EXPERIENCE PIEZOSURGERY®
When it comes to cutting bone, you can of course use traditional burs and saws. They do cut bone, too – but they do not differentiate: any soft tissue getting in their way will also be cut.

The special ultrasonic microvibrations of the original PIEZOSURGERY® technique cut bone – and nothing else. No soft tissue is damaged, which allows you to work with a precision that facilitates not only surgery itself, but reduces postoperative discomfort for your patients at the same time.

So, if you are looking for a technology with maximum precision and control – and minimal stress for you and your patients – here you go.
EXPERIENCE SAFETY.
How clinical applications benefit from PIEZOSURGERY® technology.

**SINUS LIFT TECHNIQUE**

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

**IMPLANT SITE PREPARATION**

- safe preparation in regard to the inferior alveolar nerve
- less post-operative inflammation
- faster healing and therefore 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 demand from your operating device is safety.

Now that is exactly what PIEZOSURGERY® is about. Its major strength is minimizing the risk of cutting soft tissue like vascular and nerve masses – as these are not sensitive to the frequencies used by the PIEZOSURGERY® technology.

→ EXTRACTION/EXPLANTATION

→ bone preservation in impacted or ankylosed root and third molar extractions
→ safe preparation in regard to the mandibular nerve for wisdom tooth extraction
→ reduced amount of facial swelling and trismus 24 hours after surgery
→ immediate implant site preparation due to the maximum precision in alveolar bone osteotomy-osteoplasty.

→ BONE BLOCK GRAFTING

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

→ REFERENCES


When mectron introduced PIEZOSURGERY® in 2001, the technology was revolutionary for bone surgery: a device providing precision, safety, perfect ergonomics and the highest quality to surgeons all around the world. The new technology immediately became state-of-the-art for bone surgery devices.

Having set this benchmark, we improved the technology in the following years - with a strong focus on ergonomics. The outcome: two devices offering a perfect balance between cutting performance and safety – PIEZOSURGERY® touch and the new PIEZOSURGERY® white.

How mectron re-defines bone surgery again with the new PIEZOSURGERY® devices.
HOW PIEZOSURGERY® LETS YOU FOCUS 100% ON SURGERY

STEP 1: tap on the surgery type. STEP 2: choose the irrigation type. STEP 3: start surgery. Believe us: it is as easy as that. No further insert specific adjustments are required – the fine tuning and indication for each insert is automatically achieved by the PIEZOSURGERY® electronic feedback-system.

This feedback-system is the heart of our PIEZOSURGERY® technology. It automatically detects each insert in few hundredths of a second, continuously monitors and adjusts things like the optimal insert movement or the appropriate power used – and lets you concentrate on your actual job: surgery itself.

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This is your perfect starting tool into bone surgery with PIEZOSURGERY®. The new PIEZOSURGERY® white comes with 100% simple handling for utmost treatment security, materials especially selected for easy cleaning, disinfection and sterilization and cost-effective standard parts for perfect economy.

So if you always wanted to use the groundbreaking PIEZOSURGERY® technology, but were held back by economical considerations – here’s your chance to take your bone surgery to the next level.

EXPERIENCE ECONOMY.

How mectron gets you started with the new PIEZOSURGERY® white.

- APC (AUTOMATIC PROTECTION CONTROL)
  - recognizes deviations from standard functioning automatically
  - stops power and liquid in less than 0.1 seconds
  - shows cause of the interruption on the keyboard

- FLEXIBILITY
  - 360° function of the foot control

- FLUSH FUNCTION
  - started by a finger tip
  - cleaning cycle for the device’s main irrigation tubes

- HANDPIECE
  - choice between handpiece with or without LED light
  - handpiece and handpiece cord (including the irrigation line) are fully sterilizable together
  - handpiece cord is extremely flexible
EXPERIENCE PERFECTION.
How mectron raises bone surgery to a completely new level with the PIEZOSURGERY® touch.

