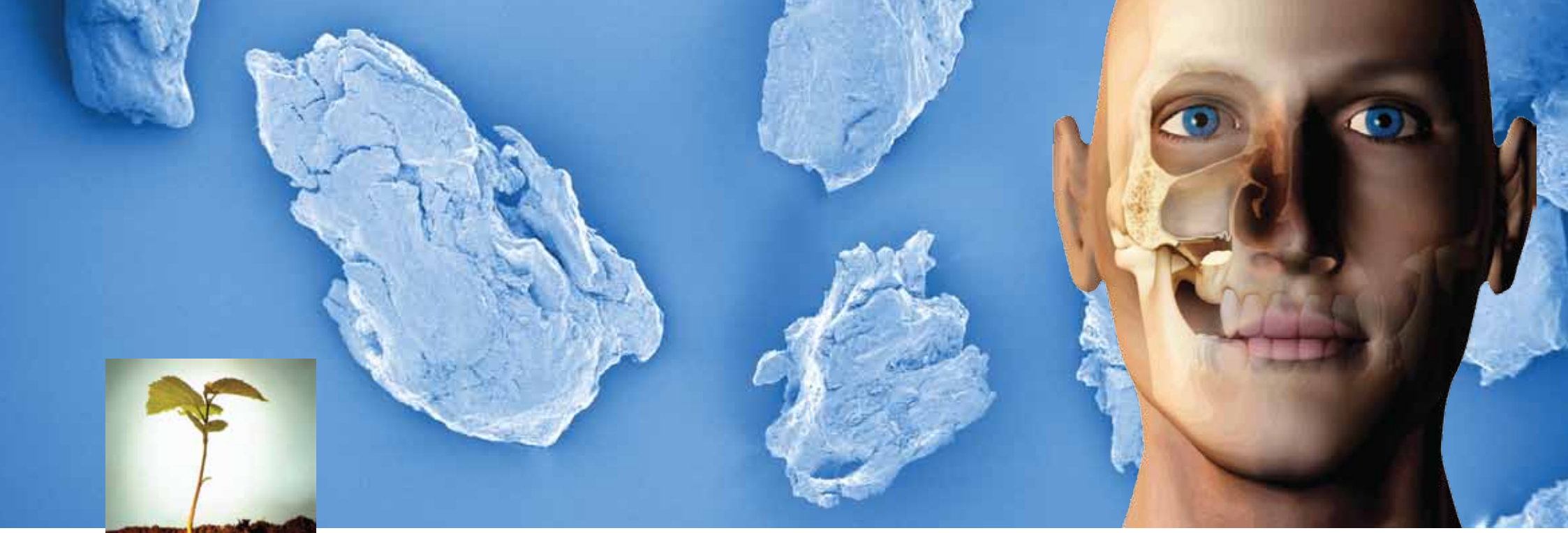


OsteoBiol®
by Tecnoss

Bone Grafting Materials

ORAL AND MAXILLOFACIAL PRODUCTS

REGENERATION SCIENCE

INSPIRED BY NATURE


Source: Tecnoss® Dental Media Library

Dedicated products for the Oral and Maxillofacial Surgeons (OMFS)

CLINICAL INDICATIONS OF OSTEOBIOL® MAXILLOFACIAL PRODUCTS

Tecnoss® developed and patented a unique biotechnology that prevents the ceramization phase of natural bone and preserves the tissue collagen, allowing an osteoclastic-type remodelling of the biomaterial, similar to physiological bone turnover.

OsteoBiol® maxillofacial range of products are engineered to fill bone defects after trauma, reconstruction or corrections in non-load-bearing indications. The extensive range of products will help surgeons to make the right decision when it comes to choose the perfect product for a specific clinical indication.

OsteoBiol® products are osteoconductive, biocompatible, of natural origin and offer optimal porosity. This will enhance the bone remodelling process offering an extensive bone graft replacement in an average time of 24 months while average re-entry time is 6 months.

SURGICAL PROCEDURES

Treatments may be performed on the craniomaxillofacial complex: mouth, jaws, neck, face, skull, and include:

>> dentoalveolar surgery (surgery to remove impacted teeth, difficult tooth extractions, extractions on medically compromised patients, bone grafting or preprosthetic surgery to provide better anatomy for the placement of implants, dentures, or other dental prostheses)

>> diagnosis and treatment of benign pathology (cysts, tumors etc.)

>> diagnosis and treatment (ablative and reconstructive surgery, microsurgery) of malignant pathology (oral & head and neck cancer)

>> diagnosis and treatment of congenital craniofacial malformations such as cleft lip and palate and cranial vault malformations such as craniosynostosis, (craniofacial surgery)

>> diagnosis and treatment of chronic facial pain disorders

>> diagnosis and treatment of temporo-mandibular joint (TMJ) disorders

>> diagnosis and treatment of dysgnathia (incorrect bite), and orthognathic (literally “straight bite”) reconstructive surgery, maxillomandibular advancement, surgical correction of facial asymmetry

>> diagnosis and treatment of soft and hard tissue trauma of the oral and maxillofacial region (jaw fractures, cheek bone fractures, nasal fractures, LeFort fracture, skull fractures and eye socket fractures)

>> splint and surgical treatment of sleep apnea, maxillomandibular advancement, genioplasty (in conjunction with sleep labs or physicians)

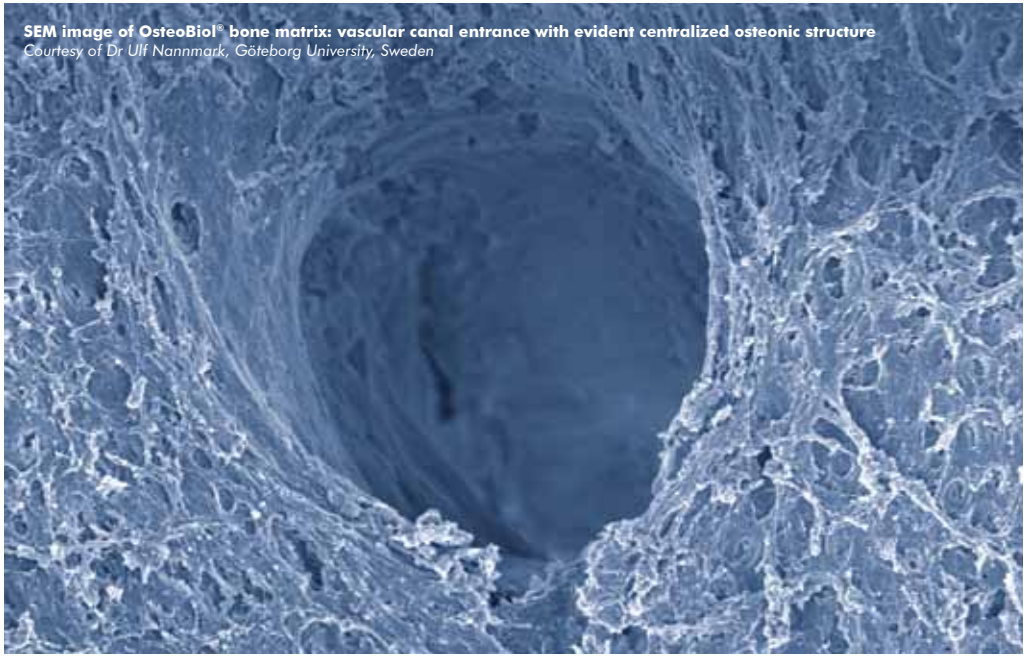
>> surgery to insert osseointegrated dental implants and Maxillofacial implants for attaching craniofacial prostheses and bone anchored hearing aids.

