EXPERIENCE PRECISION

PIEZOSURGERY® - consistently improving surgical outcomes.

PIEZOSURGERY® has caused a paradigm shift in osseous surgery and is becoming the new standard of care in oral and periodontal surgery.

We invite you to learn about our technology, which gives you maximum intra-operative precision and control – and minimal stress for you and your patients. Once you learn more, we know PIEZOSURGERY® will become an intrical element in your daily practice, as it has for thousands of leading clinicians worldwide.

MAXIMIZE SURGICAL PRECISION

Maximum surgical precision and intra-operative tactile sensation for minimally invasive surgeries thanks to micrometric cuts.

WHY PIEZOSURGERY®?

Saws and burs limit your intra-operative control and may cause damage to bone and soft tissues. Additionally, the friction caused by their movement can lead to tissue overheating and necrosis.

PIEZOSURGERY® allows surgeons to have maximum control through its microvibrations, thus achieving extreme precision and safety.

SELECTIVE CUTS

Our patented dual wave technology is designed to cut bone and not soft tissues. This provides maximum safety for surgeons and patients.

IMPROVE BONE HEALING WITH THE USE OF PIEZOSURGERY®:

- reduction in the number of inflammatory cells and cytokines at the surgical site.
- promotion of BMP release and neo-osteogenesis.
- faster healing and bone remodeling.

CAVITATION EFFECT

Experience maximum intra-operative visibility, due to the temporary hemostasis induced by the cavitation effect.

IMPROVED PATIENT OUTCOMES 2, 3, 4

- fewer surgical complications compared to traditional surgical instruments.
- less swelling after surgery with PIEZOSURGERY®.
- faster and better osseointegration after implant site preparation.
- faster and less traumatic post-operative recovery.
EXPERIENCE HEALING
PIEZOSURGERY® - consistently improving surgical outcomes.

→ MACROVIBRATIONS

→ high surgical control
→ precision and safety
→ clinical and histological advantages

→ HISTOLOGICAL RESULTS


When a surgeon uses PIEZOSURGERY® instead of conventional instruments, there is a significant acceleration in the healing response: inflammation is more controlled, there is a significant early increase in bone morphogenetic protein (BMP) levels, and faster new bone formation1,2.

Additionally, PIEZOSURGERY®'s unique cutting action characteristics allow preserving the integrity of soft tissues such as membranes and the periosteum, for an enhanced healing response when compared to manual instruments3.

Because PIEZOSURGERY® respects soft tissues and reduces intra-operative bleeding, the overall iatrogenic trauma is reduced, with immediate, tangible patient benefits. Patients don’t lose as much blood, don’t experience as much post-operative swelling, and overall report reduced discomfort associated with the surgical procedure4.

4 Crippa et al. Eur Arch Otorhinolaryngol. 2011 Feb 16.
Clinical benefits of PIEZOSURGERY® technology

**SINUS LIFT TECHNIQUE**

- safer opening of the lateral window
- fewer membrane perforations
- safe detachment of the membrane
- fewer post-operative complications

**IMPLANT SITE PREPARATION**

- safe preparation, respecting the inferior alveolar nerve
- less post-operative inflammation
- faster healing and higher primary stability
- possibility of immediate post-extractive implant site prep
- possibility of differential implant site prep (correction of the axis)

**REFERENCES**

Whether it is about sinus lift or implant site preparation, about extraction or bone block grafting – one of the most important features you should demand from your operating device is safety.

Piezosurgery®’s major strength is minimizing the risk of cutting soft tissue. These structures are not sensitive to the frequencies used by the PIEZOSURGERY® technology.

→ EXTRACTIO/N EXPLANTATION

→ bone preservation in impacted or ankylosed root and third molar extractions
→ safe in proximity to the inferior alveolar nerve wisdom tooth extraction
→ reduced amount of facial swelling and trismus 24 hours after surgery
→ immediate implant site preparation

→ BONE BLOCK GRAFTING

→ maximum surgical control in bone grafting from mandibular ramus and chin
→ absence of necrosis on the surface of the cut
→ presence of nucleated osteocytes, indicative of the atraumatic effect

→ REFERENCES


→ REFERENCES


EXPERIENCE PERFORMANCE
The 4th generation of the original, unrivaled, evidence-based technology.

