

mectron



PIEZOSURGERY® *plus*

EXPERIENCE PIEZOSURGERY®

→ BONE SURGERY, REVOLUTIONIZED

A manifold list of benefits and advantages, which appear during and after surgery:

→ INTRAOPERATIVE ADVANTAGES

- **Selective Cut** Maximum safety for surgeons and patients. Reduced risk of damage to surrounding soft tissue (dura, nerves and vessels).
- **Micrometric Cut** Maximum surgical precision and intra-operative tactile sensation.
Minimal bone loss through the cutting width.
- **Cavitation Effect** Maximum intra-operative visibility. Blood-free surgical site.

→ POSTOPERATIVE BENEFITS

- **Healing** Better and faster bone healing.
- **Edema** Reduced postoperative swelling and discomfort.

→ EVIDENCE BASED

“ Piezosurgery (PS) is a safe and effective tool that can be specifically recommended for bone splitting and graft, laminotomy and craniotomy in cosmetically eloquent areas. The limit of operation times can be overcome by a learning curve in neurosurgery and PSP.

Massimi L, Rapisarda A, Bianchi F, Frassanito P, Tamburrini G, Pelo S, Caldarelli M.

Piezosurgery in pediatric neurosurgery.

World Neurosurg. 2019 Mar 1. pii: S1878-8750(19)30514-5. doi: 10.1016/j.wneu.2019.02.103.

The application of piezosurgery in orbital decompression is more suitable than an oscillation saw due to superior cutting properties such as less damage to surrounding soft tissue or a thinner cutting groove.

Stähr K, Eckstein A, Holtmann L, Schlüter A, Dendy M, Lang S, Mattheis S.

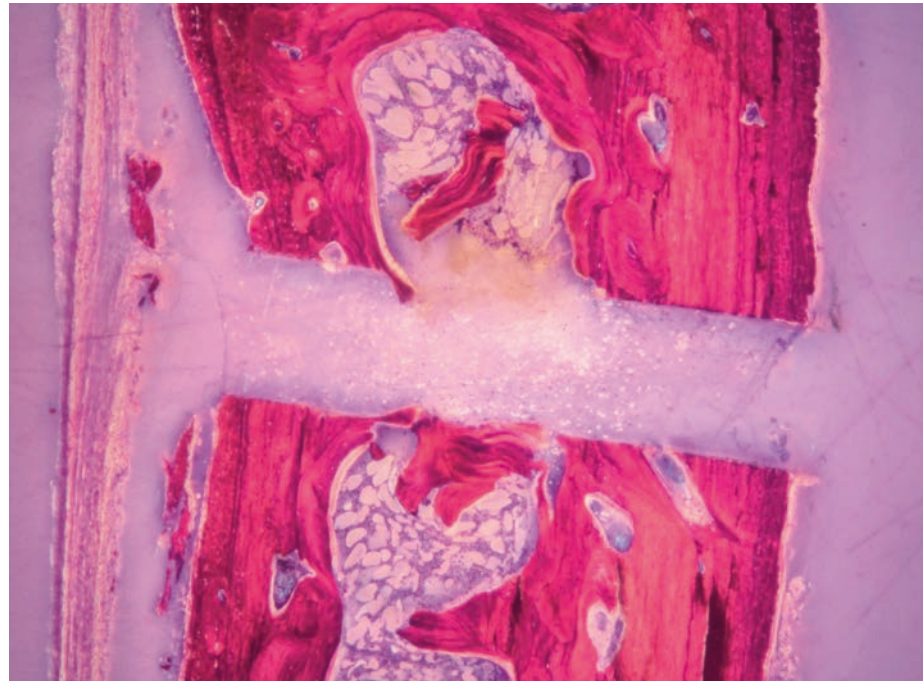
A comparative analysis of piezosurgery and oscillating saw for balanced orbital decompression.

Orbit. 2019 Dec;38(6):433-439. doi: 10.1080/01676830.2018.1552709.

→ PIEZOSURGERY® INDUCES
MICRO-VIBRATIONS

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.

Vercellotti T, Crovace A, Palermo A, Molfetta A. The Piezoelectric Osteotomy in Orthopedics: Clinical and Histological Evaluations (Pilot Study in Animals). Mediterranea Journal of Surg Med 2001; 9:89-95.



