

**INCREDIBLE<sup>TM</sup>**  
DEVICES

# Full Body Laser Treatment in 45 minutes

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**ATHENA** Technology uses  
Super Pulsed Diode Laser  
System; Perfect for  
ALL SKIN types



 Health Canada Licensed

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**ATHENA<sup>TM</sup>**  
SUPER ICE 

# Introduction to ATHENA SUPER ICE

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- Medical Device
- Laser Hand Piece
- Foot Pedal
- Inter-lock

# Key Words

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- Frequency (Hz)
- Fluence (J/cm<sup>2</sup>)
- Spot Size (mm)
- Pulse Duration (ms)
- Wavelength (Nm)

# Theory

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The ATHENA SUPER ICE hair removal device employs volumetric heating of the dermal tissue. This heat can alter the stem cell function of the hair. The fluence of each pulse is delivered at a low level, and the pulses are delivered rapidly to collectively heat the dermal tissue and thermally damage the hair follicle. The melanin content in the hair acts as a chromophore, conducting heat and raising the temperature of the follicle above that of the dermal tissue. Since hair is a good conductor, the temperature of the hair will not drop below that of the heated dermis. The duration of each pulse is shorter than the thermal relaxation time of the hair follicle, allowing the energy to accumulate within the follicle and cause more heat trauma.



# Theory

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Once the sub-dermal layer is sufficiently heated to 45 - 50°C, the absorption from the pulses of the ATHENA SUPER ICE device raises the temperature of the follicle to 50 - 55°C. This temperature effectively impairs the function of the biological elements responsible for hair re-growth, such as hormones, growth factors, and stem cells (bulge). This volumetric heating technique substantially reduces pain and discomfort, while minimizing the negative side effects of traditional laser hair removal.

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# Introduction

## 1.1 Use Of This Manual

ATHENA SUUPER ICE device is designed to meet international safety and performance standards. Personnel operating the system must have a thorough understanding of the proper operation of Diode Laser Therapy Systems.

This manual is intended to assist technicians in the use and operation of this system. Do not operate the system until you have read this manual and fully understand its operation. If any part of this manual is unclear, contact your service representative for clarification.



### Warning



**Use of this device beyond the scope specified in this manual may cause harm to the operator and/or the patient. Therefore, personnel should read this manual and become thoroughly familiar with all its safety requirements and operating procedures before attempting to use and/or operate this system.**

This manual should always accompany the system and its location must be known to all operating personnel. Additional copies of this manual are available from your service representative.





## **1.2 Doctor's Responsibilities**

A suitably licensed practitioner will be responsible for the use and operation of the equipment, as well as ensuring all operator qualifications. INCREDIBLE LASER makes no representations regarding any local laws or regulations that may apply to the use of any medical device. Physicians are responsible for contacting local licensing authorities to determine the legal certification required for the clinical use and operation of the device.

## **1.3 Maintenance**

The ATHENA SUPER ICE device is a precision medical device that requires regular routine maintenance, which must be performed by authorized INCREDIBLE LASER technicians. Failure to follow the maintenance guidelines will void all express and implied warranties. Please contact INCREDIBLE LASER or your service representative for further details.

## **1.4 System Modifications**

Unauthorized modifications to the hardware, software, or specifications of the ATHENA SUPER ICE machine will void all express and implied warranties. INCREDIBLE LASER assumes no responsibility for the use or operation of any such modified equipment.

## **1.5 Resale Inspection**

The ATHENA SUPER ICE device is a sophisticated medical device. If any INCREDIBLE LASER equipment is resold by anyone other than an authorized sales representative, INCREDIBLE LASER will conduct a resale inspection, performed by INCREDIBLE LASER technicians, to ensure that the equipment is functioning properly and meets the manufacturer's specifications. Using the equipment after resale and before inspection is considered misuse, which may cause harm and void all express and implied warranties.

INCREDIBLE LASER also offers service contracts and extended warranties for its equipment. For more information about these services, please contact INCREDIBLE LASER or your service representative.

## **1.6 Abbreviations And Acronyms**

|    |                    |
|----|--------------------|
| °C | Degrees Celsius    |
| A  | Ampere Alternating |
| AC | Current Continuous |
| CW | Wave               |

|                   |   |
|-------------------|---|
| Hz                | Hertz                                     |
| IEC               | International Electrotechnical Commission |
| J                 | Joule                                     |
|                   |   |
| J/cm <sup>2</sup> | Joules Per Square Centimeter              |
|                   |   |
| Kg                | Kilogram                                  |
| LCD               | LCD Monitor                               |
| led               | Led Light                                 |
| OD                | Optical Density Skin Protection           |
| SPF               | Skin Protection Factor                    |
| VAC               | Volt                                      |
| W                 | Watt                                      |

# Safety

## 2.1 Introduction

This chapter describes general safety issues in the use of ATHENA SUPER ICE device, with particular emphasis on optical and electrical safety.

ATHENA SUPER ICE device can emit high-intensity infrared laser radiation, which can cause serious damage to soft tissue, especially the eyes. Therefore, to avoid serious injury, all doors and windows in treatment rooms should be appropriately equipped with high-density shading materials to prevent inadvertent exposure. There must be warning signs outside treatment rooms.


ATHENA SUPER ICE device focus on two aspects: functionality and safety. The system is designed with comprehensive safety screening protocols designed to reduce risk to users and patients. Given the high intensity and energy output of lasers during operation, all personnel involved must adhere to the above precautions. Before starting operation, check that applicable accessories are installed correctly and that the power cord is intact. Finally, confirm that all relevant employees are wearing eye protection.

|  |   |
|--|---|
|  <b>Warning</b> |   |
|                 | <b>Radiation Emitting device has restrictions on who is certified to operate.</b> |


ATHENA SUPER ICE device system is specifically designed to minimize accidental exposure to hazardous radiation.

With proper operation and maintenance, this system can be safely used by trained and qualified operators. Supervising medical practitioners and all other personnel involved in operating or maintaining the ATHENA SUPER ICE device must be familiar with the safety information outlined in this chapter.

The first consideration should be the safety of patients, operator and other personnel. Well-trained staff and well-organized treatment rooms primarily ensure patient safety. Patient education is also important and should include information about the nature of the treatments being given.



Warning



Certain materials, such as cotton and wool can catch fire when enriched with oxygen due to the high temperatures produced by laser equipment. Solvents and flammable solutions used for cleaning and disinfection should be allowed to fully dry-out before using the laser equipment. Special attention should be given to the risk of internal gases that may ignite.

2.2 System Security Measures

The ATHENA SUPER ICE device is designed to maximize safety for both the patient and the operator.

Here are some preventive safety measures for this system.


2.2.1 Electrical Safety

Some components may still be active after the power is turned off, therefore, no part of the device housing may be removed except by authorized INCREDIBLE LASER personnel.

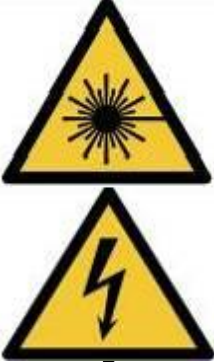
This equipment is grounded through the grounding conductor in the power cord. This protective grounding is critical to safe operation.

This device uses isolated AC.

Be sure to familiarize yourself with the instrument's components and specifications before use.



Warning



**DO NOT open the device even if the equipment is turned OFF.**

**DO NOT operate the equipment if the power cord is frayed or damaged.**

**Do not immerse or spray the laser console, touch screen with liquids, as this may cause equipment damage and electric shock. Wait for 15 mins.**

**Clean the touch screen only when the system is turned off and disconnected from power.**

Built-in security measures include:

After switching over the system, perform a software check on all safety-related hardware.

A watchdog loop continuously monitors the operation of the system during operation. The

circuit breaker on the service panel protects the system by tripping when the power supply

is overloaded. To resume normal operation, reset the circuit breaker by lifting the handle

and then restart the system.

If an error occurs, the system displays a warning message to the operator and disables further operations. Refer to Tech Support team.

### 2.2.2 Diode Laser Safety

- 1. The laser converts electrical energy into light energy and directs it to the targeted treatment area.
  - 2. Emergency shutdown button immediately shuts down the device!
  - 3. A password on the service screen prevents unauthorized changes to the system's basic operating parameters.
  - 4. The system includes a secure remote inter-lock connector for connecting the external inter-lock on the entrance door of the treatment room. The external remote inter-lock is continuously connected to the foot switch, ensuring that when installed, the system is disabled and operation is prohibited if the entrance gate is opened.
  - 5. The system includes status indicators: a yellow emission indicator light on the front panel of the device and a buzzer.
- When the system is ready to trigger a pulse, the yellow transmit indicator light flashes and the buzzer sounds a warning.
- 6. Laser pre-ignition is only initiated when the operator switches to ready mode and presses the foot switch (minimal risk).
  - 7. Laser emission is only enabled when the foot switch and remote interlock are both pressed simultaneously.
  - 8. Once the system is turned on, water is circulated through out the system to keep it cool.
  - 9. Water flow and temperature should be monitored to eliminate the risk of module overheating. Laser handle will stop firing if, for any reason, water stops flowing or if the water temperature is 40°C (104°F) or above.
  - 10. The system is equipped with a foot switch for easy use as well as a safety measure.

|  |  |
|--|--|
|  <b>Warning</b> |  |
|                 | <b>Any laser emitting device can cause injury if used improperly. Staff working with lasers must always be aware of possible hazards and must take appropriate safety measures as described in this manual and training!</b> |



## 2.3 Treatment Room

The treatment room should not include any reflective objects such as mirrors and glass objects and windows. This equipment should only be used by necessary personnel who are properly trained in the safe operation of ATHENA SUPER ICE device.

Please ensure that all treatment room personnel are familiar with the ATHENA SUPER ICE device controls and are able to appropriately disable the system immediately if necessary.

## 2.4 General Precautions and Warnings

To ensure safe use of ATHENA SUPER ICE, the following precautions and warnings must be observed.

### 2.4.1 Precautions

Device operator and the supervisors should read this manual in its entirety before attempting to operate the ATHENA SUPER ICE.

The handpiece light exit must be kept clean at all times.

The system weighs approximately 90 kilograms and injury may occur if care is not taken when moving the system. The system is stable and designed to be moved, but should always be moved slowly and carefully.

### 2.4.2 **Warning!!!**

Only INCREDIBLE's authorized personnel can repair ATHENA SUPER ICE device. This includes making internal adjustments to power supplies, cooling systems, optics, handpieces, and more.

Verify that the ATHENA SUPER ICE is connected to the appropriate voltage

Operators can only perform maintenance when the system is shut down and disconnected from the power supply. Performing maintenance procedures while the system is powered can be hazardous to the operator and/or destructive to the system.

Always turn off the system when not in use.

Never leave the system in ready mode unattended.

Never allow untrained personnel to operate the system.

Never press the footswitch unless the handle is safely aimed at the specific intended target treatment area.

System should always be powered OFF during maintenance.

## 2.5 Warnings Related To Laser Exposure



### 2.5.1 Direct and Reflective Eye Exposure Hazards



All personnel (patients and medical staff) in the operating room during treatment must wear protective and anti-laser goggles recommended by INCREDIBLE LASER to protect their eyes.

It is a best practice to instruct patients to close their eyes during treatment, even if wearing goggles.



If the patient cannot wear goggles, fit the patient with opaque goggles that completely block light from reaching the eyes.