PIEZOSURGERY® touch responds to the need of simplicity and efficiency that the most demanding surgeons expect from the latest technology.

With simple, intuitive settings at the touch of your fingers, PIEZOSURGERY® touch is an extension of your body and maximizes your surgical skills to help ensure precise, safe, flawless surgical outcomes.

The PIEZOSURGERY® touch device has several innovative features including a black glass touch surface, handpieces with swivel LED lights for optimum visibility, a more compact and versatile console, and a new and improved computerized feedback system. For ease of use, this device also features intuitive setting controls as well as four handpiece holder configurations.

SIMPLE MAINTENANCE
- sterilizable, all-in-one LED-handpiece and cord system
- sterilizable, internal irrigation line, with no disposable components
- innovative handpiece cord connector ensuring easy plug-in
A touch of your finger is all you need to select cutting and irrigation settings. No further insert specific adjustments are required – the fine tuning for each insert and indication is performed automatically by PIEZOSURGERY® touch’s electronic feedback-system.

The exclusive feedback system automatically adjusts optimal insert movement and power levels to consistently provide the best cutting efficiency in every situation – allowing the clinician to focus on surgery and deliver the best possible surgical outcomes.

Thanks to its intelligent electronic feedback system, the original PIEZOSURGERY® technology provides maximum power and perfect cutting efficacy in every situation without ever compromising soft tissue safety – for surgeries which are time-efficient, safe, and successful.
EXPERIENCE PROFITABILITY
The real PIEZOSURGERY® in a new, cost-effective console.

The new PIEZOSURGERY® GP has a compact and versatile console, a standard (non-LED) handpiece, and a new and improved computerized feedback system. This device also features intuitive setting controls, as well as four handpiece holder configurations.

PIEZOSURGERY® GP combines the same cutting efficiency and all of the clinical benefits of our patented dual wave technology with standard manual functions.

Constructed with cost-effective materials selected for easy cleaning, disinfection and sterilization, PIEZOSURGERY® GP offers the clinician a budget-friendly instrument to be incorporated in the daily clinical practice.

AUTOMATIC PROTECTION CONTROL
- recognizes deviations from standard functioning automatically
- stops power and irrigation in less than 0.1 seconds
- displays a diagnostic icon on the keyboard.
The perfect device to enter the world of PIEZOSURGERY®.

As an entry-level product you couldn't ask for a more versatile, yet effective, ultrasonic device to provide your patients with state-of-the-art treatment.

PIEZOSURGERY® GP was developed for the general practitioner who performs a limited number of surgical procedures, yet wants to incorporate the benefits of PIEZOSURGERY® in their practice.

PIEZOSURGERY® GP is an excellent option for the young specialist who has just opened a practice and wants to enter the world of PIEZOSURGERY®.

PIEZOSURGERY® GP is also ideal for the budget-conscious specialistic practice looking to incorporate a device in each operatory.

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EXPERIENCE INNOVATION.

With new, clinician-designed inserts released every year, PIEZOSURGERY®’s vast array of insert options will never hold you back.

Our commitment to maximizing your return on investment drives us to expand the range of clinical applications for PIEZOSURGERY® devices through the ongoing development of innovative insert designs.

All PIEZOSURGERY® inserts are developed in response to specific clinical needs and result from collaborations with universities and clinical practitioners. Our rigorous insert development process includes finite elements analyses, computer simulations, serial prototyping, and extensive laboratory and clinical research.

Thanks to clinical experience and our cutting-edge technological know-how, over 90 PIEZOSURGERY® insert designs are now available to surgeons worldwide – and new inserts are released every year.

