



PICO CARE MAJESTY

World First! 250 Picosecond Nd:YAG laser

Benign Pigmentation Treatment

Multi-colored Tattoo Removal

Skin Rejuvenation

Scar Treatment

532nm, 1064nm, 595nm & 660nm

Specification

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Medium	Nd:YAG
Wavelength	1064 nm / 532 nm
Pulse Duration	1064 nm : 250 ps 532 nm : 190 ps
Max Energy	1064 nm : 500 mJ 532 nm : 250 mJ
Peak Power	1064 nm : 2 GW(@500 mJ / 250 ps) 532 nm : 1.3 GW(@250 mJ / 190 ps)
Spot Size	2 mm ~ 10 mm(step 1 mm)
Repetition rate	Single, 1 ~ 10 Hz
Handpiece	Zoom, Collimation, MLA 532 DOE, 1064 DOE, Dye(595 nm, 660 nm)



Features, Advantages, and Benefits

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Features

- Provides the shortest pulse duration, 250ps among the current pico lasers
- High peak power up to 2 GW
- Stable laser output
(Deviation: within 1.7%)

Advantages

- Faster and more effective treatment results with low energy
- Effective in the treatment of tattoos that have reached their limit to be improved
- Patient-tailored treatment using 7 types of handpieces and 4 types of wavelengths

Benefits

- A clinic where has the latest pico laser system with 250ps pulse width
- Wide indication range from pigmentation to scar, pore and improvement of skin laxity
- Possible to compose various treatment programs
- More powerful effects with fewer session
- Less side effects

Key Words

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Tattoo Removal

- Effective even for light-colored tattoos that have reached their limit to be treated
- Safe and effective for small pigment particle
- Fast and powerful with only a small amount of energy
- Removal of tattoo without skin damage
- Reduce the number of treatments by half while doubling the treatment effect!

Improvement of Scar, Pore and Skin Texture

- Effective for skin pores and scars by applying Pico-Fraxel treatment
- Short recovery period with only a small amount of energy, better clinical effect with high peak power
- Make your bumpy skin smooth by Majesty
- A pore eraser, Pico Care Majesty

Dermal Rejuvenation and Skin Tightening

- Collagen formation and regeneration through LIOB formation
- Improve the skin's condition through dermal remodelling
- Improvement of rough skin and fine lines
- Improving uneven skin tone and elasticity!

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World First 250ps

- 01 | World First 250 picosecond
- 02 | SRT : Stress Relaxation Time
- 03 | Higher Peak Power
- 04 | LIOB
- 05 | 4ns vs 450ps vs 250ps
- 06 | Indication



All in One Treatment

- 01 | 4 Wavelengths
- 02 | Multiple Handpieces
- 03 | MLA Handpiece
- 04 | DOE Handpiece
- 05 | DYE Handpiece



Stability

- 01 | Output Energy Stability
- 02 | Pulse Duration Stability
- 03 | High Quality Beam Profile



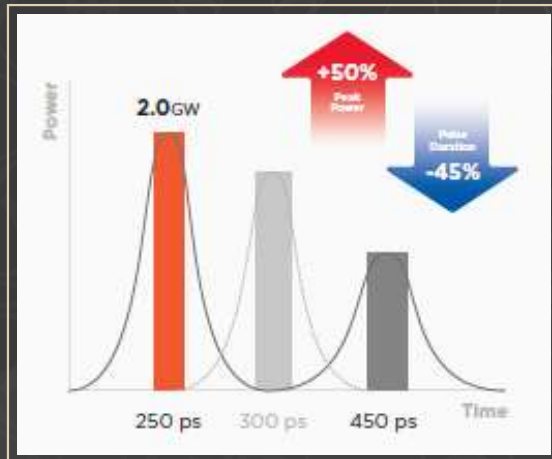
Clinical Cases

World First 250 Picosecond Laser



For internal training

World First, World Best

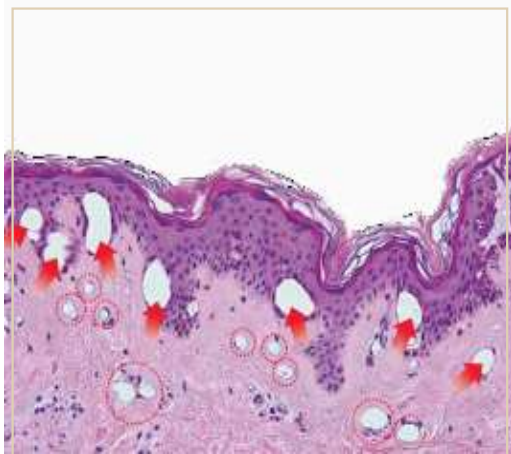


45% Faster

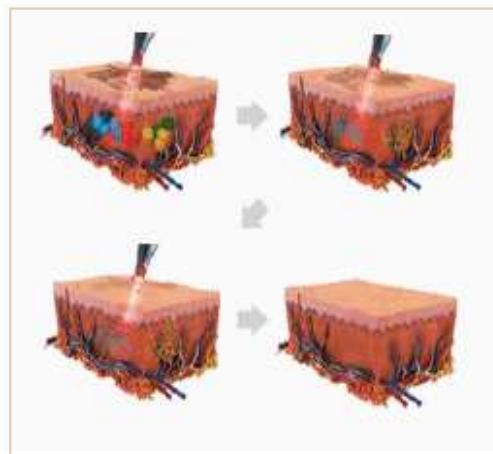
50% More Powerful

The first 250 picosecond laser in the world
Outputs 2GW of powerful peak power with the shortest pulse duration
in the aesthetic industry!

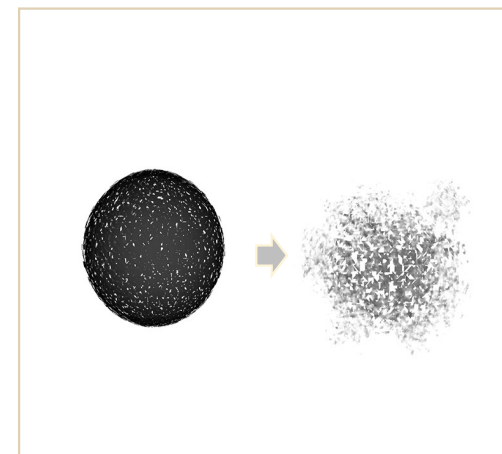
The shorter the Pulse Duration, the higher the Peak Power,
the more effective treatment is possible without damaging the surrounding
tissues by breaking the pigment particles of the lesion into smaller pieces!



