BONETWO²
BIOMEMBRANE FOR GUIDED TISSUE REGENERATION
Guided tissue regeneration is performed by isolating an area without bone from the soft covering tissues. The connective tissue regrows faster than the bone tissue, occupying the area without bone and preventing its regeneration. The new bone growth requires the creation of a plane below which the lack of tissue is kept for a sufficient period for regrowing.

**BONE TWO** achieves these conditions and has a mechanical resistance as to enable suturing to the surrounding tissue under strong tension. The space deficient in bone can be filled with biocompatible and/or bioactive material and covered by **BONE TWO biomembrane**.

**BONE TWO** is a micro thin network made of natural connective fibres which prevents the cell migration and maintains the barrier function, without creating necrosis, until it is integrated in the surrounding connective tissues. **BONE TWO** does not need to be removed, does not give an inflammatory response:
- it has zero toxicity.
- It is completely replaced by the patients tissue in 2/3 months, then the barrier never fails but it changes in autologous tissue.
The ideal membrane to obtain guided osseointegration has to be adaptable to every shape, thin, but at the same time as much strong enough to be strongly sutured to the surrounding tissue, perfectly integrating into the receiving tissues and reabsorbable without an inflammatory response.

**BONE TWO biomembrane** is protein-free equine pericardium. It is made of a connective fibre network mainly made of collagen with structure and strength which cannot be imitated by synthetic collagen obtained from artificial methods. For this reason, the thickness of 1/10 mm, 2/10 mm offers a mechanical strength higher also than other animal biological sheets with which **BONE TWO Biomembrane** has been compared.
The incomparable microstructure made of fibres interwoven in various sizes, achieves a physical resistance and a reabsorption resistance. For these properties **BONE TWO Biomembrane** offers the possibility of replacing missing or torn tissues.

**BONE TWO Biomembrane** can be kept exposed for wide areas which are not covered with tissue, since it does not cause hypertrophy and polypos degeneration of the free flaps as occurs on artificial membranes. Moreover, it acts as a guide for the epithelial tissue new growth. The collagen of **BONE TWO** is impermeable to cells and permeable to liquids. **BONE TWO** has a thickness of 0.15 mm which is much smaller in diameter than an artificial membrane. It can be placed between tissues without encumbrance and can be cut and sutured under tension.

*SEM image of BONE TWO surface made of collagen fibres interwoven.*

*SEM image of BONE TWO thickness made of multiple sheets.*
HIGH ADHESION

**BONE TWO Biomembrane** presents a micro structure made of interwoven fibres which exhibits a strong adhesive property. **BONE TWO Biomembrane** has a translucent surface (viscerale pericardium side) and an opaque surface (cardiac wall).

![SEM image of the opaque surface (more adhesive): irregular interwaving of connectival fibres.](image)

TESTED IN DIFFICULT SITUATIONS

**BONE TWO** is used as tympanic prosthesis in otology and for reconstruction of septum ulcers in rhinology.

In the first case, both surfaces of the membrane are widely exposed to air since they are not covered by skin flaps of the auditory canal.

In the second instance, **BONE TWO** cannot be covered by mucous flaps: the exposed areas can reach some cm². Also in these cases **BONE TWO** does not produce any necrosis, is resistant to bacterial contamination and acts as guide to the growth of connective and epithelial tissue coming from the covering external flaps.
INDICATIONS AND CLINICAL APPLICATIONS

Re-modelling of atrophic ridges:
BONE TWO biomembrane is used in maxillary sinus rise operations in association with filling material (= hydroxyapatite or similar) in order to stimulate tissue regeneration, to determine bone generation and to improve the biomaterials integration.

Another use is the mandibular ridge augmentation, always in association with filling materials, by guiding the new growth of the soft and hard tissues.

Extraction surgery:
BONE TWO biomembrane is used after dental extraction, both in case of roots which penetrate the maxillary sinus to avoid oro-antral fistulae and in areas which will have to be reconstructed from the prosthetic point of view in a following moment, to prevent loss of substance which, otherwise, would be unavoidable.

Implantology:
The application of BONE TWO biomembrane, in this field, is suggested when an implant has to be inserted in insufficient bone or when there is a bone defect adjacent to the implant itself.

BONE TWO biomembrane is also used in post-extraction implantology, for an early stabilization of the implant in the post-operative phase, with very good clinical results.

Periodontology:
BONE TWO biomembrane is used in the treatment of periodontal pockets and in the reparation of bifurcations. The insertion of BONE TWO biomembrane in order to isolate a II class bifurcation defect, by suturing the membrane around the interested element improves the operations success with very good bone reparation.

Photographs
1. Insertion of cylindrical hollow implant. Recession of vestibular wall in case of generation incapability.
2. Filling of a bone defect with Bone Two particles.
3. Positioning of Bone Two Biomembrane.
4. The cap - screw of the implant collaborates to the membrane maintenance in situ.
5. “Surgilon” suture. The vestibular bone wall has been remodelled.
PACKAGES
Box of 1 sterile pcs 15x15 mm code D15HM
Box of 1 sterile pcs 25x25 mm code D25HM

RX - operative

RX - 3 months, guided tissue regeneration.
BONE TWO® is a connective sheet derived from equine pericardium.

The sacrificed animals are provided with veterinary certification of eligibility. The pericardium sheet is transported to the laboratory where the most suitable parts for constructions of the membrane are selected. The selected sheets are treated with proteolytic enzymes and subsequently dipped in solutions which stop the enzymatic action. The selected sheets are examined under the microscope segment by segment, to identify the areas most suitable for use on the basis of the consistency and resistance of the network collagen structure. Then they are thinned to even thickness and punched into different sizes, each designed for a particular use.

The treated sheets are dipped in a mixture of propylene oxide and ethyl alcohol for the preservation and sterilization. The methods used in the work cycles are in accordance with GMP legislation - Good Manufacturing Practice - which foresees the monitoring of each working cycle, of the raw material batches, of the production machine operation control cards, of the production flow charts and of the quality check-ups, made with systems devoted to the in-process and final material testing. Once the work cycles have been completed, the membranes are checked to ascertain mechanical resistance to tensile stress and pressure according to the statistical methods. The connective tissue mesh is checked by the examinations under the optical and scanning electron microscope.

The working cycles and the packaging of the membranes are made in white chamber in class ISO 7 filtered atmosphere, on laminar flow benches, in order to avoid air contamination. For each lot the microbiological enumeration is carried out when the work cycles have been completed in order to establish whether it is suitable for sterilization. If any batch at this stage exceeds a predetermined level of microorganisms per gram, it is not admitted to the subsequent sterilization and packaging phases. Citotoxicity and pyrogenicity tests carried out on the finished packaged product show that BONE TWO® does not provoke tissue inflammation.

BONE TWO® is presented in a little glass containing keeping solution for maintenance of the product. Each package exhibits data referred to sterilization, sell-by dates, lot number and product code.

CONTRAINDICATIONS: BONE TWO SHOULD NOT BE IMPLANTED IN PATIENTS WITH ALLERGIES TO EQUINE MEAT.