Nature provides all the necessary elements for bone regeneration

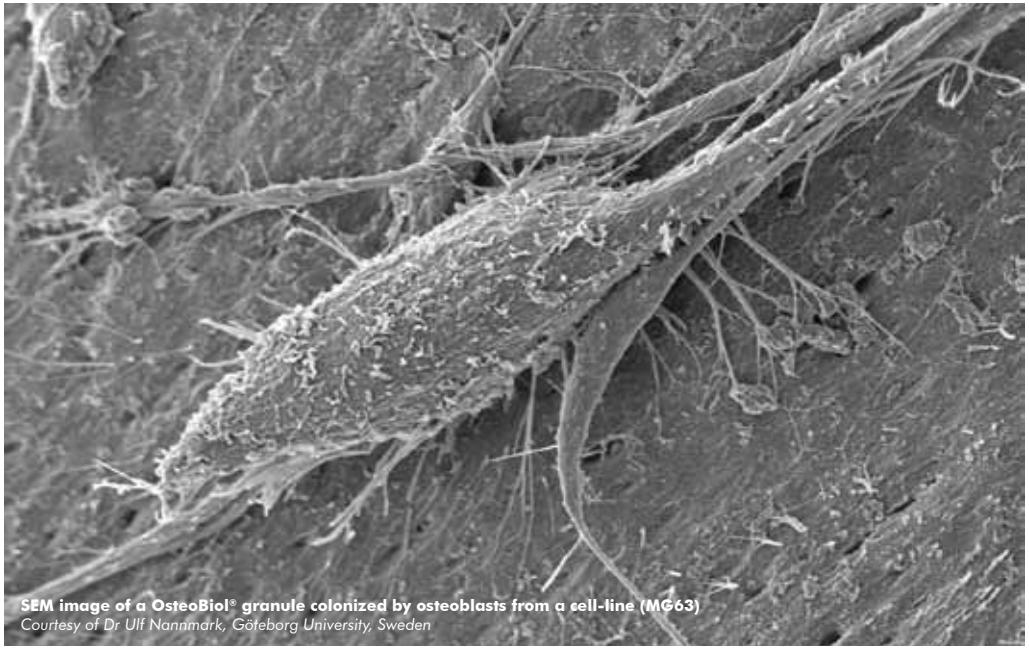
OUR AIM IS TO ACCELERATE AND GUIDE THE NATURAL BONE REGENERATION PROCESS

Tecnoss® developed and patented a unique biotechnology that prevents the ceramization phase of natural bone and preserves the tissue collagen, allowing an osteoclastic-type remodelling of the biomaterial, similar to physiological bone turnover.

Research and development of biomaterials has gone through many stages, but always toward one goal: to heal bone deficit with newly-formed quality tissue in order to achieve functional recovery. All of this in the least time possible. The examination of clinical results and the commercial diffusion of various kinds of products developed by the biomedical industry show a clear superiority of products of natural origin over those of synthetic derivation.



SEM image of OsteoBiol® bone matrix: vascular canal entrance with evident centralized osteonic structure
Courtesy of Dr Ulf Nannmark, Göteborg University, Sweden



SEM image of a OsteoBiol® granule colonized by osteoblasts from a cell-line (MG63)
Courtesy of Dr Ulf Nannmark, Göteborg University, Sweden

The structure of animal bone is morphologically more similar to human bone than any synthesized product.

Over the last twenty years several processes have been developed to allow the grafting of heterologous origin products in the human body without adverse reaction. The first products developed through these technologies have shown encouraging clinical results, even if made of bone mineral matrix only.

The OsteoBiol® new generation of biomaterials, thanks to a revolutionary technology, goes beyond the simple role of aiding natural bone regrowth by stimulating and accelerating this vital physiological process.

OSTEOBIOL® BONE MATRIX: A DUAL-PHASE REVOLUTION

OsteoBiol® Bone Matrix granules are endowed with characteristics very similar to human mineral bone[26] and can be used as an alternative to autologous bone.

Their natural micro-porous consistency facilitates new bone tissue formation in defect sites and accelerates the regeneration process.

Gradually resorbable, it preserves the original graft shape and volume (osteoconductive property)[19].

See literature page for more information

"All OsteoBiol® collagenated biomaterials provide the natural substrate for correct bone tissue regeneration and repair, facilitating and accelerating the physiological regeneration process and allowing optimal results within a reasonable period of time"

Giuseppe Oliva MD
R&D Director
Tecnoss s.r.l.

Collagen, a key factor for clinical success



OsteoBiol® membrane collagenic structure
Source: Courtesy of Nobil Bio Ricerche, Villafranca d'Asti, Italy

Tecnoss® exclusive manufacturing process is able to neutralize the antigenic components present in heterologous bone (achievement of biocompatibility) and to preserve the collagen matrix inside the granules of biomaterial.

Moreover, the molecular structure of natural hydroxyapatite is not significantly altered thanks to the limited maximum process temperature[26].

These characteristics of OsteoBiol® products allow a consistent bone neo-formation and a close contact between mature neo-formed bone and biomaterial granules.

Collagen has a key role in bone regeneration process in that:

>> it acts as a **valid substrate for platelet activation** and aggregation

>> it serves to **attract and differentiate** the **mesenchymal stem cells** present in the bone marrow[A]

>> it increases the **proliferation rate of the osteoblasts** up to 2/3 times[B]

>> it stimulates the **activation of the platelets, osteoblasts and osteoclasts** in the tissue healing process

The presence of collagen inside each granule makes OsteoBiol® Bone Matrix hydrophilic and facilitates further mixing with collagen gel (OsteoBiol® *Gel 0*).

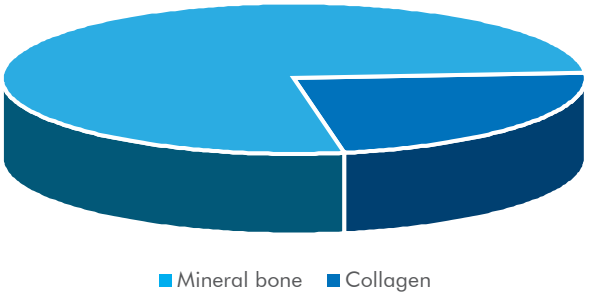
This technology has permitted the development of a new versatile and innovative product: OsteoBiol® *mp3*.

Its consistency allows an ideal filling of bone defects and guarantees simple handling and fast application.

The OsteoBiol® new generation of dual-phase biomaterials, thanks to a revolutionary technology, goes beyond the simple role of aiding natural bone regrowth by stimulating and accelerating this vital physiological process.

See literature page for more information

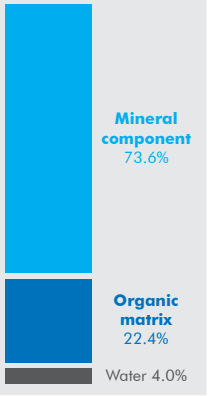
Dual-phase composition of **OsteoBiol® Bone Matrix**



Source: University of Duisburg-Essen, Germany

RESULTS OF INORGANIC CHEMICAL ANALYSES PERFORMED ON OSTEOBIOL® BONE MATRIX

Chemical element	OsteoBiol® Bone Matrix (% in weight)
Ca	25.7%
PO_4^{3-}	35.2%
C	13.6%
H	2.2%
N	2.9%
O (not in PO_4^{3-})	20.4%
TOTAL	**100.0%**
Ca/P (n:n)	1.73



Inorganic chemical analyses results
Source: University of Duisburg-Essen, Germany

RESULTS OF ORGANIC CHEMICAL ANALYSES PERFORMED ON OSTEOBIOL® BONE MATRIX

"The separated proteins (one lane) were fractionated in ten portions and analysed with nano-LC-ESI MS/MS. In the fractions 1-5 in the range from 20-200kDa we found **ONLY COLLAGEN**. In the fractions 6-10 we identified **NO PROTEIN**"



Organic chemical analyses results
Source: Proteome Factory, Germany

Collagen and bone regeneration

Guided Bone Regeneration (GBR) is necessary to treat bone deficits due to lesions or bacterial infections.