If the area to be treated is close to the eye (such as the eyelid), protect the eye with a corneal shield.



|  |   |
|--|---|
|  <b>Warning</b> |   |
|                 | <b>Radiation from ATHENA SUPER ICE can cause serious eye damage or blindness. Do not treat eyebrows, eyelashes, or other areas within the bony area around the eyes. For maximum safety, patients must wear authorized goggles during all treatments.</b> |

|  |   |
|--|---|
|  <b>Warning</b> |   |
|                 | <b>When operating a laser system, Never look directly into the laser light or handle or apparatur on the far side of the handle, even if you are wearing laser safety glasses. Never aim the laser beam anywhere other than the intended treatment area. Stray laser light and its reflections are always a potential hazard and can cause serious irreversible eye damage.</b> |

| <div>Warning</div> |  |
|---|--|
| <div></div>        | <p><b>Eye safety precautions: Clearly identify treatment rooms by prominently posting approved Warning and Safety signs, outside the treatment door and inside the Treatment room.</b></p> <p><b>Cover all windows with dark filament to ensure that the laser beam does not escape the treatment room. Restrict access to treatment rooms while equipment is in use. Only personnel trained to operate the equipment should have access. Make sure the foot switch is clean and working properly. Place the footswitch where it cannot be confused or mistaken.</b></p> |

| <div>Warning</div> |   |
|---|---|
| <div></div>        | <p><b>Do Not transmit laser output through an optical instrument designed for long distance (such as a telescope)</b></p> |

2.5.2 Safety Glasses

| <div>Warning</div> |  |
|---|--|
| <div></div>        | <p><b>Radiation from ATHENA SUPER ICE is harmful to the human eye. All personnel must use 810 Provides adequate protection against nano-radiation (OD&gt;5) goggles. Additional goggles can be ordered from your INCREDIBLE LASER representative.</b></p> <p><b>Nominal eye hazard distance NOHD: 19m (assuming irradiation duration 0.2 s).</b></p> |

2.5.3 Explosion and Fire Hazard



The absorption of light energy increases the temperature of the absorbing material. Take precautions to reduce the risk of igniting combustible materials in and around the handling area.

This system is not suitable for use in the presence of flammable mixtures of air or oxygen.

If alcohol is used to clean and disinfect any part of the ATHENA SUPER ICE,

allow it to completely dry before operating the system.

Flammable materials must be kept at a safe distance from the system.

|  <b>Warning</b> |  |
|--|--|
|                 | <p><b>Do not operate in an environment with volatile solvents such as alcohol, gasoline or other solvents.</b></p> <p><b>When preparing treatment area, do not use any flammable substances such as alcohol or acetone. If necessary, wash with soap and water before treatment.</b></p> |

## 2.5.4 Voltage Hazard

The system uses 110V AC power. To avoid personal injury, do not operate the system until the exterior panels are properly closed. Do not attempt to remove or disassemble exterior panels.

Whenever system maintenance is performed, never leave the ATHENA SUPER ICE Systems Powered ON or unattended.

## 2.6 System Security Features

ATHENA SUPER ICE is equipped with many safety features. All treatment room personnel should be familiar with the location and operation of these safety features.

### 2.6.1 Emergency shut-off Knob

This red knob is used for emergency shutdown. When the button is pressed, it instantly shuts down power to the entire system.

To reset the emergency shut-off knob, turn it clockwise. Otherwise, the system will remain powered off.

***Precaution!!***

***The emergency shut-off knob should only be used in the event of an Emergency.***

### 2.6.2. Running Status Indication

The system has two status indicators: a yellow LED located on the front panel of the device and a buzzer.

The yellow LED has 2 modes:

Steady on - when the system is on and in standby mode

Blinking - glowing and blinking only when the module's trigger and footswitch is pressed.

The buzzer beeps: Intermittent during light emission, same as pulse repetition frequency:

If the repetition frequency is 2Hz, the buzzer will beep twice per second.

### **2.6.3. Remote Interlock Connector**

The system contains a safety remote interlock connector that should be connected to the external microswitch on the treatment room entrance door. The external remote interlock is connected in series with the foot switch, so when installed, it will cause the system to shut down.

### **2.6.4. Double Safety Technology For Laser Emission**

Diode laser beam emission can only be enabled when the operator simultaneously presses the foot switch and turns on start button; Therefore, accidental lasering can only occur due to a double error condition (minimal risk).

### **2.6.5. Cooling System**

The module is cooled using a thermoelectric cooling method to minimize patient discomfort during treatment and reduce postoperative side effects, such as local skin redness and swelling. The tissue is cooled via a metal ring and a cold sapphire window. During operation, the system can reach a minimum temperature of -30°C.



## 2.6.6. Temperature Control Protection System

Miniature infrared temperature sensors are installed on both sides of the handle's light outlet, which can capture the skin surface temperature in real time. If the skin temperature exceeds 44°C, the emission of the laser beam will be immediately cut off or blocked.

Through the 2.6.5 tissue cooling system, the temperature of the skin surface can be effectively reduced, so that when the laser is irradiated, the heat of the laser will be quickly absorbed and released, avoiding the accumulation of heat effectively .

Through the 2.6.6 temperature control protection system, the device provides an immediate protection mechanism when the skin temperature exceeds 44°C.

The combined use provides double safety against burns to the treatment area of the patient.

## 2.6.7. Laser Modular Design

The modular design ensures the safe use of the ATHENA SUPER ICE system.

Since the light or laser beam is generated in the module itself, rather than in a console (like a traditional laser drive power supply), there is no need to have an articulated arm or other beam delivery system. In contrast, ATHENA SUPER ICE Systems module consists of an all-in-one light mixer that combines several emitters to create a uniform, square beam. Since light emission is limited to the module, there is no dangerous light radiation in the console or cables.

During use of the system, the beam is placed on the patient's skin, reducing stray light while increasing the effectiveness of the treatment.

## 2.7 Equipment Classification

According to the method of protection against electric shock: This system is a Class III device.

According to the degree of electric shock protection: the laser handle is a type BF part.

## 2.8 Device tags

### 2.8.1 System Label

ATHENA SUPER ICE System carry the following warning, certification and identification labels: The identification label is affixed to the back of the device. This label contains the

Following information:

- Manufacturer details
- System name and model
- Serial number and manufacturing date
- System electrical requirements







| Incredible™ Diode Laser Therapy System  |         |   |   |                |          |
|---|---------|---|---|----------------|----------|
| Model / Modèle  |         | Athena Super ICE Console - V19  |   |                |          |
| Power Supply / Alimentation Electrique  |         | 110V~ 50/60Hz 1800VA  |   |                |          |
| Laser Class / Classement Laser  |         | Class 4   | Max Energy Density / Densité Énergétique Maximale |                | 100J/cm² |
| Wavelength / Longueur D'onde  |         | 808nm   |   |                |          |
| <div>SN</div>   | 7860909 |  | 2024 - 09 - 21                                    | Weight / Poids | 90kg     |
|    |         | 3D Medical Technologies Inc.  |   |                |          |
|   |         | www.IncredibleLaser.com   |   |                |          |
| <div>CE<div></div></div> |         |   |   |                |          |
| UDI   |         | Health Canada Medical Device License:   |   |                |          |

Figure 2-2: Identification label

# Installation

## 3.1 Introduction

ATHENA SUPER ICE Systems are designed to be installed in a treatment room or clinic and require minimal site preparation.

When purchasing ATHENA SUPER ICE Systems, the buyer will perform a complete on-site installation, including initial system testing and calibration. A complete set of instructions is included in this manual.

Equipment delivery and installation are carried out by INCREDIBLE LASER authorized personnel

Personnel will provide the following services upon delivery:

Unpack the machine package and place it in a suitable and safe place which has selected in advance

Verify the integrity of the system and its components

Connecting system components (handle , foot switches, handle connectors)

Plug the system into a designated power outlet

Test the functional operation of all system components and software

If necessary, coordinate the execution of on-site safety inspections



Warning



Any packaging damage discovered before opening the package should be reported to your **INCREDIBLE LASER** representative and insurance company.

### 3.2 Equipment List

ATHENA SUPER ICE Systems include the following components:

| Name             | No | Name           | No |
|------------------|----|----------------|----|
| HOST User        | 1  | Power line     | 1  |
| manual           | 1  | Foot switch    | 1  |
| Treatment handle | 1  | Funnel         | 1  |
| Staff goggle     | 2  | Therapy goggle | 1  |
| Plastic pipe     | 1  |                |    |

### 3.3 Required Facilities

Before unpacking the system, make sure that the treatment room meets the requirements described in the following sections.

#### 3.3.1 Space and Positioning

The space should be allocated with adequate ventilation and free airflow. The working area of the system should be prepared according to the system dimensions proposed in. To ensure proper ventilation, always keep the sides of the system at least 20 inches (0.5 meters) away from walls or other potential airflow obstructions.

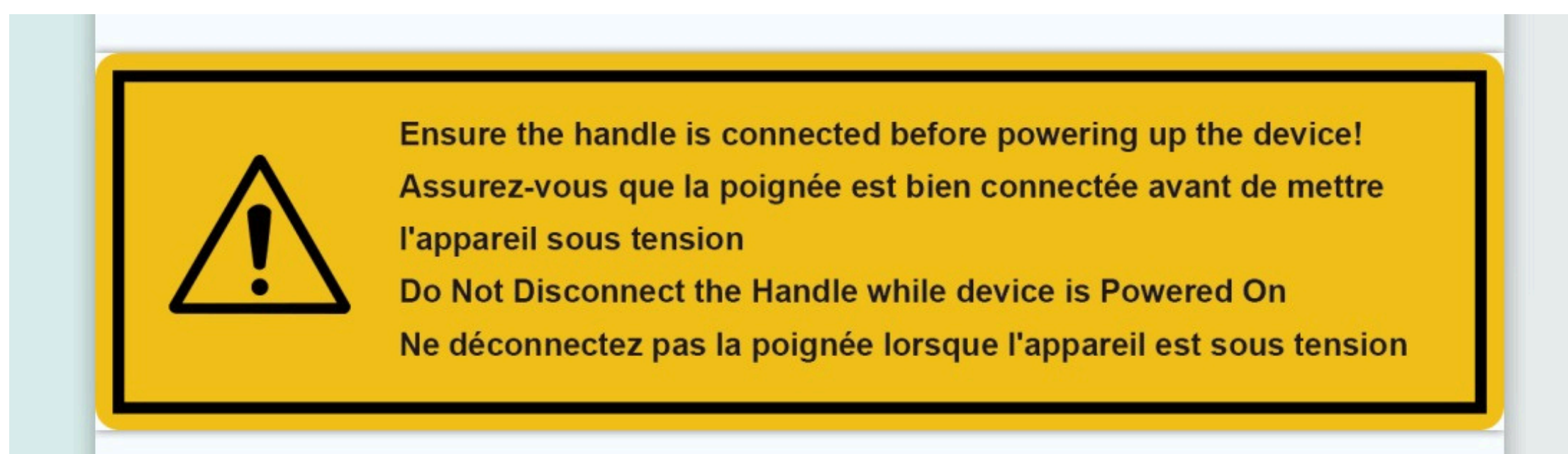
#### 3.3.2 Electrical Requirements

At the customer's request, the system is factory pre-wired for local line voltage. Therefore, this system will require a separate line power supply: 110VAC, 50 Hz, single phase.

