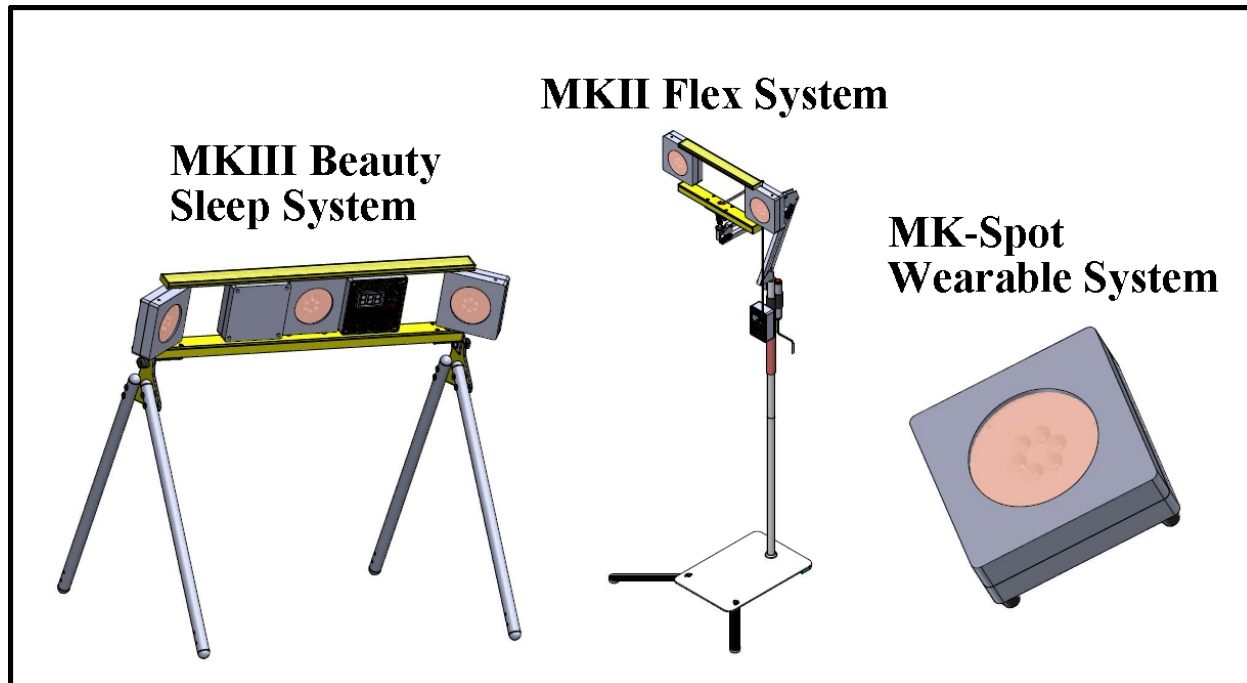


RED PULSE THERAPY – A High Frequency Pulsed Red and Infrared Light Therapy, the most effective Red-Light Therapy



Red light therapy

Red light therapy has been around for over 50 years. It involves exposure to fairly strong sources of visible red light (540~700nm) and invisible Near Infrared light (700nm~ 880nm). It is a safe natural, non-invasive therapy technique. Impressive, peer-reviewed clinical research on red light therapy treatments has significantly increased over the last 2 decades, with over 1,000 published studies and trials showing a wide range of extremely positive findings. And all with very few documented side effects or risks. Therefore, in the last 10-15 years it has been more widely accepted by medical experts. Benefiting from the advancement of semiconductor LED technology, the compact, affordable and clinically-effective red light therapy devices for use in home environment are finally available in the market for general public.

How red light therapy works

Red and near infrared light are thought to act primarily on the mitochondria of cells, leading to greater energy production. Any cell that has mitochondria will, in theory, see some benefit from appropriate light therapy. The key difference between red and infrared light is that wavelengths of red light can only be absorbed and used in the first 2.5mm of skin tissue, whereas infrared light wavelengths can penetrate much deeper into the skin and reach more body cells as deep as 10mm. This same mechanism is also responsible for many of the benefits of natural sunlight, which contains rich red and infrared wavelengths as part of its spectrum. However, sunlight comes bundled with potentially harmful UV along with other non-healing spectra such as blue and green light. Red light therapy does not have this shortcoming at all.

The benefit of red light therapy

- Helps blood circulation, improves energy production
- Speeds up tissue regeneration, improve wound healing and diminish scars
- Promotes collagen generation and reduce wrinkles, improving aesthetic characteristics of skin
- Reduces inflammation and stimulates healing of chronic pains, proven to reduce suffering to many different forms of arthritis and muscle pain
- Boosts serum melatonin level and mitigates chronic insomnia
- Promotes physical and mental relaxation, helps enter deep sleep, and relieves fatigue
- Provides benefits for fitness, muscle recovery and muscle performance

Red light therapy vs natural sunlight

Below are the reasons that a red light therapy device is superior to sunlight in helping improve our health:

- Can be **used in any season and any time**, including cold winter and night time
- Can be **used indoors, in a private, controlled environment**
- Output is **only the healthy parts of the light spectrum, there is no harmful UV light or unintentional tanning**
- Allows full control of red light projection parameters and therapy timing to promote the best result

Risks and side effects of red light therapy

All the research shows that Red-light therapy is safe and well-tolerated. The few small side effects that have been observed include:

- Temporary redness and tightness of the skin (not the same as a sunburn since there are no harmful UV lights present in Red Pulse therapy), therefore we recommend apply skin moisturizer before and after the therapy to help relieve this issue
- Slight but harmless eye strain (as one might have under lights of any kind), this issue can be minimized by using comfortable eye covering to block the strong light that may stress the eyes and thus mitigate most of the eye strain problem

In conclusion, with proper uses, red light therapy is a perfectly safe, virtually risk free non-invasive natural treatment.