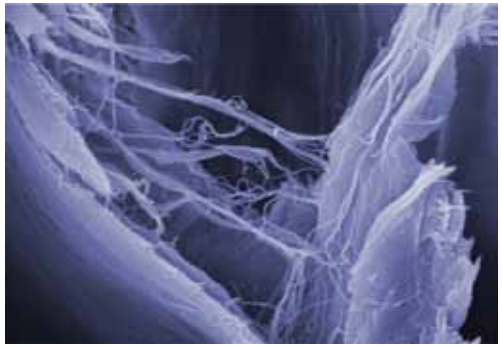
The bone defect recovery occurs through the general mechanisms of tissue healing, that is, by complex dynamic mechanisms directed towards the repair of tissue function and anatomic integrity.

The discovery of the events pathway leading to tissue healing has helped to clearly identify the main actors in bone healing process; the concomitant presence of the following three components is necessary for the formation of *de novo* bone tissue:

>> the **platelets** represent the principal actors during the first phase of the healing process, when, subsequent to a lesion, an initial deposition of fibrin and the formation of blood clot take place. This phase is characterized by significant activation of the chemical signals mediated by cytokines and growth factors.

In fact, the primary post-haemorrhagic clot formation process through platelet aggregation and lysis causes the release of both the coagulation cascade factors and growth factors, such as PDGF, IGF 1, IGF 2 and VEGF which are known for their activating effect on osteoblasts and osteoclasts, and TGF-β (Bone Morphogenetic Proteins belong to this superfamily) which starts bony callus formation.

>> the **osteoblastic precursors** deriving from bone marrow mesenchymal stem cells are responsible, after cell differentiation in osteoblasts, for the second phase of the healing process (enchondral and/or intermembranous ossification) thanks to the synthesis of collagen and other components of the extracellular matrix.



SEM image of a OsteoBiol® *Evolution* collagenic matrix
Nobil Bio Ricerche, Villafranca d'Asti, Italy

>> an **insoluble substrate**, suitable carrier for osteoinductive signal and able to support and guide new bone tissue formation.

Sampath and Reddi (1980) demonstrated crosslinked type I collagen to be the most appropriate carrier for promoting osteoinductive signal activity.

The continuous progresses in comprehension of biological mechanisms regulating bone tissue morphogenesis can be exploited also for elaboration of natural or artificial products able to restore or maintain the function of damaged tissues and organs (tissue engineering)[C,D,E].

In vitro studies demonstrated that heterologous collagen is able to induce differentiation of mesenchymal osteoprogenitor stem cells into osteoblasts[A], and that association of collagen type I with a scaffold of hydroxyapatite significantly enhances osteoblasts proliferation rate[B].

This important scientific evidence provides the rationale behind **OsteoBiol® product line: a complete series of biomaterials with collagen base**.

Collagen, in addition to its well-known structural action carried on connective tissues, is endowed with the following important properties, useful in tissue reparation processes:

1. **Haemostasis**: collagen is able to activate the receptors present on cellular membranes of platelets, responsible for their aggregation and lysis process; moreover, during the first week, it reinforces the action of fibrin in the formation of the primary clot, and then, in the second week, it replaces the function of fibrin.

2. **Debridement**: collagen has a chemotactic action on monocyte/macrophage cell lines, from which osteoclasts derive; these cells, through their action on mineral component resorption of both bone tissue and Tecnoss® biomaterials, can draw, activate and collaborate with osteoblasts in bone rearranging and remodeling.

3. **Angiogenesis**: the drawn monocytes/macrophages, in their turn, stimulate both osteoblastic activity and angiogenesis process in grafting site.

4. **Osteoblastic activity**: collagen, binding to fibronectin, promotes the anchorage of mesenchymal stem progenitors, on which it exerts its chemotactic action, and induces differentiation into osteoblasts[A].

5. **Receiving site remodeling**: exogenous collagen grafting can contribute in decreasing remodeling times of immature bone tissue.

6. **Osteoconduction and guided regeneration**: naturally integrated with mineral component, collagen is able to increase osteoblasts proliferation rate[B], while as a resorbable membrane it is able to guide connective tissue regeneration.

See literature page for more information



Over recent years clinical research efforts have been focussed on a better understanding of the precise indications for various bone augmentation procedures and materials. Autogenous bone is generally considered the gold standard however it has to be harvested and patients may not always be happy to donate their own bone since there is a biological price to pay – postoperative morbidity at the donor site. The scientific literature tends to grossly underestimate the incidence of complications at donor sites simply because complications are underreported. Therefore, we do have a problem and we do need a solution. The solution is theoretically quite simple, to take bone from somewhere else. Bone could be taken from other humans, from various mammals or it could be artificially produced. Each alternative has potential advantages and disadvantages and personal beliefs and moral aspects play important roles in the decision making. If we are objective and examine the scientific evidence we can conclude that evidence is accumulating that various animal derived bone grafts may be as good if not a better than autogenous bone [F,G]. More evidence is still needed but there are numerous ongoing trials which will provide additional information in the near future. So we can hazard to say that after the revolution of osseointegrated implants in the seventies and eighties we are now very much part of the bone substitute revolution.

So what is the situation today? That xenografts offer a reliable if not better alternative to autogenous bone in practically all indications when used in conjunction with dental implants or in periodontal therapy. That there is more evidence supporting the use of xenografts than other types of bone substitutes. That the ideal bone substitute should be easy to handle and should not be resorbed too fast via an inflammatory process or induce adverse reactions. We now need to understand and identify the best materials and techniques to reconstruct bone in the most challenging situations such as the heavily resorbed maxilla.

Marco Esposito DDS, PhD
Director Postgraduate Dental Specialties
Manchester Academic Health Science Centre
The University of Manchester, UK

OsteoBiol®
by Tecnoss

Used in more than 200 000 surgeries
Distributed in over 40 countries
Strong scientific background
Extraordinary clinical results

See literature page for more information

Products engineered for specific clinical indications

CLINICAL INDICATIONS

INDICATION VS PRODUCT MATRIX

	ALVEOLAR REGENERATION		MAXILLARY SINUS LIFT		PERI-IMPLANT REGENERATION	HORIZONTAL AUGMENTATION		VERTICAL AUGMENTATION	ORBITAL RESTORATION
	SOCKET PRESERVATION	RIDGE PRESERVATION	LATERAL ACCESS	CRESTAL ACCESS	DEHISCENCES AND FENESTRATIONS, PERI-IMPLANT LESIONS	2-WALL DEFECTS	RIDGE SPLIT	INLAY TECHNIQUE	
mp3 Pre-hydrated collagenated heterologous cortico-cancellous bone mix *Granulometry 600-1000 µm* *Granulometry 1000-2000 µm*		ONE OR TWO WALLS MISSING			ONE OR TWO WALLS MISSING			IN ASSOCIATION WITH SP-BLOCK	
Putty Pre-hydrated collagenated heterologous cortico-cancellous bone paste *Granulometry up to 300 µm*									
Apatos Mix Cortico-cancellous heterologous bone mix *Granulometry 1000-2000 µm*		ONE OR TWO WALLS MISSING			ONE OR TWO WALLS MISSING				
Sp-Block Collagenated heterologous cancellous block								IN ASSOCIATION WITH MP3	
Dual-Block Collagenated heterologous cortico-cancellous block									
Lamina Collagenated heterologous cortical bone									
Evolution Heterologous collagen membrane									
Derma Porcine derma membrane									

