



# Skull Base, Micro- and Neurosurgery

Solutions with the CURIS® 4 MHz Radiofrequency Generator

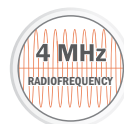


PRECISION ELECTROSURGERY  
Made in Germany



# CURIS® 4 MHz Radiofrequency Generator

## One unit – many applications

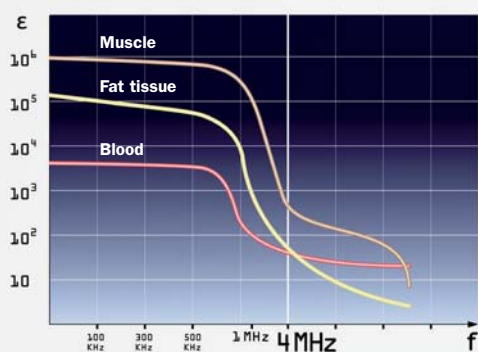


The CURIS® 4 MHz radiofrequency generator relies on our innovative impedance-controlled 4 MHz technology: It is gentle to the tissue and effective for coagulation and for cutting. Scientific studies have shown that tissue trauma may be reduced by using CURIS® 4 MHz radiofrequency technology.<sup>1</sup>

### Impedance-controlled 4 MHz radiofrequency technology

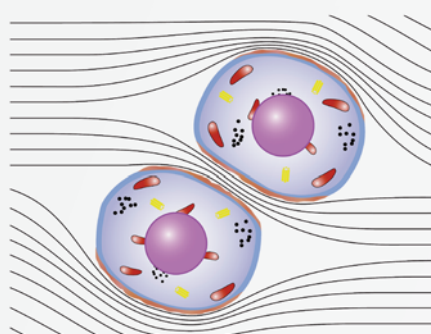
The higher the frequency, the less the resistance of biological tissue to electromagnetic fields – up to the point where cell membranes are capacitively coupled. This effect is created by the CURIS® 4 MHz radiofrequency generator in all monopolar and bipolar modes. When using conventional electro-surgical units the electromagnetic field concentrates between the cells and only heats up the outer layer. However, with the CURIS® 4 MHz radiofrequency generator cell membranes are conductive, and energy is absorbed evenly inside the cells. As a result, energy is administered gently and in a highly focused fashion. Precise monopolar cuts are possible while lateral heat damage is kept to a minimum.<sup>2</sup>

Permittivity/Frequency



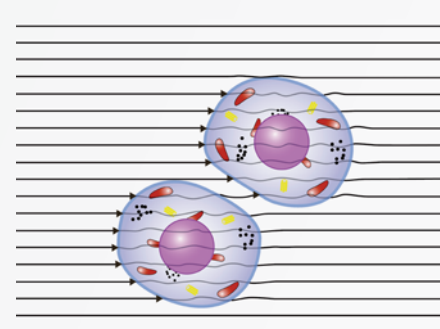
This diagram shows the permittivity of tissue, which depends on the frequency of the electromagnetic field.

Conventional electro-surgical units



The electromagnetic field concentrates between the cells and heats up only the outer layer.<sup>3</sup>

CURIS® 4 MHz radiofrequency generator



Cell membranes are conductive and the energy is absorbed evenly inside the cells. The results are highly focussed tissue effects.<sup>3</sup>

<sup>1</sup> Muehlfay G. et al., A study on the type of lesions achieved by three electro-surgical methods and their way of healing. Romanian Journal of Morphology & Embryology, 2015, 56(4): 1383-1388

<sup>2</sup> Hoffmann T.K. et al., Comparative analysis of resection tools suited for transoral robot-assisted surgery, European Archives Oto-Rhino-Laryngology, 2014, 271(5): 1207-1213

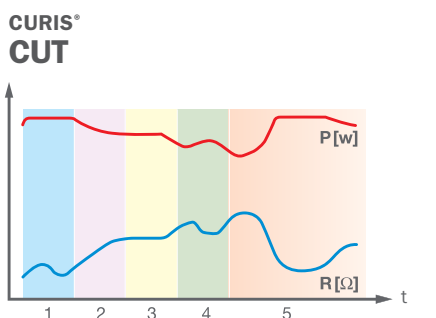
<sup>3</sup> Holder, D. S., "Brief introduction to Bioimpedance" in: Electrical Impedance Tomography – Methods, History and Applications. IOP Publishing Ltd, 2005



# Precision thanks to **AutoRF™**

AutoRF™ is a smart impedance control function that will tailor the power output of the CURIS® 4 MHz radio-frequency generator to the tissue condition. Whether it is cutting through different types of tissue (such as mucosa, muscle, fat or connective tissue) or altering tissue conditions during coagulation, the AutoRF™ feature will deliver adapted power output as required by the different tissue impedance.