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**CUT EFFICIENTLY**
- effective and safe SHARP inserts
- fine and uniform cutting
- used for osteotomy, osteoplasty and implant site preparation

**CUT SAFELY CLOSE TO NERVES**
- diamond-coated SMOOTHING inserts for precise and controlled operation on bone structures
- safe osteotomy close to delicate anatomical structures such as Schneiderian membrane and nerves

**CLINICAL VERSATILITY**
- BLUNT inserts for soft tissue preparation
- root planing in periodontology

**EASY ORGANIZATION**
- set of inserts for specific clinical applications
- stainless steel tray with depth markings
- ideal for sterilization and storage

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INSERT DEVELOPMENT

1. inserts are developed in close collaboration with prestigious universities.
2. finite element analyses and computer simulations are performed for all inserts, ensuring safety and durability.
3. extensive laboratory and clinical testing prior to release on the market.
PIEZOSURGERY®'s inserts are individually-crafted, sophisticated surgical instruments.

PIEZOSURGERY®'s unique cutting action results from the application of ultrasonic modulated vibrations to a surgical insert. To deliver the best surgical performance, the insert and handpiece must vibrate in unison up to 36,000 times per second. To withstand such an enormous strain, all PIEZOSURGERY® inserts are individually crafted from forged stainless steel and designed to couple with the handpiece perfectly for optimal tuning.

PIEZOSURGERY®'s proprietary, 12-step insert manufacturing process lasts several months and employs the finest materials and most advanced technological processes to guarantee that all inserts meet the highest quality and cutting efficiency standards.

**PRECISION**
PIEZOSURGERY® inserts are individually crafted using a CNC controlled 5-dimensional sharpening machine, which cuts with an accuracy of up to 0.1 μm.

The whole cutting process for a single insert lasts up to 12 min.

**SURGICAL OPTIONS**
- Depending on their clinical application, inserts are coated with specially selected diamonds.
- Different diamond sizes ensure optimal surgical performance in each clinical application.

**LONG-LASTING**
A coating of titanium nitride, applied to all cutting inserts, increases their surface hardness, thus reducing friction and corrosion, thus increasing the insert’s working life.

**QUALITY YOU CAN COUNT ON**
Lot numbers are laser etched on each insert, ensuring traceability pursuant to the highest quality control standards.

**INDIVIDUAL QUALITY INSPECTION**
Each insert is visually inspected by a Quality Control representative to guarantee that surgeons worldwide will receive only the best performing instruments.
PIEZOSURGERY® has dedicated inserts for a wide variety of clinical applications.

Our technology is designed to empower surgeons to perform more and better surgeries. PIEZOSURGERY® has over 90 inserts specifically designed for use in many applications in oral surgery and implantology, from sinus lift to ridge splitting, extractions and even orthognathic procedures.

OPTIMAL VISIBILITY
- swivel LED-light can be directed to the insert tip
- choice between automatic, and permanent light or switched off
EXPERIENCE ULTRA-OSSEOINTEGRATION.

PIEZOSURGERY® induces new bone formation, leading to faster osseointegration of dental implants.

Implant site preparation with PIEZOSURGERY®, the revolutionary technique – safe and precise.

• improved primary stability and faster osseointegration compared to sites prepared with conventional drills¹
• high intraoperatory control: our patented² implantology inserts with double irrigation allow a perfect control of the site preparation.
• implant site preparation with PIEZOSURGERY® allows placement of all dental implants requiring osteotomies of 2, 3 and 4 mm.

STEP-BY-STEP IMPLANT SITE PREPARATION TECHNIQUE

1 initial pilot osteotomy
OPTIONAL: verify the pilot osteotomy axis with alignment PIN IM1S
2 pilot osteotomy in anterior or posterior region
OPTIONAL: verify the pilot osteotomy axis with alignment PIN 2-2.4
3 preparation of the cortical basal bone from 2 to 3 mm to ease progressive implant site enlargement
4 enlargement or finalization of the implant site using a 3 mm insert with double irrigation for optimum cooling

²US PATENTS 8,109,931, 8,082,951, D539,909, D539,908, D509,588.
preparation of the cortical basal bone from 3 to 4 mm to ease progressive implant site enlargement
6 finalization of the implant site using a 4 mm insert with double irrigation to avoid overheating
7 implant positioning
8 OPTIONAL: correction of the pilot osteotomy axis (differential implant site preparation); OR finalization of the implant site close to the alveolar nerve
EXPERIENCE EFFICIENCY

