



**Veralase Handheld R&D Laser**

**Instruction for Use**

[www.veralase.com](http://www.veralase.com)

Model Number: 100-xxx



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# 1. General Information

- Devices are sold and supported by Veralase for medical research and development in many fields of study. Veralase lasers are designed for preclinical and clinical treatments for skin ailments and other medical research.
- Please carefully read the following important safety precautions prior to unpacking and operating this equipment. In addition, please refer to the complete User's Manual for additional important notes and cautionary statements regarding the use and operation of the system.
- Do not attempt to operate the system without reading all the information provided with each of the components.

**NOTE:** The laser should only be operated by personnel authorized to use Class IV laser devices. This manual is only intended as additional training for these professionals.

## 2. Symbols and Definition

	<p><b>WARNING</b> Situation has the potential to cause bodily harm or death.</p>
	<p><b>ELECTRICAL SHOCK</b> Hazard arising from dangerous voltage. Any mishandling could result in irreparable damage to the equipment, and personal injury or death.</p>
	<p><b>LASER RADIATION WARNING</b></p>
	<p><b>READ USER INSTRUCTION</b></p>

-Please read **all** instructions that were provided prior to operation of the system.

-If there are any questions, please contact Veralase LLC or the authorized representative through whom the system was purchased.

## 3. System Specifications

Model	Wavelength	Units
100-001	808	nm
100-002	905	nm
100-003	980	nm
100-004	1064	nm
100-005	1270	nm
100-006	1310	nm
100-007	1450	nm
100-008	1550	nm

	Symbol	Typical (1)	Units
<b>Optical</b>			
Output Power (CW)	$P_o$	$\leq 2$ (@1450nm) 808, 905, 980, 1064, 1270, 1310, 1450, 1550 nm	watts
Center Wavelength	$\lambda_c$	1550 nm	nm
Spectral Width	$\Delta\lambda$	10	nm 3dB
Wavelength Temp. Coeff.	$\lambda_{coef}$	0.7	nm/C
Standard Optical Output		4 x 4	mm

(1) At 1450nm unless otherwise specified

<b>Electrical / Data</b>			
Power Adapter Input		100 - 240	VAC
		50-60	Hz
Power Adapter Output		5	VDC
		1200	mA
Handheld Laser Input		micro USB	
Programing Software Provided		Windows-based	

<b>Program Parameters</b>			
Current Level - Up to 5 settings (2)		0, 0.2 to 7	A
Burst Pulse Width (2)		0 to 32000	ms
Burst Pulse Frequency (2)		0 to 500	Hz
Number of Pulses per Burst		0 to 32000	
Auto-Delay Between Burst Cycles		0 to 32000	ms
Power-On Sound		programmable	
Laser-Firing Sound		programmable	
Power-Off Sound		programmable	
Low Battery Sound		programmable	

(2) Programmable setpoints for each setting

## 4. Laser Specifications

	Min	Max	Units
<b>General</b>			
Dimensions	39 x 61 x 167		mm
	1.53 x 2.40, 6.57		inches
Operating Temperature	10	40	C
Storage Temperature	10	40	C
Current draw while idle		<10	mA
Current draw while off		<2	mA
Power on wait time		1	sec

	Min	Max	Units
<b>CW Operation</b>			
<b>Laser Current</b>			
Range	0	7,000	mA
Resolution	50		mA
Accuracy	50		+/- mA
Noise/Ripple		200	mA
Compliance Voltage	1	3.3	V

### Programming

#### Stock Program Modes / Parameters

PC interface to sync data	USB 2.0 Full speed (Type micro-B)
PC sync program	Windows App - <a href="http://www.veralase.com/setup.exe">www.veralase.com/setup.exe</a>
Programming Interface	Web interface - <a href="http://esweb.veralase.com">esweb.veralase.com</a>
Current Level - High	0 to 7 A
Current Level - Medium	0 to 7 A
Current Level - Low	0 to 7 A
Burst Pulse Width	0 to 32000 ms
Burst Pulse Frequency	0 to 500 Hz
Number of Pulses per Burst	0 to 32000
Auto-Delay Between Burst Cycles	0 to 32000 ms
Number of Cycles per Trigger	1 to 160000
Power-On Sound	Programmable
Laser-Firing Sound	Programmable
Power-Off Sound	Programmable
Capacitive sensors on aperture	Programmable
Charging during use	Programmable
Cooling fan	Programmable

## 5. System Setup

### Unpacking

1. Unlock the case with the key provided.
2. Remove all items from the box and verify each item is accounted for. The system is carefully packaged to minimize the possibility of damage during shipment. Inspect the shipping box for external signs of damage or mishandling. Inspect the contents for damage. The contents of the box include:



-If any item is missing or damaged, immediately contact Veralase LLC or the authorized representative from whom the system was purchased.