When dissecting different types of tissue in one cut (skin, fat, muscles), the unit has to process and respond to the AutoRF™ data in a flash. For this reason, the CURIS® 4 MHz radiofrequency generator has two microprocessors for additional safety and speed.



### Monopolar cutting:

Sections 1 to 5 show the different kinds of tissues and cutting speeds to which the unit adjusts its power output automatically. Illustration only.

## p<sup>3</sup>™-technology



p<sup>3</sup>™, which stands for pulsed power performance, is active in all coagulation modes of the CURIS® 4 MHz radiofrequency generator. Radiofrequency energy is delivered in about 50 small packages per second. Due to the pulsed power output, there are short breaks between the individual packages, giving the tissue enough time to absorb the energy. Highly focused, yet gentle coagulation with minimal thermal damage is possible.



“The CURIS® 4 MHz radiofrequency generator provides unparalleled precision to the neurosurgeon seeking optimal control in neurosurgical cases. I have used the device for surgery in the cavernous sinus, resection of cavernous malformation from the motor cortex, minimally invasive clipping of anterior communicating artery aneurysm, and resection of acoustic neuroma. I found the ability to perform pinpoint coagulation with minimal thermal and electrical spread increasing the safety and efficacy of my operations.”

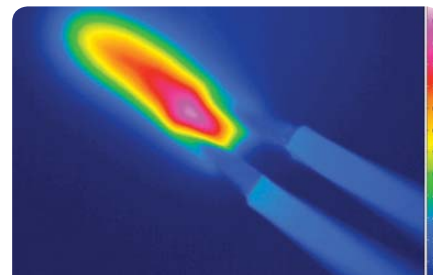
**Ali Zomorodi, MD**  
Duke Neurosurgery, Durham, NC (USA)



CURIS® : one unit  
- many applications

## SuperGliss® non-stick Technology

The material specially developed for SuperGliss® non-stick bipolar forceps prevents overheating of the tips during coagulation. Laboratory tests confirm the outstanding non-stick properties that last throughout the lifetime of the instrument.<sup>4</sup>



SuperGliss® non-stick tips remain cool.



### SuperGliss® non-stick bipolar forceps

Our entire range of products can be found on our website [www.sutter-med.com](http://www.sutter-med.com)

shown here: bayonet, total length: 20.0 cm, tips: 0.7 mm | with US pin connector:  
**78 21 83 SG** | **78 21 83 SGS**



The **MicroTip** geometry makes the insulation disappear from the surgeon's sight and opens up the view through the tips.



The **classic plateau** shape gives instruments a strong grip, and allows dissection, grasping and coagulation of larger structures and vessels.

## SuperGliss® non-stick ELP bipolar forceps



**Uta Schick, MD**  
**Münster (Germany)**

“The design and construction of the SuperGliss® non-stick ELP bipolar forceps with different angles and sizes represent a technical innovation that can lead to improved surgical outcomes. These bipolar forceps enhance the quality and quantity of tumor and tissue resection and dissection in skull base surgery and open the possibility of new surgical approaches to microscopic tumor resection and hemorrhage coagulation in the anatomical areas of the skull base.”



### SuperGliss® non-stick ELP bipolar forceps

Our entire range of products can be found on our website [www.sutter-med.com](http://www.sutter-med.com)

shown here: bayonet, total length: 20.0 cm, tips: 0.4 mm, 45° angled upwards | with US pin connector:  
**78 22 86 SL** | **78 22 86 SLS**



The **Extra Low Profile (ELP)** tips are shorter and more delicate. Their design is ideal to meet the challenges of fine, microsurgical interventions.



Intraoperative use of SuperGliss® non-stick ELP bipolar forceps: Removal of medial sphenoid wing meningioma

<sup>4</sup> Sutter Medizintechnik GmbH, data on file, Freiburg (Germany)



"The sharp tips allow a precision that surpasses all other bipolar forceps I have used throughout my career. The forceps are well-balanced and the tines are very slender, but strong. With the small upward angulation of the tips, the SuperGliss® non-stick zhora bipolar forceps are perfect for skull base tumors in deep and narrow fields, as well as for more superficial, minimally invasive procedures."

**Torstein R. Meling, MD**  
Geneva (Switzerland)



**SuperGliss® non-stick zhora bipolar forceps**

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shown here: bayonet, total length: 20.0 cm, tips: 0.2 mm, 10° eccentric | with US pin connector:  
**78 49 86 SGZ** | **78 49 86 SGSZ**



The **zhora** tips are specially delicate. Due to their eccentric tip design by a 10° upward skew, the tips are clearly visible in the operating field. In narrow and confined spaces this is particularly advantageous.