Forms LIOB effectively



Breaks down Tattoo ink



Destroys Melanosome safely

01 World First 250 Picosecond

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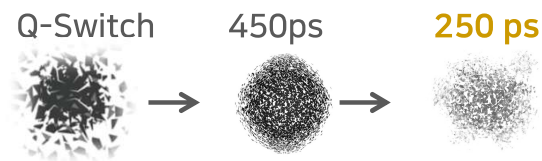
PICOSECOND

The speed unit that is **1000 times**
faster comparing to nanosecond
(0.000000000001 sec)

10^{-9} → 10^{-12}

PICOSECOND Laser

Comparing to the conventional Q-Switch,
remove the ink more effectively and safely
by breaking the pigment particles
with the shorter pulse duration and
higher peak power



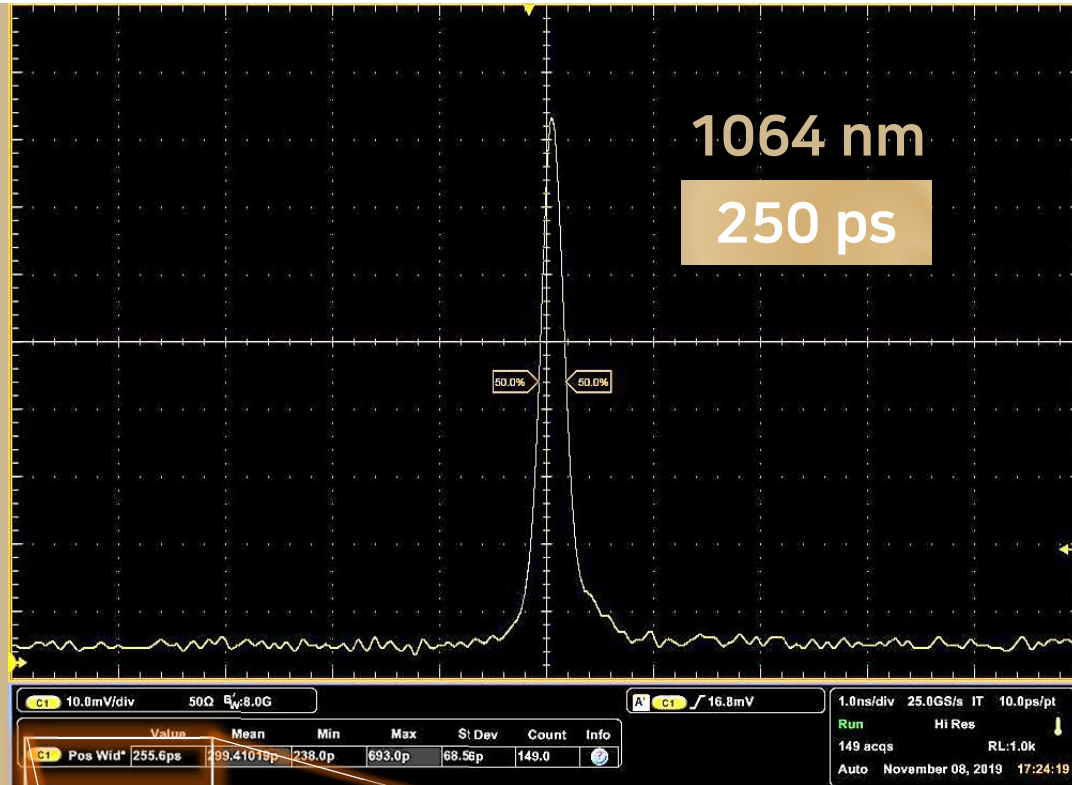
Laser Tissue Interaction

The shorter the pulse duration,
the stronger
the **photoacoustic effect**
and the weaker the photothermal effect

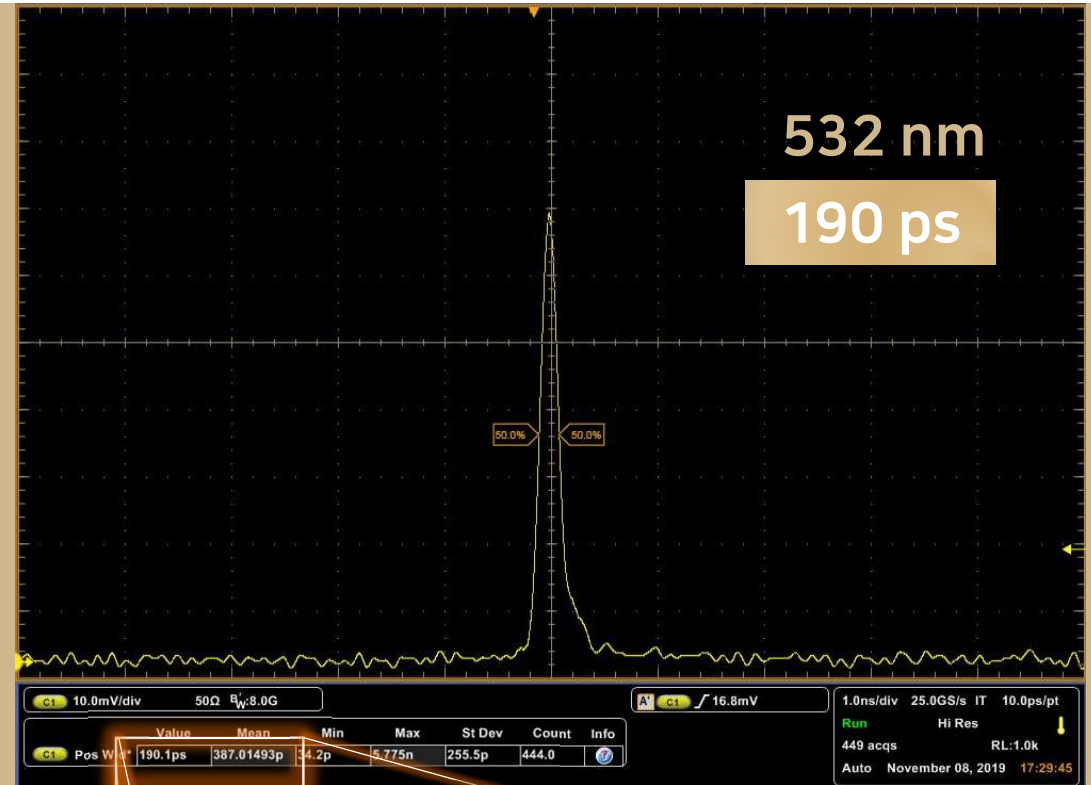
TRT → **SRT**

01 World First 250 Picosecond

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Value	
C1	Pos Wid* 255.6ps



Value	
C1	Pos Wid* 190.1ps

For internal training

Why do we need 250ps?

