PIEZOSURGERY®

A NEW ERA IN BONE SURGERY

INTRAOPERATIVE ADVANTAGES

- **Selective Cut**
  - Maximum safety for surgeons and patients.
  - Reduced risk of damaging soft tissues (dura, nerves and vessels).

- **Micrometric Cut**
  - Maximum surgical precision and intra-operative tactile sensation.
  - Minimal bone loss through the cutting depth.

- **Cavitation Effect**
  - Maximum intra-operative visibility.
  - Blood-free surgical site.

POSTOPERATIVE BENEFITS

- **Healing**
  - Better and faster bone healing.

- **Edema**
  - Reduced the postoperative swelling and discomfort.

CLINICAL EVIDENCE

- "Piezosurgery is a safe tool for selective bone cutting for opening of the internal auditory canal with preservation of facial nerve and hearing function in acoustic neurina surgery.”
- "Piezoelectric device allows surgeons to achieve better results compared to a traditional surgical saw, especially in terms of intraoperative blood loss, postoperative swelling and nerve impairment. This device represents a less aggressive and safer method to perform invasive surgical procedures such as a Le Fort I osteotomy.”
- "Piezoelectric surgery reduces the impact on soft tissues (vessels and nerves) which lie adjacent to the area of treatment. Compared to traditional methods it enables optimal healing because it reduces the post-surgery swelling and discomfort.”

Picture taken from surgeries performed by Prof. M.I. Rossello, San Paolo Hospital, Savona, Italy
Perfect integrity of the osteomized surfaces with a cut which is clean, regular and without imperfections or pigmentation. The bone surface which was cut using the piezoelectric device showed no sign of lesions to the mineralized tissues and presented live osteocytes with no sign of cellular suering. Mediterranean Journal of Surg Med 2001; 9:89-95.

The inflammatory cells were more numerous in samples obtained from the drilled sites (Fig. 1). Neo-osteogenesis was quantified by considering the absolute number of osteoblasts per high-power field (mean of 10 fields) in osteo-genetic areas; it was consistently more active in the bone samples from the implant sites prepared using the piezoelectric bone surgery technique (Fig. 2). In the group A, the lower post-operative pain highlights the absence of a thermal effect on the surface cut and shows a better healing process.
PIEZOSURGERY® MEDICAL DEVICES ➔ A LARGE VARIETY OF SURGICAL APPLICATIONS

PIEZOSURGERY® plus, the more complete device for all needs, in all surgical applications.

COMPLETE

➔ Power joins precision
➔ High efficiency
➔ High level technology
### SURGICAL APPLICATIONS

- ORAL/MAXILLOFACIAL SURGERY
- OTOLARYNGOLOGY
- PLASTIC/RECONSTRUCTIVE
- HAND SURGERY
- FOOT SURGERY
- NEUROSURGERY
- SPINE SURGERY
- ORTHOPEDICS
- THORACIC SURGERY

### PIEZOSURGERY® plus

### PIEZOSURGERY® flex

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**PIEZOSURGERY® flex**, the essential and flexible device for ambulatory and operating theatre.

### ESSENTIAL

- Control joins precision
- Compact and portable
- Easy to use
PIEZOSURGERY® plus
THE COMPLETE DEVICE

A complete device capable of providing maximum efficiency in all surgical fields thanks to two piezoelectric channels delivering two different power levels and with independent electronics.

 CHANNEL 1 – MEDICAL HANDPIECE
- Superior intra-operative control and surgical sensitivity
- Maximum flexibility in creating osteotomy lines

 CHANNEL 2 – MEDICAL+ HANDPIECE
- Maximum performance with highly mineralised bone
- Maximum efficiency through all the cutting depth
STEP 1: select the channel desired.

STEP 2: choose the insert.

STEP 3: confirm the settings by pressing OK.

STEP 4: start surgery.

PIEZOSURGERY® plus is provided with APC (Automatic Precision Control) software, which guarantees maximum safety. The software automatically recognizes deviations from normal functioning and stops the device in less than 150 ms. The error message on the screen allows for easy restoration of operating conditions. Two independent handpieces are provided, allowing for greater flexibility and performance during surgery.

All functions can be managed by the touch screen. Choosing the handpiece, selecting the surgical type, switching from one handpiece to the other is just a touch on the screen.

PIEZOSURGERY® plus is provided with smart software. For each surgical tip, the software automatically sets the optimal working settings. Power and irrigation levels can also be adjusted manually depending on the surgical needs.

The software automatically recognizes deviations from normal functioning and stops the device in less than 150 ms. The error message on the screen allows for easy restoration of operating conditions. Two independent handpieces are provided, allowing for greater flexibility and performance during surgery.
PIEZOSURGERY® flex
→ THE ESSENTIAL DEVICE

An essential device capable of providing high cutting efficiency in a compact and easy to use unit.