The actual benchmark in bone surgery comes with 100% perfection in every detail: An exclusive black glass touch screen, the easy to handle user interface and features like the handpiece with rotatable LED raise the work flow in bone surgery to a completely new level.

Get ready for selecting bone quality and irrigation flow, all it takes is a touch. Get ready for the most comfortable device in bone surgery ever. Get ready for PIEZOSURGERY® touch.
EXPERIENCE INNOVATION.

How mectron develops new inserts again and again – with clinicians, for clinicians.

Who could have better ideas and suggestions for new surgical inserts than surgeons themselves? That is why most of our ideas are coming directly from experienced clinicians.

The combination of their ideas with our longstanding experience and technical know-how in insert development is the basis for inserts that are absolutely outstanding and allow highly precise surgical interventions.

A perfect example of our expertise is the world’s thinnest osteotomy insert with only 0.25 mm thickness. The best proof of our expertise is that we have more than 80 high quality inserts – the widest range of inserts for piezoelectric bone surgery worldwide.

→ SHARP INSERTS
  → gentle and effective bone cutting action
  → fine and well-defined cutting line
  → used for implant site preparation, osteoplasty techniques and bone chip harvesting

→ SMOOTHING INSERTS
  → diamond-coated surfaces for precise and controlled operation on bone structures
  → preparation of difficult and delicate structures (ex. sinus augmentation, nerve lateralization)
  → preparation of the final bone shape

→ BLUNT INSERTS
  → soft tissue preparation (ex: Schneiderian membrane)
  → root planing in periodontology

→ INSERT KITS
  → set of inserts for specific application
  → stainless steel tray with depth markings
  → for sterilization and storage

→ INSERT DEVELOPMENT
  → 1. close collaboration with universities for the development of inserts
  → 2. computer simulation of shape and insert movement. The finite elements method allows precise prognoses of insert movements
  → 3. extensive clinical testing – feedback from experienced practitioners
EXPERIENCE QUALITY.
How mectron guarantees highest quality standards for every single insert.

A CNC controlled 5-dimensional sharpening machine cuts with an accuracy of up to 0.1 μm. The whole cutting process for a single insert lasts up to 12 min.

- DIAMOND COATING
  Depending on the indication, the inserts are coated with specially selected diamonds. The granulometry of the diamond coating is adapted to the respective treatment.

- TITANIUM NITRIDE COATING
  A coating of titanium nitride, applied to inserts, increases the hardness of the surface, avoids corrosion and therefore increases working life.

- LABELING
  Each insert is labeled gently by a laser.

- QUALITY CHECK
  Each insert is checked in detail before getting an OK for sales.

During every surgical procedure, an ultrasonic insert oscillates up to 36,000 times per second – an enormous endurance test for the material. That’s why only medical grade stainless steel is employed in the production of mectron inserts. And that is why every single ultrasonic insert has to pass 12 working steps before it is ready to bear our name.

Furthermore, these 12 working steps ensure the perfect match of device and insert – which is crucial for the controlled insert vibration, the basis of the PIEZOSURGERY® efficiency.
EXPERIENCE DIVERSITY.

How PIEZOSURGERY® covers everything from implantology to orthodontic surgery.

Around 70 different inserts have been already developed for mectron PIEZOSURGERY®, creating the most complete range of tips on the market for a large variety of clinical indications.
EXPERIENCE INTEGRATION.
How PIEZOSURGERY® will support osseointegration of implants!

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

- faster osseointegration: thanks to the reduction of inflammatory cells and the more active neo-osteogenesis compared to drilled sites
- high intraoperative control: the particular shape of the implant inserts allows a perfect control of the site preparation
- preparation of 2, 2.8, 3, 3.4 and 4 mm: site preparation with PIEZOSURGERY® allows placement of all common implants

CLINICAL HANDLING

1 initial pilot osteotomy
OPTIONAL: check the preparation axis with alignment PIN IM1S
2 pilot osteotomy in anterior or posterior region
OPTIONAL: check the preparation axis with alignment PIN 2-2.4
3 to optimize concentricity of implant site preparation between Ø 2 and Ø 3 mm, preparation of the cortical basal bone
4 to enlarge or to finalize the implant site preparation; insert with double irrigation for optimum cooling
Ultrasonic implant site preparation using PIEZOSURGERY®: a multicenter case series study analyzing 3,579 implants with a 1- to 3-year follow-up.