Melanosome SRT
300ps

Tattoo particles TRT
100ps~10ns

- For SRT for 1um size of melanosome, 300ps is suitable
 - » To treat the lesion safely by destroying melanosome only without damaging surrounding tissue, the Pulse Duration should be shorter than 300ps
- For TRT for 10~100nm size of Tattoo particles is 100ps~10ns
 - » For safe and effective treatment without thermal damage, the Pulse Duration needs to be shorter due to the small size of the tattoo particles
- The shorter the pulse duration, the higher the peak power
 - » Excellent scar treatment and skin rejuvenation effects can be induced by forming LIOB more effectively with high peak power

01 User Feedback

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Feedback after using demo equipment

○ ○ ○



Doctor A

For the tattoos that have reached the limit to be **treated** even after performing more than 10 times with the conventional pico laser (450ps), I could see a **superior tattoo removal effect** with just 2 times of Majesty treatment



Doctor B

Compared to the conventional pico laser (450ps), **Majesty was effective for tattoo treatment** with only a small amount of energy



Doctor C

Compared to the conventional picolaser (450ps), **Majesty gives excellent MLA effect (pores and scars)** with low downtime

For internal training

02 SRT: Stress Relaxation Time

Pulse Duration is shorter than SRT = Able to treat the lesion safely **without damaging adjacent tissues**

Stress Relaxation Time

- Time before the transmission to the adjacent tissues after the "Shock Wave" caused by the explosion of the target
- Time before the transmission that the photoacoustic effect to the target turns into photothermal



Thermal Relaxation Time

- Amount of time that the "Photothermal effect" is limited only to the target, not diffusing the heat to adjacent tissues
- Time before the thermal damage to adjacent tissues by Photothermal effect

02 SRT: Stress Relaxation Time

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Laser Safety and Effectively Removes Multicolor Tattoos

Eric F. Bernstein, MD, MSc (Eng),^{1,†} Kevin T. Schomacker, PhD,² Lisa D. Basilavechio, RN,¹ Jessica M. Plugis,¹ and Jayant D. Bhawalkar, PhD²

¹Main Line Center for Laser Surgery, Ardmore, Pennsylvania 19003

²Syneron-Candela Corporation, 530 Boston Post Road, Wayland, Massachusetts 01778

Background and Objectives: Although nanosecond-domain lasers have been the mainstay of laser tattoo removal for decades, recent disruptive innovations in laser design have introduced a new class of commercial Q-switched lasers that generate picosecond-domain pulses. **Study:** A picosecond-domain, Nd:YAG laser with a KTP frequency-doubling crystal was used to treat 31 decorative tattoos in 21 subjects. Safety and effectiveness were determined by blinded evaluation of digital images in this prospective clinical study.

Results: The average clearance overall as evaluated by blinded observers evaluating randomized digital photographs was $79 \pm 0.9\%$ (mean $\pm$ sem) after an average of 6.5 treatments. Of the 31 tattoos completing treatment, 6 had

available with pulse-durations from approximately 50–100 ns as is typical of Q-switched alexandrite lasers, to about 20–50 ns pulse-durations of ruby lasers, down to approximately 5–10 ns pulse-durations available with Q-switched Nd:YAG lasers [2]. Nanosecond-domain Q-switched lasers have been the gold-standard for tattoo removal for decades, with gradual improvements in laser design enabling higher fluences with large beam-diameters being introduced over many years [12].

Recent disruptive innovations in laser design have introduced a new class of commercial Q-switched lasers that generate picosecond-domain pulses [13,14]. Prototype, research lasers in the picosecond-domain were available 20 years ago and demonstrated effectiveness at removing

Computational modeling of stress transient and bubble evolution in short-pulse laser irradiated melanosome particles

Moshe Strauss

Nuclear Research Center, Negev, P. O. Box 9001, Beer Sheva, Israel, and
University of California Davis, Department of Applied Science, Livermore, CA 94550

Two types of relaxation times are important in identifying the relevant dynamics of the system: thermal relaxation and stress relaxation. Thermal conductivity changes the temperature in a structure of size d on a characteristic thermal relaxation time $t_{th} = d^2 / (4\alpha)$, where in water $\alpha = 1.4 \times 10^{-3} \text{ cm}^2/\text{sec}$.¹ For a melanin granule of size 15 nm, $t_{th} = 400 \text{ psec}$ and for a melanosome of radius 0.5 μm , $t_{th} = 0.5 \mu\text{sec}$. Thus, for laser pulses below 100 psec the melanin particle is almost thermally confined while the melanosome is completely thermally confined.

The stress relaxation time is defined for a structure of size d by $t_s = d / C_s$, where C_s is the sound speed which in water is 1500 m/sec. For a granule of size 15 nm, $t_s = 10 \text{ psec}$, and for a melanosome of 0.5 μm , $t_s = 300 \text{ psec}$. For laser pulses shorter than 100 psec the melanin stress is relaxed, while the melanosome stress is almost confined. Thus, pressure released by the melanin hot spots uniformly accumulates on the melanosome scale.

- Small tattoo particle and benign epidermal pigmentation require shorter pulse duration
- TRT of melanin and melanosome= 400psec and 500nsec
- Stress relaxation times of melanin and melanosome = 10psec and 300psec

02 SRT: Stress Relaxation Time

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Majesty

250 ps < melanosome SRT < melanosome TRT

With the shorter Pulse Duration than the SRT of Melanosome,
able to treat the lesions safely
without damaging adjacent tissues

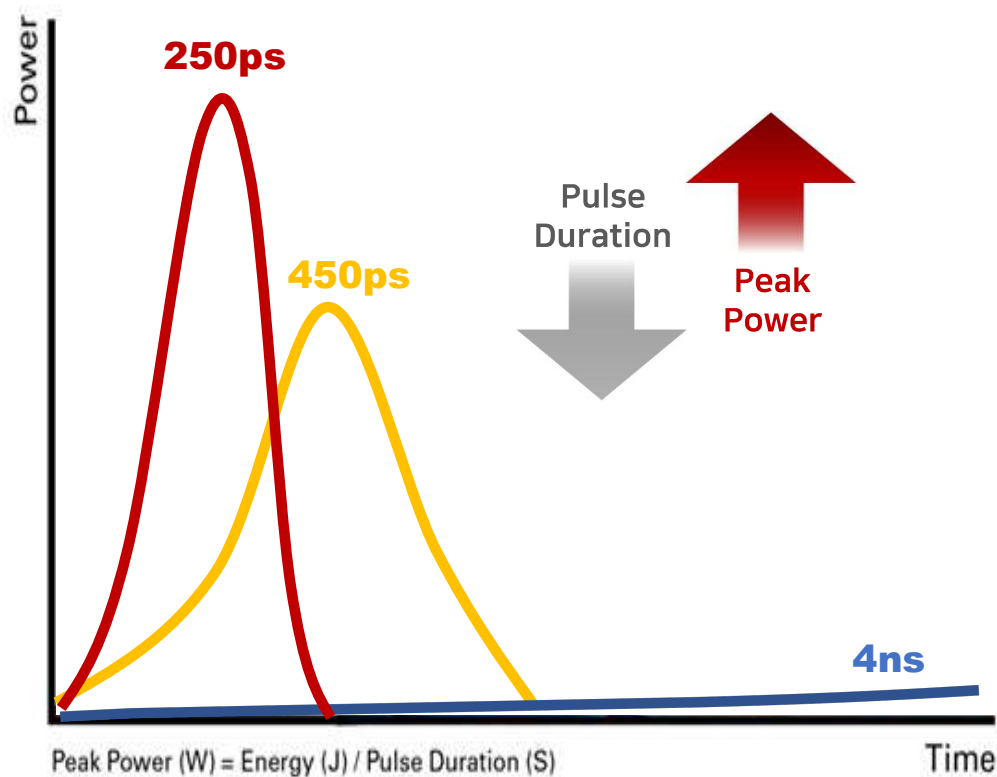
450ps Laser

melanosome SRT < 450 ps < melanosome TRT

With the shorter Pulse Duration than the TRT of Melanosome,
able to treat the lesions with less thermal damage