-It is suggested to save the packaging material and box, in case the equipment needs to be stored or relocated at a future date.

## 6. Safety Information



Class IV Laser Device.

Only for use by authorized personnel.

**Lasers can produce serious injury to the eyes if not handled with care.**

### 6.1 Interlock

Interlock should be attached to the door of the room of operation, and laser will immediately stop operation if interlock is detached.

### 6.2 Password:

Laser is associated with default password set at the factory. The default password is **Start Button, Trigger Button, Trigger Button, Start Button**. The customer is strongly advised to change the password before starting using the device

To change the password on the handheld laser device, the user needs to log into the Veralase database, find the device using the serial number, and change the password followed by syncing the device.

### 6.3 Safety glasses

Authorized personnel **MUST** wear laser safety glass before using the laser. Laser safety glasses can be found at [www.thorlabs.com](http://www.thorlabs.com) or [www.newport.com](http://www.newport.com)

### 6.4 Capacitive Sensor:

The laser can only fire when sensor detects tissue in full contact with the outer ring of the laser aperture.

To turn the capacitive sensor on / off the user needs to log into the server, find the device using the serial number, navigate to the sensors tab, and turn the capacitive sensor on / off followed by syncing the device.



# 7. Design

## 7.1 Laser Design

Note: Veralase device is NOT designed to be disassembled and serviced. Never open laser device.



## 8. How to Use for Medical Applications

### 8.1 Turn on/ Turn off the device

- Turn on your Laser by pressing the power button once. You will hear a high-pitched beep and the lights will turn on.
- Turn off your Laser by holding down the power button for about 2 seconds. The unit will automatically power down after 2 minutes with no activity.

### 8.2 Bluetooth

- Download the Veralase app from iOS app store or Android app store, and turn on app.
- To Pair: Hold down the power button first and then hold trigger button together until the power level indicator lights flash.
- Click the pair icon in the app, type 654321 into pairing code dialog.

### 8.3 Power Level

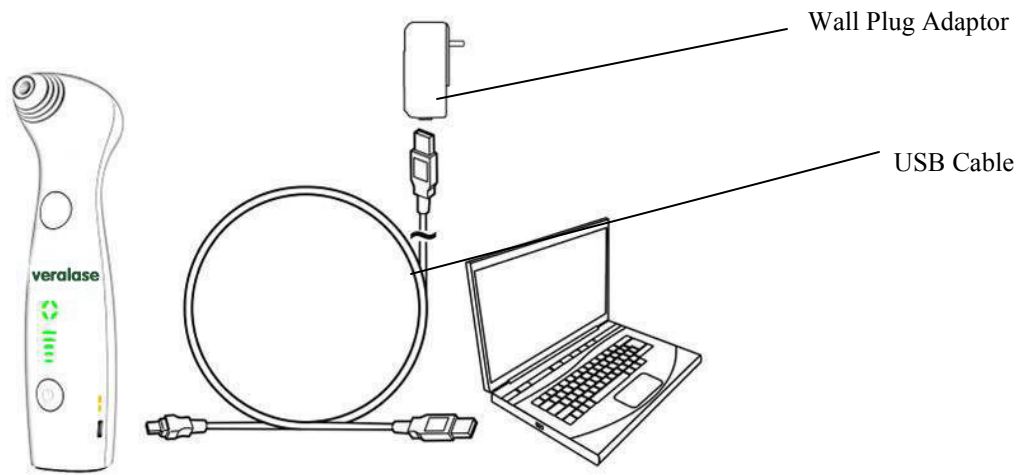
- Press the power button again to increase the power level to the desired strength.







### 8.4 Treatment

- To start the treatment, user needs to mount the laser device properly and turn the device on. Press the treatment button to start the laser program treatment. Note the user may adjust the power level of the laser by clicking the power on/ off button.
- If capacitive sensor is on, the user can only use the device with full laser aperture contact against the tissue. If treatment is interrupted, the laser will stop and a rejection tone will sound

### 8.5 Charging Instruction

- First, connect the USB cable to the charging port of the device.
- If using a computer to charge, connect the large end of the USB cable to the USB port of the computer.
- Connect the large end of the USB cord to the wall plug adaptor and plug into a wall outlet.
- When your R&D Laser is connected to a power source, the battery indicator lights will flash until the battery is fully charged. Once the battery is fully charged, the battery indicator lights will stop flashing. It should take no longer than 5 hours to fully charge the device.