Ultimate performance and handling

mp3



Tissue of origin
Heterologous cortico-cancellous bone mix

Tissue collagen
Preserved plus an additional 10% collagen gel (OsteoBiol® *Gel 0*)

Physical form
Pre-hydrated granules and collagen gel

Composition
90% granulated mix, 10% collagen gel

Granulometry
600-1000 µm
1000- 2000 µm

Re-entry time
About 5 months

Packaging
Syringe: 2.0 cc

Product code
600-1000 µm
A3010FS | 1 Syringe | 2.0 cc | Porcine
A3010FE | 1 Syringe | 2.0 cc | Equine

1000-2000 µm
A3210FS | 1 Syringe | 2.0 cc | Porcine
A3210FE | 1 Syringe | 2.0 cc | Equine

Scientific publications on OsteoBiol® *mp3*
8 - 11 - 14 - 16 - 19 - 22 - 24 - 25 - 32 - 33 - 36 38 - 40 - 42 - 43

See literature page for more information



PRE-HYDRATED READY-TO-USE BONE MIX

CHARACTERISTICS

Heterologous origin biomaterial made of 600-1000 µm or 1000-2000 µm pre-hydrated collagenated cortico-cancellous granules, properly mixed with OsteoBiol® *Gel 0*. Thus, it is possible both skipping the hydration phase and decreasing the risk of accidental exposure of material to pathogens during manipulation and grafting phases; furthermore the syringe is flexible and ideal to simplify grafting in the receiving site. The granules are endowed with characteristics very similar to human mineral bone[26], and can be used as an alternative to autologous bone.

Their natural micro-porous consistency facilitates new bone tissue formation in defect sites and accelerates the regeneration process.

Gradually resorbable[19], it preserves the original graft shape and volume (osteoconductive property).

Moreover, thanks to its collagen content, the product facilitates blood clotting and the subsequent invasion of repairing and regenerative cells.

HANDLING

mp3 is available in ready-to-use syringes and can be easily grafted avoiding the hydration and manipulation phases.

After adapting the material to the defect shape, it is necessary to remove non stable residues before proceeding to soft tissue suture.

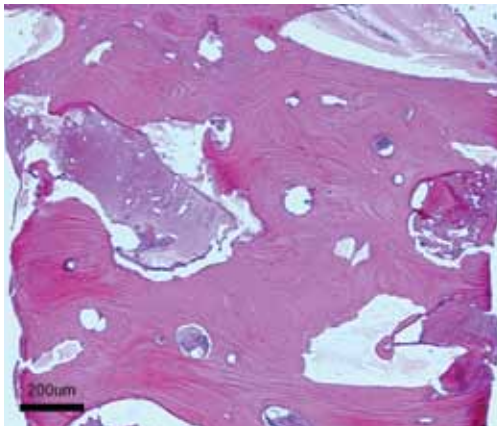
CLINICAL INDICATIONS SUMMARY

Oral surgery and implantology: thanks to its particular formulation and granulometry, *mp3* is ideal for grafting in surgical procedures of maxillary sinus lift with lateral access[14,32].

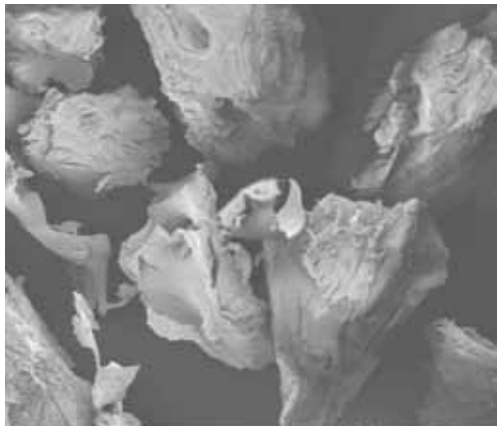
A membrane OsteoBiol® *Evolution* or OsteoBiol® *Special* is recommended to cover the antrostomy.

Maxillofacial: filler of bone defects after trauma, reconstruction or corrections in non-load-bearing indications.

mp3 can be used as drug carrier.



Histology on maxillary sinus biopsy taken at 24 months. 48% new bone formation, 13% residual granules
Source: Biopsy by Dr Roberto Rossi, Genova, Italy
Histology by Dr Ulf Nannmark, University of Göteborg, Sweden



SEM image of OsteoBiol® *mp3* granules. Magnif. x50
Source: Courtesy of Dr Ulf Nannmark, University of Göteborg, Sweden



Maxillary sinus grafted with OsteoBiol® *mp3*
Source: Courtesy of Dr Gianluca Reato, Mestre, Italy



Maxillary sinus grafted with OsteoBiol® *mp3*
Source: Courtesy of Dr Roberto Rossi, Genova, Italy



Horizontal augmentaton performed with OsteoBiol® *mp3*
Source: Courtesy of Dr Rosario Sentineri, Genova, Italy

Engineered for peri-implant defects

Putty



PRE-HYDRATED COLLAGENATED HETEROLOGOUS CORTICO-CANCELLOUS BONE PASTE

CHARACTERISTICS

Bone paste with 80% micronized heterologous bone (granulometry up to 300 μm) and 20% collagen gel (OsteoBiol® *Gel 0*).

Made with an exclusive process that provides the product with exceptional malleability and plasticity, making it easy to apply in sockets and peri-implant defects with walls.

Thanks to its collagen component, the product facilitates blood clotting and the subsequent invasion of repairing and regenerative cells.

HANDLING

Inject the product and adapt it to defect morphology without compression. An *Evolution* membrane is recommended to protect *Putty* grafted in peri-implant defects. Successful grafting needs complete stability of the biomaterial: for this reason *Putty* must be used only in cavities able to firmly contain it.

CLINICAL INDICATIONS

Implantology: versatile alveolar filler to preserve crestal volume and in immediate post-extractive implants where it facilitates primary stability; ideal for the treatment of peri-implantitis and in ridge split procedurers.

Oral surgery: ideal filler after dental extractions, granulomas, dentigerous cysts.

