EHY – 2030 MODEL

Oncothermia systems

› FOR LOCO-REGIONAL TUMOR TREATMENT

oncotherm
hyperthermic oncology

Oncotherm – About us

Oncotherm develops, manufactures and markets cancer treatment systems since 1988 that utilize Oncothermia to treat tumors. Oncothermia is a further development of the classical method of Hyperthermia, one of the oldest cancer treatment methods, and it allows a personalized, nontoxic therapy using an electric field and promoting the body's natural regulatory processes. In accordance with its corporate philosophy, Oncotherm's mission is to heal cancer, to increase cancer patients' life expectancies and to improve patients' quality of life.

Oncothermia: how the method works and how it is used

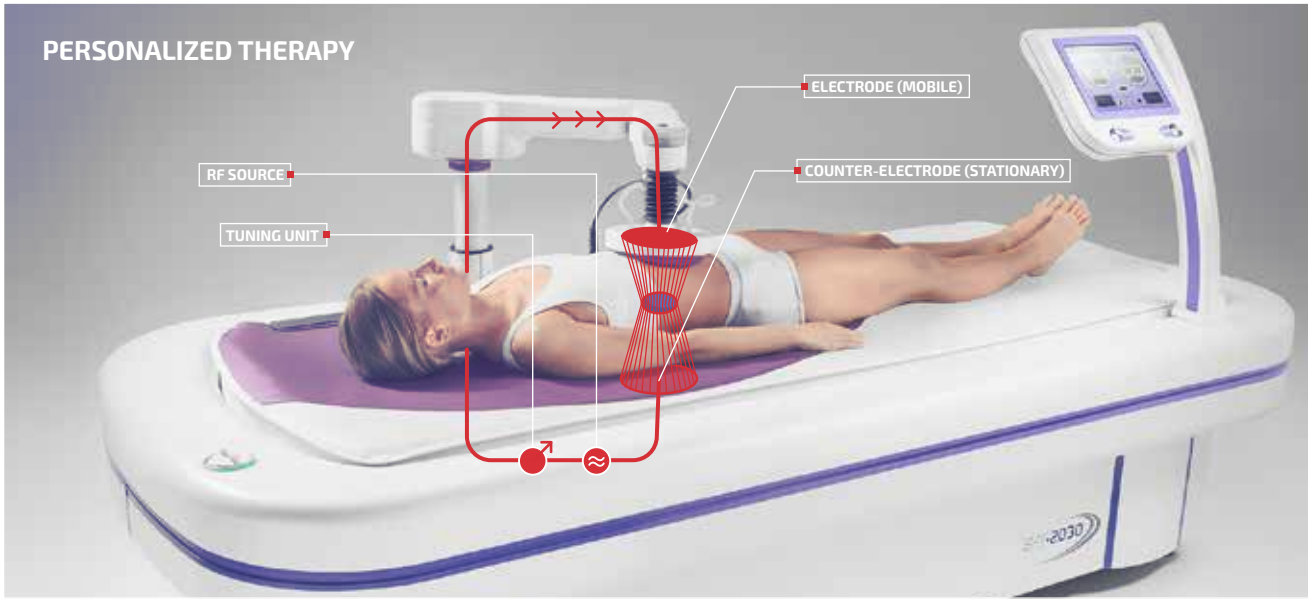
A modulated electric field with a carrier frequency of 13.56 MHz is generated by two active electrodes. Since malignant tissue has higher conductivity than healthy human tissue, the **electric field tends to flow predominantly through the malignant tumor tissue**. The combination of deep-layer heating and the electric field leads to stimulation of malignant tumor cells. This, in turn, triggers increased apoptotic activity in the tumor region and as a result, promotes cell death.

Oncothermia: the method

Compared with classic Hyperthermia, which is a homogeneous heating and can result in burns, Oncothermia is heterogeneous, selected heating.Thanks to the selection at cellular level, the radiation only has an effect in the region of the tumor with 45°C heating at cellular level, the whole tumor heating up to 40-42°C, while the healthy regions remain as good as untouched.While classic Hyperthermia works at a temperature of 42°C, Oncothermia achieves a greater effect on cellular level, with selected heating, the methode called: Nanothermia. Of course, all electromagnetic radiation devices used for tumor treatment must fulfill stringent safety requirements. We meet such safety requirements via our own high standards and solid scientific findings, and via the low levels of radiation that our devices produce. Oncotherm systems are fitted with special 120 dB attenuation of the carrier frequency (i.e. the surrounding radiation is a million times lower than in the patient him/herself), so at an output of 150 W the radiation is less than 2 mW. All Oncotherm systems are classified according to the guidelines on electromagnetic compatibility. Due to focused energy flow of Oncothermia , more than 95% of energy dose are absorbed into tumor, compared to other classic Hyperthermia solution, with significantly less effectivity. This high efficiency is the key to use only 250W output power.