Sinus lift by lateral approach with PIEZOSURGERY® – after 15 years we re-define the protocol

EROSION TECHNIQUE: THE MAXIMUM, EVIDENCE-BASED SAFETY*

1. Insert SLC – osteoplasty of the sinus vestibular wall
2. Insert SLO-H – bone window osteotomy
3. Insert SLO-H – bone window detachment
4. Surgical forceps – bone window removal
5. Insert SLS – sinus membrane separation
6. Insert SLE1 – sinus membrane elevation from the sinus floor
7. Insert SLE2 – sinus membrane elevation from the palatal wall
8. Bone grafting procedure
9. Membrane placement

REVISITED SINUS LIFT BY LATERAL APPROACH

1. sinus vestibular wall consumption and sinus cavity identification (dark colour)
2. bony window osteotomy
3. bony window removal
4. sinus membrane separation from the bony window margins
5. beginning of the sinus membrane elevation from the sinus floor
6. finalization of the sinus membrane elevation from the palatal wall
7. bone grafting procedure
reduce the risk of membrane perforation
→ new SLC insert to perform the osteoplasty of the sinus vestibular wall with maximum safety and unparalleled intra-operative control
→ new high-efficiency and safe SLO-H osteotomy insert
→ new thin SLS membrane separator, more efficient than the old generation (elephant paw shaped)
→ new elevators (SLE1, SLE2) with sharp terminal part to cut Sharpey’s fibers from the endosteum with the maximum safety. The endosteum will be protected thanks to the convexity of the tips
→ new insert SLE1 to start the sinus membrane elevation from the sinus floor
→ new insert SLE2 to finalize the sinus membrane elevation from the palatal wall

REFERENCES *
→ Vercellotti T. Letter to the Editor Clinical Oral Implants Research, Volume 20, Issue 5, Date: May 2009, Pages: S31-S32
→ Vercellotti T, Lang Niklaus P. “Piezosurgery in a Daily Practice” - Forum Implantologicum - Volume 8, Issue 1
Piezosurgery® optimizes access for osseous resective surgery

In collaboration with Professor Leonardo Trombelli and the University of Ferrara, Italy, mectron developed 5 inserts for osteotomy and osteoplasty procedures in periodontal resective surgery.

The combination of inserts with special shapes and dimensions makes it possible to perform controlled remodeling of the bony profile, avoiding the risk of damaging dental structures or other anatomically important structures. The precision and minimal invasiveness of PIEZOSURGERY® make these inserts a perfect tool for surgeons during the most delicate osteoplasty procedures in periodontal surgery.
The criss-cross surface works like a perio file. It allows very efficient bone remodeling and a longer life span of the insert.

Spherical inserts (Ø 1.8 and 2.3 mm), facilitating the surgical procedure in preparing buccal and lingual cortical bone. Their diamond coating of D150 allows an effective but still controlled bone modeling.

Wedge-shaped perio files (respectively from 1.3 to 0.7 mm and from 2 to 1 mm thickness), with only 2 working surfaces, they allow interproximal osteoplasty without damaging adjacent root surfaces.

Lanceolate shaped insert with a D90 diamond coating. It can be used for root planning and debridement as well as in interproximal spaces where perio files cannot properly access.
The new PIEZO-LIFT technique facilitates sinus lift, by crestal approach. New clinical protocol according to Tomaso Vercellotti. PIEZO-LIFT TECHNIQUE: The insert PL3 works like a piston inside a cylinder. Bony ring of the sinus floor for maximal surgical security.
ENDORSED BY CLINICAL EXPERTS

PEIZOSURGERY®'s clinical superiority is recognized and endorsed by leading clinicians worldwide.

"The incorporation of Piezosurgery® into both my private practice and Institute over the past 8 years has indeed resulted in a distinct paradigm shift with all of my bone grafting protocols. This exciting technology has afforded me the ability to fine tune and finesse all bone related surgery including donor and recipient site preparation for bone grafting and implant placement, as well as extraction site management and implant removal."