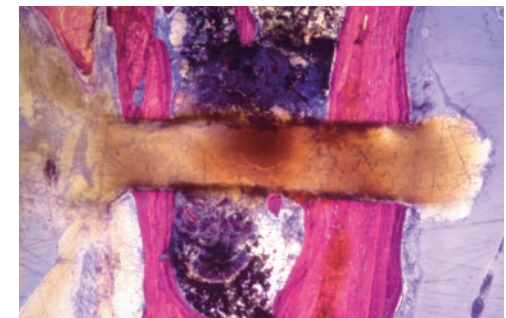
PIEZOSURGERY®

- Increased surgical control
- Enhanced precision and safety
- Proven clinical and histological advantages

→ BONE BURS AND SAWS INDUCE
MACRO-VIBRATIONS



Bone bur



Bone saw

- Limited surgical control
- Reduced precision



CE
0051

PIEZOSURGERY® *plus*

EXCELLENCE IN BONE SURGERY

PIEZOSURGERY® *plus* is engineered to support an expansive range of surgical applications. Every field of surgical excellence is backed by evidence based intraoperative and postoperative advantages.

EXCELLENCE

Mectron is recognized worldwide as the market leader in ultrasonic bone surgery, with over 15 years of research and continuous innovation:

- Power meets precision
- Increased efficiency
- Cutting-edge technology



NEURO & SPINE
EXCELLENCE



ENT
EXCELLENCE



CRANIOFACIAL
EXCELLENCE



ORTHOPEDIC
EXCELLENCE



FACIAL BONE
EXCELLENCE



THORACIC
EXCELLENCE



PIEZOSURGERY® *plus*

→ EXCELLENCE IN PERFORMANCE

Maximum efficiency, control and performance - you name it: PIEZOSURGERY® *plus* is the device for everyone who wants everything – and can be used for nearly all surgeries, from neurosurgery to thoracic, from reconstructive to craniofacial.

Innovative features, including two independent handpieces and channels, provide you with superior results across every surgical field.



→ HANDPIECE FOR STANDARD CHANNEL

- Superior intra-operative control and surgical sensitivity
- Maximum flexibility in creating osteotomy lines





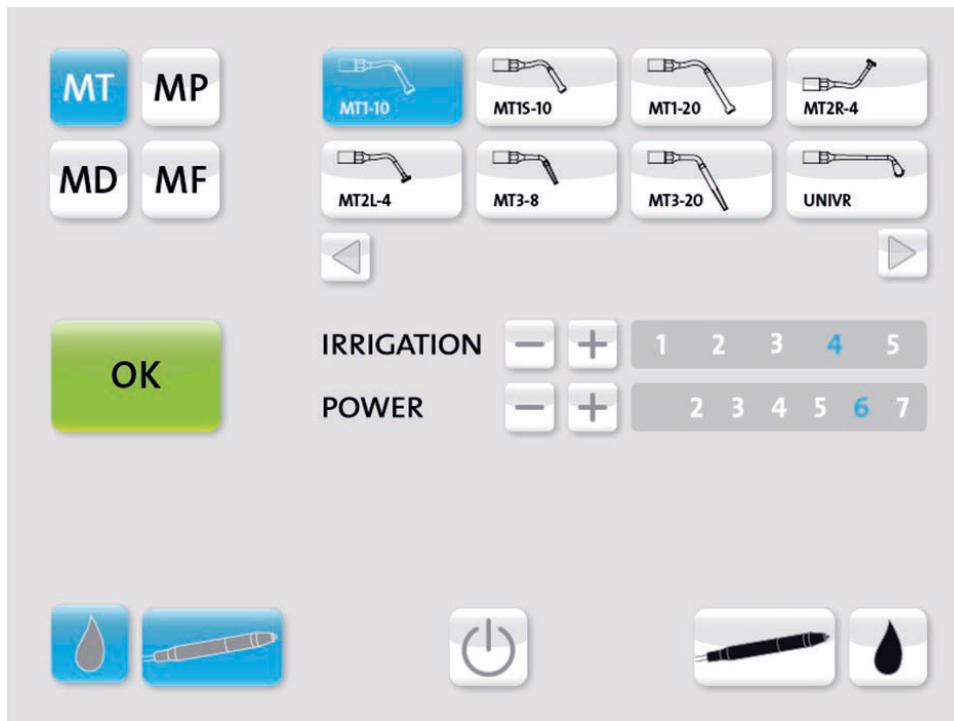
→ HANDPIECE FOR PLUS CHANNEL

- Maximum performance with highly mineralized bone
- Maximum efficiency through all cutting depths

PIEZOSURGERY® *plus*

EXCELLENCE IN TECHNOLOGY

PIEZOSURGERY® *plus* ALLOWS YOU TO FOCUS 100% ON SURGERY



STEP 1:
select the channel desired.