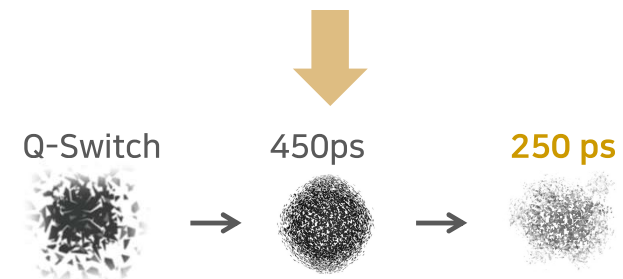
For internal training

03 Higher Peak Power



Based on the same energy,

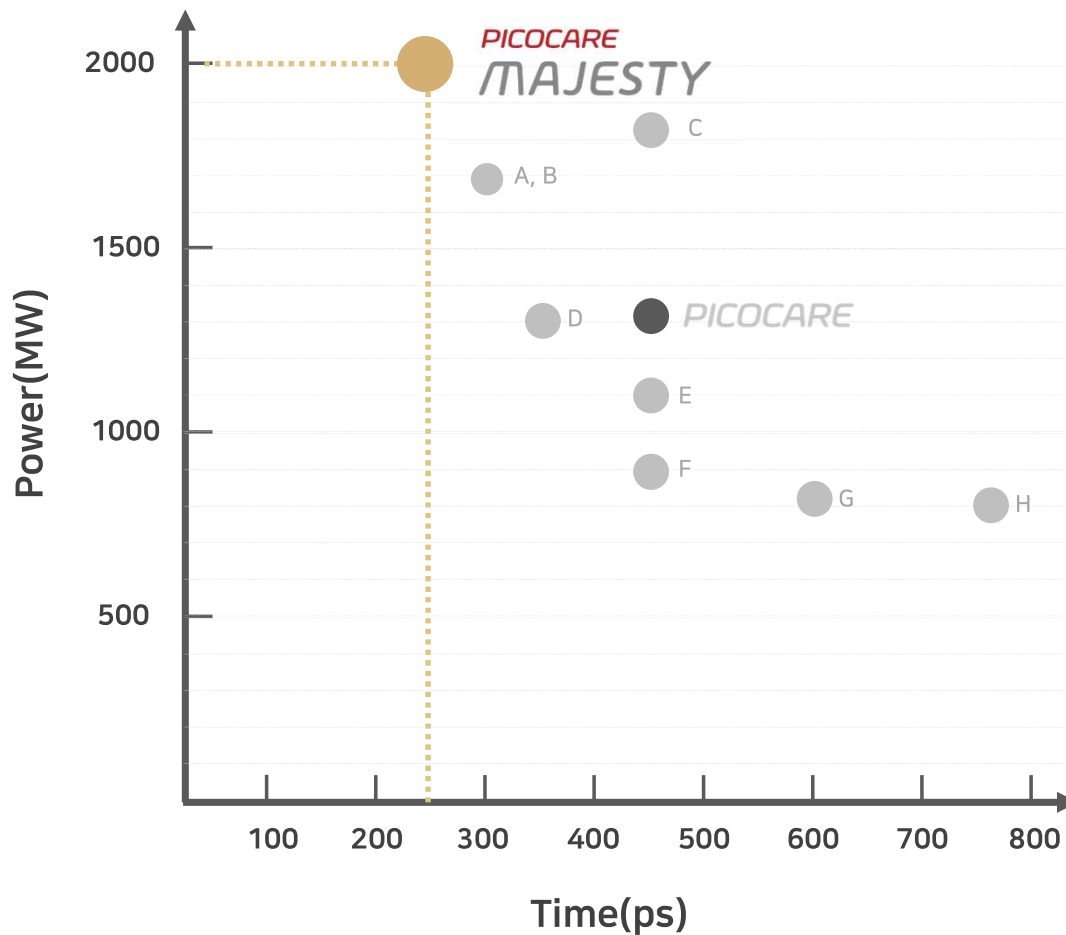
- 1 The shorter the Pulse Duration, the higher the Peak Power
- 2 The higher the Peak Power, the stronger the Photoacoustic effect



**With a shorter Pulse Duration,
able to break down the pigmented particles
more effectively**

03 Higher Peak Power

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Peak Power(W) = Energy(J) / Pulse Duration(s)

$$\frac{0.5 \text{ J}}{0.00000000025 \text{ sec}} = 2 \text{ GW}$$

- When the powerful energy is given to the tissue, the temperature of the tissue rises rapidly and it expands by that thermal effect, which causes breaking down the tissue with a strong shock wave $\Rightarrow$ Photomechanical effect
- The higher the Peak Power, the stronger the photomechanical effect, enabling to treat pigments and tattoos safely and effectively

For internal training

03 Higher Peak Power

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World first 250ps MAJESTY - With its high peak power,

Treat the lesion effectively by breaking down the pigmented particles **into the smallest**



Pigment ——— 4ns ——— 450ps ——— 250ps

03 Higher Peak Power

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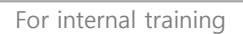
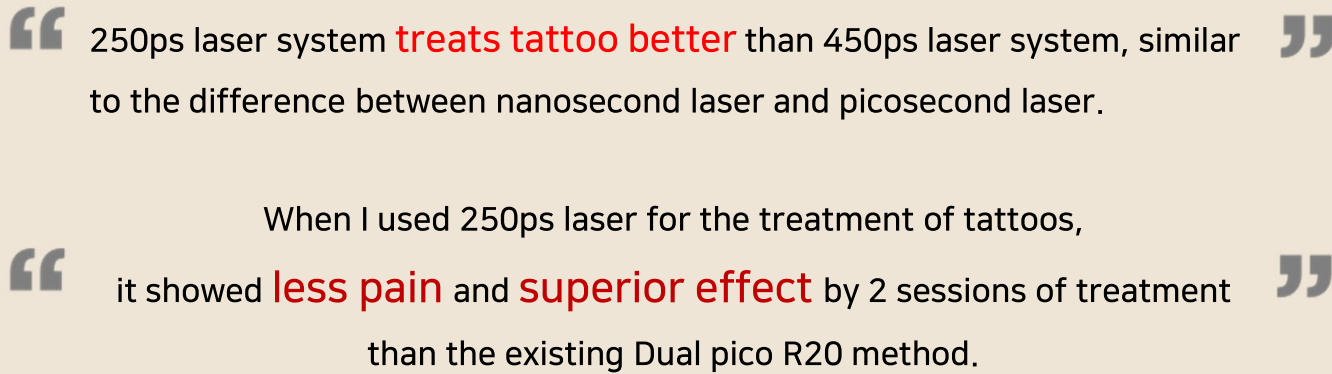
The smaller the broken pigmented particles, the easier it is to be removed by macrophages.