Charger State	Battery Indicators	Condition
Charger Disconnected	 Top is ON Bottom is ON	Normal operation—Battery over half charge
	 Top is OFF	Normal operation—Battery less than half charge
	 Top is OFF Bottom is Blinking	Very low charge. May stop functioning.
Charger Connected	 Top is OFF Bottom is Blinking	Still charging. Less than half charge.
	 Top is Blinking Bottom is ON	Still charging. More than half charge.
	 Top is ON Bottom is ON	Charge complete. Disconnect and treat.

# 9. Maintenance

## 9.1 Service and Maintenance















- The device does not require assembly or regular maintenance.
- Never attempt to service it in any manner. If you have any questions regarding servicing or maintenance, please call Veralase LLC.
- If the laser appears damaged, do not use the device and contact your laser service provider for repair or replacement

## 9.2 Cleaning and Disinfection

- Gently place the cotton swab into the opening on the Laser Aperture to clean the glass lens and remove any debris.
- Wipe down device with anti-bacterial swab such as an alcohol swab and be sure device is fully clean and dry before next use. Never open the laser housing.

## 9.3 Troubleshooting

Refer to the following table if you are having problems operating the device. If you still have questions, please visit [www.veralase.com](http://www.veralase.com) or email Veralase Customer Service at [info@veralase.com](mailto:info@veralase.com)

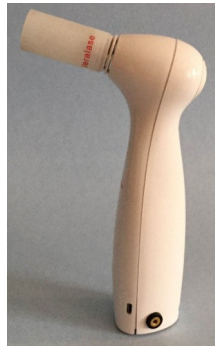
Front Light Indicates	Battery Indicators	User Action	Reference Code
Power lights on but Usage Light lowest level blinking 	 Normal	Replenish Usage	2
Power lights on but All Usage light lowest level blinking 	 Blinking SLOWLY B-T-B-T  Blinking FAST	Replenish Usage	3
All Front lights off - can't treat 	 B-TT-B-TT	Contact Customer Service	5
	 Blinking SLOWLY BB-T-BB-T	Turn off device and Turn back on. If not resolved, contact Customer Service	7
	 Blinking SLOWLY at the same time	Charge device by plugging into electrical outlet	8
	 Blinking FAST B-TTT-B-TTT	Contact Customer Service	9
	 Blinking FAST B-TTT-B-TTT	Contact Customer Service	10
	 Blinking FAST B-TTTT-B-TTTT	Release Treatment button. Contact Customer Service	11
	 Blinking FAST BB-TT-BB-TT	Contact Customer Service	12
	 Blinking FAST B-TTTTT-B-TTTTT	Release Power button. Contact Customer Service	13

## 10. Database Interface

Please refer to Veralase website for more information  
<https://www.veralase.com/support-videos>

# 11. Appendix

The set of nose cones are used to set the distance from the laser aperture to the subject under test. The data below shows the laser aperture size for each laser setup given the wavelength, power and nose cone.



Output Spot Size Table (mm)