Abstract
This multicenter case series introduces an innovative ultrasonic implant site preparation (UISP) technique as an alternative to the use of traditional rotary instruments. A total of 3,579 implants were inserted in 1,885 subjects, and the sites were prepared using a specific ultrasonic device with a 1- to 3-year follow-up. No surgical complications related to the UISP protocol were reported for any of the implant sites. Seventy-eight implants (59 maxillary, 19 mandibular) failed within 5 months of insertion, for an overall osseointegration percentage of 97.82% (97.14% maxilla, 98.75% mandible). Three maxillary implants failed after 3 years of loading, with an overall implant survival rate of 97.74% (96.99% maxilla, 98.75% mandible).

Cytokines and Growth Factors Involved in the Osseointegration of Oral Titanium Implants Positioned using Piezoelectric Bone Surgery Versus a Drill Technique: A Pilot Study in Minipigs.


Conclusion
Piezoelectric bone surgery appears to be more efficient in the first phases of bone healing; it induced an earlier increase in BMPs, controlled the inflammatory process better, and stimulated bone remodeling as early as 56 days post-treatment.

5 to optimize concentricity of implant site preparation between Ø 3 and Ø 4 mm, preparation of the cortical basal bone
6 to finalize the implant site preparation; insert with double irrigation to avoid overheating
7 implant positioning
8 OPTIONAL: to correct pilot osteotomy axis (differential implant site preparation), to finalize the implant site preparation close to the alveolar nerve

The inserts for the implant site preparation are dedicated to bone quality of the maxilla.
EXPERIENCE CONTROL.

How the SINUS PHYSIOLIFT® II gives you perfect control during sinus lift operations.

The new SINUS PHYSIOLIFT® II controls the pressure in the sinus cavity!

- Elevation of the sinus membrane with micrometric precision by means of hydrodynamic pressure
- Watertight sinus elevators CS1 or CS2 for hydrodynamic sinus lift
- Atraumatic technique not requiring the use of hammer and osteotome
- Implant site preparation using PIEZOSURGERY® – the new insert P2-3 SP allows to remove the sinus basal cortex with minimal risk of penetrating into sinus cavity due to its conical shape
- Multiple implant placement can be performed
- A flapless procedure can be performed in some cases

HANDLING

After preparation of the site with PIEZOSURGERY®, the CS1 or CS2 elevator is introduced, and the tube connected to a syringe containing 2 ml of physiological saline solution is then inserted in the CS1 or CS2. With the SINUS PHYSIOLIFT® II protocol, it is possible to elevate the Schneiderian membrane safely, controlling the pressure of the liquid by means of the attached Physiolifter device.
**CLINICAL OUTCOME**
The radiographic controls showed that the graft material was distributed evenly around the implants, suggesting the integrity of the membrane.*

**MULTIPLE IMPLANT SINUS LIFT**
This technique, devised for single tooth gaps, can be used even if several teeth are missing. The surgical procedure is identical for the second implant site: a second screw elevator CS1 or CS2 is inserted. It must be ensured during this procedure that the first screw elevator is impenetrable by applying a special airtight seal so that the system is not pneumatized during the second lift.*

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The coronal part of the expander is smooth, only the initial part being threaded. When the smooth part comes into contact with the corticalis, instead of penetrating into it, it displaces it, facilitating lateral expansion.

Uses an implantology micromotor for ridge expansion. Maximum control of the direction of insertion and of the torque (screwing power).