Tissue of origin
Heterologous cortico-cancellous bone mix

Tissue collagen
Preserved plus an additional 20% collagen gel (OsteoBiol® *Gel 0*)

Physical form
Pre-hydrated granules and collagen gel of plastic consistency

Composition
80% granulated mix, 20% collagen gel

Granulometry
Up to 300 μm

Re-entry time
About 4 months

Packaging
Syringe: 1.0 cc

Product code
HPT61S | 1 Syringe | 1.0 cc | Porcine
HPT61E | 1 Syringe | 1.0 cc | Equine

Scientific publications on OsteoBiol® *Putty*
3 - 6 - 12 - 31 - 39

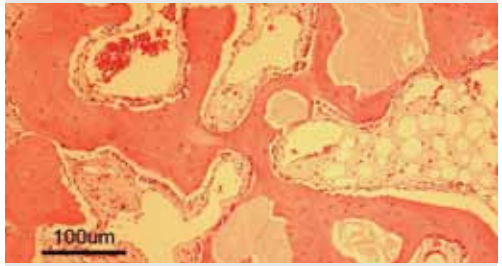
See literature page for more information











Biopsy showing newly formed bone after treatment with OsteoBiol® *Putty* 5 weeks after implantation in rabbit maxillae. Original magnification x20
Source: Histology by Dr Ulf Nannmark, University of Göteborg, Sweden

Nanocrystalline hydroxyapatite

Apatos 1000-2000



COLLAGENATED HETEROLOGOUS CORTICO-CANCELLOUS BONE MIX

CHARACTERISTICS

Apatos is a biomaterial of heterologous origin with characteristics similar to mineralized human bone; it can therefore be used as alternative to autologous bone. The natural microporous consistency of *Apatos* facilitates the formation of new bone tissue in bone defect area, accelerating the process. *Apatos* nanocrystalline hydroxyapatite is a mix of cortical and cancellous bone granules.

HANDLING

Apatos must always be hydrated and thoroughly mixed with a few drops of sterile saline; it can also be mixed with patient's blood. Finally it can be mixed if necessary with the drug selected for surgery; the mixture thus obtained should be positioned with a sterile spatula or syringe for biomaterials.

CLINICAL INDICATIONS

Oral surgery: granulomas, dentigenous cysts and ridge split.

Implantology: universal filler used in treatment of dehiscences and peri-implantitis, two wall defects, lateral and crestal access sinus lift. In particular *Apatos* is progressively resorbed and replaced by new bone, guaranteeing optimal preservation of the graft volume. When needed, Apatos graft can be protected with OsteoBiol® *Evolution* membrane or Soft Cortical *Lamina*.

Maxillofacial: filler of large maxillofacial bone defects, reconstruction or corrections in non-load-bearing indications, may be used as a drug-carrier.

Tissue of origin
Heterologous cortico-cancellous bone mix

Tissue collagen
Degraded

Physical form
Radiopaque granules of mineral hydroxyapatite

Composition
100% cortico-cancellous mix

Granulometry
1000-2000 μm

Re-entry time
About 5 months

Packaging
Vial: 1.0 g

Product codes
A0210FS | 1 Vial | 1.0 g | Porcine
A0210FE | 1 Vial | 1.0 g | Equine

Scientific publications on OsteoBiol® *Apatos*
6 - 9 - 10 - 34 - 41

See literature page for more information

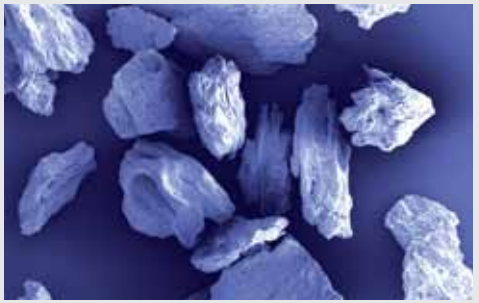








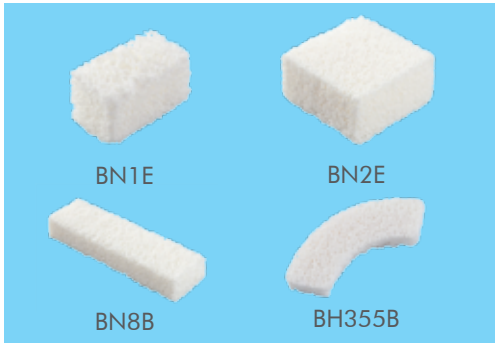




SEM images of OsteoBiol® *Apatos* cancellous granules
Source: Courtesy of Dr Ulf Nannmark, University of Göteborg, Sweden

Dried large granules and collagenated blocks

Sp-Block



COLLAGENATED HETEROLOGOUS CANCELLOUS BLOCK

CHARACTERISTICS

Cancellous block of heterologous bone produced with an exclusive Tecnoss® process which avoids ceramization of the hydroxyapatite crystals, thus accelerating physiological resorption. *Sp-Block* supports new bone formation: thanks to its rigid consistency it is able to maintain in time the original graft volume, which is particularly important in case of large regenerations. Moreover, its collagen content facilitates blood clotting and the subsequent invasion of regenerative and repairing cells, favoring *restitutio ad integrum* of missing bone.

HANDLING

Sp-Block must be hydrated before use for 5/10 minutes with sterile lukewarm physiological solution or with antibiotics.

Afterwards, it can be adapted to the receiving site which must be accurately decorticated in order to guarantee maximum contact; the block should always be protected with a resorbable barrier (*Evolution* membrane).

CLINICAL INDICATIONS

Filler of larger size bone defects, vertical (inlay technique) or horizontal ridge augmentation. Even though xenogenic blocks provide structural support to the bony defect, these biomaterials are not indicated for use in load bearing situations, unless used in combination with appropriate osteosynthesis fixation.

Tissue of origin
Heterologous cancellous block

Tissue collagen
Preserved

Physical form
Rigid dried block

Composition
100% cancellous bone

Re-entry time
About 8 months

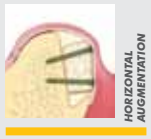
Packaging
10x10x10 mm, 10x10x20 mm, 10x20x20 mm, 35x10x5 mm

Product code

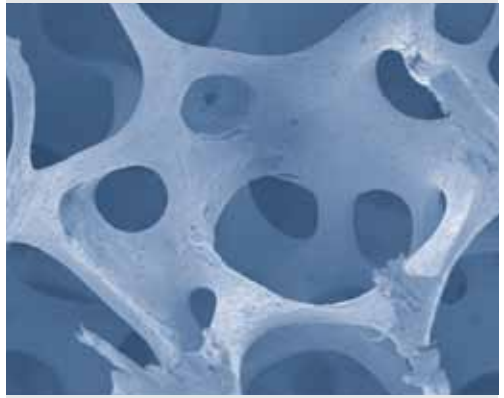
BN0E	1 Blister	10x10x10 mm	Equine
BN1E	1 Blister	10x10x20 mm	Equine
BN2E	1 Blister	10x20x20 mm	Equine
BN8B	1 Blister	35x10x5 mm	Bovine
BH355B	1 Blister	35x10x5 mm	Bovine Curved

Scientific publications on OsteoBiol® *Sp-Block*
37

See literature page for more information







SEM image of OsteoBiol® cancellous block trabeculae
Source: Courtesy of Dr Ulf Nannmark, University of Göteborg, Sweden

Dual-Block



COLLAGENATED HETEROLOGOUS CORTICO-CANCELLOUS BLOCK

CHARACTERISTICS

Dual-Block supports new bone formation due to its extremely osteoconductive surface: thanks to its rigid consistency the block is able to mantain in time the original graft volume, which is particularly important in case of large regenerations. Moreover the collagen content facilitates blood clotting and the subsequent invasion of regenerative and repairing cells, favoring restitutio ad integrum of missing bone.

HANDLING

Dual-Block must be hydrated before use for 5/10 minutes with sterile lukewarm physiological solution or with antibiotics.

Afterwards, it can be adapted to the receiving site which must be accurately decorticated in order to guarantee maximum contact; the block should always be fixed with osteosynthesis microscrews and protected with a resorbable barrier (*Evolution* membrane).

CLINICAL INDICATIONS

Dual-Block is indicated for heavily reabsorbed maxilla horizontal augmentation.