Power input lines should be free of transients, voltage and current spikes, sags, and surges. Therefore, the power cord of ATHENA SUPER ICE system should not be shared with other heavy variable loads, such as elevators, air conditioning systems, large motors, etc.

The system needs a safe and reliable electrical environment. Do not overload the power supply, otherwise it will cause the power circuit to burn out or even cause a fire. Avoid the following problems: the power supply of the power board does not meet the requirements, the wiring is messed up, the insulation of the circuit joint part is poor, the joint part is not handled properly, the capacity margin of the air switch, fuse and other protective devices is too small, the power socket plug is loose, the power socket wiring is wrong, etc.

The system is grounded through a grounding conductor in the power cord that plugs into the wall outlet. Good grounding is essential for safe operation.



### 3.3.3 Environmental Requirements

#### **Air Quality:**

The system should operate in a non-corrosive environment. Corrosive substances such as acids can damage the surfaces of wires, electronic components, and optical components.

Dust particles in the air should be kept to a minimum. Dust particles absorb light and heat up. Hot particles on optical lenses can damage them. Metal dust is destructive to electrical equipment.

#### **Temperature:**

To ensure optimal operation of your system, maintain the following temperature and relative humidity levels:

Working temperature: 5°C~30°C (41°F~86°F)

Working relative humidity: ≤80%





Frequent usage can cause the device to overheat. Therefore, it is recommended to install air conditioning in the room where the system is used.

## 3.4 Installation

### 3.4.1 Foot Switch Connection

To connect a footswitch, connect the footswitch's connector to the connection port on the system's service panel.

### 3.4.2 Hand Tools

To connect a handle, connect the access end of the handle to the machine's handle interface.

### 3.4.3 Water

After the handle and foot switch are installed, prepare about 3000ml of pure water and add it to the water tank in two batches. After adding once, turn on the power. When the water level in the water tank drops to 1/3, add the remaining water. When the water level reaches the level shown in the figure (Figure 3-2), the water supply can be started normally.



Figure 3.2 Schematic diagram of water tank

### 3.4.4 Power Outlet

Connect the power source and connect part of the power cord to the electrical outlet on the service panel. Connect the other part to a (110VAC) electrical outlet.

### 3.4.5 Transportation



During the installation process, if you need to lift the device, place your hands or use appropriate tools on designated areas (such as the bottom of the product or the caster frame) as support points for transportation. Ensure that the product is properly supported, and do not tilt beyond 15° to maintain stability.

# System Description

## 4.1 Introduction

This chapter provides a detailed introduction to ATHENA SUPER ICE device. The description covers the system's main components, controls, functional subsystems, and system specifications.

## 4.2 General System Description

The ATHENA SUPER ICE hair removal device is based on the principle of selective photothermal dynamics, as human skin is a relatively transparent structure. Under the powerful laser, the skin behaves like a piece of transparent cellophane. The laser penetrates the skin and reaches the hair follicles, where hair grows. The melanin in the hair follicle absorbs a large amount of laser energy and eventually converts it into heat energy, raising the temperature of the follicle. This process destroys the function of the hair follicle, causing it to lose its ability to regenerate, thereby achieving hair removal.

Laser parameters and other system functions are controlled from a control panel on the console, which provides interface to the system microcontroller via an LCD touch screen.

## 4.3 System Components and Controls

ATHENA SUPER ICE Systems consists of the following main components

1. The main console unit includes the main CPU board, power module, laser power supply, laser device, cooling system and switch module.
2. Hand tools
3. Foot switch.



**Figure 4-1: Main system components**

## **4.3.1 Main Console**

The console unit contains the following system components:

### **4.3.1.1 Host CPU Plate**

This board controls the operation of the subsystem in real time. It integrates advanced microprocessors, memory chips, and digital and analog interfaces.

This ATHENA SUPER ICE device is equipped with self-testing software that uses a watchdog function to continuously monitor system operation.

The software continuously checks the hardware status and if an error condition is detected:

- An error symbol will be displayed
- Audible alarm signal is activated

### 4.3.1.2 Power Module

Power modules provide power to system components:

LRS-150-24 DC24V- Cooling system and water circulation system power supply

LBPS-32V110-TEC12- Laser power supply

LRS-350-12 DC12V - Powers control board and color screen

A9-iC65N-2P-20A-Machine circuit breaker

### 4.3.1.3 Cooling System

The cooling system includes some fans. Three fans are located inside the system. Two fans cool the laser device and one fan cools the switching power supply.

### 4.3.2 Control Panel

The system control panel includes the following functions

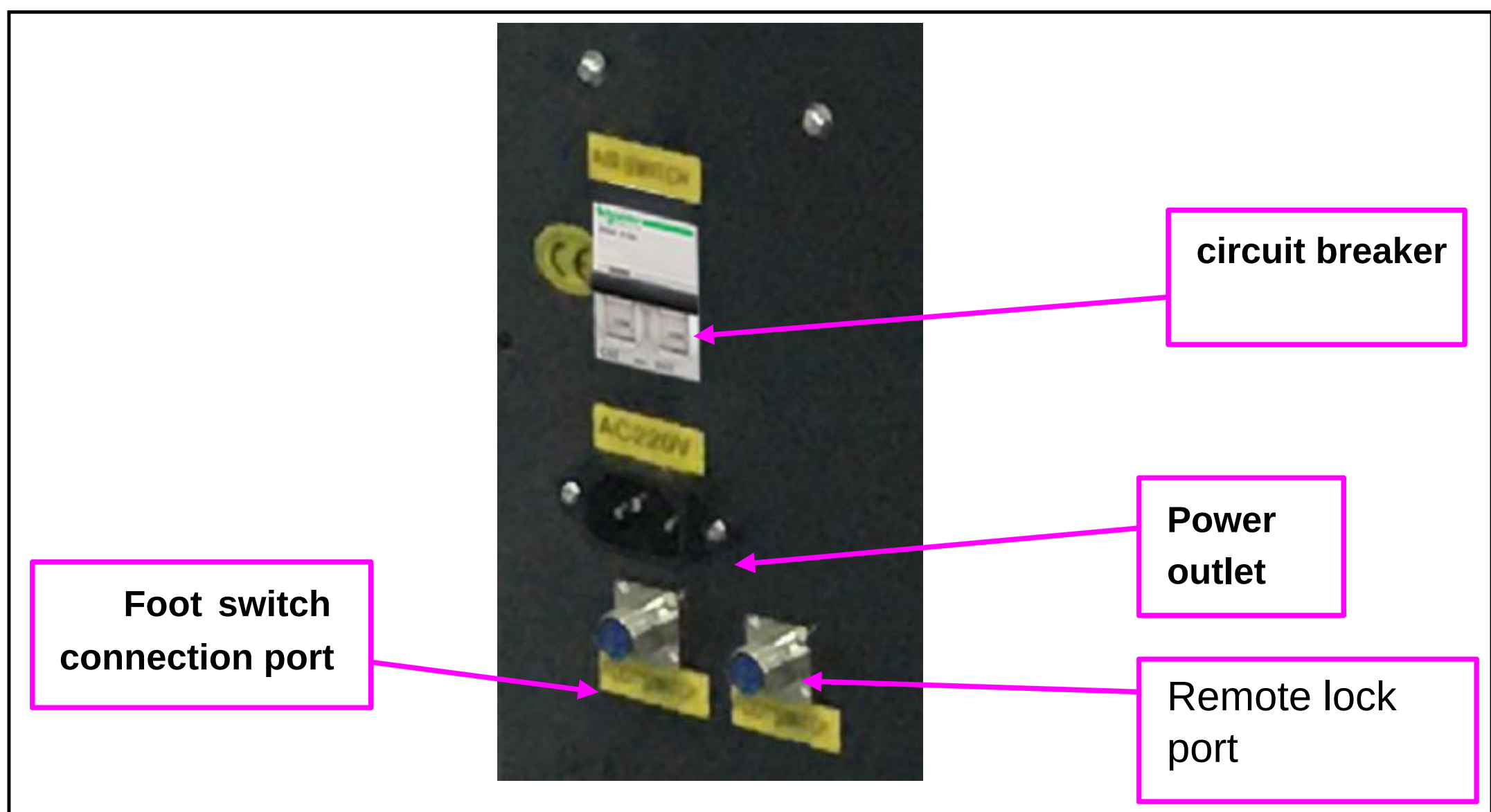
- **Emergency Shutdown Button** - This is a red mushroom-shaped button used for emergency shutdown of the system.
- **LCD Display** - This touch-controlled screen provides status and settings information for the ATHENA SUPER ICE Systems.
- **Keyswitch** - Turns the system on when activated.

### 4.3.3 Maintenance Panel

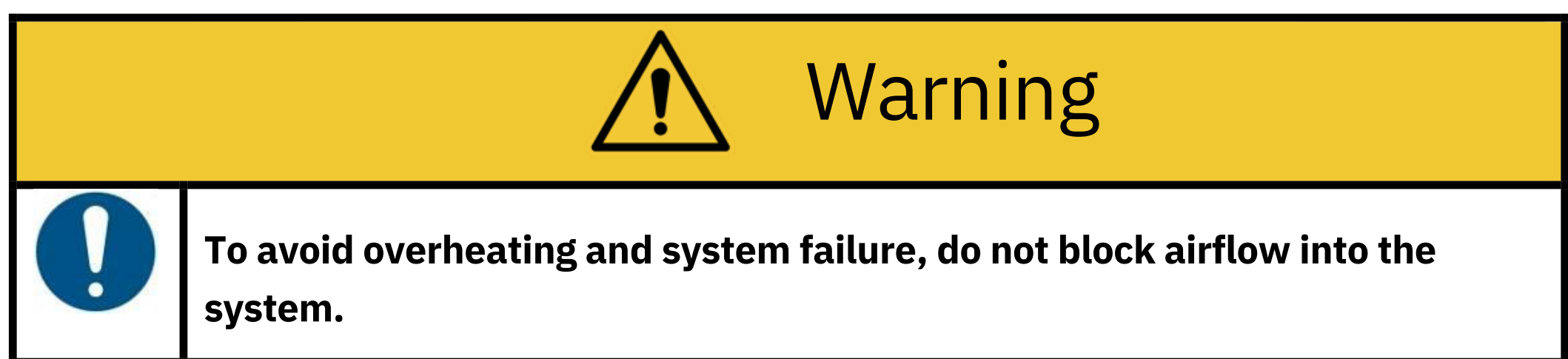
The service panel (see Figure 4-2) is located on the back of the system. It houses all the controls and connections needed for the system:

- Power outlet
- circuit breaker
- Foot switch connection port
- Remote lock port