STEP 2:
choose the insert.

STEP 3:
confirm the settings by pressing OK.

STEP 4:
start surgery.



MAXIMUM SAFETY

PIEZOSURGERY® *plus* is equipped with APC (Automatic Precision Control) software, ensuring 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.

SMART SOFTWARE

PIEZOSURGERY® *plus* is equipped with a 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 surgical needs.



→ TOUCH SCREEN

All functions are managed utilizing the touch screen interface. You can choose your preferred handpiece, select your surgical preference and later alternate handpieces with a simple tap of the screen.





SURGICAL INSERTS

→ EXCELLENCE IN VARIETY

Osteotomy, Osteoplasty, Drilling, Finishing; short, long; straight, angled, curved – PIEZOSURGERY® *medical* inserts cover a vast variety of surgical needs.

Mectron's extensive range of inserts are guaranteed to offer the best performance and highest quality on the market.

→ OSTEOTOMY

Surgical inserts of different shapes and dimensions, short and long, curved and straight, 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 inserts short and long, curved and straight, designed to perform bone remodeling and harvesting with the utmost safety.

- Shank length up to 10 cm



→ DRILLING

Surgical inserts to drill holes with very tight tolerance, minimizing the risk of bone necrosis.

- Head diameters from 0.8 to 1.8 mm



→ FINISHING

Surgical inserts 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.

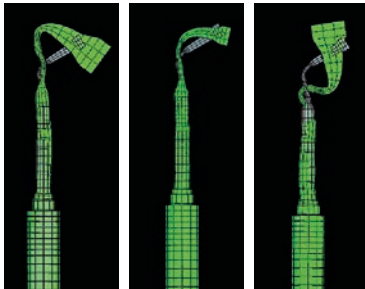


→ EXCELLENCE IN QUALITY

During surgery, an ultrasonic insert oscillates up to 36.000 times per second.

We use only medical grade stainless steel in the production of Mectron inserts. Every single ultrasonic insert is required to pass rigorous quality assurance tests before it is ready to bear our name.

→ INSERTS DEVELOPMENT



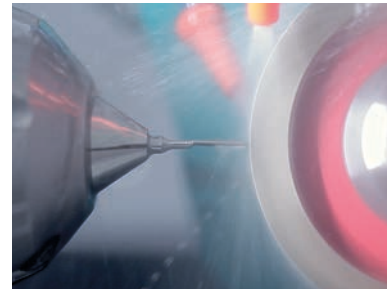
1. research and collaboration with renowned surgeons
2. computer simulation of shape and insert movement. The finite elements method allows precise prognoses of insert movements
3. thorough clinical tests to validate prototypes

→ THERMAL TREATMENTS



Provide raw surgical tips the necessary hardness, corrosion resistance and elastic response to vibration.

→ SHARPENING AND SURFACE COATING



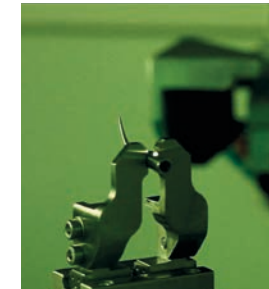
A proprietary CNC 5-dimensions sharpening machine cuts with an accuracy of up to 0.1 μm . Depending on the surgical indication, specific surface treatments are made, which include diamond coating with diamonds of different granulometries.

→ QUALITY CONTROL



Surgical inserts are individually checked throughout the manufacturing process. Checks range from dimensional control of the rough insert to visual inspection of final package.

→ MARKING

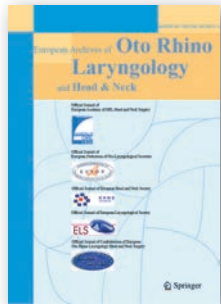


Each surgical insert is laser marked. The code is engraved on the shaft of the surgical tips for superior safety.

EXPERIENCE PIEZOSURGERY®

→ SCIENTIFICALLY AND CLINICALLY VALIDATED

→ BONE HEALING



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.

Piezosurgery in otology: a promising device but not always the treatment of choice.