975 nm Wavelength									
Nose Cone(mm)	None	5	10	15	20	25	30	35	40
Power output(mW)									
250	1.3 × 5.1	1.5 × 4.9	1.8 × 4.6	2.1 × 4.4	2.3 × 4.1	2.6 × 3.9	2.8 × 3.6	3.1 × 3.4	3.4 × 3.1
500	1.5 × 5	1.9 × 4.8	2.2 × 4.6	2.5 × 4.4	2.8 × 4.2	3.1 × 4	3.5 × 3.8	3.8 × 3.6	4.1 × 3.4
1000	2.1 × 4.8	2.5 × 4.6	2.9 × 4.5	3.4 × 4.3	3.8 × 4.2	4.2 × 4	4.6 × 3.9	5 × 3.7	5.5 × 3.6
1500	2.8 × 4.8	3.3 × 4.7	3.9 × 4.5	4.4 × 4.4	5 × 4.2	5.6 × 4.1	6.1 × 3.9	6.7 × 3.8	7.2 × 3.6
2000	3 × 4.8	3.7 × 4.7	4.3 × 4.5	4.9 × 4.4	5.6 × 4.2	6.2 × 4.1	6.8 × 3.9	7.5 × 3.8	8.1 × 3.6
1064 nm Wavelength									
Nose Cone(mm)	None	5	10	15	20	25	30	35	40
Power output(mW)									
250	2 × 5.4	2.4 × 5.2	2.8 × 5.1	3.3 × 4.9	3.7 × 4.8	4.1 × 4.6	4.5 × 4.5	5 × 4.3	5.4 × 4.2
500	2.2 × 5.4	2.6 × 5.2	3.1 × 5.1	3.6 × 4.9	4.1 × 4.8	4.5 × 4.6	5 × 4.5	5.5 × 4.3	6 × 4.2
1000	2.7 × 5.4	3.2 × 5.2	3.8 × 5.1	4.3 × 4.9	4.9 × 4.8	5.4 × 4.6	6 × 4.5	6.5 × 4.3	7.1 × 4.2
1500	2.9 × 5.4	3.6 × 5.2	4.2 × 5.1	4.8 × 4.9	5.4 × 4.8	6.1 × 4.6	6.7 × 4.5	7.3 × 4.3	7.9 × 4.2
2000	3.1 × 5.4	3.8 × 5.2	4.4 × 5.1	5.1 × 4.9	5.7 × 4.8	6.4 × 4.6	7 × 4.5	7.7 × 4.3	8.3 × 4.2
1270 nm Wavelength									
Nose Cone(mm)	None	5	10	15	20	25	30	35	40
Power output(mW)									
250	1.4 × 5.3	1.7 × 5.2	2 × 5.1	2.3 × 5	2.6 × 4.9	2.9 × 4.8	3.2 × 4.7	3.5 × 4.6	3.8 × 4.5
500	1.7 × 5.3	2.1 × 5.2	2.4 × 5.1	2.8 × 5	3.1 × 4.9	3.5 × 4.8	3.8 × 4.7	4.2 × 4.6	4.5 × 4.5
1000	2.1 × 5.2	2.6 × 5.1	3 × 5.1	3.5 × 5	3.9 × 5	4.4 × 4.9	4.8 × 4.9	5.3 × 4.8	5.7 × 4.8
1500	2.5 × 5.2	3 × 5.1	3.5 × 5.1	4 × 5	4.5 × 5	5 × 4.9	5.5 × 4.9	6 × 4.8	6.5 × 4.8
2000									

Output Spot Size Table (mm) Continued

1310 nm Wavelength									
Nose Cone(mm)	None	5	10	15	20	25	30	35	40
Power output(mW)									
250	3.7×5.5	4.5×5.4	5.4×5.3	6.2×5.2	7.1×5.1	7.9×5	8.8×4.9	9.6×4.8	10.5×4.7
500	6.1×5.5	7.5×5.4	8.9×5.3	10.3×5.2	11.7×5.1	13.1×5	14.5×4.9	15.9×4.8	16×4.7
1000	6.1×5.5	7.5×5.4	8.9×5.3	10.3×5.2	11.7×5.1	13.1×5	14.5×4.9	15.9×4.8	16×4.7
1500	6.1×5.5	7.5×5.4	8.9×5.3	10.3×5.2	11.7×5.1	13.1×5	14.5×4.9	15.9×4.8	16×4.7
2000	6.1×5.5	7.5×5.4	8.9×5.3	10.3×5.2	11.7×5.1	13.1×5	14.5×4.9	15.9×4.8	16×4.7
1450 nm Wavelength									
Nose Cone(mm)	None	5	10	15	20	25	30	35	40
Power output(mW)									
250	2.2 × 4.7	2.7 × 4.6	3.2 × 4.6	3.7 × 4.5	4.1 × 4.5	4.6 × 4.4	5.1 × 4.4	5.6 × 4.3	6 × 4.3
500	2.6 × 4.7	3.1 × 4.6	3.7 × 4.6	4.2 × 4.5	4.7 × 4.5	5.2 × 4.4	5.8 × 4.4	6.3 × 4.3	6.8 × 4.3
1000	2.8 × 4.9	3.4 × 4.8	4.1 × 4.7	4.7 × 4.6	5.3 × 4.5	5.9 × 4.4	6.6 × 4.3	7.2 × 4.2	7.8 × 4.1
1500	3.1 × 4.9	3.8 × 4.8	4.5 × 4.7	5.2 × 4.6	5.9 × 4.5	6.6 × 4.4	7.3 × 4.3	8 × 4.2	8.7 × 4.1
2000	3.8 × 4.9	4.6 × 4.8	5.4 × 4.7	6.2 × 4.6	7 × 4.5	7.8 × 4.4	8.6 × 4.3	9.4 × 4.2	10.2 × 4.1

The Nose Cone size above is the effect length from the laser aperture to Nose Cone aperture. The full length is listed below.