Majesty delivers a stronger photoacoustic effect to the pigmented particles with the shortened Pulse Duration.

By the result of breaking down pigments very finely, it gets a faster and better effect in removal of tattoo pigments.



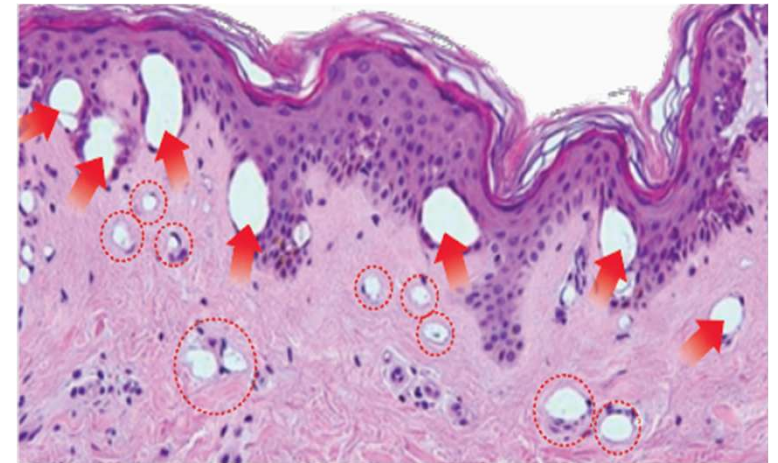
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LIOB

Laser Induced Optical Breakdown



LIOB : Laser-Induced Optical Breakdown

Cavitation occurs only in the target layer by the laser induced optical breakdown(LIOB) while protecting the stratum corneum
→ Skin rejuvenation effect through collagen regeneration



High Power Density

When a very short pulse duration meets a high peak power, the power density increases and laser-induced optical breakdown (LIOB) occurs.



Cavitation

Cavitation occurs in the target tissue (epidermal or dermal layer) while protecting stratum corneum by the LIOB.

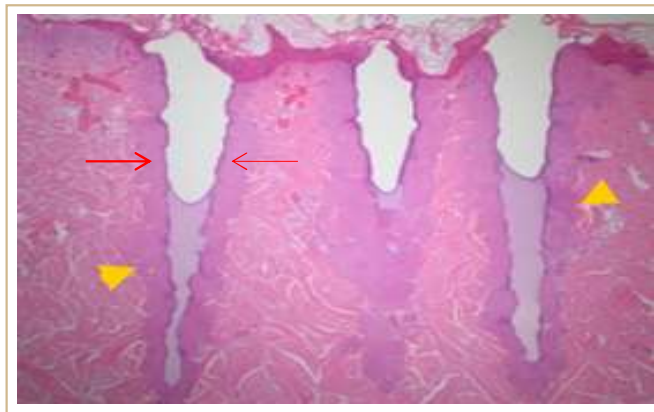


Healing Process

Promotes collagen and elastin fibers, and induces a healing process

Excellent effects
for Scar &
Skin rejuvenation

Scar treatment by conventional fractional Laser



Thermal Ablation
Thermal damage may remain in the tissue

Due to severe pain and heat sensation, it is necessary to apply anaesthetic cream for 40 minutes prior to the treatment

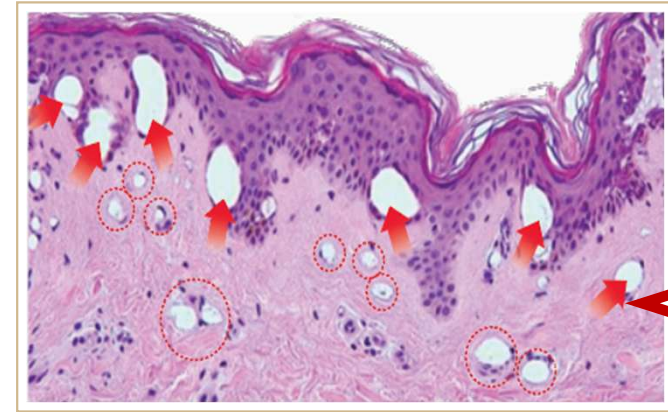
The scab may persist for 2 weeks after the procedure and the chance of developing side effects such as PIH is high

Mechanism

Pain

Downtime

Scar treatment by PICO CARE MAJESTY



Safe & Effective
Scar
treatment

LIOB
No thermal damage in the tissue

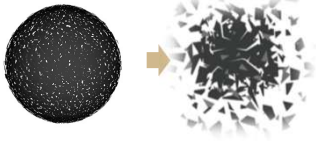
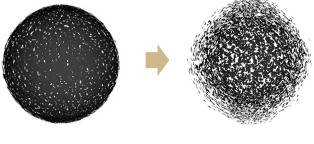
The anaesthetic cream can be applied for 20 minutes prior to the treatment **with a tolerable pain level**

The scab may persist for 7 days after the procedure and **the incidence of PIH is relatively low**

For internal training

05 4ns vs 450ps vs 250ps

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	Q-Switch	Other Pico	MAJESTY
Pulse duration	4ns	450ps	250ps
Peak Power	+	++	+++
Mechanism	Photoacoustic +photothermal	Photoacoustic	Photoacoustic
Photoacoustic effect	+ 	++ 	+++++ 
LIOB	-	++	+++

06 Indication

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Multi-colored Tattoo Removal

- Body Tattoos
- Cosmetic Tattoos



Pigmented Lesion Treatment

- Lentigines
- Freckles
- Café-Au-Lait
- Age Spot
- PIH
- Melasma
- Ota Nevus



Skin Rejuvenation

- Uneven Skin Texture
- Dull Skin Tone
- Fine Lines / Wrinkles
- Enlarged Pores



Scar Treatment

- Acne Scars
- Atrophic Scars
- Hypertrophic Scars

For internal training



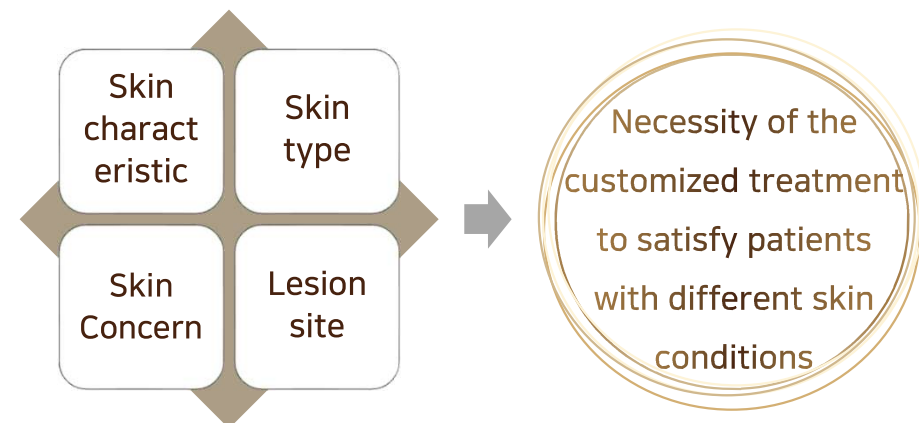
**Everything changes by
one thing**

All In One

We provide customizable options
to patients with the appropriate selection of
handpieces and wavelengths that suit each
patient's skin type and skin concerns.