→ MODE SETTING
Offer the best surgical performance for each insert.

→ SETTINGS TABLE
The recommended parameters (mode, power and irrigation) always provide the best efficiency for each insert.

→ FEEDBACK SYSTEM
Automatically monitors and adjusts the tuning of the vibration frequency for each insert.
A comfortable suitcase to move PIEZOSURGERY® flex as needed.

- COMPACT & PORTABLE
- EASY TO HANDLE IN THE OR
  - touch screen display
  - external irrigation system
  - 3 m handpiece cord
  - 5 m power cord
SURGICAL INSERTS

HIGH-QUALITY PRODUCTION

Surgical inserts are made of medical grade stainless steel and undergo a 12-step production process guaranteeing its quality.

Inserts vibrate at 36,000 micro-vibrations/sec. and can stand the huge mechanical solicitations they are exposed to during surgeries.

HEAT TREATMENT
Provides the raw insert with the required hardness, resistance to corrosion and elastic response to vibrations.

GRINDING AND SURFACE COATING
The automatic 5-axis CNC grinder cuts with a precision up to 0.1 μm. Based on indications for use, specific treatments are performed on the insert surface, including diamond coating with diamonds in different grain sizes.

MARKING
Each insert is laser-marked. The code is engraved in the insert’s stem for higher security.

QUALITY CONTROL
Each insert undergoes quality controls during the production process. Checks range from a dimensional control on the semi-finished product to the control of sterilized inserts before packaging.
SURGICAL INSERTS
FOR ALL NEEDS

Our vast choice of inserts responds to any surgical need, offering the best performance during all interventions as well as excellent intra-operative and post-operative outcomes.

1. research and collaboration with renowned surgeons
2. use of a dedicated software simulating the final product to develop the insert’s movement with the greatest precision
3. thorough clinical tests to validate prototypes

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OSTEOTOMY
Surgical tips of different shapes and dimensions, short and long, curved and angled, designed to perform osteotomies with the utmost safety even in difficult to reach surgical sites.
- Saw thickness from 0.35 to 0.6 mm
- Osteotomy depth up to 20 mm
- Shank length up to 10 cm

OSTEOPLASTY
Surgical tips short and long, curved and angled, with sharp edges, for bone modeling and bone chip harvesting.
- Shank length up to 10 cm

DRILLING
Surgical tips to drill holes with very tight tolerance, minimizing the risk of bone necrosis.
- Head diameters from 0.4 to 2.0 mm

FINISHING
Surgical tips of different shapes and dimensions, curved and angled, with heads of different shapes and with different diamond coatings, to finish the osteotomies in very delicate anatomies.
DISCOVER MECTRON EXPERIENCE

PIEZOSURGERY® is Mectron’s original piezoelectric surgical technique, the only one validated by 15 years of scientific publications and research.

All literature references, further information on the product and a complete list of Congresses and Courses Mectron will take part in are available on our website: www.mectron.com

The Products section offers further information and technical details on Mectron’s PIEZOSURGERY® equipment and surgical inserts provided.

Clinical videos by the most renowned surgeons in all fields (maxillofacial surgery, microsurgery, hand and foot surgery) are available on our website.

The Events sections lists all courses and workshops where you can discover and experience Mectron’s PIEZOSURGERY® technology. Information is available on courses and seminars as well as congresses featuring Mectron’s own exhibition stand.
Piezosurgery seems suitable to perform precise thin osteotomies while limiting damage to the bone itself and to the underlying delicate structures even in the case of unintentional contact. These advantages make the piezoelectric bone scalpel a particularly attractive instrument in neurosurgery.

Iacoangeli M., Rienzo A.D., Nocchi N., Balercia P., Lupi E., Regnicolo L., Somma L.G., Alvaro L., Scerrati M.

Piezosurgery proved to be a useful and safe technique for selective bone cutting and removal of osteophytes with preservation of neuronal and soft tissue in ACDF. In particular, the angled inserts were effective in cutting bone spurs behind the adjacent vertebra which cannot be reached with conventional rotating burs.

Grauvogel J., Scheiwe C., Kaminsky J.

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Grauvogel J., Scheiwe C., Kaminsky J.

The minimal postoperative pain appears remarkable; in the same direction, the first impression about the rapidity of recovery appears noteworthy: it results in a reduced necessity of postoperative medications, due to a lesser production of granulation tissue and, consequently, to the possibility to better foresee the stabilized result with important anatomical and functional implications.

Pirodda A., Raimondi M.C., Ferri G.G.
# PRODUCTS

## ACCESSORIES

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## CONTAINERS FOR CLEANING AND STERILIZATION PROCEDURES

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* torque wrench to tighten the inserts: MTS-10 L (03600009), MPS L (03600008), MP6 L (03600009)
# SURGICAL INSERTS

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