Whatever is the applied technique, it is recommended to fill the gaps around the block with a biomaterial in granules to achieve the desired volume and contour of the augmented recipient site.

Tissue of origin
Heterologous cortico-cancellous block

Tissue collagen
Preserved

Physical form
Rigid dried block

Composition
100% cortico-cancellous bone

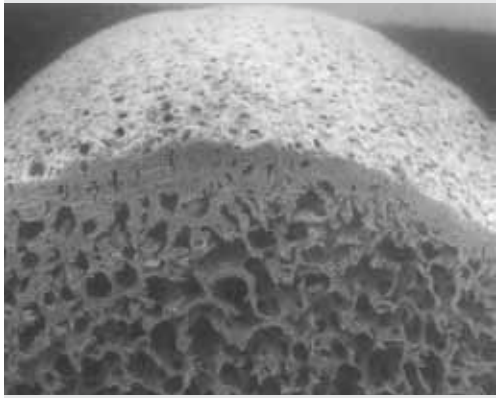
Re-entry time
About 8 months

Packaging
20x15x5 mm, 20x10x5 mm, 20x20x5 mm, 20x15x5 mm

Product code

STN4B	1 Blister	20x15x5 mm	Bovine
STN5B	1 Blister	20x10x5 mm	Bovine Curved
STN6B	1 Blister	20x20x5 mm	Bovine Curved
STS7S	1 Blister	20x15x5 mm	Porcine Curved





SEM image of OsteoBiol® cortico-cancellous block
Source: Politecnico di Torino, Italy

Collagenated cortical bone barriers

Soft Lamina



COLLAGENATED HETEROLOGOUS CORTICAL BONE

CHARACTERISTICS

Soft Lamina is made of cortical bone of heterologous origin which undergoes a process of superficial decalcification, nevertheless maintaining the typical consistency of the bone tissue from which it originates.

The Standard model after hydration becomes flexible and can be adapted to the defect morphology creating, once fixated with osteosynthesis screws, a semi-rigid covering to the underlying graft. This property is particularly useful when it is necessary to obtain a space making effect in esthetic areas, as well as in horizontal augmentation of two wall defects.

Every model of *Lamina* must always be fixated with titanium micro-screws.

HANDLING

Cortical Lamina can be shaped with sterile scissors until the desired size is reached, then it must be hydrated for 5/10 minutes in sterile physiological solution. Once it acquires the desired plasticity, it must be adapted to the grafting site; it should always be immobilized with titanium microscrews.

CLINICAL INDICATIONS

Reconstruction or corrections in non-load-bearing indications, may be used as a drug-carrier.

Even though xenogenic bone graft provide structural support to the bony defect, these biomaterials are not indicated for use in load bearing situations, unless used in combination with appropriate osteosynthesis fixation.

Tissue of origin
Heterologous cortical bone

Tissue collagen
Preserved

Physical form
Rigid dried lamina, flexible after re-hydration

Composition
100% cortical bone

Thickness
Standard: 2-4 mm
Medium Curved : 0.8-1.0 mm

Estimated re-entry time
Standard: about 8 months
Medium Curved: about 6 months

Packaging
30x30x(2-4) mm, 35x35x(0.8-1) mm

Product code
LS03SS | 1 Blister | 30x30x(2-4) mm | Porcine
LS03SE | 1 Blister | 30x30x(2-4) mm | Equine
LS10HS | 1 Blister | 35x35x(0.8-1) mm | Porcine
LS10HE | 1 Blister | 35x35x(0.8-1) mm | Equine

Scientific publications on OsteoBiol® *Lamina*
5 - 23 - 27 - 29 - 38

See literature page for more information





LM image of an OsteoBiol® *Lamina* hydrated with blood: vascularisation enhanced by the presence of the original vascular canals
Source: Courtesy of Prof Ulf Nannmark, University of Göteborg, Sweden

Semi Soft Lamina



COLLAGENATED HETEROLOGOUS CORTICAL BONE

CHARACTERISTICS

Semi-Soft Lamina is made of cortical bone of heterologous origin which undergoes a process of superficial semi-decalcification (50% vs *Soft Lamina*), nevertheless maintaining the typical consistency of the bone tissue from which it originates.

HANDLING

Semi-Soft Lamina can be shaped with sterile instruments until the desired size is reached, then it must be hydrated for 5/10 minutes in sterile physiological solution.

Once it acquires the desired plasticity, it must be adapted to the grafting site.

CLINICAL INDICATIONS

Orbital floor and wall reconstruction after trauma; may be used as a drug-carrier. Reconstruction or corrections in non-load-bearing indications. Even though xenogenic bone graft provide structural support to the bony defect, these biomaterials are not indicated for use in load bearing situations, unless used in combination with appropriate osteosynthesis fixation.

Tissue of origin
Heterologous cortical bone

Tissue collagen
Preserved

Physical form
Rigid dried lamina, flexible after re-hydration

Composition
100% cortical bone

Thickness
Fine: 1 mm

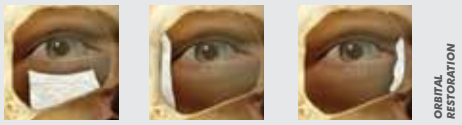
Estimated re-entry time
About 8 months

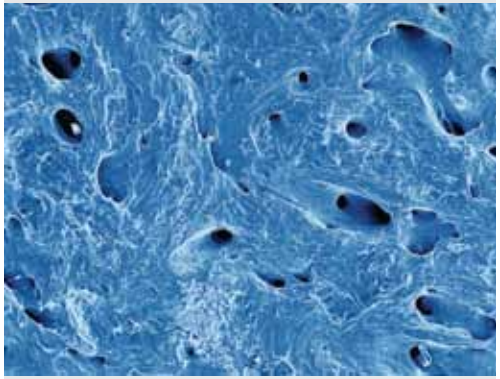
Packaging
35x35x1 mm

Product code
LS35LS | 1 Blister | 35x35x1 mm | Porcine
LS35LE | 1 Blister | 35x35x1 mm | Equine

Scientific publications on OsteoBiol® *Lamina*
5 - 23 - 27 - 29 - 38

See literature page for more information





SEM image of the surface of OsteoBiol® *Lamina* showing the presence of the original vascular canals
Source: Courtesy of Prof JL Calvo Guirado, University of Murcia, Spain

The natural Evolution of collagen membranes



Tissue of origin
Heterologous pericardium

Tissue collagen
Preserved

Physical form
Dried membrane with one smooth side and one micro-rough side

Composition
100% pericardium

Thickness
0.4 mm (±0.1 mm)

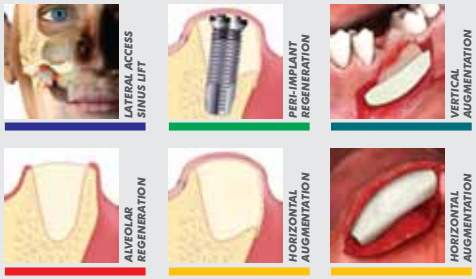
Resorption time
About 3 months

Packaging
40x40 mm, 80x60 mm

Product code
EV04LLE | 1 Blister | 40x40 mm | Equine
EV06LLE | 1 Blister | 80x60 mm | Equine

Scientific publications on OsteoBiol® *Evolution*
1 - 4 - 6 - 7 - 8 - 14 - 15 - 16 - 17 - 18 - 19 - 24
30 - 32 - 34 - 36 - 37 - 38 - 40 - 41

See literature page for more information



Evolution

HETEROLOGOUS COLLAGEN MEMBRANE

CHARACTERISTICS

Obtained from mesenchymal tissue (heterologous pericardium) the *Evolution* membrane is completely resorbable. Its structure is made of dense collagen fibers of high consistency and of extraordinary resistance that offer the specialist surgeon:

>> the maximum adaptability to bone tissue and soft tissues

>> an easy and secure suturability to nearby tissues

>> the best membrane/bone and membrane/periosteum interface

>> stability and prolonged protection of the underlying graft.