	Skin Type 1	Skin Type 2	Skin Type 3	Skin Type 4	Skin Type 5	Skin Type 6
Lentigines	● 532nm Zoom H/P	● 660nm DYE H/P	●			
PIH	●		1064nm Zoom H/P			●
	●		1064nm Collimation H/P			●
Melasma	●		1064nm Zoom H/P			●
	●		1064nm Collimation H/P			●
Brightening	●		1064nm Zoom H/P			●
	●		1064nm Collimation H/P			●
Acne scar	●		1064nm MLA H/P			●
Acne redness	● 595nm DYE H/P	●				
Enlarged pores	●		1064nm MLA H/P			●
Uneven skin texture	●		1064nm MLA H/P			●
	●		1064nm DOE H/P			●
Tattoo	●		1064nm Zoom H/P			●
Red colored tattoo	● 532nm Zoom H/P	●				
	● 595nm DYE H/P	●				
Green colored tattoo	● 660nm DYE H/P	●				

All In One



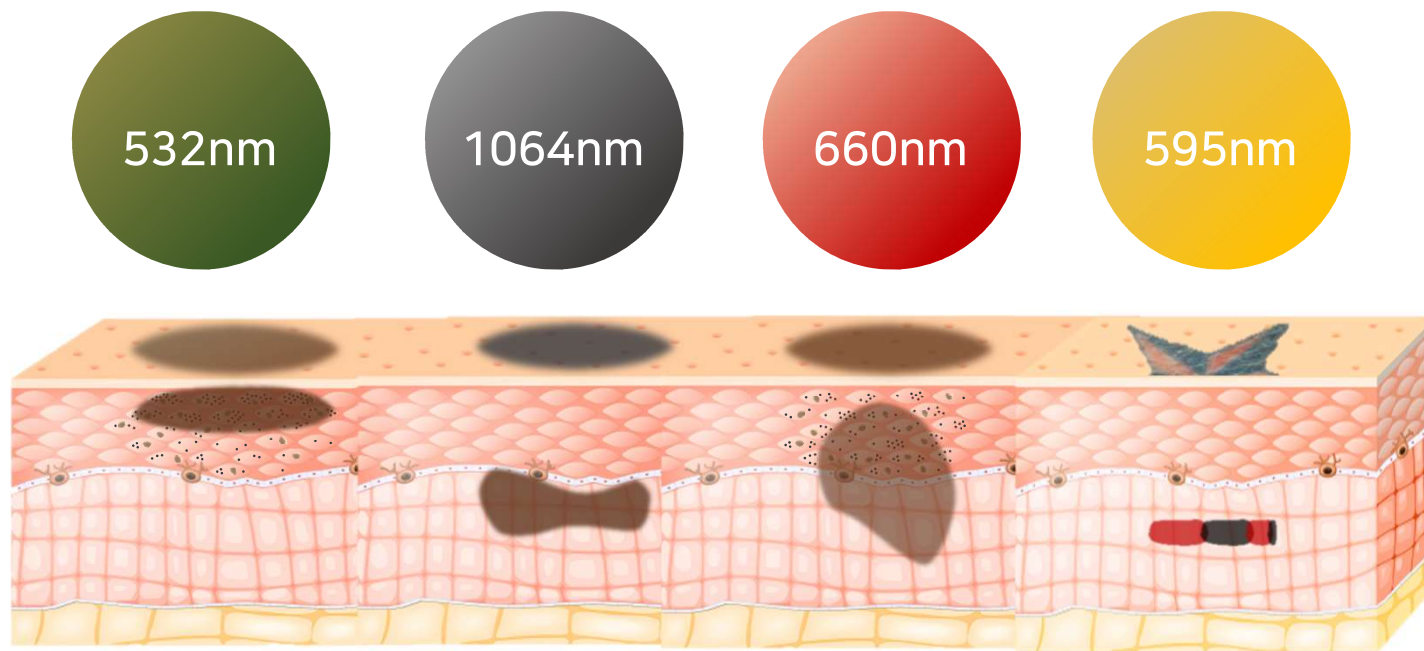
Treat the lesion by using
7 different types of handpieces &
4 different wavelengths
in keeping with the treatment purpose

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01 4 Wavelengths

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With 4 different wavelengths, you can treat more effectively for different types of the lesion and treatment areas



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02 Multiple Handpieces

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With 7 types of handpieces, you can make the flawless skin,
applying it differently by the lesion

Pigments
Tattoos

Pico-
toning
Brightening

Pico-fraxel
Pores, scars
Skin tightening,
Fine lines
Skin texture

Pico-fraxel
Skin tone, PIH
Skin texture

Pigments
Multi-
colored
tattoos

Zoom H/P
532 & 1064nm



Collimation H/P
532 & 1064nm



MLA H/P
532 & 1064nm



DOE H/P
532 nm 1064 nm



DYE H/P
595 nm 660 nm



For internal training

03 MLA Handpiece

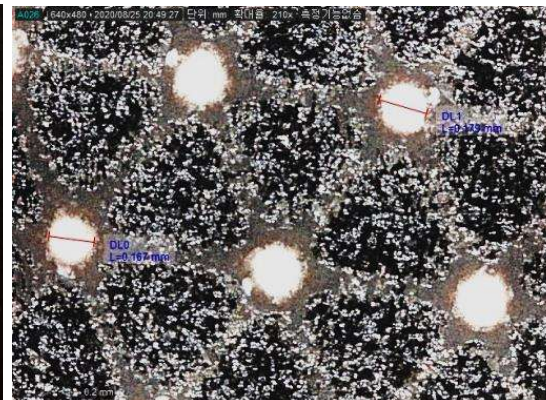
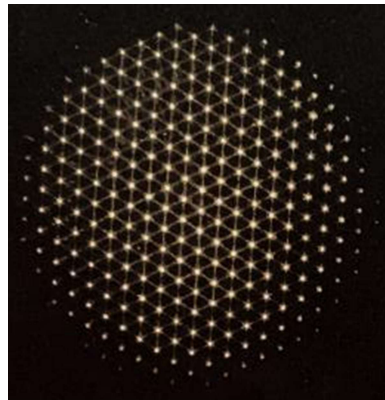
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MLA 3~10mm

When a beam passes through the special lens (MLA) inside the handpiece and splits into several parts, it makes focal irradiation

Effective for scar treatment and skin rejuvenation
with **23 times** higher peak power than the conventional Zoom handpiece!