Schematic illustration of oncothermia treatment

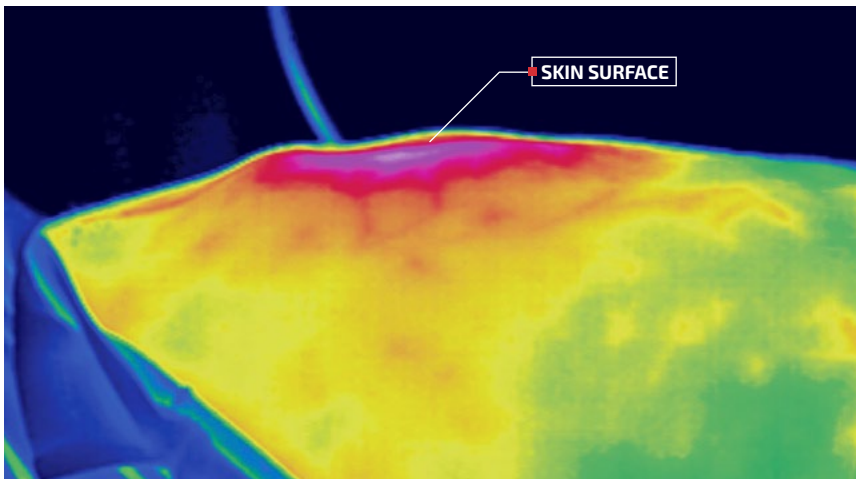
The illustration shows how the electric field, produced by the two active electrodes, passes through the patient's body. As shown schematically, the electric field tends to move through the pathways with the lowest impedance, i.e. through the malignant tissue (tumor).



Hyperthermia and Oncothermia

EXPLAINING THE DIFFERENCE

Oncothermia, a unique improvement on conventional oncological Hyperthermia, represents the next generation of Hyperthermia therapy. Modulated electro-hyperthermia (mEHT) selectively destroys malignant cells by applying the required specific energy dose. While traditional Hyperthermia functions solely via certain thermodynamic parameters, such as temperature, Oncothermia functions by controlling absorbed energy doses, via an approach similar to that used in radiation therapy. Oncothermia moves beyond conventional heat therapies by using controlled, selective energy transfer. Oncothermia transports energy directly to malignant cells, via a selecting electric field. The therapy thus functions in a largely apoptotic manner. The entire treatment is controlled by the modulated electric field that passes through the patient. In the process, the tumor becomes a constant, controllable parameter within a closed electric circuit.