**Figure 4-2 Maintenance panel**



#### **4.3.4 Foot Switch**

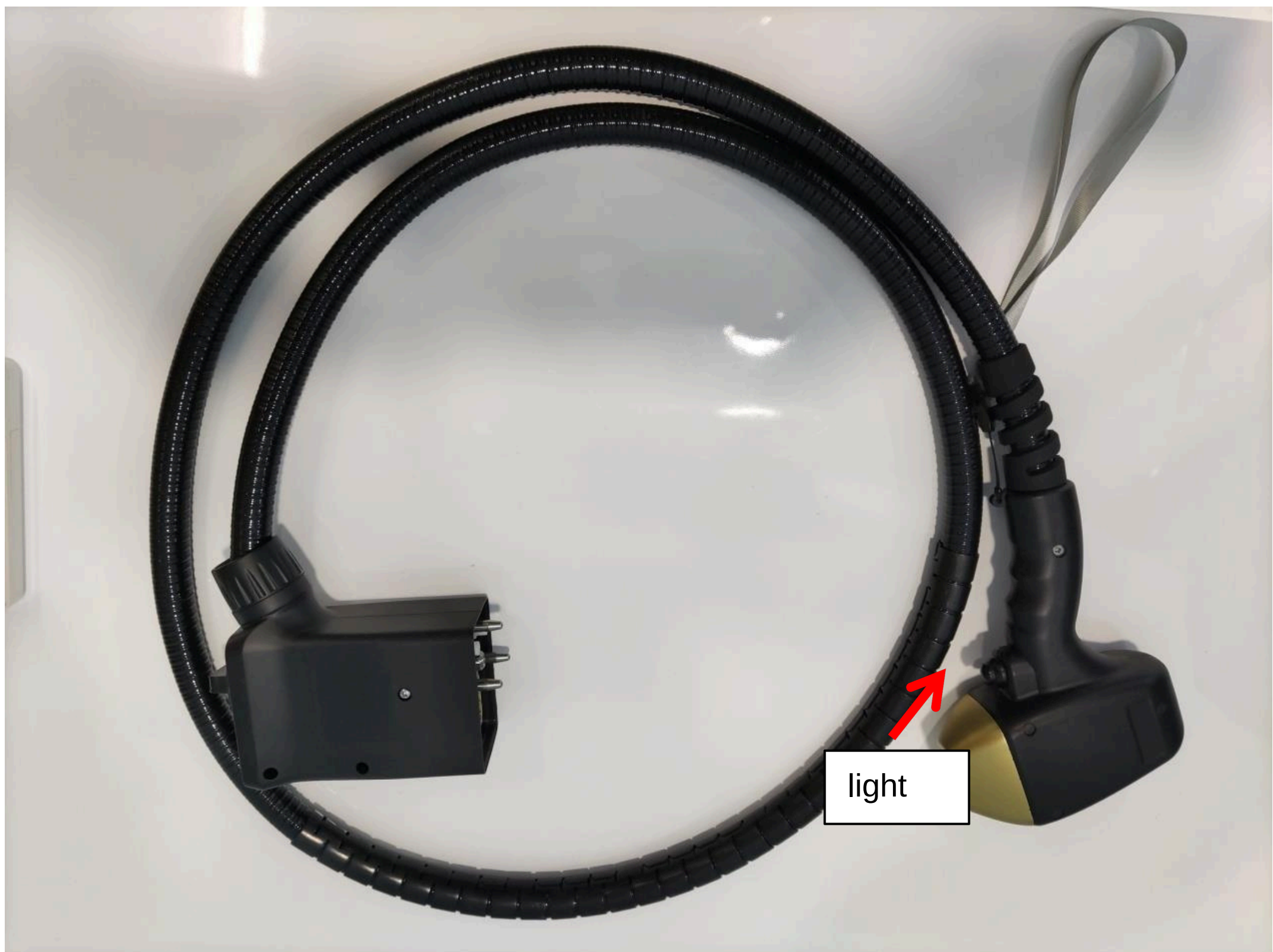
The foot switch is connected to the system through the foot switch connection port on the maintenance panel (see Figure 4-2). Laser emission will only occur when the foot switch is activated.

The footswitch is only enabled when the system is in ready mode. Pressing the footswitch in standby or any other mode will not activate the laser handpiece.

#### **4.3.5 Hand Tools**

The handle is part of the machine; the mounting end of the handle is installed on the machine, and when the machine is in a ready state, hold the handle and press the button handle to release the light.

The upper and lower limits of pulse width and energy output size are set in the program. The pulse range can be adjusted according to the screen parameters, and the output energy range can be adjusted according to the screen parameters.



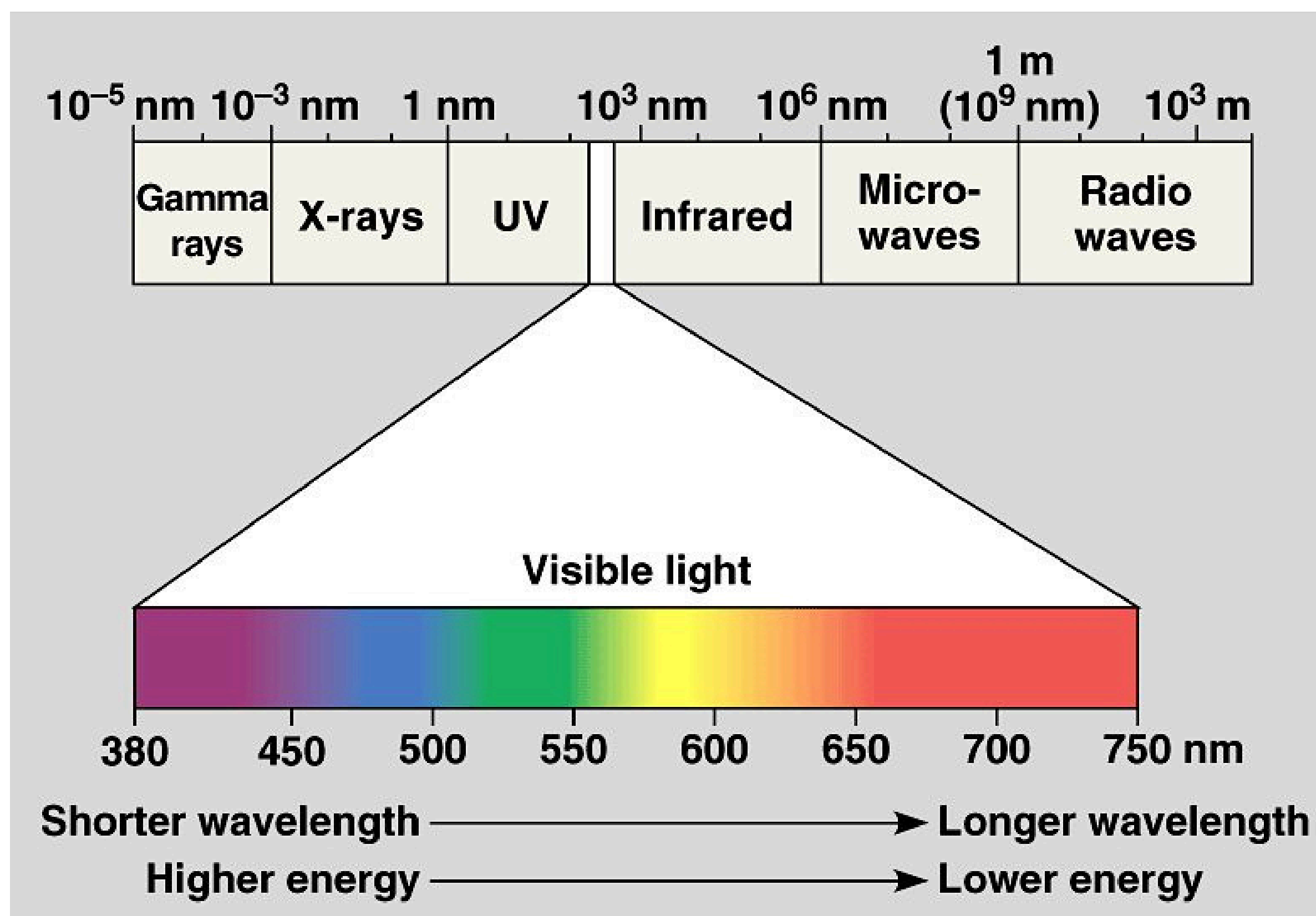
**Figure 4-4 Hands**

## **4.4 System specifications**

- ①AC 110V
- ②AIR SWITCH
- ③DISTILLED WATER IN
- ④DISTILLED WATER OUT
- ⑤WATER LEVEL
- ⑥INTERLOCKING DEVICE

# WaveLengths

## 5. Wavelengths



## 5.1 Light Spectrum

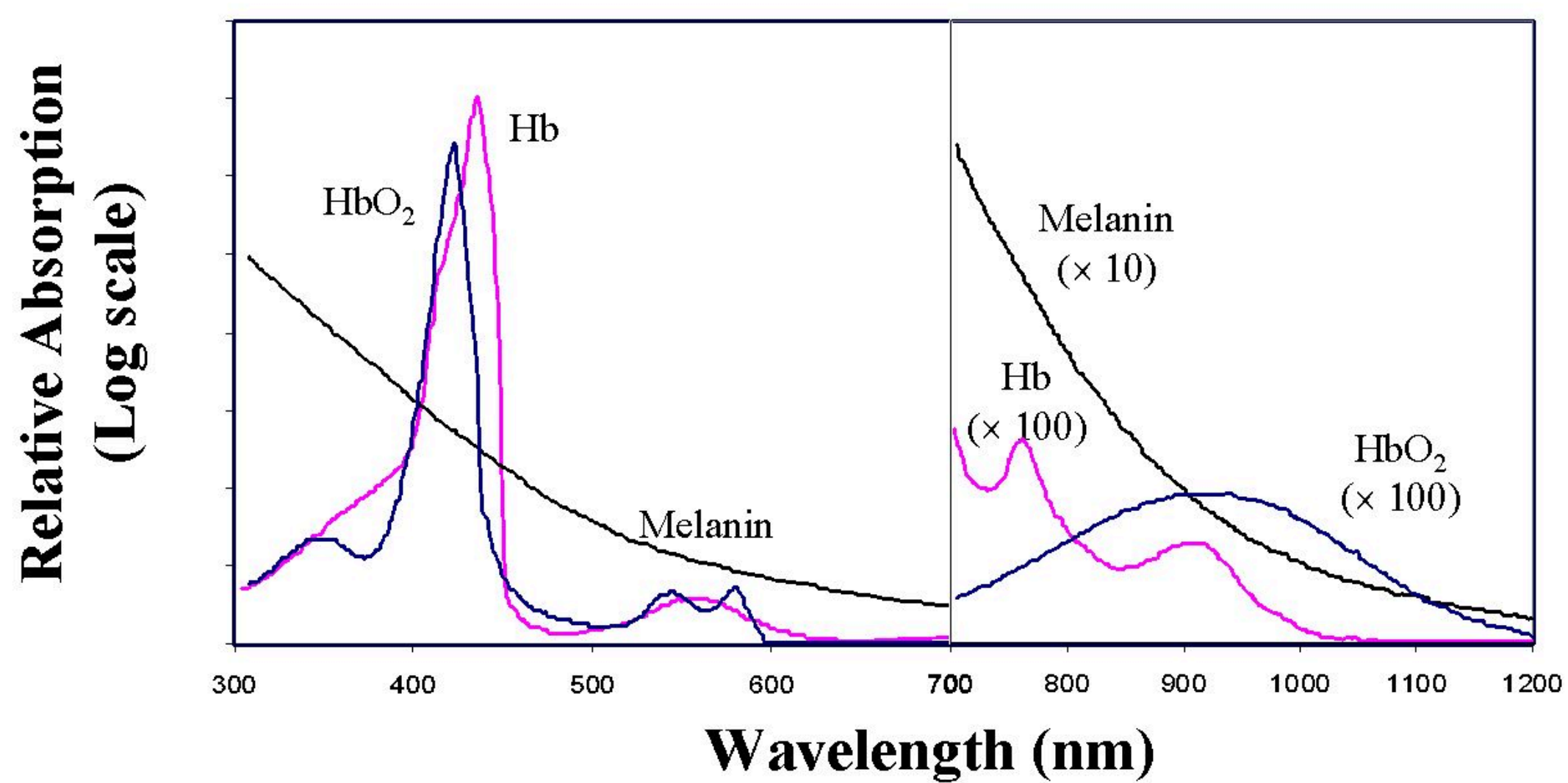
| Color  | Wavelength |
|--------|------------|
| violet | 380–450 nm |
| blue   | 450–495 nm |
| green  | 495–570 nm |
| yellow | 570–590 nm |
| orange | 590–620 nm |
| red    | 620–750 nm |