The Proprietary Red Pulse Therapy Technology Innovations

Red Pulse therapy products are clinical grade home use red light therapy products. All are equipped with some or all the proprietary high-tech innovations listed below, which enhance and maximize the benefits of the red light therapy, providing significantly improved effectiveness over other red light therapy products currently on the market.

1. High frequency, high intensity LED pulse light delivery

High frequency (>5KHz) pulse is the key technology that increases the skin penetration depth and result the highest therapeutic effectiveness

According to medical publication titled: “Higher pulse frequency of near-infrared laser irradiation increases penetration depth for novel biomedical applications.” Published: January 7, 2021 by Barbora et al.

Their research results demonstrate a novel discovery that NIR Pulsed Wave (PW) irradiation improves the associated penetration depth significantly in contrast to Continuous Wave (CW) exposures. In addition, higher pulse frequency (repetition rate) further enhances the penetration depth compare to lower frequency of the same wavelength.

Citation: Barbora A, Bohar O, Sivan AA, Magory E, Nause A, Minnes R (2021) Higher pulse frequency of near-infrared laser irradiation increases penetration depth for novel biomedical applications. PLoS ONE 16(1): e0245350.
<https://doi.org/10.1371/journal.pone.0245350>

Red Pulse products unique high frequency pulse drive technology take the advantage of the high frequency Pulsed Wave irradiation higher skin penetration property and increase the therapeutic result effectively.

Red Pulse poly-spectrum therapy product lines are all equipped with the proprietary “Poly-spectrum LED light source” and are powered by the proprietary programmable “High frequency pulsed constant current” LED driver - drive current, current pulse on time and frequency are all adjustable. The Red Pulse LED driver delivers high pulsed current to drive the high-power LED in a high-frequency, constant current, pulse train (operating frequency capable of reaching up to 10KHz). These high current pulses effectively project high intensity, high- frequency pulsed light beam to the user target skin area.

The **Red Pulse** model name originates from this unique high-frequency, constant current pulse driving technology.

2. Use of high-tech Total Internal Reflection optical lens enables deep skin penetration from distance

User gets high effectiveness and with comfort zone during therapy

For Red Pulse MK-Spot, MKII and MKIII model series, one important application is to be used for “Photodynamic Facial Skin Rejuvenation therapy.” To get maximum therapeutic effectiveness, most of the red light facial therapy product in the market needs to position the light source in front, around and as close as possible to the face to get maximum skin penetration depth. But for those with a tendency towards claustrophobia, it is very uncomfortable. It is especially important to place the light source as far as possible from the face of those users. Existing home use red light facial therapy products can only supply low power to their light source to avoid discomfort from heat transfer from the high-power LED light source placed too close to the skin or face. Therefore, therapeutic effectiveness is not high.

MKII and MKIII series perfectly solve the above problems. Red Pulse MK series special light sources are designed to use the narrow beam-angle **TIR** (Total Internal Reflection) optical lens. This high-tech **TIR** lens captures and delivers 95% of energy from the high-power LED and fully utilizes the light energy emit from the LED source. It also can amplify the light intensity more than 16 times and accurately focus the light energy into the small treatment area (please refer to https://en.wikipedia.org/wiki/Inverse-square_law). As a result, the Red Pulse series product design can strategically position the high-power LED light source 6~18 inches comfortable distance from the skin or face, and still offer deep skin penetration. The user will not be stressed by the need to place the light source too close to the face, and at the same time still get the most effective treatment.

3. Uses compact cold-forged aluminum heat sink with active cooling

Red Pulse light source is light weight, small size, portable and easy setup and operated

Red Pulse MK-Spot, MKII and MKIII models are each equipped with cold forged aluminum-fin heat sinks and combined with active cooling to remove heat generated from the high-power LEDs. This technology provides the advantage of very effective cooling in a compact, light-weight form factor. All the Red Pulse MK product series have the nice features of low temperature rise, light weight (less than 10 pounds), small size, portability and can be set up and operated alone without the help of a partner.

4. Red Pulse poly-spectrum LED light source

Emulates closely to the natural sunlight's most therapeutic wavelengths

In our research and extended experiments, we have explored the best combinations of different spectrum LED mixes to create a poly-spectrum that can achieve most effective therapeutic results. Interestingly, our experimental results show that the natural sunlight spectrum in the range of 550nm~880nm is the most therapeutic for our body. The Red Pulse poly-spectrum LED light source emulates closely to the natural sunlight for wavelength within the range of 550nm~880nm. This range excludes the harmful or unusable parts of the natural sunlight spectrum.

5. User friendly smart digital control switch and remote-control switch

Control functions can be easily operated in any treatment posture and position

Red Pulse poly-spectrum light therapy products are all equipped with an internal digital programmable timer controller switch with digital display to ease and optimize the control of light treatment sessions. This microprocessor-based timer switch allows the user to easily program their therapy session intervals from 1 to 40 minutes and automatically turn off the light source upon completion of treatment. It is also equipped with a wired remote-control switch, so that the user can easily operate the remote-control

switch in any treatment position - even when lying down and unable to reach the main controller.

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