Spot size : 10 mm
Energy : 300 mJ
Dot size : 170 μ m

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04 DOE Handpiece

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DOE 532/1064

When a beam passes through the special lens (DOE) inside the handpiece and splits into several parts, it makes uniform irradiation

Effective for pigments treatment and skin rejuvenation
with low downtime and less pain compared to MLA!



Spot size : 9 x 9 mm
Energy : 200 mJ
Dot size : 190 μ m

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05 DYE Handpiece

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Dye595

Dye660

■ 595 nm

With its high absorption in hemoglobin and low absorption in melanin, good for rosacea, inflammatory acne, flushing, and blue colored tattoo.

■ 660 nm

With its high absorption in melanin and low absorption in hemoglobin, good for epidermal pigmentation and green colored tattoo.

05 DYE Handpiece

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Effectively remove all kinds of multi-colored tattoo using the Dye Handpiece

	Brown	Red	Yellow	Green	Blue	Purple	Black
532nm	●	●	●				
1064nm				●	●	●	●
595nm					●		
660nm				●			

● Good

● Very Good

For internal training

Stable power
within 1.7% of
output deviation
even by irradiating
18,000 shots
for 30 minutes

For internal training

Channel A

498.0mJ

Statistics

Min

468.0mJ

Max

532.0mJ

Average

499.4mJ

Std.Dev.