CC guide – To match tines exactly and prevent scissoring of the tips.

Reinforced for optimized spring tension.

**SuperGliss® non-stick TEO bipolar forceps**

**TEO**



"These Sutter bipolar forceps offer the versatility required for standard microsurgery and endoscope-assisted surgery. They are well-balanced, have a minimal amount of non-insulated ends for obvious safety benefits, tips with different thickness for different tissues, various angled tips for different viewing angles, and good grip. I believe they are the best bipolar forceps on the market."

**Charlie Teo, MD**  
Randwick (Australia)



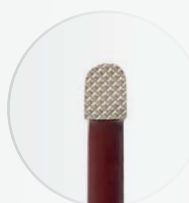
**SuperGliss® non-stick TEO bipolar forceps**

Our entire range of products can be found on our website [www.sutter-med.com](http://www.sutter-med.com)

shown here: bayonet, total length: 23.0 cm, tips: 2.0 mm, 60° and 7.0 mm angled upwards | with US pin connector:  
**78 31 96 SG** | **78 31 96 SGS**



The SuperGliss® non-stick TEO bipolar forceps offer more insulation towards the distal tip. In addition, **TEO** tips are shorter and rounder compared to the other SuperGliss® non-stick models. Different angles enable the surgeon to work "around corners" - ideal for endoscope-assisted procedures.



The serrated tips of SuperGliss® non-stick TEO bipolar forceps provide an even better grip for improved grasping of tissue.

shown here:

Our entire range of products can be found on our website [www.sutter-med.com](http://www.sutter-med.com)

bayonet  
total length: 23.0 cm  
tips: 0.4 mm x 4.0 mm

78 81 89



## Masterpiece™ non-stick

Bipolar forceps



The Masterpiece™ non-stick bipolar forceps were designed with precision and control in mind. I use the Masterpiece™ non-stick bipolar forceps for the precise coagulation of small-diameter vessels in narrow spaces. Fine tips, slim tines and easy rotation add to your skills and improve your performance even at targets far from the surface. The non-stick material reduces charring and sticking.

**S. Rosahl, MD**  
Erfurt (Germany)

Each Masterpiece™ non-stick comes with a storage tray for safe cleaning and sterilization.



**Non-stick technology:** Our specially developed material prevents overheating of the tips during coagulation



**SuperGrip:** Pinpoint grasping and a better grip thanks to microstructured tips



**Unparalleled view onto the tips** thanks to slim and sturdy tines



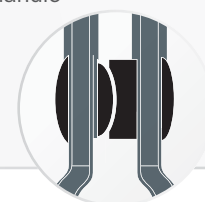
**Effortless and comfortable use** thanks to ideal balance and low weight



**Grip and rotation in the hand** due to soft-touch material and round-edged handle

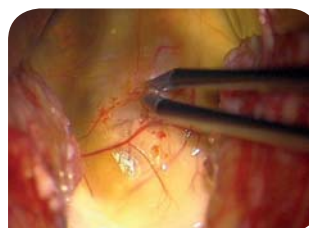


**CC guide** to match tines exactly and prevent scissoring of the tips



### Micro

The **MicroTip** geometry opens up the view to the tips. Available in a tip width of 0.2 mm and 0.4 mm. Tip length: 4.0 mm.

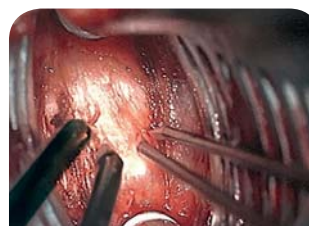


Bipolar coagulation with Masterpiece™ non-stick bipolar forceps during brainstem cavernoma surgery.



### Classic

The **Classic** plateau-shaped tips are available in a tip width of 0.4 mm and 0.7 mm. Tip length: 6.0 mm.



Masterpiece™ non-stick bipolar forceps vs. conventional bipolar forceps

**Please note:** Masterpiece™ non-stick bipolar forceps are uninsulated precision instruments which do not fulfill sections 201.8.8.3 103 and -104 of IEC 60601-2-2:2010-01. For safety information, please observe the instructions for use.

shown here:

Our entire range of products can be found on our website [www.sutter-med.com](http://www.sutter-med.com)

bayonet  
tips: 0.7 mm, 15° angled  
total length: 31.0 cm  
working length: 14.0 cm  
**70 09 16**