Alexandrite - 755nm

Diode - 808nm

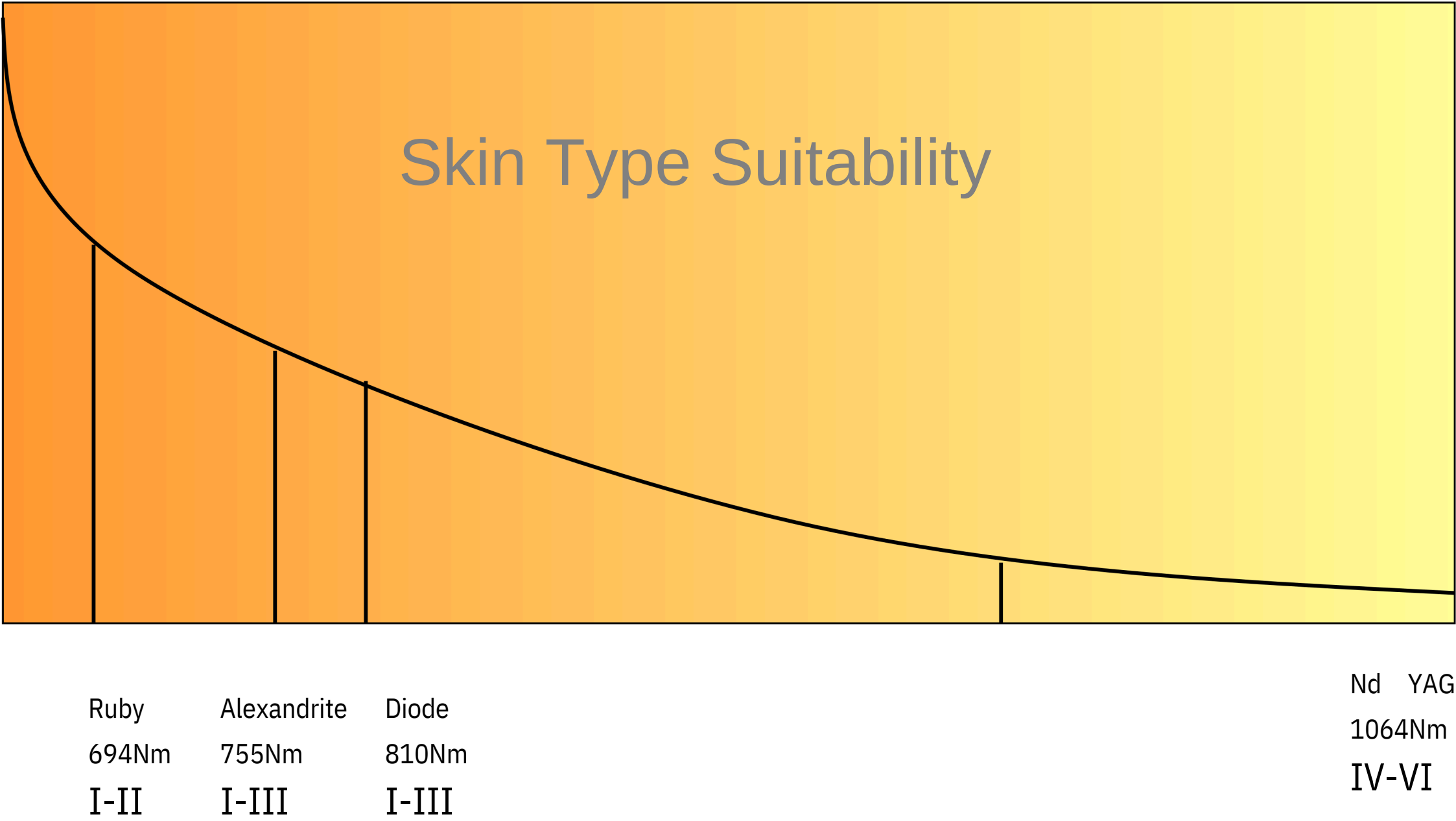
Nd:Yag - 1064nm

## 5.2 Wavelength Selection

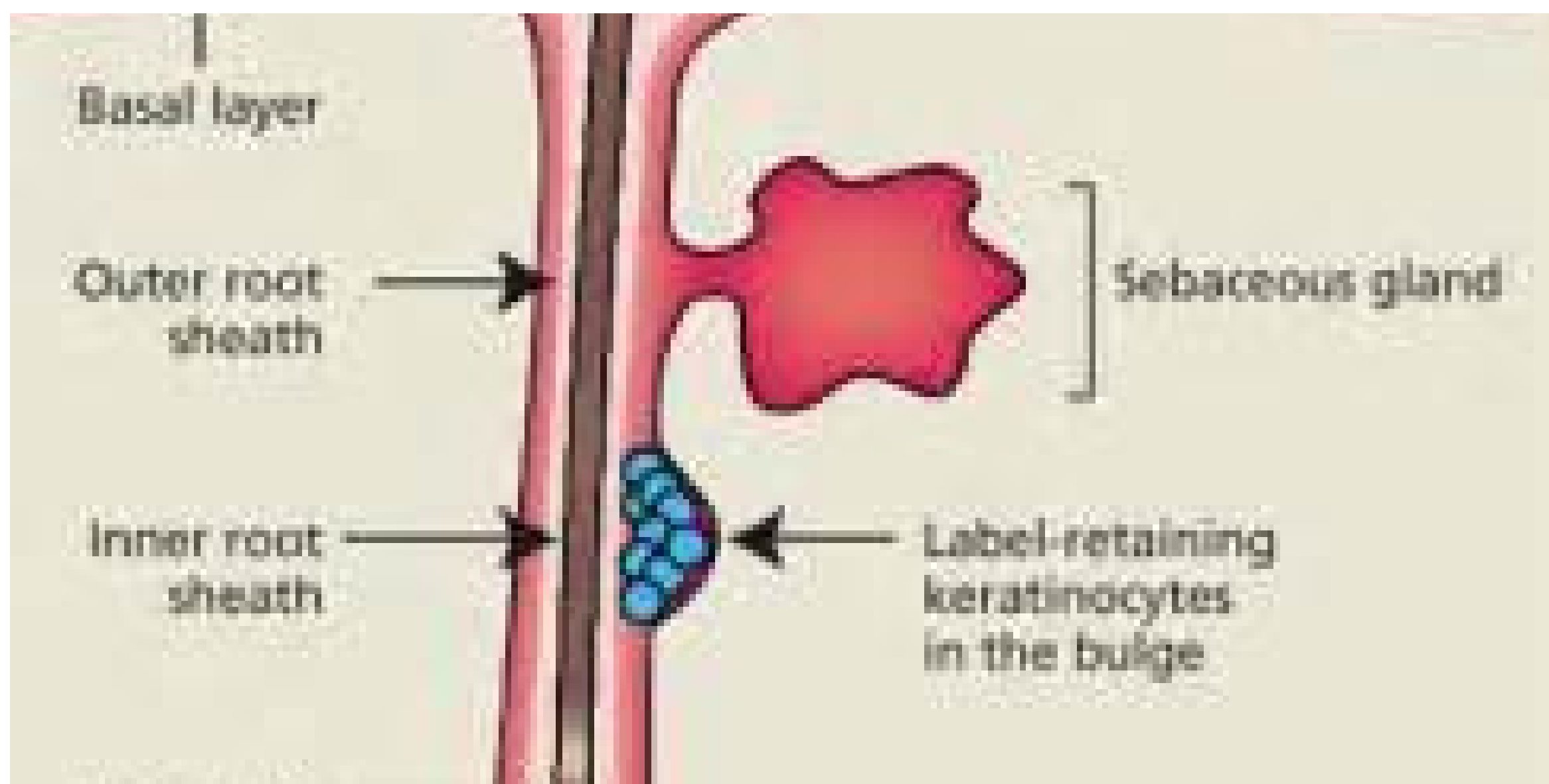




5.3 Wavelengths



## 5.4 Hair Shaft – Anatomy



### Hair Shaft – Anatomy

- I. Medulla (inner layer) is formed only in terminal hairs, and is absent in vellus hairs
- II. Cortex (middle layer) the major portion of a hair shaft
- III. Cuticle (outer layer)

### The Hair Root

Hair root' strictly refers to any of the hair below the skin. This is the portion of the hair follicle that must be destroyed to prevent growth.

Many researches believe that it is the papilla that must be destroyed to prevent re-growth, but research is still being carried out.

### The Bulge

The cyclical growth of the hair follicle is maintained by multipotent stem cells that lie within a region called the bulge.

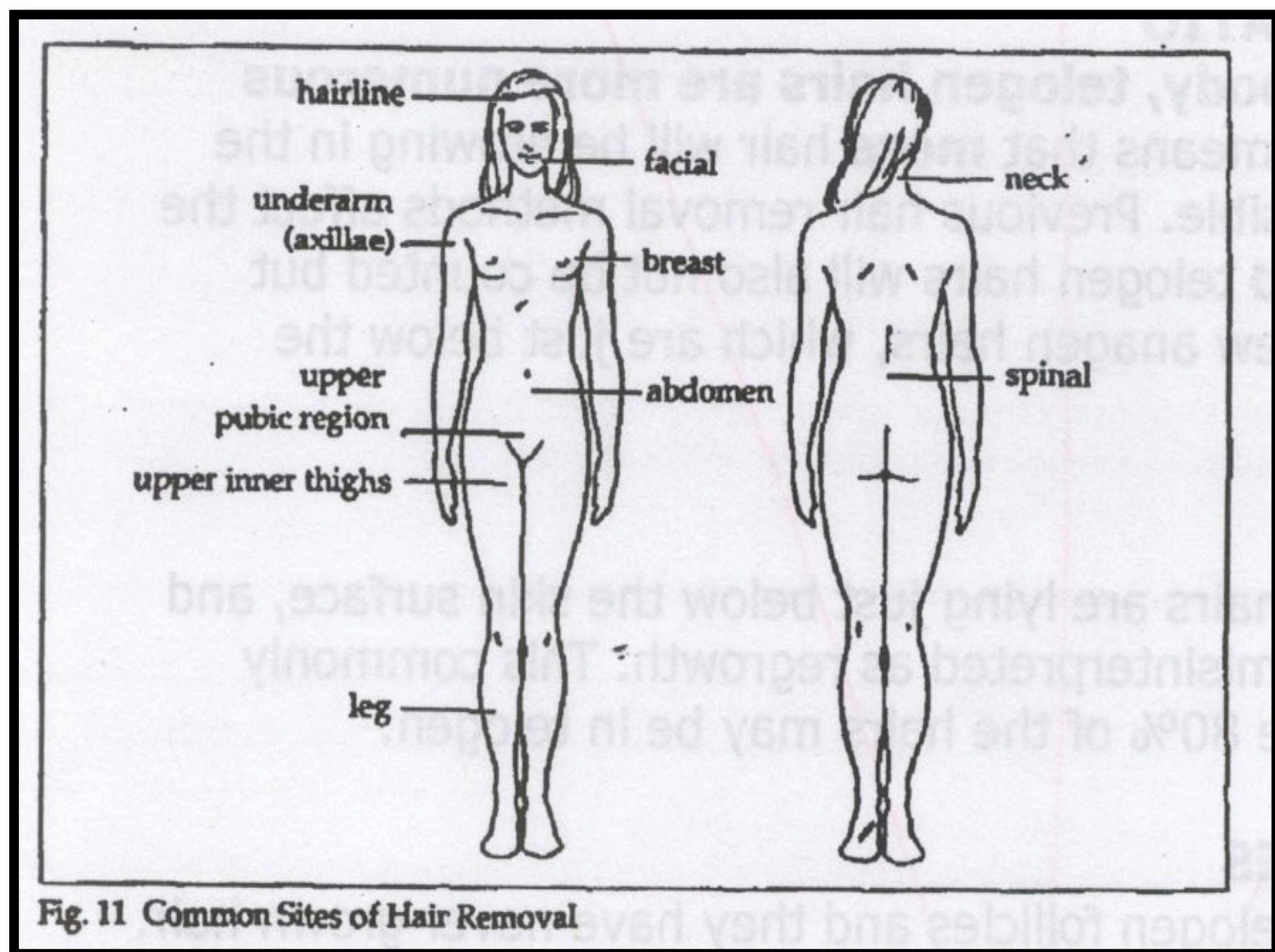
This is generally located at the base of the permanent portion of the follicular outer root sheath