7.976mJ

Overrange

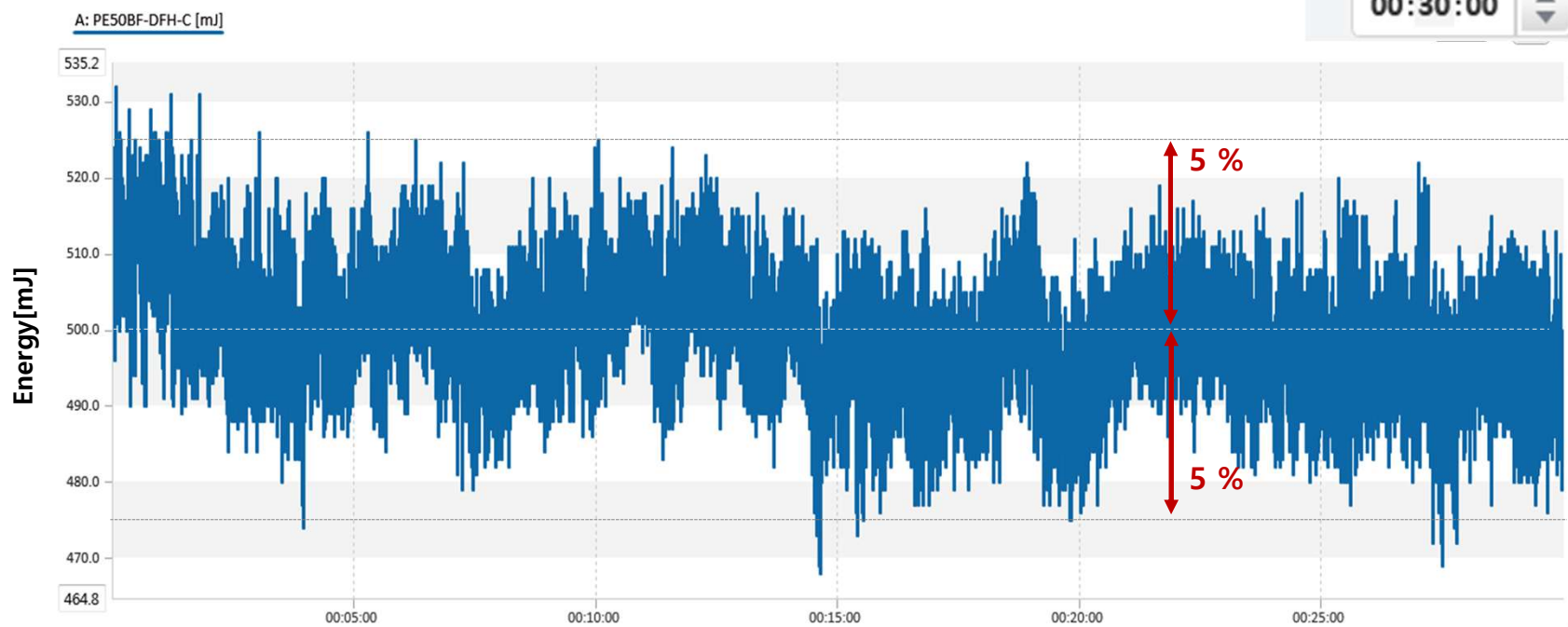
0

Total Pulses

18062

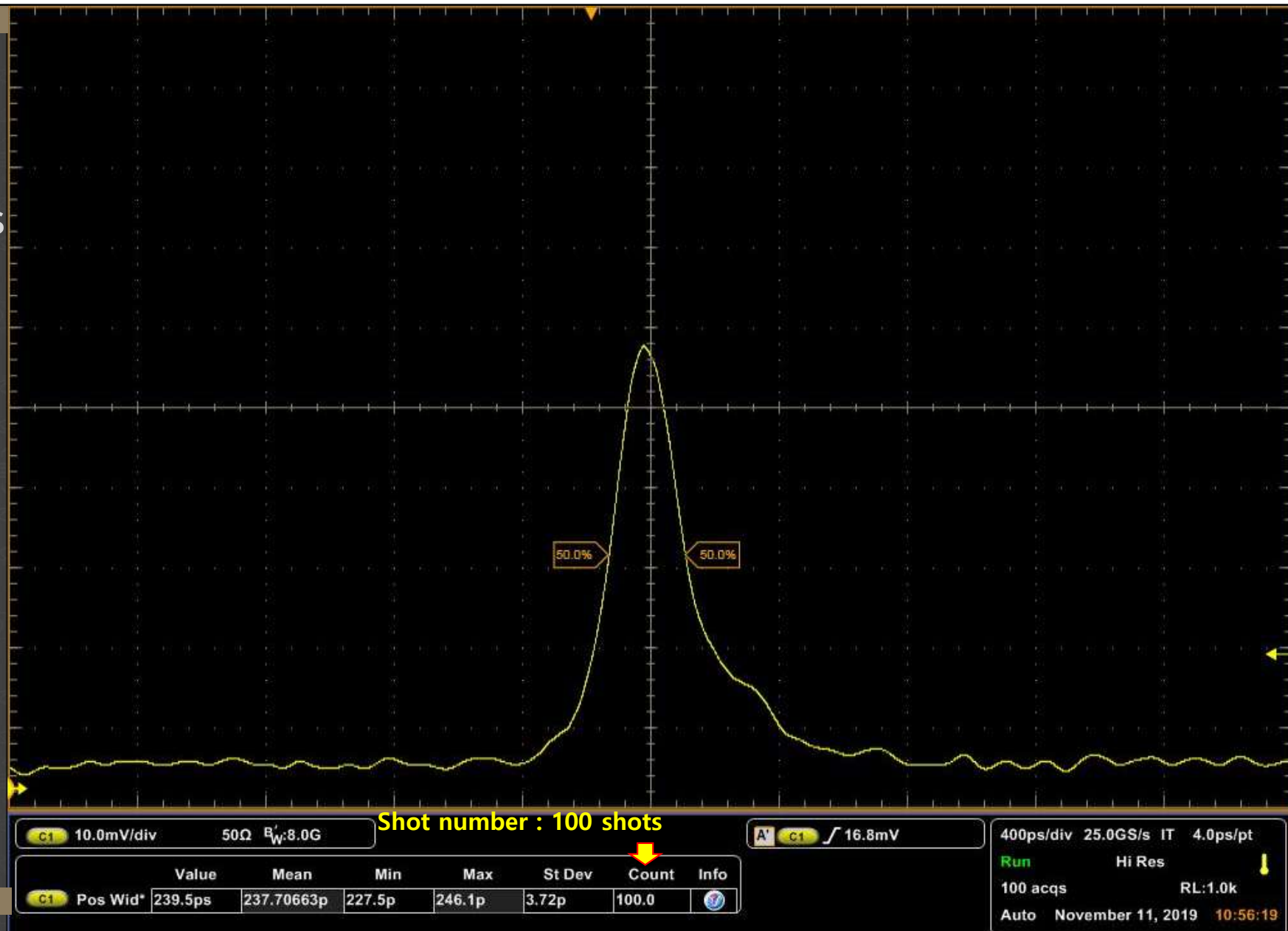
Frequency

Output deviation 1.7%



During continuous
irradiation
for 100 shots,

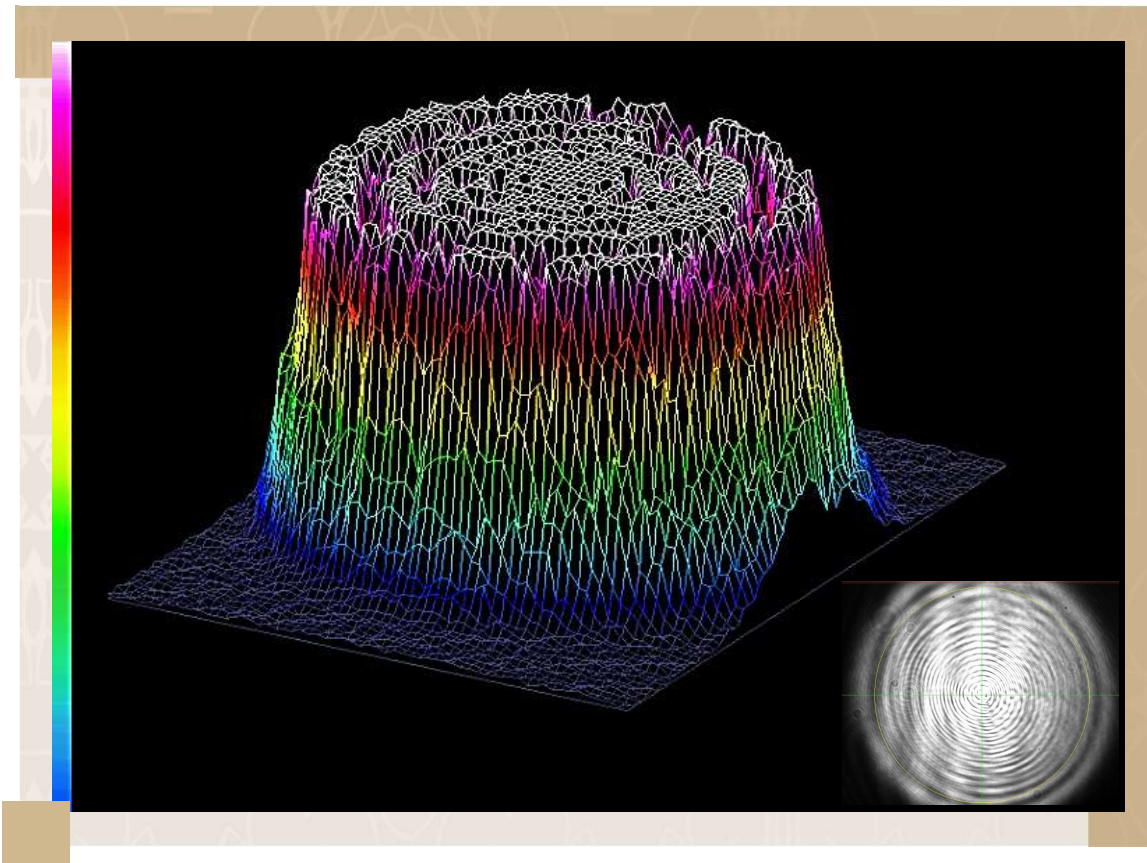
Pulse width
deviation stays
within 5% (3.7ps)



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High Quality of Beam Profile

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Beam Shape

Top Hat Beam

“Can predict a safe and effective treatment results through the even distribution of the energy in the beam profile”

Clinical Case

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Before & After : PIH

Before



After 3Tx Time



For internal training

Clinical Case

PICOCARE
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Before & After : PIH

Before



After 3Tx Time



For internal training

Clinical Case

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Before & After : PIH

Before



After 3Tx Time



For internal training

Clinical Case

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Before & After : Pigment

Before



After 1Tx Time



For internal training

Clinical Case

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Before & After : Pigment

Before



After 1Tx Time



For internal training

Clinical Case

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Before & After : Melasma

Before



After 3Tx Time



For internal training

Clinical Case

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Before & After : Melasma

Before



After 3Tx Time



For internal training

Clinical Case

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Before & After : Large Pore

Before



After 1Tx Time



For internal training



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Head Office
64 Techno 8-ro, Yuseong-gu, Daejeon, Korea

Pangyo Office
B-3F, 22, Deawangpangyo-ro 712beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, Korea

WONTECH LLC
200 Lakeside Dr., Suite 260, Horsham, PA, USA

WONTECH JAPAN CO., LTD.
1F, 3-16-6, Hatchobori, Chuo-ku, Tokyo, Japan 104-0032

WONTECH CHINA CO., LTD
3F, Hyundai motor building, 38 xiaoyun road, chaoyang district, Beijing

E-mail. wtlaser@wtlaser.com
Tel (+82) 31 1670-1450 Fax (+82) 42 934 9491
www.wtlaser.com