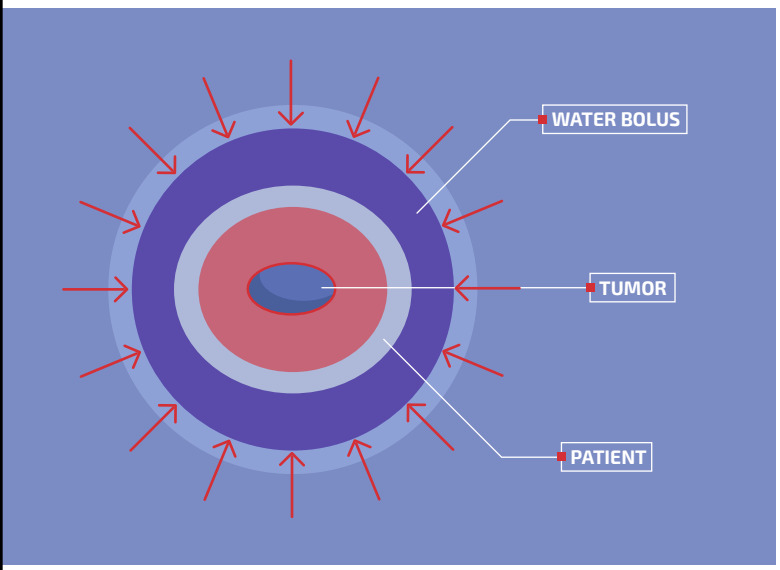


Local Oncothermia treatment

Thermal image after 20 minutes of treatment

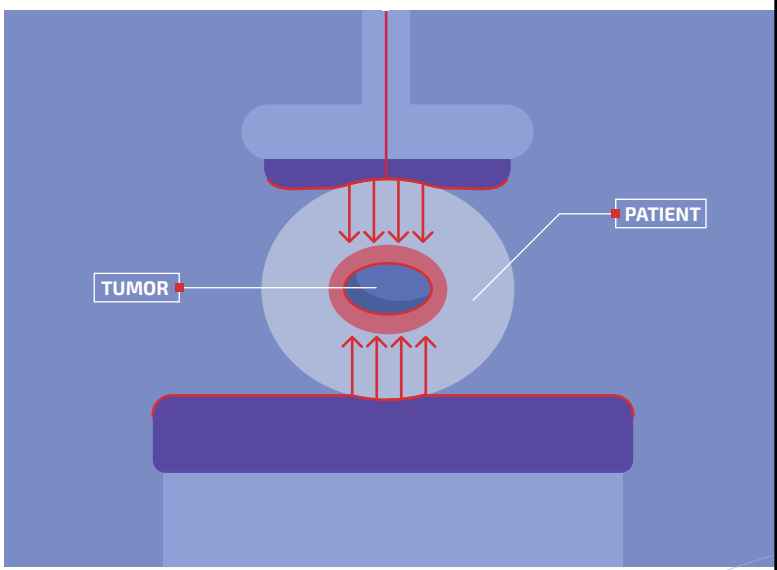
In local Oncothermia treatment as well, very little heat is generated in the vicinity of the electrode. The patient's safety is guarantee; there is no risk of skin burns.

Hyperthermia: even, focused heating



Both malignant and healthy tissues are uniformly heated from all sides. The temperature difference between tumor cells and surrounding healthy tissue is hardly measurable (even, focused heating).

Oncothermia: conductive heating



The electric field and resulting heat are directed to the area of the tumor cells, so the temperature of the healthy tissue increases only very slightly (conductive heating).

EHY – 2030 MODEL

REVOLUTIONARY NEW CONCEPT

- New shape and design
- User friendly touch screen display with full system control
- New autonom controlled step motor tuning system for the reachable fastest impedance matching
- Newly developed RF generator with increased power
  (max 250 W)
- Electronically controlled electrode holder arm system to easily position horizontally the smart electrode.
- Changeable stretching textile electrode for the smart electrode system and bed.
  (Better and more direct contact can be reached with the new changeable textile electrode than with the earlier one. There is no distilled water between the electrode and the patient, which wouldt be an additional insulation layer, only a 1,5 mm thick layer of biocompatible silicone or artificial leather)
- Hand-held emergency stop switch for the patients
- Plug-in *PMS-100*
  (Patient Management System)

Smart Electrode System (SES)

The *SES* is able to detect the proper matching of the electrode and the patients, and gives visual feedback about it to the doctors. The *SES* solution could improve the effectiveness of the treatment.

FEATURES

- Built-in Electrode Identification System and Electrode Lifetime Management
- Continuous communication with the main controller
- Conrolled surface temperature to increase treatment comfort of the patient.