US pin connector:  
**70 09 16 S**



## Calvian endo-pen® bayonet

Bipolar forceps



„The angled, thin tips of the Calvian endo-pen® bipolar forceps have proven to be very effective and precise for soft tissue coagulation to achieve hemostasis. Even very small vessels can be occluded selectively. Moreover, the instrument is helpful for outward dissection in separating normal from tumor tissue. Its easy intraoperative handling and precise coagulation make it a promising instrument for EETS for central skull base pathologies. With its slender shaft and fine tips, the instrument offers all the characteristics required for minimally invasive endonasal surgery.“

**R. Gerlach, MD**  
Erfurt (Germany)

## Calvian endo-pen® non-stick bipolar forceps

Our entire range of products can be found on our website [www.sutter-med.com](http://www.sutter-med.com)

shown here:

horizontal movement

straight tips: 0.7 mm, 15° angled  
total length: 23.0 cm  
working length: 10.0 cm  
**70 09 89 SG**

US pin connector:  
**70 09 89 SGS**



## Calvian endo-pen® non-stick bipolar forceps

Our entire range of products can be found on our website [www.sutter-med.com](http://www.sutter-med.com)

shown here:

horizontal movement

straight tips: 0.7 mm, 15° angled  
total length: 31.0 cm  
working length: 18.0 cm  
**70 09 88 SG**

US pin connector:  
**70 09 88 SGS**



Each Calvian endo-pen® comes with a storage tray for safe cleaning and sterilization.

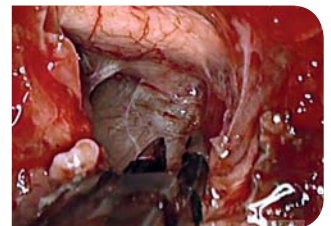
Different tips available



Horizontal movement



Vertical movement



Bipolar coagulation in endonasal and transnasal endoscopic surgery with Calvian endo-pen®



**Calvian® duckbill+**  
bipolar forceps  
with suction

45° angled tip  
working length: 12.0 cm  
**70 09 39**



Front-end coagulation is possible.



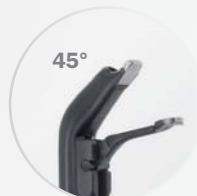
Hard-to-reach vessels and structures can be coagulated thanks to the recessed opening of the suction channel.



15°

**Calvian® duckbill+**  
bipolar forceps  
with suction

15° angled tip  
working length: 12.0 cm  
**70 09 38**



45°

**Calvian® duckbill+**  
bipolar forceps  
with suction

45° angled tip  
working length: 12.0 cm  
**70 09 39**

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## ARROWtip™ monopolar microdissection electrodes



“Endoscopic endonasal sinus surgery demands subtle hemostasis and the precise cutting performance of the instruments employed. The disadvantages of “cold steel” can be levelled out favorably by the application of radiofrequency current through an angled probe.”

**T. Kühnel, MD, Regensburg (Germany)**



**ARROWtip™** monopolar microdissection electrode  
Ø 0.3 mm, 45° angled, total length: 107 mm  
**36 03 42**

**ARROWtip™**  
monopolar microdissection electrode



45° angled  
total length: 56 mm  
**36 03 21**

**ARROWtip™**  
monopolar microdissection electrode



straight  
total length: 57 mm  
**36 03 20**

Our entire range of products can be found on our website [www.sutter-med.com](http://www.sutter-med.com)










[REF 87 00 10] CURIS® 4 MHz radiofrequency generator  
basic set with single-use patient plates

Qty.	REF	Description
1	<b>36 01 00-01</b>	<b>CURIS® 4 MHz radiofrequency generator</b> (incl. mains cord, user manual and test protocol)
1	<b>36 01 10</b>	Foot switch two pedals for CURIS® (cut & coag), cable: 4 m
1	<b>37 01 54L</b>	Bipolar cable for CURIS®, length: 3 m (not shown)
1	<b>36 07 04</b>	Monopolar handpiece (pencil) cut & coag, shaft 2.4 mm, cable: 3 m (not shown)
1	<b>36 02 38</b>	Cable for single-use patient plates, length: 3 m (not shown)
1 (x50)	<b>12 80H</b>	Patient plates, single-use, 5 x 10 pcs. (not shown)

Accessories

Generator connector	Length	Safety connector / EU flat connector	Angled connector / EU flat connector	Safety connector / US 2-pin connector
	3.0 m	 <b>37 01 54 L</b>	 <b>37 01 54 G</b>	 <b>37 01 54 S</b>
	4.5 m	<b>37 01 35 L</b>	<b>37 01 35 G</b>	<b>37 01 35 S</b>

Disclaimer:

Product availability is subject to regulatory approval in individual markets. Products may therefore not be available in all markets.  
The listed lengths and sizes serve as a guideline and may be rounded up or down. The actual lengths may vary slightly.



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