HANDLING

Membrane can be shaped with sterile scissors until the desired size is reached; it must then be rehydrated with lukewarm physiological solution.

Once it acquires the desired plasticity, it must be adapted to the grafting site.

N.B.: in case of accidental exposure, the dense collagenic matrix of *Evolution* protects the graft from infection; the membrane itself will also not be infected, allowing second intention healing.

CLINICAL INDICATIONS SUMMARY

Oral surgery and traumatology: always recommended in case of large regenerations with risks of exposure.

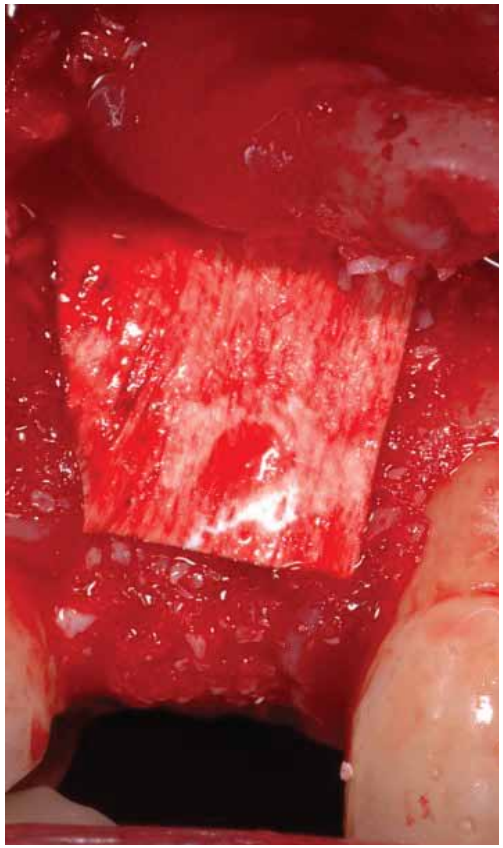
Implantology: ideal for covering antrostomy and for protection of two wall defects graft.



Source: Tecnoss® Dental Media Library



Grafting site stabilized with OsteoBiol® *Evolution*
Source: Courtesy of Dr Francesco Vedove, Bassano del Grappa, Italy



Grafting site protected with OsteoBiol® *Evolution*
Source: Courtesy of Dr Roberto Rossi, Genova, Italy



SEM image showing collagenic matrix of OsteoBiol® *Evolution*
Source: Courtesy of Nobil Bio Ricerche, Villafranca d'Asti, Italy

Porcine derma

Derma

HETEROLOGOUS MEMBRANE FOR SOFT TISSUE REGENERATION

CHARACTERISTICS

Obtained from derma of porcine origin, using an exclusive Tecnoss® process.

Their strong consistency and resistance allow a perfect stabilization and a prolonged protection of underlying graft in large regeneration procedures, together with a strong barrier action to guide the growth of epithelium and preventing its invagination.

HANDLING

Derma membrane can be shaped with scissors until the desired size is reached; then it must be hydrated for 15 minutes in sterile lukewarm physiological solution.

Once it acquires the desired plasticity, it must be adapted to the grafting site. It is always recommendable to prepare a pocket with an elevator in order to stabilize the membrane in the site after stitching the flaps.

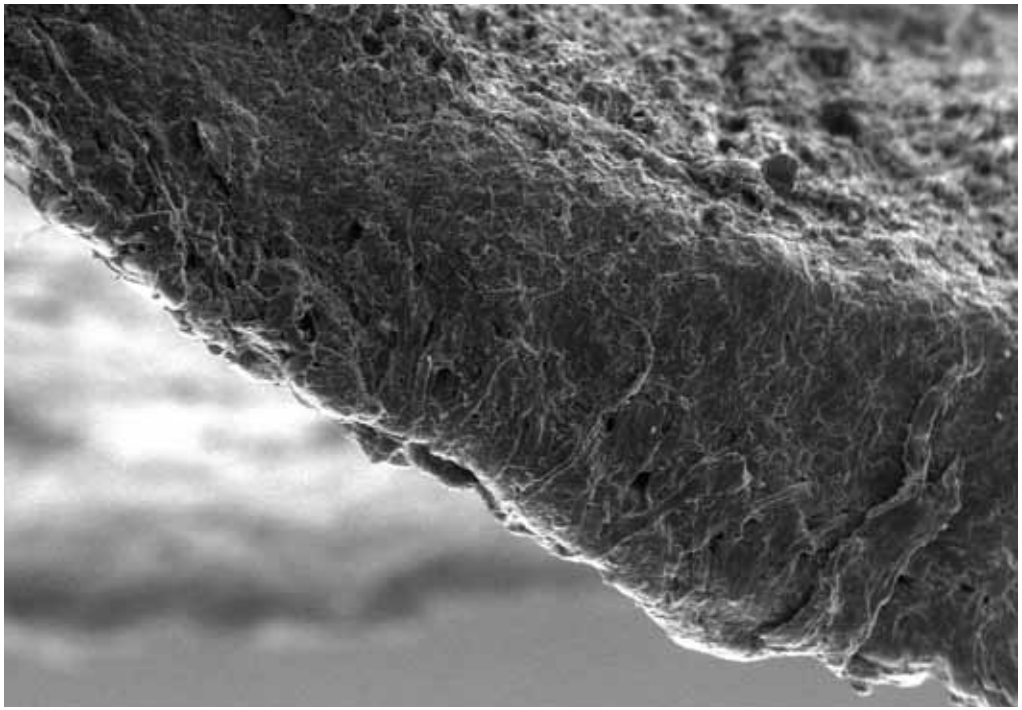
If this is not possible, the membrane can be stitched with envelope sutures which bridle it with the gingival flaps.

N.B.: if *Derma* membrane, for any reason, shows dehiscences (for example in the secondary tearing of flaps) it must absolutely not be removed, because its plasticity and consistency is such as to allow it to achieve a complete second intention healing of the wound, because of the physiological sliding of the flaps.

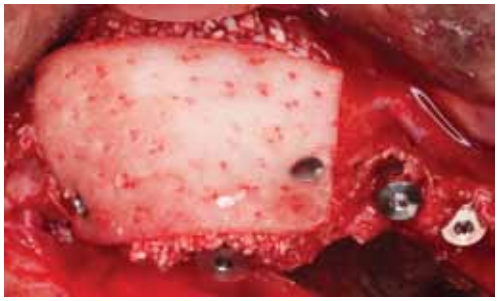
CLINICAL INDICATIONS

Oral surgery and traumatology: stabilization and protection of large regenerations with risk of exposure.

Implantology: protection of two wall defects graft, thin biotype soft tissue augmentation.



