you complete versatility at a fraction of the cost?



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Frequently Asked Questions (FAQ)

Can the Opto Advant 532 perform the same clinical procedures as an Argon laser?

Yes, the Opto Advant 532 treatment effect is clinically identical to the green (blue free) argon lasers at 514nm and therefore all the same procedures can be done. However, the longer wavelength (532nm) of the Opto Advant 532 importantly provides safer operation in the macula near the fovea due to the lower absorption by the Xanthophyll. Moreover, the longer wavelength has lower scattered radiation through the eye meaning that the laser can be used with less power providing safer and easier operation especially in patients with some lens or vitreous opacity.

What are the advantages of the Opto Advant 532 over Argon lasers?

Being a solid-state system, the Opto Advant 532 has a much higher efficiency, which means the power consumption is very low. The power consumption of the Opto Advant 532 is only 400W, whereas argon lasers may require much more power.

The argon lasers use gas tubes that degrade with time and are very expensive to replace. The Opto Advant 532 has a solid-state cavity that should last much longer and require less maintenance.

Argon lasers require intricate water cooling hook-ups and special electrical connections, whereas the Opto Advant 532 is a portable system that can be easily connected to standard outlets and is air cooled.

What are the advantages of the Opto Advant 532 over multi-wavelength lasers?

The 532nm wavelength has absorption characteristics that are very close to the ideal. Although the multi-wavelength lasers allow the user to select the theoretical optimal wavelength for certain applications, the difference is minimal and can only be noticed in very specific conditions.

Multi-wavelength lasers are very expensive and, due to their complexity, continuous maintenance is required and is also very expensive.

Can the Opto Advant 532 be used for endophotocoagulation?

Yes, the Opto Advant 532 as a wide range of endoprobes for various applications of endophotocoagulation.

Does the Opto Advant 532 have a warm up time?

No, there is no warm up time. The Opto Advant 532 is ready for use immediately after power up.



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Can the Opto Advant 532 be used in high repetition rate and high power without problems?

Yes, the Opto Advant 532 can be used in high repetition rate and high power and a ThermoElectric Cooling (TEC) system, which enables the system to operate in the most severe conditions without any problem.

Can I integrate the Opto Advant 532 with my Opto Advant YAG laser or with other comparable YAG lasers from Alcon, Lumenis and Laserex?

Yes, specialized Slit Lamp Adapters are available upon request. Please contact Opto Global for more information.

What is the lifespan of the Opto Advant 532 cavity?

It is estimated to be approximately 10,000 hours, depending on care of the system and service intervals.