Effective Aperture Length (mm)	5	10	15	20	25	30	35	40
Full Nose Cone Length (mm)	12.5	17.5	22.5	27.5	32.5	37.5	42.5	47.5

Output Spot Area (mm<sup>2</sup>) and Power Density (W/cm<sup>2</sup>) Table

975 nm Wavelength																		
Nose Cone (mm)	None		5		10		15		20		25		30		35		40	
Power Output (mW)	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )
250	7	3.8	7	3.4	8	3.0	9	2.7	9	2.7	10	2.5	10	2.5	11	2.4	11	2.4
500	8	6.7	9	5.5	10	4.9	11	4.5	12	4.3	12	4.0	13	3.8	14	3.7	14	3.6
1000	10	9.9	12	8.7	13	7.7	15	6.8	16	6.3	17	6.0	18	5.6	19	5.4	20	5.1
1500	13	11.2	16	9.7	18	8.5	19	7.7	21	7.1	23	6.5	24	6.3	25	5.9	26	5.8
2000	14	13.9	17	11.5	19	10.3	22	9.3	24	8.5	25	7.9	27	7.5	29	7.0	29	6.9
1064 nm Wavelength																		
Nose Cone (mm)	None		5		10		15		20		25		30		35		40	
Power Output (mW)	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )
250	11	2.3	12	2.0	14	1.8	16	1.5	18	1.4	19	1.3	20	1.2	22	1.2	23	1.1
500	12	4.2	14	3.7	16	3.2	18	2.8	20	2.5	21	2.4	23	2.2	24	2.1	25	2.0
1000	15	6.9	17	6.0	19	5.2	21	4.7	24	4.3	25	4.0	27	3.7	28	3.6	30	3.4
1500	16	9.6	19	8.0	21	7.0	24	6.4	26	5.8	28	5.3	30	5.0	31	4.8	33	4.5
2000	17	11.9	20	10.1	22	8.9	25	8.0	27	7.3	29	6.8	32	6.3	33	6.0	35	5.7
1270 nm Wavelength																		
Nose Cone (mm)	None		5		10		15		20		25		30		35		40	
Power Output (mW)	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )
250	7	3.4	9	2.8	10	2.5	12	2.2	13	2.0	14	1.8	15	1.7	16	1.6	17	1.5
500	9	5.5	11	4.6	12	4.1	14	3.6	15	3.3	17	3.0	18	2.8	19	2.6	20	2.5
1000	11	9.2	13	7.5	15	6.5	18	5.7	20	5.1	22	4.6	24	4.3	25	3.9	27	3.7
1500	13	11.5	15	9.8	18	8.4	20	7.5	23	6.7	25	6.1	27	5.6	29	5.2	31	4.8
2000																		
1310 nm Wavelength																		
Nose Cone (mm)	None		5		10		15		20		25		30		35		40	
Power Output (mW)	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )
250	20	1.2	24	1.0	29	0.9	32	0.8	36	0.7	40	0.6	43	0.6	46	0.5	49	0.5
500	34	1.5	41	1.2	47	1.1	54	0.9	60	0.8	66	0.8	71	0.7	76	0.7	75	0.7
1000	34	3.0	41	2.5	47	2.1	54	1.9	60	1.7	66	1.5	71	1.4	76	1.3	75	1.3
1500	34	4.5	41	3.7	47	3.2	54	2.8	60	2.5	66	2.3	71	2.1	76	2.0	75	2.0
2000	34	6.0	41	4.9	47	4.2	54	3.7	60	3.4	66	3.1	71	2.8	76	2.6	75	2.7
1450 nm Wavelength																		
Nose Cone (mm)	None		5		10		15		20		25		30		35		40	
Power Output (mW)	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )	Area (mm <sup>2</sup> )	PD (W/cm <sup>2</sup> )
250	10	2.4	12	2.0	15	1.7	17	1.5	18	1.4	20	1.2	22	1.1	24	1.0	26	1.0
500	12	4.1	14	3.5	17	2.9	19	2.6	21	2.4	23	2.2	26	2.0	27	1.8	29	1.7
1000	14	7.3	16	6.1	19	5.2	22	4.6	24	4.2	26	3.9	28	3.5	30	3.3	32	3.1
1500	15	9.9	18	8.2	21	7.1	24	6.3	27	5.6	29	5.2	31	4.8	34	4.5	36	4.2
2000	19	10.7	22	9.1	25	7.9	29	7.0	32	6.3	34	5.8	37	5.4	39	5.1	42	4.8

The Nose Cone size above is the effect length from the laser aperture to Nose Cone aperture. The full length is listed below.

Effective Aperture Length (mm)	5		10		15		20		25		30		35		40
Full Nose Cone Length (mm)	12.5		17.5		22.5		27.5		32.5		37.5		42.5		47.5



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