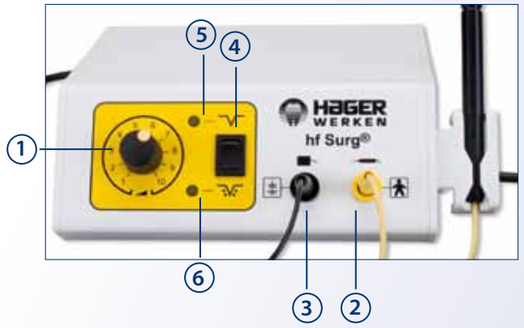
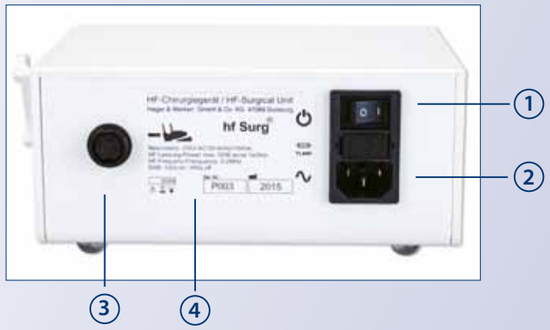
Front of device
1. Control
2. Outlet handpiece
3. Outlet neutral electrode
4. Selector key
5. Cutting mode
6. Cutting/coagulation mode



Back of device
1. On/off
2. 230 V connector with fuses
3. Foot pedal
4. Identification plate



Technical Data

hf frequency + power:	2.2 MHz, max. 50 W at load resistor 1,000 ohm
Mode of operation:	monopolar
Wave form:	permanent/modulated with approx. 80 %
Surrounding temperature:	5 – 40 °C
Storage temperature:	-20 – +70 °C
Air humidity:	< 90 % rel.
Power supply:	230 V AC, 50/60 Hz
Power input:	max. 100 VA
Medical device classification:	class 2b
Applicators handpiece:	autoclavable
Power-on time:	DAB 120 sec. ON/480 sec. OFF

Frequency + power
2.2 MHz, max. 50 W
Mains supply: 230 V/50 Hz

Measurements + Weight
W 19 x H 9 x D 18 cm
Approx. 3 kg

Scope of supply
Device with foot switch, handpiece
4 cutting electrodes and 1 neutral electrode

Article	REF
hf Surg	452 400
hf1 Surg bipolar	452 459
hf1, set of electrodes No. 40, 2, 13, 15	452 441

hf1 Surg® bipolar

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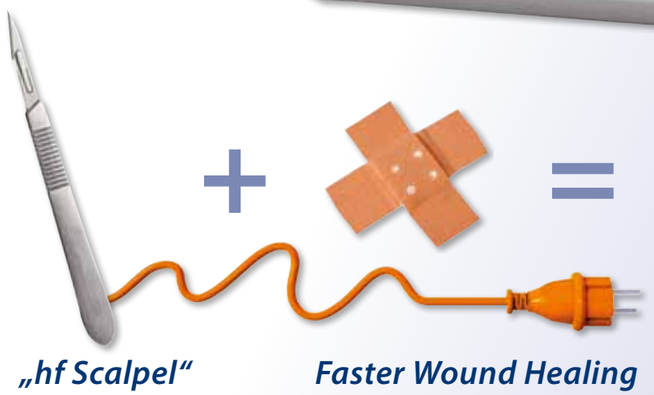
The Gentle Surgery

Almost Painless for your Patients



hf Surg®

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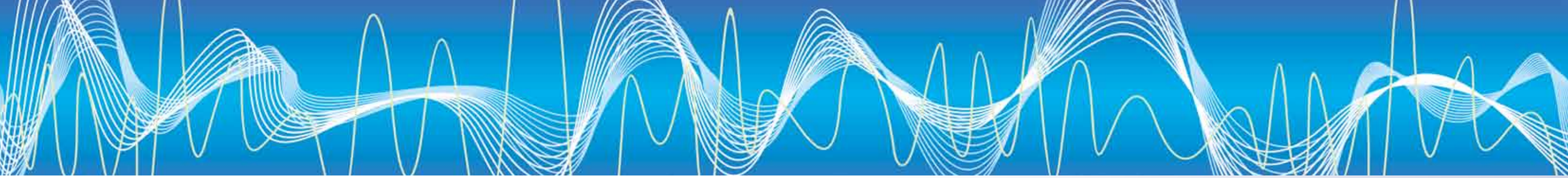


Modern Radio Frequency Technology …

... is far from being comparable to radio-surgery of former times. Today's surgery should not be mixed up with the results you receive when working with electrocautery, medical diathermia, sparking generators or partial DC devices that do not deliver surgical cutting waves.