Use of the ratchet in the last stage of insertion of the expanders. It is possible to make a half or quarter turn at a time.
EXPERIENCE STABILITY.
How mectron bone expanders guarantee you perfect stability in implantology.

- Technique for expanding the atrophic alveolar ridge
- Lateral bone condensation technique – lateral compacting of the trabeculae in poor quality bone, greatly improving primary stability
- Technique is less traumatic for the patient than working with a hammer and chisel

1 Thickness of the ridge: 3 mm – cancellous bone quality D4
2 Initial preparation of the site with IM1 insert
3 Preparation of the site with PIEZOSURGERY® insert IM2P
4 Bone expanders inserted, lateral bone compacting of the medullary bone, with transition from D4 to D3
5 X-ray view showing expanders in place
6 Implants in place
The development of Piezoelectric Bone Surgery is attributed to Prof. Tomaso Vercellotti. Mectron and Prof. Tomaso Vercellotti developed the idea of piezoelectric bone surgery, which eventually led to the production of the first prototype devices. In 1997, mectron and Prof. Tomaso Vercellotti introduced the name PIEZOSURGERY®, and its influence on Clinical Applications is evident. 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%. Microvibration and reduced noise minimize a patient’s psychologic stress and fear during ostectomy under local anesthesia.

**PIEZOSURGERY® – HISTORY OF A SUCCESS**

<table>
<thead>
<tr>
<th>Year</th>
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<tbody>
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<td>first crestal sinus lift</td>
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<td>2002</td>
<td>development of periodontal resection surgeries</td>
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<tr>
<td>2004</td>
<td>more powerful and better ergonomics – mectron presents the 2nd generation of the PIEZOSURGERY® device</td>
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**BONE HEALING**

As bone healing is not disturbed by the PIEZOSURGERY® 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.

**SENSITIVITY**

When using the PIEZOSURGERY® 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.

**SIMPLICITY**

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

**SECURITY**

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%.

**EFFECTIVITY**

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

**PATIENT COMFORT**

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

Further references include:
EXPERIENCE

How mectron has been defining the future of bone surgery for the last 18 years.

Have you ever looked for scientific studies on bone surgery using other devices than PIEZOSURGERY®? Well, you could as well look for a needle in a haystack – their number is extremely slight.

From the very beginning 18 years ago we have worked together closely with scientific institutes and done successful clinical research. That is why the PIEZOSURGERY® method is the only one supported by more than 250 clinical and scientific studies.

But find out for yourself – on www.mectron.com. Here you will find the abstract collections as well as an updated list of publications about PIEZOSURGERY®.

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

How mectron prepares you for the PIEZOSURGERY® method.

Besides its revolutionary technology, its unique level of quality and its perfect ergonomics there is another important factor for the success of the PIEZOSURGERY® technology: you.

That’s why we offer you the perfect preparation: intensive training and continuing education that has been crucial for PIEZOSURGERY® since the beginning – and which have made it what it is today: state-of-the-art in various surgical procedures.

More than 60 videos of surgeries are on the DVD. Allowing an easy orientation about the possibilities PIEZOSURGERY® is offering.
On www.mectron.com we offer you even more seminars: In the section courses and workshops you will find different seminars on PIEZOSURGERY® in English. Please contact your mectron partner for courses in your local language – you will find the contact address in the dealer list on our website.
Now, after learning about the various benefits of the PIEZOSURGERY® technology, you might ask yourself: can I get this quality, this precision, this experience and this efficiency in other dental fields, too?

The answer is: yes. mectron offers you a wide range of dental products from air-polishing to LED-polymerization lights and ultrasonic scalers. So if you are looking for a strong and reliable partner for almost every dental challenge – experience mectron.
AIRPOLISHING

ULTRASONIC SCALER

IMPLANT CLEANING

PROPHYLAXIS POWDERS

ENZYMEC

enzymatic solution for efficient removal of organic residue

specifically dedicated to the "clean" function of all PIEZOSURGERY® devices

easy handling thanks to the dosage measuring