Bone tissue augmentation

BIOHORIZONS® biologics

SynMax® bone graft substitute and PermaPro® membrane – 100 % synthetic

Benelux
Valid from October 2021

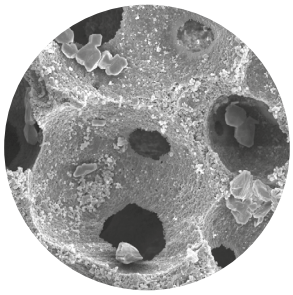
Inspiring excellence in oral reconstruction

biohorizons camlog

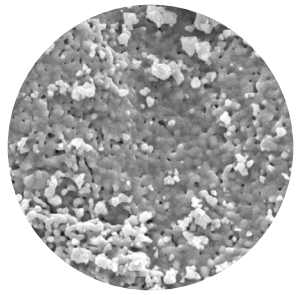
SEM analysis and histological structure of SynMax®

Physicochemical properties of suitable bone grafts

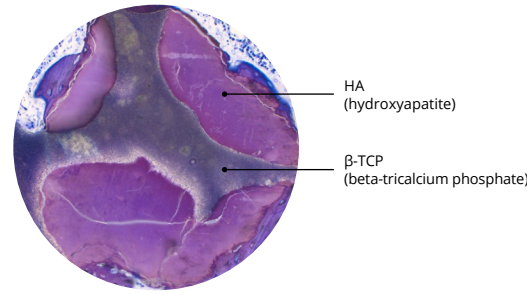
SEM analyses of SynMax® demonstrate a very rough surface and a matrix of interconnected pores with a very high porosity of approx. 80 %. The interconnected pores of SynMax® provide an ideal network of cavities for the ingrowth and migration of cells and blood vessels, thus promoting the formation of new vital bone.



SEM picture of SynMax® at 100-fold magnification, showing macroporous structure.



SEM picture of SynMax® at 1000-fold magnification, showing microporous structure.

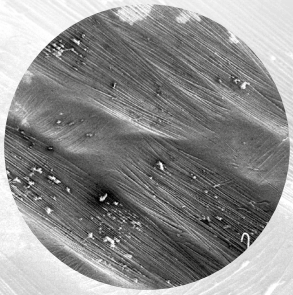


Histological structure of SynMax® – homogenous bi-phasic composition
60 % hydroxyapatite (HA) and
40 % beta-tricalcium phosphate (β-TCP).
Every particle is composed of HA and β-TCP.

SEM analysis of PermaPro®

Engineered for open healing

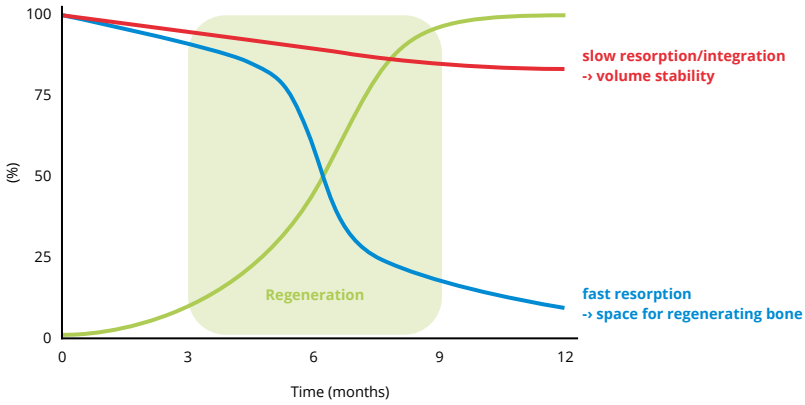
Impervious to bacteria: dense structure, reduced bacterial attachment, efficient barrier against bacterial and cellular penetration