# Hair Growth

## 6.1 Growth Hair Table

| area           | Depth of hair follicle | Dormancy circulation | Growth period circulation | Hair follicle area cm2 | Growth speed of everyday |
|----------------|------------------------|----------------------|---------------------------|------------------------|--------------------------|
| <u>face</u>    |                        |                      |                           |                        |                          |
| Upper lip      | 1~2.5mm                | 6 weeks              | 4 months                  | 500                    |                          |
| beard          | 2~4mm                  | 10 weeks             | 1 year                    | 500                    | 0.38mm                   |
| cheek whiskers | 2~4mm                  |                      |                           | 880                    | 0.32mm                   |
| eyebrow        | 2~2.5mm                | 3 months             | 4~8 weeks                 |                        | 0.16mm                   |
| ear            |                        | 3 months             | 4~8 weeks                 |                        |                          |
| epicranium     | 3~5mm                  | 3~4months            | 2~6 years                 | 350                    | 0.35mm                   |
| <u>body</u>    |                        |                      |                           |                        |                          |
| armpit         | 3.5~4.5mm              | 3 months             | 4 months                  | 65                     | 0.3mm                    |
| leg            | 2.5~4mm                | 5 months             | 4 months                  | 60                     | 0.21mm                   |
| bikini         | 3.5~5mm                | 3 months             | 4 months                  | 70                     |                          |
| arm            |                        | 4 months             | 3 months                  | 80                     | 0.3mm                    |
| breast         | 3~4.5mm                |                      |                           | 65                     | 0.35mm                   |
| body           | 2~4.5mm                |                      |                           | 70                     | 0.3mm                    |

## 6.2 Indications For Hair Removal



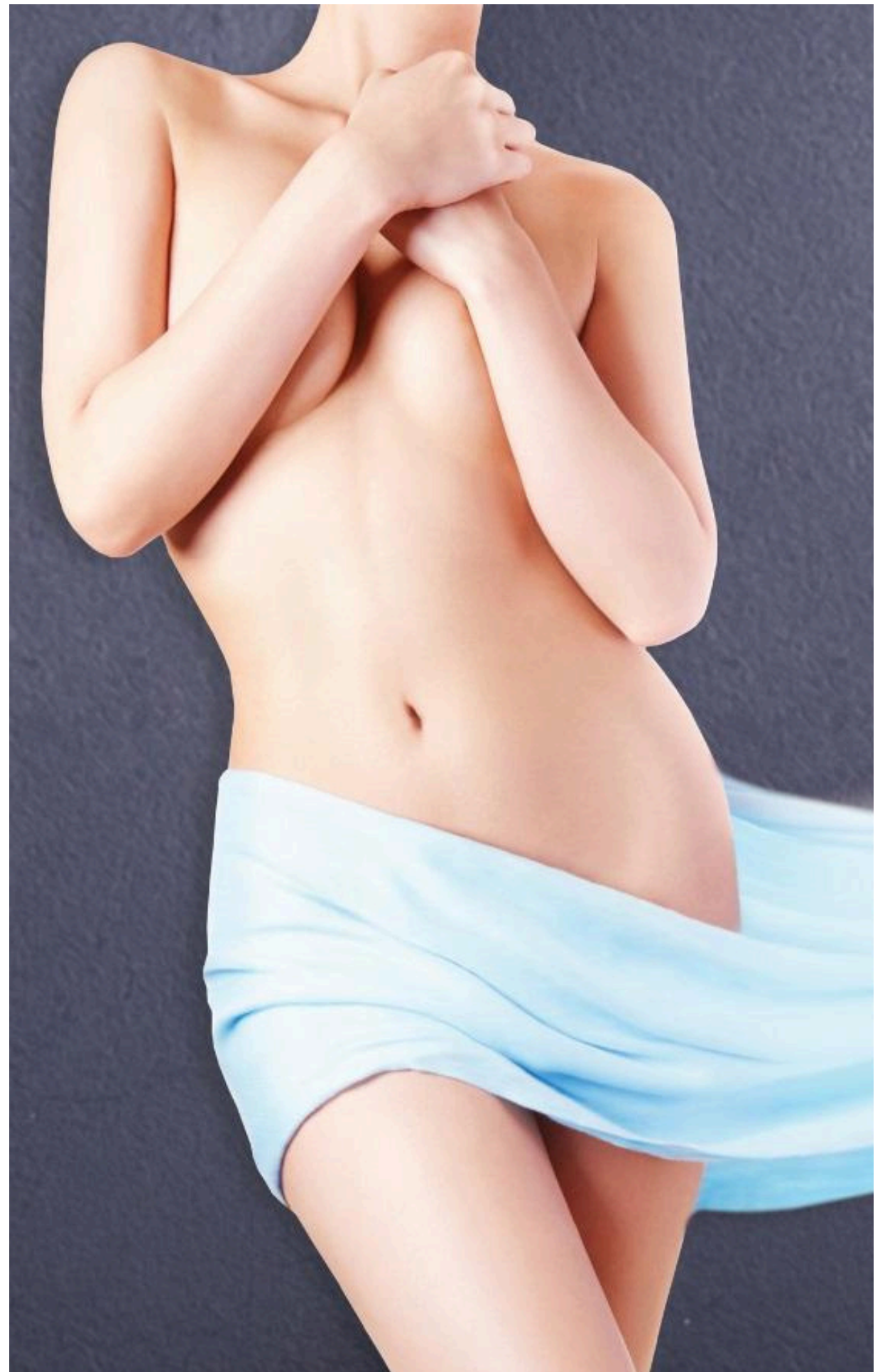
### Medical Reasons

- Hypertrichosis
- Hirsutism
- Pre-operative hair removal
- Unwanted facial and/or body hair
- Hair in skin grafts and flaps
- Ingrown beard hairs
- Transsexual change



## 6.3 Specifically Avoid Laser Treatment on:

- Common Viral Warts Moles
- Herpes Simplex or Cold Sores
- Ingrown hairs Inflamed skin i.e. eczema, skin cancer, rashes etc.
- Active lesions of acne
- Vitiligo
- Keloid Scarring
- Tattooed skin
- Never treat abnormal skin





# Contra-Indications

## 7. Contra-Indications


- Pregnancy
- Pacemakers
- Epilepsy
- Haemophilia
- Thrombosis or Thrombophlebitis
- Infectious diseases – Hepatitis and aids Suntanned skins
- Active skin preparations
- Photosensitive medications including non-prescriptive (See consultation pack)
- Gold Injections
- Self tanning products
- Metal pins and plates in the treatment area

# Athena Super Ice Parameters

## 8.1. Key Terms to Understand..

|                         |  |
|-------------------------|--|
| EPIDERMIS               | <ul style="list-style-type: none"><li>• Outer protective, non-vascular layer of the skin, protecting the dermis.Upper, "visible layers"</li><li>• Depth: 0-150 microns (estimate, varies from patient to patient)</li><li>• Indications for treatment: Tone, texture improvements (blemishes, sun spots, discoloration, uneven skin tone)</li></ul>  |
| PAPILLARY DERMIS        | <ul style="list-style-type: none"><li>• Sensitive connective tissue layer, located below the epidermis, contains nerve endings, sweat and sebaceous glands, blood, lymphnodes, collagen fibers and elastic tissue. Also has active fibroblasts and a big growth area with lots of activity</li><li>• Depth – 150-700 microns (varies from patient to patient)</li><li>• Indications for treatment: Fine Lines and wrinkles, mild/moderate scarring</li></ul> |
| RETICULAR DERMIS        | <ul style="list-style-type: none"><li>• The "structure" of the Skin – home of dormant fibroblasts (important for remodeling), melanocytes</li><li>• Depth: 700 microns and beyond (estimate, varies from patient to patient)</li><li>• Indications for treatment: collagen remodeling</li></ul>  |
| COLLAGEN                | <ul style="list-style-type: none"><li>• Most abundant protein in the human body at about 30%. It is considered the glue that holds the body together.</li></ul>  |
| ELASTIN                 | <ul style="list-style-type: none"><li>• Connective tissue found in the dermis.</li></ul>   |
| WAVE-LENGTH             | <ul style="list-style-type: none"><li>• Generally, longer wavelengths penetrate more deeply into tissue</li><li>• Measured in nanometers (e.g. a 695 penetrates deeper than 515)</li></ul>   |
| FLUENCE                 | <ul style="list-style-type: none"><li>• The total amount of energy that is delivered into the skin per surface area</li><li>• Measured in joules per square centimeter (J/cm²)</li></ul>   |
| PULSE DURATION          | <ul style="list-style-type: none"><li>• How long a pulse of light is in contact with the skin</li><li>• Measured in milliseconds (ms), seconds (s), or microseconds(us)</li></ul>  |
| HERTZ                   | <ul style="list-style-type: none"><li>• How fast pulses of light are delivered by a device</li><li>• Measured in cycles per second = Hertz (Hz)</li></ul>  |
| THERMAL RELAXATION TIME | <ul style="list-style-type: none"><li>• Scientifically measured time to heat up a target (Chromophore), but not to destroy surrounding tissue.</li></ul>   |
| CHROMO-PHORE            | <ul style="list-style-type: none"><li>• Target in the skin, Melanin, blood, water</li></ul>  |

## 8.2 Treatment Handpices On ATHENA SUPER ICE



ATHENA  
SUPER ICE

The Athena Super Ice is a diode laser that delivers an 810nm wavelength. The system is intended for permanent hair reduction on Fitzpatrick Skin Types I-V The system allows user to choose from two modes for hair removal, HRS – Hair Removal Shot Mode and HRM – Hair Removal Motion Mode Hair removal is defined as 60-95% less hair, by destroying the hair follicle with out destroying the surrounding tissue

