

## COSMETIC SKIN TREATMENT

Increasing safety and efficacy in aesthetic treatments

### Syneron

Syneron, a San Diego based company, manufactures a range of electronic devices and associated products for use in nonsurgical cosmetic procedures. The company develops products based on its proprietary Electro-Optical Synergy (ELOS) technology, which uses the synergy between electrical energy and optical energy to provide aesthetic medical treatments. The company's technology enables physicians to provide advanced solutions for a broad range of medical-aesthetic applications including body contouring, skin rejuvenation, cellulite reduction, acne, hair removal, wrinkle reduction etc. Bottom line all kinds of activities females are very interested in. Looking great without any surgery. Syneron sells its products under two distinct brands, Syneron and Candela, to dermatologists, plastic and cosmetic surgeons, other qualified practitioners, and aestheticians and medical spas. The VelaShape platform of Syneron answers the demand for body contouring systems – allowing for full body treatments including circumferential and cellulite reduction. In order to remain competitive Syneron knew they needed to improve the effectiveness of their VelaShape treatments to take it to the next level of success.

### Challenge

Syneron wanted to advance VelaShape and knew they were facing a contradiction, reducing treatment time while improving results. The cosmetic effect of the VelaShape platform is based on the combination of infrared (IR) and vacuum, coupled with bi-polar radiofrequency (RF) to heat up the subepidermal layer. This causes improved circulation, stimulates lymphatic drainage, fibroblast activity, and remodels the

extracellular matrix, resulting in skin firmness and a lifting effect.

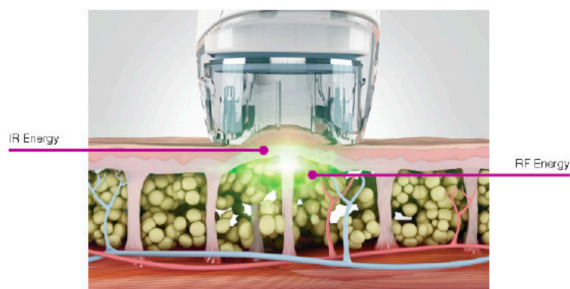
Who does not want their skin to be firm and tight? Increasing the speed and efficiency of the treatment can be accomplished if the subepidermal skin layer is heated up more swiftly. This can be achieved by increasing the power of the RF pulses and IR lamps. However, this also introduces a big risk: the skin can become overheated causing discomfort for the patient or even injuries. In the current VelaShape platform this risk is accounted for because the specialists that are using the system are measuring the patients skin at intervals during the treatment. They measure the skin with a hand held temperature gun, a process both inaccurate and time-consuming. So how could Syneron increase the power, avoid the risk of overheating a customer's skin AND provide a smooth treatment without regular interruptions?

### Solution

The solution for this problem was found in integrating a non-contact infrared temperature sensor in the applicator of the VelaShape III. This sensor continuously monitors the patients skin temperature without interfering with the treatment. When the sensor detects that the skin temperature is reaching a critical limit, the specialists is informed by a pre-alarm and the treatment time or intensity can be adjusted accordingly to avoid discomfort. They selected the Exergen Micro IRt/c sensor.

### Why this sensor?

Exergen developed and manufactures the Temporal Artery Scanner (TAT), a non-invasive body temperature thermometer that is proven to be as accurate as rectal measurements. The inventor of the TAT, Dr. Francesco Pompei, is the CEO and founder of Exergen Corporation. Dr. Pompei, who holds degrees from MIT and Harvard University and holds over 60 U.S. patents, used the heat balance – an algorithm to determine the body temperature by measuring skin temperature at the temples. Syneron's Shlomo Assa, one of the driving forces behind the VelaShape III development, realized that the knowledge of Exergen in measuring skin temperature



was essential in integrating IR measurements in the VelaShape: "It became apparent that there was only one company that had the knowledge and experience to provide a solution for our problem," said Shlomo Assa, president of Inlight Corporation, a division of Syneron Ltd. "The technical assistance of Exergen was pivotal in obtaining our goals."

## Challenges

There were many challenges in implementing IR sensing in the VelaShape applicator including:

- IR lamps that can interfere with the measurements,
- very limited space was available to mount the sensor,
- the only possible position of the sensor allowed for a very restricted view of the skin,
- vacuum conditions that needed to be respected,
- and last but not least, high power RF pulses that can heat up the entire applicator very rapidly.

Exergen's proprietary technology includes the smallest available IR sensor – the Micro IRT/c. The sensor does not need a power supply because it is self powered. It consists of only passive components and therefore does not drift, making the sensor very stable and accurate. Another advantage is that the sensor does not need periodic recalibration, as all powered sensors do. This means that Syneron has no maintenance on the sensor when the VelaShape III is in the field. Coincidentally this model was small enough to fit in the confined spaces of the applicator. A thermodynamic assessment of the applicator, and subsequent signal conditioning of the sensor read-out, were necessary to obtain the required speed and accuracy. "Bottom line: Exergen has been a true partner in our R&D phase – a sparring partner with an ingenious sensor that delivers a robust, price effective solution for a very challenging problem," said Assa.

## Benefits

Integrating non-contact IR temperature measurements of the patients skin during the treatment has proven to be very successful. It allows for faster heating up of the tissue, without overheating the skin. "We have taken advantage of the progression of science and technology to incorporate this new knowledge into a state of the art body device," said Konika Patel, vice president of clinical education at Syneron-Candela. "It is based on solid science. Controlled thermal injury at the right level over the right time leads to important changes in dermal collagen and adipocyte metabolism."

## When to be launched

We can't wait and it is great to hear that it is already in the market place. The VelaShape III was officially released in October 2013. It obtained FDA approval and CE mark in September 2013. During the Anti-Aging Medicine European Congress (AMEC) in Paris Syneron's VelaShape III device won the Anti-Aging & Beauty Trophy in the category of "non-invasive body shaping technologies". This award recognizes companies who thrive to innovate products/ devices in the field of aesthetic and anti-aging medicine. Syneron expects to sell up to ten thousand VelaShape III systems in the next 5-7 years. And the new, already award winning VelaShape does precisely that. With a peak power of 150W (more than double that of the VelaShape II), it is a powerful device that can reach the threshold temperature of 45°C (113°F) within 2 minutes, where previously it would have taken 8-10 minutes. VelaShape III claims an average abdominal circumferential reduction of 2,6 cm (1"), even up to 10 weeks after a single treatment. As a result, treatment time can be significantly reduced, with better contraction of the connective tissues. Heat can be sustained for a longer period of time and can therefore better influence changes to collagen and fat cell metabolism, resulting in better overall treatment outcomes. "That's what makes this device so cutting-edge," said Konika Patel. "It makes this treatment efficient and effective for all customers across the board because it can adjust the energy based on individual characteristics."

If you would like to have more information about this topic, please call CleverIR at +1 617 649 6322 (USA + Americas inquiries) or +31 413 376 599 (all other inquiries).