Dr. Michael Pikos
Trinity, Florida

"The Piezosurgery® unit has allowed me to perform very precise and minimally invasive procedures for my patients and it out-performs any of the other "piezo" units. This is the standard and original with substantial documentation and research behind it."

Dr. Sascha Jovanovic
Los Angeles, California

"I would not be able to achieve the same results with the same precision and lack of complications and morbidity as I am able to with this unit. THIS is the return on investment. I like the power and tactile feedback I get with the Mectron Piezosurgery® unit and knowing that the tip designs are validated by research has made this the preferred machine for me."

Dr. Giles Horrocks
Boulder, Colorado

"I use Piezosurgery® for almost all surgical procedures; it reduces my surgical stress while improving patient outcomes. This equals fun for me and it is evidence-based."

Dr. Robert Levine
Philadelphia, Pennsylvania

"I have enjoyed using the Piezosurgery® system. I use it daily to remove teeth. By using this system, I can remove a tooth with virtually no loss of buccal or labial bone, from molars to incisors. I have also been using it for all of my sinus windows with collection of the bone for sinus graft. The system is reliable and well worth the money."

Dr. Michael Block
New Orleans, Louisiana

"I have been using Piezosurgery® in my OMS practice since 2007. Piezosurgery® provides a new level of precision, efficiency and safety in surgical treatment. Complicated procedures including Sinus Grafting, Ridge Expansion and Nerve Repositioning can be performed with less stress and have an expanded role in my practice. The speed of the unit is impressive, reducing operative time and patient discomfort."

Dr. Daniel Cullum
Coeur d’Alene, Idaho

"The friend’s daughter recently came to me to have an impacted super numeral tooth removed. Upon taking a panorex radiograph, I discovered it was below the apex of the pre-molar and below the mandibular inferior alveolar canal. To my surprise, the CT showed it was against the lingual plate. I had to reflect the lingual tissue and mylohyoid muscle to gain access to the site."

Dr. Craig Misch
Sarasota, Florida

"New technology should allow a clinician to do something better, quicker or allow something that could not be done before. The Piezosurgery® unit fits those criteria for myself and the other three doctors in the practice."

Dr. Ralph Wilson
Paradise Valley, Arizona

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Dr. Daniel Cullum
Coeur d’Alene, Idaho
EXPERIENCE
EXPERTISE
mectron has been defining the future of bone surgery for the past 20 years, and it's evidence-based

For over 20 years we have had ongoing collaborations with clinical practitioners and research institutions worldwide. PIEZOSURGERY® technology is supported by more than 250 clinical and scientific studies; you will not find this substantiation with devices other than PIEZOSURGERY®.

We invite you to educate yourself on the benefits of our technology by reviewing the extensive peer-reviewed literature. Selected examples of the breadth of benefits associated with PIEZOSURGERY® are collected in our Scientific Abstracts, available for download at www.mectron.com.
As bone healing is not disturbed by the PIEZO-SURGERY® technique, it even seems to be improved, this method will have a major influence on new minimally invasive bone surgery techniques with special regard to biomechanics.


When using the PIEZO-SURGERY® technique, on the other hand, the effort required to make a cut is very slight. This means that greater precision is achieved, guaranteed by the microvibrations of the insert.


The revolutionary properties of piezoelectric surgery have simplified many common osseous surgical procedures, including sinus bone grafting.


The membrane perforation rate in this series of 100 consecutive cases using the piezoelectric technique has been reduced from the average reported rate of 30% with rotary instrumentation to 7%.


The morphometrical analysis revealed a statistically significant more voluminous size of the particles collected with PIEZOSURGERY® than rotating drills.


Microvibration and reduced noise minimize a patient's psychologic stress and fear during osteotomy under local anesthesia.


* You will find a selection of clinical and scientifical studies about mectron PIEZOSURGERY® in the brochure „Scientific Abstracts – 18 years of clinical research“. A downloadable version is available at the mectron website www.mectron.com.