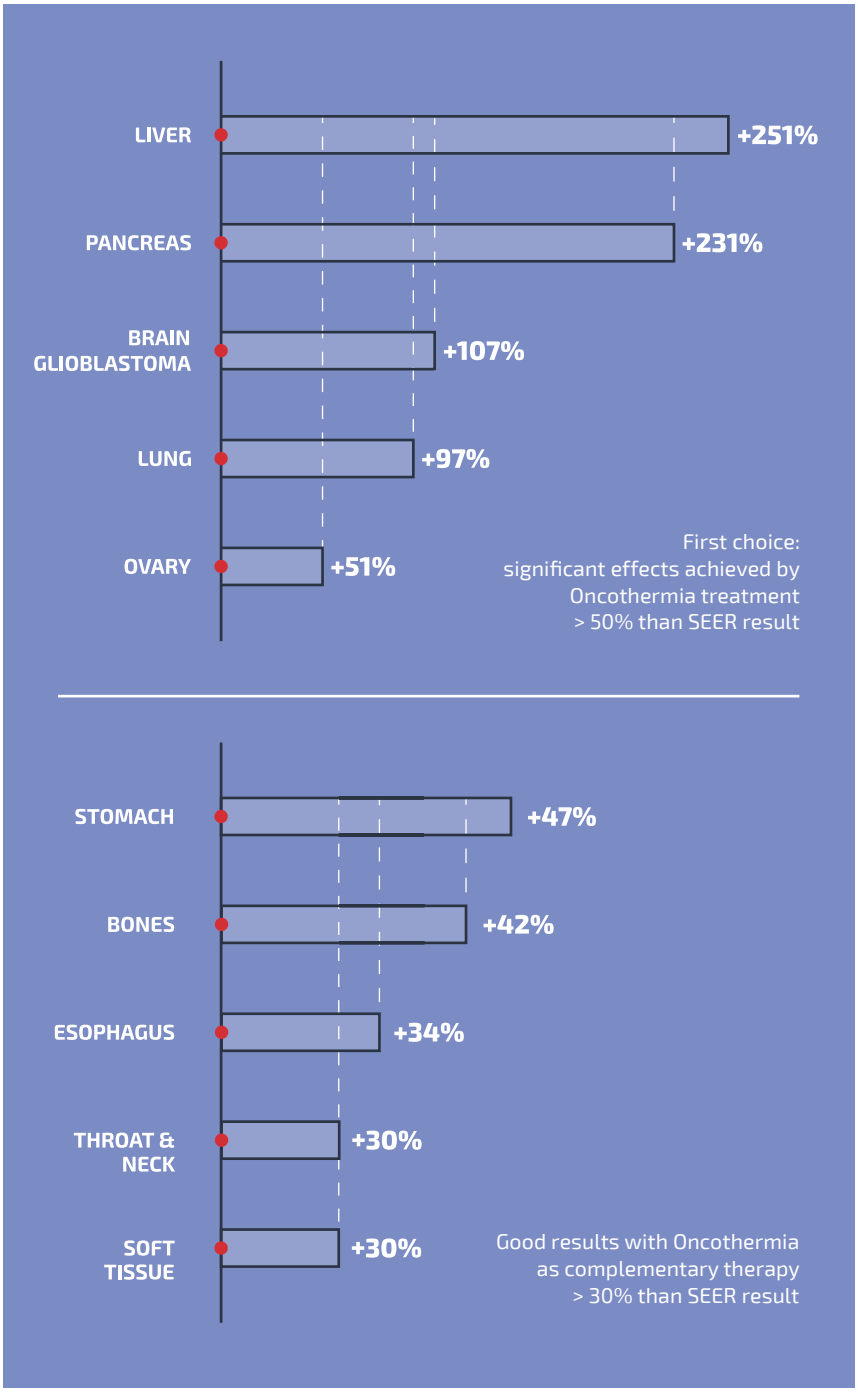
D200 electrode for sensitive area treatment (limitation to max 150W)

D300 electrode for large volumetric tumors (limitation to max 200W)

CE 0123

Medical and therapeutic benefits

Oncothermia, when used as a complementary treatment along with traditional medical therapies such as chemotherapy and radiation therapy, can significantly improve patients' conditions, prolong their survival and enhance their quality of life. This claim is backed by numerous case studies provided by leading doctors, both in Germany and in other countries, who use Oncothermia therapy on a daily basis in their offices and clinics. With their combination of electric field and heat, Oncotherm systems can also be used for the treatment of parts of the human body that are in constant motion, such as the lung, and of heat-sensitive regions, such as the brain. They are effective in body regions with high levels of blood flow, such as the liver, and in regions with high levels of air circulation, such as the lung. Many such body regions cannot be treated with other methods that are based on conventional Hyperthermia, since such methods use temperatures over 40°C. In general, Oncothermia can be used with all stages of cancer, although its current main use is with advanced solid tumors that are hardly operable or inoperable, as well as with recurrent tumors and metastases.