Radio-surgery is an atraumatic method for cutting and coagulating soft tissue. The energy exiting at the fine active electrode causes bursting of the cells in a split seconds, thus guaranteeing cutting without burnings. The heat separates and evaporates the cells in the wave course, resulting in a cutting of the tissue as if separated by a razor sharp scalpel, which results from the heat being produced by the resistance the tissue opposes to the passage of the high frequency wave. This wave is transferred by a fine antenna which is called surgical or active electrode. Cutting technique is as fine and minimally invasive as the finest electrode allows and indicates. High frequency current is used to protect the patient from an electric shock. The atraumatic characteristics of radio-surgery offer remarkable advantages.

hf Surg is equipped with automatic voltage regulation, continuous adjustability of intensity as well as with acoustic and optic indication. The optimal control by foot switch is ergonomic and guarantees the mobility of the hands at any time.

It is the high frequency waveforms that are responsible for the excellent quality of surgeries with little time needed and for safest minimal invasive use with an optimal surgery outcome without bacterial carryover. Fast wound healing is achieved, offering the patient a prompt return of quality of life.

Advantages of HF Surgery

- ✓ Fast, scalpel-like and pressureless cuts
- ✓ Immediate reduction of hemorrhage and even wound edges
- ✓ Quick and nearly pain-free wound healing
- ✓ Clear operation field
- ✓ Pressureless, stress-free working
- ✓ Easy handling incl. foot switch
- ✓ State-of-the-art 2.2 MHz technology

After surgery

After 24 hours

After 4 days

FIELDS OF APPLICATION / ADJUSTMENTS

Filtered Wave Cutting - CUT MODE

- Extremely precise tissue management
- Clean and nearly pain-free
- Optimally suitable for histological biopsy

This mode, which produces a continuous energy flow, is excellently applicable for a clean separation of tissue without coagulation. This mode works with minimal heat and minimal hemostasis. It should especially be used where tissue shrinkage must not be risked and when working near the bone or the periost. This adjustment is also most effective for biopsy for histological examination.

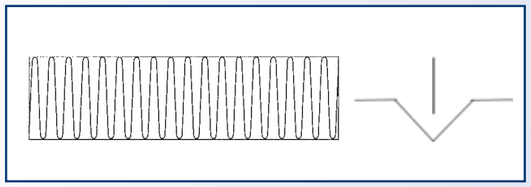
Cutting/Coagulation - CUT/COAG MODE

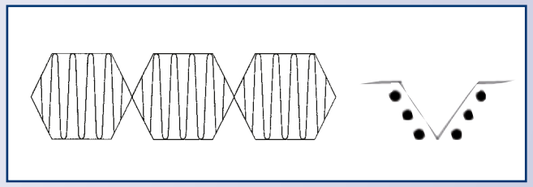
- Simultaneous cutting and coagulation
- Optimal for plastic surgical interventions

This mode allows precise cutting with simultaneous coagulation of the cutting surface. Although the coagulation zone is hardly noticeable clinically it delivers an effective hemostasis, which does not result in disorder of primary wound healing and which disappears upon completion of wound healing. Such cuts should not be sewed, this mode is perfect for plastic surgery.

TIP: Activation of the electrode by pressing the foot switch before it touches the tissue. This guarantees an even cutting right from the start.

Light modulated wave





HF CUT & CUT COAG

Program No.	COAG Program	Power (Watt)	Scale Adjustment	Indication / Remark
1	CUT	ca. 28	6	unmodulated wave = sine wave - Sulcus extension - Gingivectomy - Internal gingivectomy - Open curettage - Tumor resection - Flap surgery - Vestibule plastic - Excision
3	CUT	ca. 22	5	
2	CUTCOAG	ca. 22	5	(Slightly modulated wave) - Gingival plastic - Exposure of teeth, stumps, approx. steps or crown edges - Removal of hyperplasia For plastic work and removal of tissue if, aside from cutting, coagulation of the cutting surface is desired. Caution! One-tenth less tissue 24 h postoperatively (caused by higher lateral heat). Apply only in case there is sufficient space to bone and periosteum.
4	CUTCOAG	ca. 17	4	

... Continuation

CASE STUDY

In the following you find a reasonable assignment of the filtered wave regarding the recommended indications. The wave features an excellent cutting efficiency with nearly zero coagulation. It is, therefore, suitable for the following indications:

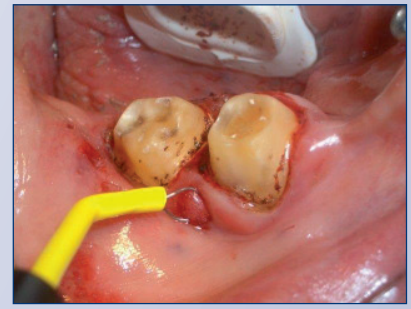
- ✓ Sulcus extension
- ✓ Gingivectomy
- ✓ Internal gingivectomy
- ✓ Open curettage
- ✓ Flap surgery
- ✓ Vestibule plastic
- ✓ Excision

In contrast, the slightly modulated wave is mainly used for plastic works. When cutting, the cutting edges are coagulated. Indications are:

- ✓ Gingival plastic
- ✓ Exposure of teeth, stumps, approximate steps and/or crown edges
- ✓ Removal of hyperplasia
- ✓ Tongue surgeries

Open curettage followed by gingivectomy without height loss of gingiva

Loosening of frenulum



Exposure of short stumps

The high frequency technology is fun and worth being used on a regular basis.
It is a fact that laser and high frequency technologies are not at all archrivals; rather, the two technologies complement one another! Typical for laser and hf is the postoperative pain reduction by the deactivation of nerve fiber ends.

Ideal for the protection of wounds and sutures: Reso-Pac® wound protection paste (REF 155 014) in combination with Myzotect®-Tincture (REF 155 005)

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Continuation ➔

The gentle surgery
… in which every dentist is also an artist: The new hf Surg

Innovative or old hat?

Is the use of high frequency technology for treatment of soft tissue in dentistry still state-of-the-art and up-to-date? Or is it an outmoded relict of a bygone era? And how does comparativeness versus scalpel and laser technology look like in daily practice routine of dentistry?

About the author: Silvia Geiger, instructor for periodontics and surgery in the company Hager & Werken, offers you an update on the new technique.

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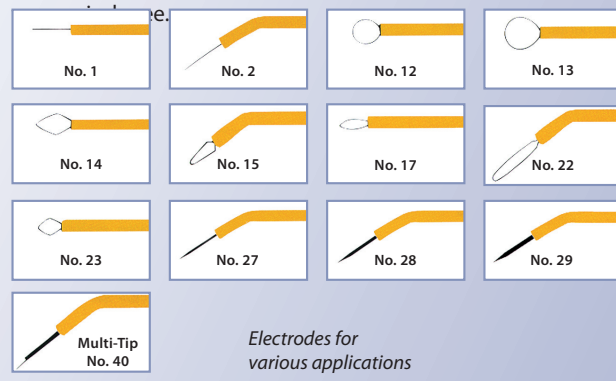
The company Hager & Werken reacted to the popular demand of dental physicians - laser freaks as well as laser skeptics, surgeons with many years of professional experience and those who have been practicing for a few years only or will be starting their professional life - by launching a small hf Surg soon: A compact device for cutting and cutting with simultaneous coagulation.

Which are the facts that we should take into consideration? Yes, indeed, application of heat on the human body has already been known from the writings of the ancient Egyptians, from Hippocrates and Celsius. Radio-surgery started in the early years of the 20th century. Physicians tried to remove tissue by means of glowing wires. The devices were called cauteries. They acted like soldering irons, i.e. the tissue was removed with a frequency of 50 Hz leading to third-degree burns with nasty symptoms like pain, inflammations and consequently poor healing tendencies. Relevance to practice was only created in the further course of radio-surgery development by application of high-frequency waves of over 0.5 MHz, which achieve an evaporation of the tissue. This means that the tissue is heated promptly and evaporated without necroses by bundling of electric power at the discharge end of the active electrode. The active electrode remains cold all the time. As a result the cells/the tissue in the micro area (cell area) burst which is represented as cut in the macro area.

The first high-frequency surgery device custom-built for dentistry was launched in 1969, as there is a significant difference in treating the soft gingiva/mucosa or other tissue structures. Ellmann was the first to introduce the filtered wave in 1973, which, in connection with a high frequency (formerly 1.2 MHz, today 2.2 MHz), allows working near the bone and taking biopsies for histological findings. This is only possible based on these two facts, as, in reverse, the contact to the needle electrode in the tissue does not cause an additional coagulation. Ergo correctly used high-frequency surgery is no longer "heat surgery" at all. As the hf Surg contains two different wave types, the filtered as well as the slightly modulated wave, this device is ideal for cutting, and thus as scalpel alternative, and for plastic works. It works with a frequency of 2.2 MHz meaning 2,200,000 wave cycles per second. Neither discolorations nor necroses will occur when used appropriately, the treated area will heal fast and nearly painless.

Compared to the scalpel, you work in areas with little blood, partially even in bloodless areas. Consequently, an optimal view is guaranteed! And we can better and more effectively treat what



Electrodes for various applications