### 8.2.1 FITZPATRICK Skin Typing Chart

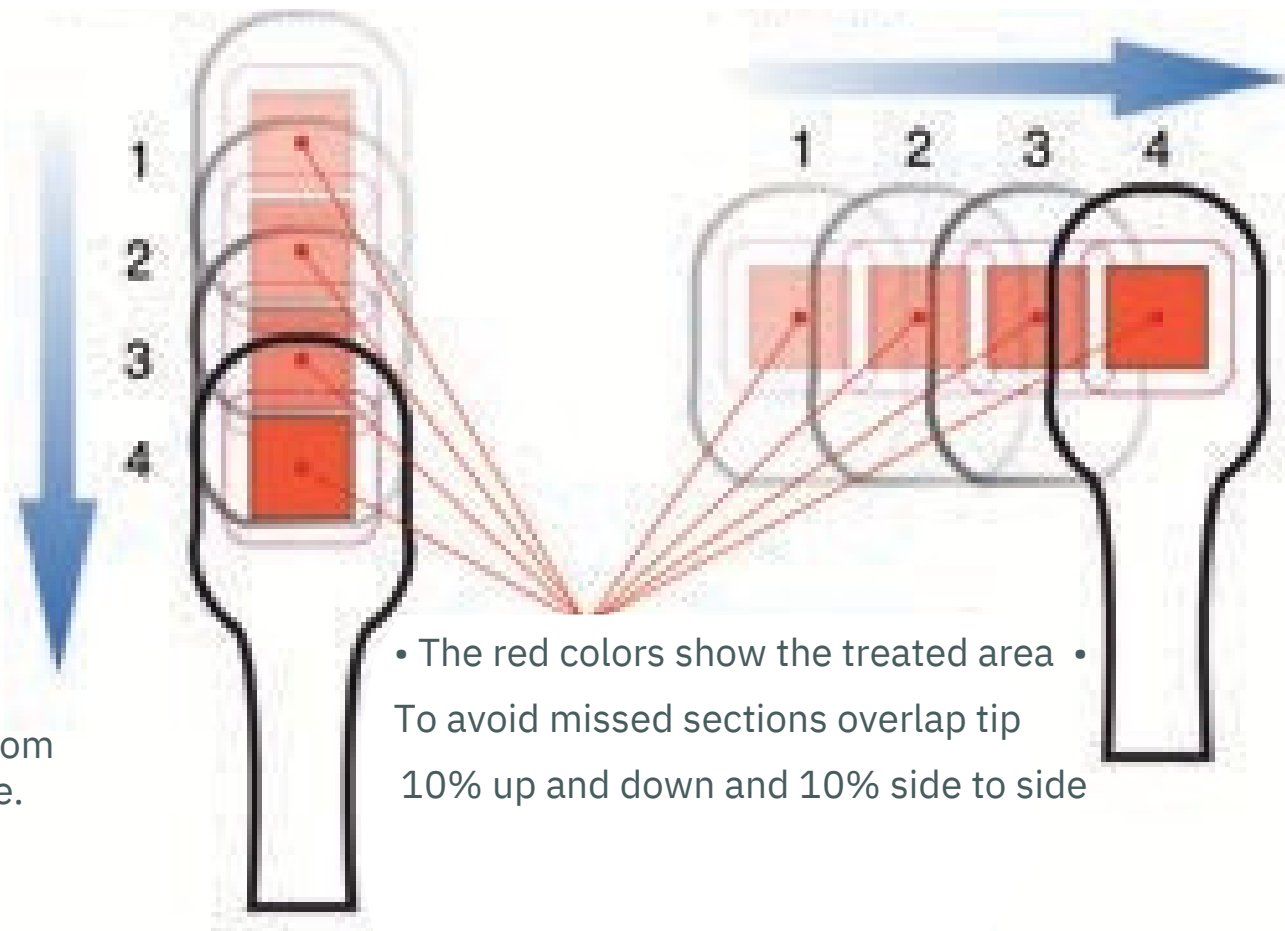
| SKIN TYPE | IMAGE   | ETHNIC GROUP  | HAIR COLOUR                     | EYE COLOUR                           | SKIN COLOUR                                | TANNING ABILITY                               |
|-----------|---|---|---------------------------------|--------------------------------------|--|---|
| TYPE I    |   | Albinos and some red heads                                      | Red / blonde                    | Light blue, Green                    | Very pale, white, pale white with freckles | Burns, very easily, never tans                |
| TYPE II   |  | Northern / Eastern European-Irish, Scottish, English, Norwegian | Blonde, red, light brown        | Light blue, Green, hazel             | Pale white                                 | Burns easily, rarely tans                     |
| TYPE III  |  | Mediterranean, Middle East, French Canadian, Italian, Latino    | Chestnut, dark blonde           | Brown, deep blue, green, hazel, grey | White, light brown                         | Sometimes burns, gradually tans               |
| TYPE IV   |  | East Asian – Chinese, Japanese, Taiwanese                       | Brown, medium brown, dark brown | Hazel, browns                        | Medium brown, dark brown, black            | Hardly ever burns, tans very easily           |
| TYPE V    |  | Indian descent – East Indian, First Nation, Filipino            | Dark brown, black               | Brown                                | Dark brown                                 | Rarely burns, tans easily and quickly darkens |
| TYPE VI   |  | African origin  | Black                           | Brown                                | Black                                      | Never burns, tans, very dark                  |

8.3 HAIR REMOVAL (HRS) – STATIC MODE

| SKIN TYPE | HAIR COLOR  | HAIR TEXTURE | PULSE TYPE | PULSE DURATION(MS) | ENERGY/FLUENCE (J/CM2) |
|-----------|-------------|--------------|------------|--------------------|------------------------|
| I         | Blonde Red  | Fine         | Single     | 91                 | 30                     |
|           |             | Medium       | Double     | 91                 | 28                     |
|           |             | Coarse       | Triple     | 91                 | 26                     |
|           | Light Brown | Fine         | Single     | 91                 | 30                     |
|           |             | Medium       | Double     | 91                 | 28                     |
|           |             | Coarse       | Triple     | 91                 | 26                     |
|           | Dark Brown  | Fine         | Single     | 91                 | 30                     |
|           |             | Medium       | Double     | 91                 | 28                     |
|           |             | Coarse       | Triple     | 91                 | 26                     |
|           | Black       | Fine         | Single     | 91                 | 30                     |
|           |             | Medium       | Double     | 91                 | 28                     |
|           |             | Coarse       | Triple     | 91                 | 26                     |
| II        | Blonde Red  | Fine         | Single     | 91                 | 30                     |
|           |             | Medium       | Double     | 91                 | 28                     |
|           |             | Coarse       | Triple     | 91                 | 26                     |
|           | Light Brown | Fine         | Single     | 91                 | 30                     |
|           |             | Medium       | Double     | 91                 | 28                     |
|           |             | Coarse       | Triple     | 91                 | 26                     |
|           | Dark Brown  | Fine         | Single     | 91                 | 30                     |
|           |             | Medium       | Double     | 91                 | 28                     |
|           |             | Coarse       | Triple     | 91                 | 26                     |
|           | Black       | Fine         | Single     | 91                 | 30                     |
|           |             | Medium       | Double     | 91                 | 28                     |
|           |             | Coarse       | Triple     | 91                 | 26                     |

Vertical Method

Perform treatment shot from top to bottom by shot type.



Horizontal Method

Perform treatment shot from left to right by shot type.

| SKIN TYPE | HAIR COLOR  | HAIR TEXTURE | PULSE TYPE | PULSE DURATION(MS) | ENERGY/FLUENCE (J/CM2) |
|-----------|-------------|--------------|------------|--------------------|------------------------|
| III       | Blonde Red  | Fine         | Single     | 95                 | 30                     |
|           |             | Medium       | Double     | 95                 | 28                     |
|           |             | Coarse       | Triple     | 95                 | 26                     |
|           | Light Brown | Fine         | Single     | 95                 | 30                     |
|           |             | Medium       | Double     | 95                 | 28                     |
|           |             | Coarse       | Triple     | 95                 | 26                     |
|           | Dark Brown  | Fine         | Single     | 95                 | 30                     |
|           |             | Medium       | Double     | 95                 | 28                     |
|           |             | Coarse       | Triple     | 95                 | 26                     |
|           | Black       | Fine         | Single     | 95                 | 30                     |
|           |             | Medium       | Double     | 95                 | 28                     |
|           |             | Coarse       | Triple     | 95                 | 26                     |
| IV        | Dark Brown  | Fine         | Single     | 100                | 30                     |
|           |             | Medium       | Double     | 100                | 28                     |
|           |             | Coarse       | Triple     | 100                | 26                     |
|           | Black       | Fine         | Single     | 100                | 28                     |
|           |             | Medium       | Double     | 100                | 26                     |
|           |             | Coarse       | Triple     | 100                | 24                     |
| V         | Dark Brown  | Fine         | Double     | 100                | 23                     |
|           |             | Medium       | Double     | 100                | 22                     |
|           |             | Coarse       | Triple     | 100                | 21                     |
|           | Black       | Fine         | Double     | 100                | 22                     |
|           |             | Medium       | Double     | 100                | 21                     |
|           |             | Coarse       | Triple     | 100                | 20                     |
|           |             |              |            |                    |                        |
| VI        | Black       | Fine         | Double     | 100                | 20                     |
|           |             | Medium       | Double     | 100                | 18                     |
|           |             | Coarse       | Triple     | 100                | 15                     |

### ATHENA SUPER ICE IN HRS MODE

**Pre-Treatment:** 1. Cleanse with 70% Alcohol 2. Mark out treatment area with white eyeliner. 3. Shave any residual hairs left on the surface.

**Treatment Technique:** **1.** Apply 1mm of Clear Ultrasonic gel **2.** Secure wrist strap **3.** Pick and place over bony areas (jawlines/shins) and slide and glide over larger areas, wiping your tip after each treatment row, 10% overlap of the treatment tip for most effective treatment

**Positive Endpoints:** Sulphur smell, hair popping, Perifollicular edema, a and erythema

**Post Treatment:** Apply Aloe Vera, 1% HC cream and/or white vinegar

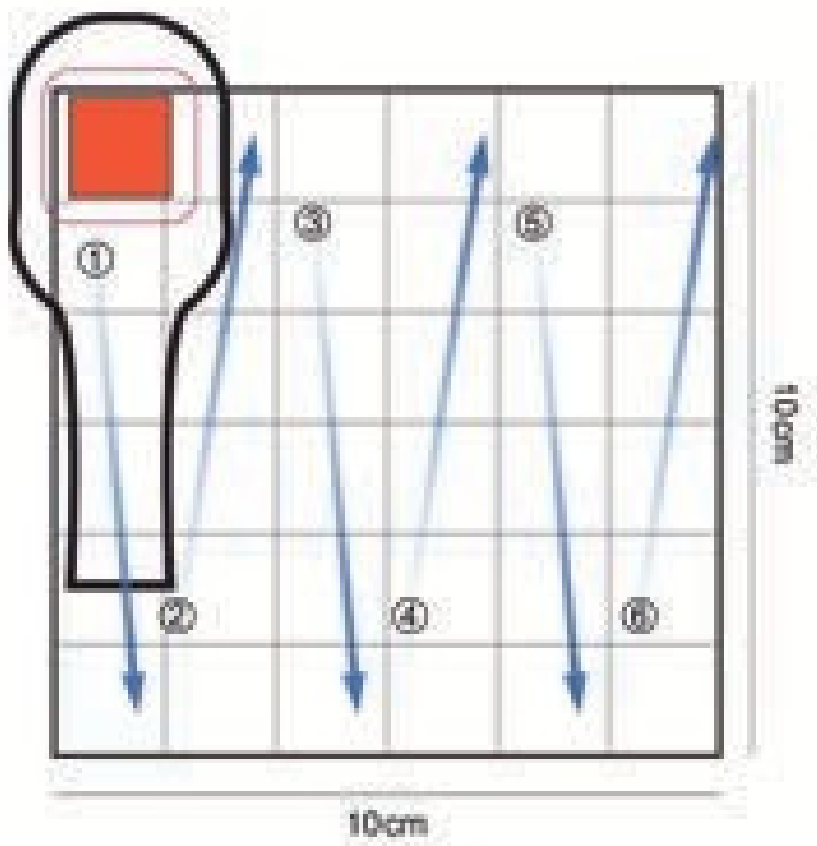
**Treatment Intervals:** *Face*-every 4 to 6 weeks, *Body*-8 to 10 weeks.