Additional average survival time after Oncothermia treatment, compared to SEER database

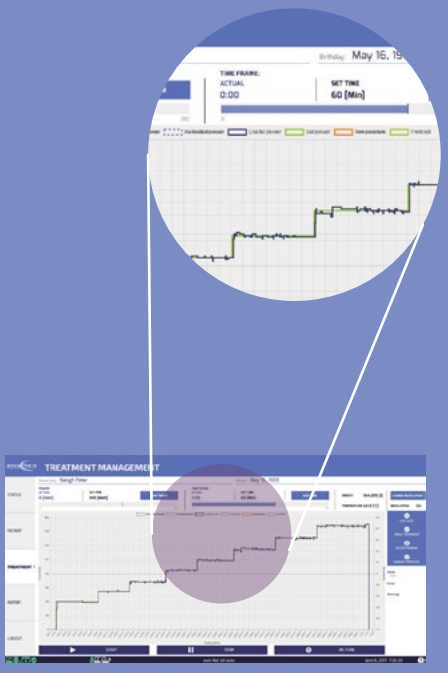
- Results and numbers of cases from a large-scale retrospective study on the use of Oncothermia on different tumor entities. For all tumor entities studied, studied patients showed a higher survival rate in the first year after cancer diagnosis.

Patient Management System (PMS- 100)

SSD QOL WEB

FEATURES

- Newly developed hardware configuration, increased processor power for smooth software function execution.
- High speed and capacity SSD driver, integrated to mother board to store patient and treatment log. Module base information log
- Web base remote access and control in Online mode, independent remote, encrypted server data saving (no data loss). In case of equipment malfunction, automated notification to service engineer.
- Redesigned software architecture. (easy to use user interface). Supported Oncotherm devices: EHY-2030 and EHY-2000plus
- Pre-defined treatment power curves. (Step up heating), patient base
- Built in QoL questionnaires for patient traceability, automated data evaluation
- Multi language (English, German, Hungarian, Korean, Japan, French)



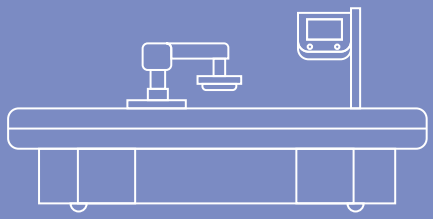
Technical specifications

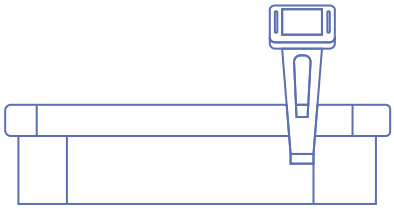
Mains voltage	**AC 230 V / 50 Hz, AC 110V; 50/60Hz**
Power input	**max. 600 W**
Maximum power output	**max. 250 W**
Nominal load	**50 Ohm**
Output carrier frequency	**13,56 Mhz**
Output modulating frequency	**Pink noise**
Weight	**430 kg**
Dimensions (HxLxW)	**1320 x 2500 x 1150 mm**
Temperature	**+15°C - +30°C**
Relative air humidity	**20% - 60% (non-condensing)**
Air pressure	**800 - 1060 hPa**

PRODUCT RANGE

EHY-2030

EHY-2030 is our latest development in the treatment of loco-regional tumors. The newly designed device includes the Smart Electrode System (*SES*), the plug-in Patient Management System (*PMS-100*) and a user-friendly touch screen display with full system control. The new RF generator with increased power has been developed with a new intelligent controlled step motor tuning system for the reachable fastest impedance matching.



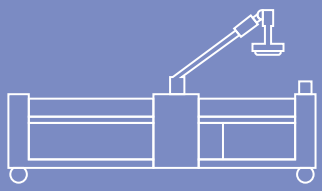


EHY-3010

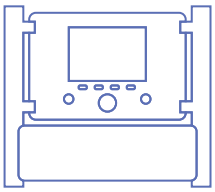
EHY-3010 is designed for the simultaneous multi-local treatment of advanced, metastatic disseminated, malignant and solid tumors. Within the range of Oncothermia systems, it is the pioneering breakthrough in the field of multi-local tumor therapy. Instead of a bolus electrode, this system uses textile electrodes, which are even more flexible to adjust to the treatment area.

EHY-2000plus

EHY-2000plus is widely accepted system for locoregional deep Hyperthermia applications. This model has been used for treatment worldwide for more than 20 years. Popular, versatile device, applicable for all kind of solid tumors. It has been improved by taking into account the experiences of our doctors and experts, and the requirements of patients and the people treating them. The EHY-2000plus is easy to use and reliable device.



EHY-1020



EHY-1020 is our professional device for treating prostate diseases. Both malignant and benign tumors (BPH) can be treated using system: a catheter with built-in electronics and counter electrode. The EHY-1020 system is compact and easy to use. The method has been successfully used by our customers for many years. The results of the treatment are excellent and nevertheless many unpleasant side effects that are known from other forms of treatment can be avoid.

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