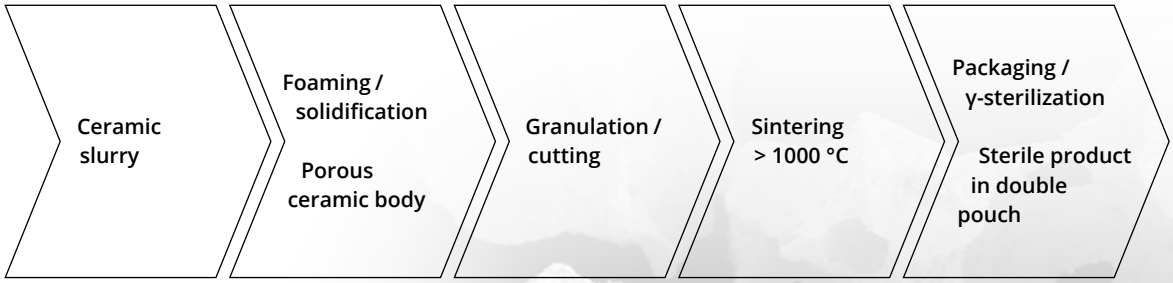
SEM picture of PermaPro® at 30-fold magnification.

Bi-phasic composition of SynMax® ensures controlled resorption

SynMax® acts as a temporary, osteoconductive scaffold and is gradually replaced by new bone as part of the natural remodelling process.



Manufactering process of SynMax® – 100 % synthetic bone graft substitute



SynMax® and PermaPro® – synthetic alternatives

SynMax® – osseous integration with following controlled resorption [1, 2]

Commonly used bone substitutes are human bone, i.e. autografts or allografts, bone material from other species or synthetic materials. While autografts are considered the "gold standard" with regard to biocompatibility their use is hampered by concomitant donor site pain and morbidity and volume limitations of how much material can be harvested. Therefore, considerable efforts are made to investigate the use of materials from alternative sources and to develop techniques that do not rely on harvesting autogenous bone but do in result in sufficient bone formation within a short time frame.

SynMax® is a fully synthetic, safe and biocompatible material that, when brought into an osseous environment, serves as an osteoconductive scaffold to support the ingrowth and fusion of adjacent, vital bone. SynMax® is composed of 60 % hydroxyapatite and 40 % beta-tricalcium phosphate. After implantation, the material undergoes a natural remodeling and is gradually resorbed and replaced by new bone.

PermaPro® – high-density PTFE barrier membrane

PermaPro® is an exceptionally thin, non-resorbable, biologically inert and biocompatible membrane made of high-density polytetrafluoro-ethylene (PTFE). PermaPro® maintains its structural characteristics both during the initial implantation and over the whole healing time. Due to its dense structure, the membrane acts as an efficient barrier against bacterial and cellular penetration, and may therefore be left in place for open healing in certain indications.

The use of PermaPro® is especially recommended for regeneration of bone defects outside the ridge contour because it offers a higher stability and superior space-maintaining properties compared to resorbable (collagen) membranes. In addition, open healing with PermaPro® in socket or ridge preservation enables maintenance of the soft tissue architecture and contours since no primary wound closure is required. Due to the missing flap closure, the mucogingival line will not be displaced and the attached/keratinized gingiva will be preserved.

Product properties of SynMax® and PermaPro®

SynMax® – synthetic resorbable bone graft substitute

- 100 % synthetic, no risk of disease transmission, high safety
- Controlled resorption due to biphasic composition
- Very rough surface and high porosity supports integration and bone formation

PermaPro® – synthetic non-resorbable PTFE membrane

- 100 % synthetic PTFE barrier membrane
- Ultra-thin (~0.08 mm)
- Impervious to bacteria due to dense structure
- Easily removable due to minimal tissue ingrowth into the surface structure
- No need for primary soft tissue closure (indication-dependent) [3, 4]
- Easy recovery thanks to blue color
- Rounded edges for minimal tissue trauma
- Easy fixation with sutures or pins

SynMax® is also extremely suitable for use in combination with platelet concentrates/L-PRF, since its material characteristics allow excellent binding and release kinetics of signaling molecules/growth factors.

Ideal for the following indications – regeneration and augmentation

The aim of any tissue regeneration technique, and bone grafting in particular, is to achieve formation of living and reactive tissue able to undergo a sustained state of remodelling to maintain the mechanical and the biologic function over time. The use of bone augmentation techniques is frequently required prior to the placement of dental implants under unfavourable local conditions when the native bone volume is insufficient, for example following bone atrophy, periodontal disease, tooth extraction, or trauma.