SEM image of OsteoBiol® *Derma*
Source: Politecnico di Torino, Italy



OsteoBiol® *Derma* grafted
Source: Courtesy of Dr. Antonio J. Murillo Rodriguez, Eibar, Spain



OsteoBiol® *Derma* grafted
Source: Courtesy of Dr. Juan M. Aragoneses Lamas, Madrid, Spain



Tissue of origin
Porcine derma

Tissue collagen
Preserved

Physical form
Dried membrane

Composition
100% derma

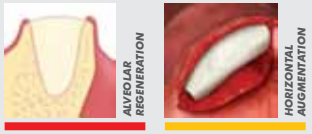
Thickness
Fine: 1.0 mm
Standard: 2.0 mm

Estimated resorption time
Fine: about 3 months
Standard: about 4 months

Packaging
Fine: 50x50 mm
Standard: 30x30 mm, 50x50 mm

Product codes

ED05FS	1 Blister	Fine	50x50x1 mm	Porcine
ED03SS	1 Blister	Standard	30x30x2 mm	Porcine
ED05SS	1 Blister	Standard	50x50x2 mm	Porcine



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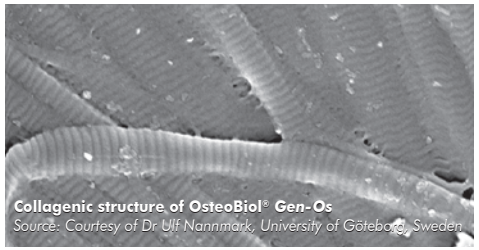
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Collagenic structure of OsteoBiol® Gen-Os
Source: Courtesy of Dr Ulf Nannmark, University of Göteborg, Sweden

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Tecnoss® develops and produces biomaterials of animal origin to obtain Medical Devices of new conception, providing a valid and innovating aid to the surgeon and a clinical benefit to the patient.

Materials are manufactured under a new technology that conditions animal tissues in order to neutralize the antigenic components present in animal bony tissues (achievement of biocompatibility) and allows development of products unique in their kind, capable of satisfying every surgical need.

Tecnoss® biomaterials provide excellent healing results thanks to an active colonization of the receiving site by patient's cells and therefore favor the process of restitutio ad integrum of injured tissues.

The raw material from which Tecnoss® obtains its products comes from Italian animal farms, selected and certified under the strict control of the Italian National Veterinary Health Service.

The biological matrix from which the Tecnoss® Medical Devices product line is derived has been subjected to a series of biological and histocompatibility tests carried out on both animal and human tissues showing the perfect and complete bioavailability and biocompatibility of the products (ISO 10993 certification compliant).

Clinical studies with histological reports published on international scientific journals confirm results achieved and therefore the quality of the production.

Tecnoss® biomaterials are manufactured in conformity with European Directive 93/42/EEC (amended by 2007/47/EEC) and Commision Directive 2003/32/EEC. Italian Istituto Superiore di Sanità (ISS) is the Notified Body (0373) for CE mark of Tecnoss® Medical Devices.

All Tecnoss® Products are sterile and for single use. Sterilization is performed with gamma rays and is periodically checked; expiration date is 60 months from date of production.

CE 0373 NOTIFIED BODY

Tecnoss® products comply with the highest quality standards such as ISO 13485, 93/42/EEC (amended by 2007/47/EEC) **and 03/32/EEC**

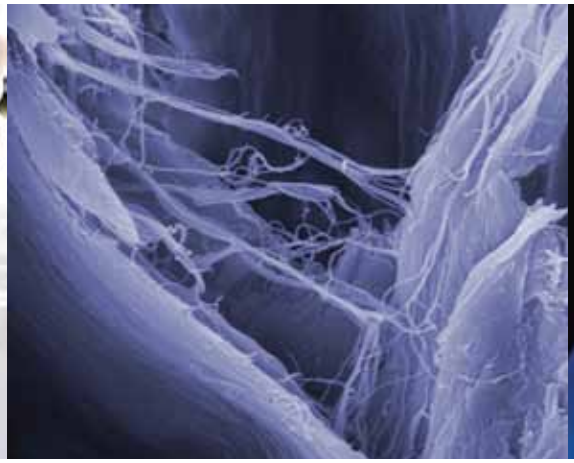


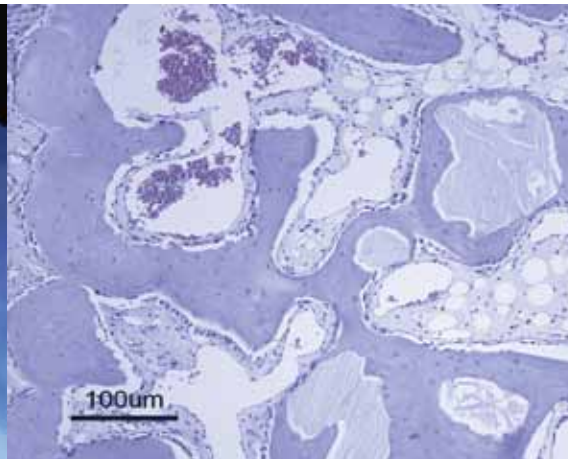


Product codes | OMFS

PRODUCT	PACKAGING	TYPE	SIZE	PORCINE CODE	EQUINE CODE	BOVINE CODE
mp3 600-1000	1 Syringe	BONE MIX	2.0cc	A3010FS	A3010FE	
mp3 1000-2000	1 Syringe	BONE MIX	2.0cc	A3210FS	A3210FE	
Putty	1 Syringe	BONE PASTE	1.0cc	HPT61S	HPT61E	
Apatos Mix 1000-2000	1 Vial	GRANULES	1.0g	A0210FS	A0210FE	
Sp-Block	1Blister	NORM	10x10x10mm		BN0E	
Sp-Block	1Blister	NORM	10x10x20mm		BN1E	
Sp-Block	1Blister	NORM	10x20x20mm		BN2E	
Sp-Block	1Blister	NORM	35x10x5mm			BN8B
Sp-Block CURVED	1 Blister	HARD	35x10x5mm			BH355B
Dual-Block CURVED	1 Blister	SOFT	20x15x5mm	STS7S		
Dual-Block	1 Blister	NORM	20x15x5mm			STN4B
Dual-Block CURVED	1 Blister	NORM	20x10x5mm			STN5B
Dual-Block CURVED	1 Blister	NORM	20x20x5mm			STN6B
Soft Cortical Lamina	1 Blister	DRIED / STANDARD	30x30x(2.0-4.0)mm	LS03SS	LS03SE	
Cortical Lamina	1 Blister	DRIED / SEMI-SOFT	35x35x(1.0)mm	LS35LS	LS35LE	
Curved Lamina	1 Blister	DRIED / MEDIUM	35x35x(0.8-1.0)mm	LS10HS	LS10HE	
Evolution	1 Blister	DRIED / FINE	40x40x(0.3-0.5)mm		EV04LLE	
Evolution	1 Blister	DRIED / FINE	80x60x(0.3-0.5)mm		EV06LLE	
Derma	1 Blister	DRIED / FINE	50x50x(0.8-1)mm	ED05FS		
Derma	1 Blister	DRIED / STANDARD	30x30x(2.0)mm	ED03SS		
Derma	1 Blister	DRIED / STANDARD	50x50x(2.0)mm	ED05SS		

OsteoBiol®
by Tecnoss



Tecnoss s.r.l. is an innovative, globally active company that develops, produces and documents premium-quality xenogenic biomaterials by the brands Tecnoss® and OsteoBiol®.

Its 15 years of research led to its patent-protected production process that ensures neutralization of antigenic components in order to achieve biocompatibility while preserving the natural collagen matrix inside the biomaterial.

Tecnoss® products comply with highest quality standards such as ISO 13485 (notified body TÜV Rheinland), 93/42/EEC (amended by 2007/47/EEC) and 03/32/EEC (notified body CE 0373).

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