**Patient/Client should be clean shaven and cannot have a fresh tan( 4 to 6 weeks).**



# 8.4 HAIR REMOVAL (HRM) – GLIDING MODE

| SKIN TYPE | HAIR COLOR  | HAIR TEXTURE<br><i>Fine</i> | PULSE DURATION (MS) | PULSE REPETITION(HZ) | ENERGY/ FLUENCE (J/CM2) | NUMBER OF PASSES |
|-----------|-------------|-----------------------------|---------------------|----------------------|-------------------------|------------------|
| I         | Blonde Red  | Medium                      | 45                  | 5                    | 15                      | 4-5              |
|           |             | Coarse                      | 45                  | 5                    | 14                      |                  |
|           |             |                             | 45                  | 5                    | 13                      |                  |
|           | Light Brown | Fine                        | 45                  | 5                    | 15                      | 4-5              |
|           |             | Medium                      | 45                  | 5                    | 14                      |                  |
|           |             | Coarse                      | 45                  | 5                    | 13                      |                  |
|           | Dark Brown  | Fine                        | 45                  | 5                    | 15                      | 4-5              |
|           |             | Medium                      | 45                  | 5                    | 14                      |                  |
|           |             | Coarse                      | 45                  | 5                    | 13                      |                  |
|           | Black       | Fine                        | 45                  | 5                    | 15                      | 4-5              |
|           |             | Medium                      | 45                  | 5                    | 14                      |                  |
|           |             | Coarse                      | 45                  | 5                    | 13                      |                  |
| II        | Blonde Red  | Fine                        | 45                  | 5                    | 15                      | 4-5              |
|           |             | Medium                      | 45                  | 5                    | 14                      |                  |
|           |             | Coarse                      | 45                  | 5                    | 13                      |                  |
|           | Light Brown | Fine                        | 45                  | 5                    | 15                      | 4-5              |
|           |             | Medium                      | 45                  | 5                    | 14                      |                  |
|           |             | Coarse                      | 45                  | 5                    | 13                      |                  |
|           | Dark Brown  | Fine                        | 45                  | 5                    | 15                      | 4-5              |
|           |             | Medium                      | 45                  | 5                    | 14                      |                  |
|           |             | Coarse                      | 45                  | 5                    | 13                      |                  |
|           | Black       | Fine                        | 45                  | 5                    | 15                      | 4-5              |
|           |             | Medium                      | 45                  | 5                    | 14                      |                  |
|           |             | Coarse                      | 45                  | 5                    | 13                      |                  |



| SKIN TYPE | HAIR COLOR  | HAIR TEXTURE | PULSE DURATION(MS) | PULSE REPETITION(HZ) | ENERGY/ FLUENCE (J/CM2) | NUMBER OF PASSES |
|-----------|-------------|--------------|--------------------|----------------------|-------------------------|------------------|
| III       | Blonde Red  | Fine         | 50                 | 5                    | 14                      | 4-5              |
|           |             | Medium       | 50                 | 5                    | 13                      |                  |
|           |             | Coarse       | 50                 | 5                    | 12                      |                  |
|           | Light Brown | Fine         | 50                 | 5                    | 14                      | 4-5              |
|           |             | Medium       | 50                 | 5                    | 13                      |                  |
|           |             | Coarse       | 50                 | 5                    | 12                      |                  |
|           | Dark Brown  | Fine         | 50                 | 5                    | 14                      | 4-5              |
|           |             | Medium       | 50                 | 5                    | 13                      |                  |
|           |             | Coarse       | 50                 | 5                    | 12                      |                  |
|           | Black       | Fine         | 50                 | 5                    | 14                      | 4-5              |
|           |             | Medium       | 50                 | 5                    | 13                      |                  |
|           |             | Coarse       | 50                 | 5                    | 12                      |                  |
| IV        | Dark Brown  | Fine         | 57                 | 5                    | 13                      | 4-5              |
|           |             | Medium       | 57                 | 5                    | 12                      |                  |
|           |             | Coarse       | 57                 | 5                    | 11                      |                  |
|           | Black       | Fine         | 60                 | 5                    | 13                      | 4-5              |
|           |             | Medium       | 60                 | 5                    | 12                      |                  |
|           |             | Coarse       | 60                 | 5                    | 11                      |                  |
|           |             |              |                    | 5                    |                         |                  |
| V         | Dark Brown  | Fine         | 57                 | 5                    | 8                       | 4                |
|           |             | Medium       | 57                 | 5                    | 7                       |                  |
|           |             | Coarse       | 57                 | 5                    | 6                       |                  |
|           | Black       | Fine         | 60                 | 5                    | 8                       | 4                |
|           |             | Medium       | 60                 | 5                    | 7                       |                  |
|           |             | Coarse       | 60                 | 5                    | 6                       |                  |
|           |             |              |                    |                      |                         |                  |
| VI        | Black       | Fine         | 65                 | 5                    | 8                       | 4                |
|           |             | Medium       | 65                 | 5                    | 7                       |                  |
|           |             | Coarse       | 65                 | 5                    | 6                       |                  |

### ATHENA SUPER ICE IN HRM MODE

**Pre-Treatment:** 1. Cleanse with 70% Alcohol 2. Mark out treatment area with white eyeliner in 10X10 gride size. 3. Shave any residual hairs left on the surface.

**Treatment Technique:** 1. Apply 1mm of Clear Ultrasonic gel 2. Secure wrist strap 3. Perform 4 passes, horizontal, vertical, horizontal, vertical. 10% overlap of the tip for most effective treatment and wipe tip after every treatment row is complete.

**Positive Endpoints:** Sulphur smell, hair popping, Perifollicular edema, a and erythema

**Post Treatment:** Apply Aloe Vera, 1% HC cream and/or white vinegar

**Treatment Intervals:** *Face*-every 4 to 6 weeks, *Body*-8 to 10 weeks.

**Patient/Client should be clean shaven and cannot have a fresh tan (4 to 6 weeks old) before having a treatment.**

# Client Consultation

## 9.1 Treatment application

Prepare self and client with appropriate PPE Cleanse the treatment area thoroughly and dry the skin Mark larger treatment areas of the body out in 15 x 15 cm squares and medium sized areas in 10 x 10cm squares, with white pencil Apply a layer of the clear gel to the treatment area Keep hand piece in contact with the skin and move in 'paint brush' like strokes to cover the entire grid area. Move the hand piece at a rate of 5 – 10 cm per second Repeat this motion until the desired clinical end point of Perifollicular oedema and Erythema Power can be increased until the client can feel a warmth in the skin

## 9.2 Pre-Treatment Advice

- Bleach or depilatory creams should not be used for 2 weeks before or during the ATHENA SUPER ICE treatment course
- Do not use products containing retinol or strong AHA fruit acids prior to or during your hair removal treatment
- No waxing, plucking or threading during the course
- Do not sunbathe or use sunbeds 4 weeks prior to and after treatment
- Body or facial scrubs are recommended 1 week or less before treatment to avoid ingrown hairs

## 9.3 Post Treatment Advice

### Expected side effects

- Erythema
- Swelling
- Perifollicular
- oedema

### Post Care

- No hot baths or showers – tepid only
- No heat treatments i.e. saunas and steam rooms
- No deodorant, perfumes or scented body lotions/creams
- No swimming or Jacuzzis No steam ironing or cooking over boiling saucepans
- SPF 30+ must be worn on exposed skin daily



## Laser Hair Removal Consent Form

I understand that I will require several treatments to obtain a significant, long-term reduction of hair growth. I understand I may experience fewer, thinner, slower re-growth of hairs, temporary hair loss and/or permanent hair reduction. \_\_\_\_\_

**I confirm that I have none of the known conditions that could make treatment contraindicated, such as:**

1. Unprotected sun exposure, tanning beds, and sunless tanners 3-4 weeks prior
  2. Waxing of the area within the last 8 weeks
  3. Use of depilatory creams or bleach 4-6 weeks prior
  4. Pregnancy and nursing mothers
  5. Temporary dermal fillers within the last 2 weeks
  6. Permanent fillers particularly silicone (silicone insulates creating much heat)
  7. History of seizures
  8. History of keloid scarring
  9. Active infection, undiagnosed lesions, warts, tattoos in the treatment area
  10. History of cold sores (herpes simplex); treatments can reactivate herpes, and prophylactic medication may be recommended
  11. Retin-A and similar products 3 days before and 7 days after treatment
- Client Initials \_\_\_\_\_

I understand there is a possibility of short-term effects, risks of this procedure include, but are not limited to, the following:

**Pain** – Some people may feel some pain with this treatment, similar to snapping the skin with a rubber band.

**Redness** – Laser treatment will cause redness of the area. The redness may be present for weeks to months.

**Swelling** – Swelling will be present after the procedure and should likely resolve after 1-2 weeks.

**Pigmentary Changes** – The treated area may heal with altered pigmentation (either lighter or darker skin).

**Scarring** – Risk of scarring is at any time during the healing process, it may be discolored and may be permanent.

**Blistering** – The laser procedure may produce heating in the upper layers of the skin resulting in blister formation.

**Scabbing** – A scab may be present after a blister forms. The scabbing will disappear during the natural wound healing process of the skin.

**Infection** – An infection of the wound is always possible.

**Acne Breakout** – Acne or folliculitis may follow laser/IPL hair reduction treatments.

**Eye Damage** – Protective eyewear will be provided; it is important to keep this eyewear on at all times during the treatment to protect your eyes from accidental laser/IPL exposure.



Please alert us immediately if you have been in the sun, had a tan,, or a sunburn, within the last 4 weeks. Client Initials \_\_\_\_\_

I understand prolonged or excessive sun exposure, tanning, or tanning beds within the last three weeks is not allowed prior to treatment.

Spray tanning and bronzers must be removed prior to treatment. No UV exposure 3-5 days post treatment. Client Initials \_\_\_\_\_

The area to be treated must be shaven within seven days prior to treatment. Shaving is required throughout the treatment plan. No waxing, tweezing, threading or hair removal creams can be used to treated areas between appointments. Client Initials \_\_\_\_\_

I understand that photos may be taken for my medical records. Client Initials \_\_\_\_\_

**Client Name**

\_\_\_\_\_

**Client Signature**

\_\_\_\_\_

**Date**

\_\_\_\_\_

**Staff Name**

\_\_\_\_\_

**Staff Signature**

\_\_\_\_\_

**Date**

\_\_\_\_\_





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