Eur Arch Otorhinolaryngol. 2012 Mar; 269(3):1059.
doi: 10.1007/s00405-011-1841-2. Epub 2011 Nov 22.

→ SAFETY



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.

Use of Piezosurgery for removal of retrovertebral body osteophytes in anterior cervical discectomy.

Spine J. 2014 Apr;14(4):628-36. doi: 10.1016/j.spinee.2013.06.085. Epub 2013 Dec 4.

→ BENEFITS



The user evaluated piezosurgery to be superior allowing a more precise osteotomy and offering the possibility of angled cuts, thus minimizing the amount of remaining bone of the deep lateral wall. It was also assessed to have an easier handling due to less vibration of the hand-piece, particularly when cutting and resizing the lateral orbit prior to replantation.

Kerstin Stähr, Anja Eckstein, Laura Holtmann, Anke Schlüter, Meaghan Dendy, Stephan Lang & Stefan Mattheis (2018):

A comparative analysis of piezosurgery and oscillating saw for balanced orbital decompression.

Orbit, DOI: 10.1080/01676830.2018.1552709

→ PRECISION



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 as a Further Technical Adjunct in Minimally Invasive Supraorbital Keyhole Approach and Lateral Orbitotomy.

J Neurol Surg A Cent Eur Neurosurg. 2015 Mar;76(2):112-8.

→ EASE



Piezoelectric osteotomy reduced surgical time, blood loss, and inferior alveolar nerve injury in bimaxillary osteotomy. Absence of macrovibrations makes the instrument more manageable and easy to use and allows greater intraoperative control with higher safety in cutting in difficult anatomical regions.

Bertossi D., Lucchese A., Albanese M., Turra M., Faccioni F., Nocini P., Rodriguez Y Baena R.

Piezosurgery versus conventional osteotomy in orthognathic surgery: a paradigm shift in treatment.

J Craniofac Surg. 2013 Sep;24(5):1763-6. doi: 10.1097/SCS.0b013e31828f1aa8.



→ PRODUCTS



→ PIEZOSURGERY® plus device

05170003

→ ACCESSORIES

Handpiece for plus channel	03120243
Torque wrench for plus channel	02900116
Torque wrench for extension of long inserts*	02900115
Handpiece for standard channel	03120127
Torque wrench for standard channel	02900080
Irrigation kit single use (box of 10 units)	03230008
Trolley-case	04440018
Cart	03540009

→ CONTAINERS FOR STERILIZATION OF HANDPIECE AND TORQUE WRENCH

Container for sterilization completed with cover with valve	02900173
Tray for sterilization completed with cover	02900172
Thermodisinfection adaptor for handpiece	04610008
Filter for thermodisinfection adaptor	04590006

→ SPARE PARTS

Power-supply cable	00050020
Footswitch for PS plus	04620004
Peristaltic pump	03210006
Drip stands for saline bag	01380002
Metal cone for standard handpiece	00710034
Metal cone for plus handpiece	00710090
Protection for standard handpiece's connector	03150086
Protection for plus handpiece's connector	00690022

* MT5-10 L (03600009), MT8-20 L (03600013), MP5 L (03610008), MP6 L (03610009)

→ SURGICAL INSERTS

			STD HANDPIECE 03120127	PLUS HANDPIECE 03120243
OSTEOTOMY	MT1-10	03600001	●	
	MT1S-10	03600007	●	
	MT1-20	3600002	●	
	MT2R-4	03600003	●	
	MT2L-4	03600004	●	
	UNIVR	03600008	●	
	MT6S-10	03600011	●	
	MT7-3	03600012	●	
	MT9-13	03600016	●	
	MT4-10 +	03600010		●
	MT5-10 L	03600009		●
	MT8-20 L	03600013		●
	MT4-20 +	03600014		●
	MT10-20 +	03600015		●
	OSTEOPLASTY	MP1	03610001	●
MP2		03610002	●	
MP3-a30		03610003	●	
MP4 +		03610007		●
MP5 L		03610008		●
MP6 L		03610009		●
DRILLING	MD2-08	03620010	●	
	MD2-10	03620004	●	
	MD3-14	03620006	●	
	MD3-18	03620008	●	
FINISHING	MF1	03630001	●	
	MF2	03630002	●	
	MF3	03630003	●	
	MF4	03630004	●	
	MF5	03630005	●	
	MF6	03630006	●	



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