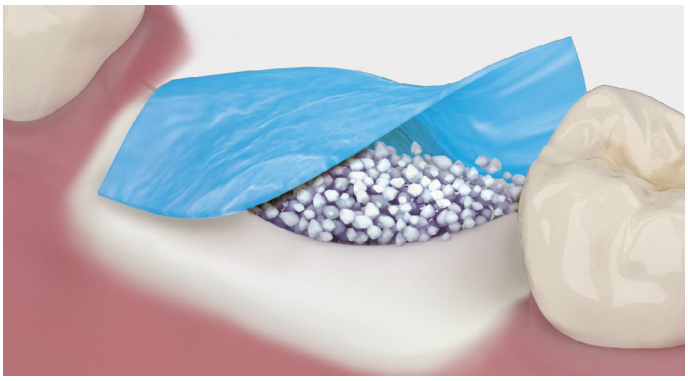
SynMax® – synthetic resorbable bone graft substitute

- Sinus lift
- Ridge augmentation
- Intraosseous defects
- Extraction sockets
- Osseous defects
- Furcation defects

PermaPro® – synthetic non-resorbable PTFE membrane

PermaPro® is a temporarily implantable membrane for use as a space-creating barrier in GBR and GTR.

- Socket and ridge preservation (open healing)
- Horizontal/vertical ridge augmentation
- Fenestration and dehiscence defects
- Intraosseous defects (1 to 3 walls)



Regeneration of extraction sockets
Filling the socket with SynMax® in combination with PermaPro® membrane regenerates bone and so retains the volume and shape of the bone over time.

Regeneration of periodontal osseous defects
A tooth with a good prognosis can be retained by regenerating lost bone, with the support of biomaterials such as SynMax® in combination with PermaPro® membrane.

Preference for PermaPro® over a collagen membrane

- Higher form stability
- Augmentation outside the ridge contour
- Synthetic nature – no religious or dietary conflicts
- Exposure – situations where primary wound closure is not desired (indication dependent)

Safe and reliable synthetic alternative to bone material – respectively membranes from other species [1–5]

High patient acceptance

- Due to the synthetic nature, any risk of disease transmission is eliminated.
- Alternatives if a patient has ethical or safety concerns with the application of allogeneic or xenogeneic materials.
- If a resorbable bone grafting material is preferred (e. g. young patients).

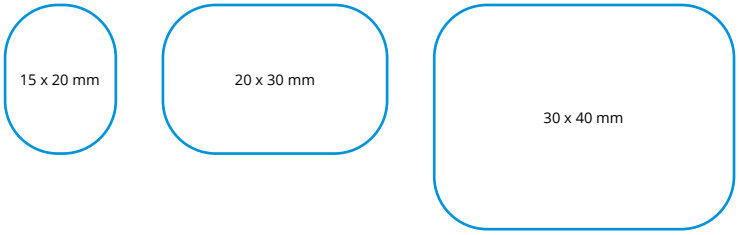
Ordering information

SynMax® (synthetic bone substitute)

Art. No.	Volume	Particle size
BM1013.1005	0.5 cm^3	500–1000 µm
BM1013.1010	1.0 cm^3	500–1000 µm
BM1014.1005	0.5 cm^3	800–1500 µm
BM1014.1020	2.0 cm^3	800–1500 µm

PermaPro® (synthetic PTFE membrane)

Art. No.	Product size
BM2005.1520	15 x 20 mm
BM2005.2030	20 x 30 mm
BM2005.3040	30 x 40 mm



References

[1] Binderman et al. Haim Tal, IntechOpen. April 4th 2012.
[2] Jelusic et al. Clin Oral Implants Res. 2017 Oct;28(10):e175-e183.
[3] Zafiropoulos et al. Medicina (Kaunas). 2020 Apr 28;56(5):216.
[4] Papi et al. Antibiotics (Basel). 2020 Mar 3;9(3):110.
[5] Lorenz et al. Int J Implant Dent. 2017 Sep 5;3(1):41.

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