



# BEGO BIOMATERIALS

When the result counts

Partners in Progress



## Challenge what exists – get the right answers

We practise systematic thinking with a passion – and we are never satisfied with the status quo. We combine indication-appropriate implant dentistry products, an innovative implant design, compatible system abutments, a safe biomaterial system and functionally optimised guided surgery.

### A system is perfect if all its components work together in harmony

With our feeling for what is needed and a keen eye for what is possible, when developing our solutions we ask how can planned and reproducible results be achieved?

### The right solution in regeneration

We have a deep understanding of the diverse demands placed on biomaterials and our range of biomaterial products offers you the right solution to meet your expectations and the specific requirements of your treatment concepts.

### BEGO

BEGO is a globally active, medium-sized company that provides premium products.

Making the future possible together.

## Contents

<b>Intro</b>	<b>2</b>
<hr/>	
BEGO OSS	4
BEGO OSS S	6
Discover Osseointegration	8
BEGO Collagen Membrane	10
BEGO Collagen Fleece	12
<hr/>	
More Information	14
<hr/>	



BEGO Biomaterials

RELIABLE

SERVICE

INNOVATIVE

COST EFFECTIVE

SUCCESSFUL

TESTED

AESTHETICS

FUNCTION

ECONOMIC

PRACTICAL

UNCOMPLICATED

ESTABLISHED

FUNCTION

GENTLE

LONG-LIVED

COMFORT

ERGONOMIC

PARTNERSHIP

SAFETY

## BEGO OSS

Thermal transformation processes applied to natural bovine bone material produce the clinically important bone graft material BEGO OSS.

Osteoblasts use BEGO OSS as a structured scaffolding during bone regeneration. BEGO OSS is not resorbable and forms a tight osteoceramic interlocking with the newly formed bone that is stable over the long term.

### Tip

Do not compress BEGO OSS into the defect because a loose interlocking of the particles leaves space for bone regeneration and vascularisation. Autologous bone chips can be mixed in and have a positive effect on the regeneration outcome. A healing phase of at least 6 months is recommended.

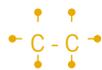
### Processing

In a high-temperature procedure the bovine bone material is transformed into its ceramic mineral phase. This removes all the organic components, achieving ideal protection against disease transmission and allergic reactions.

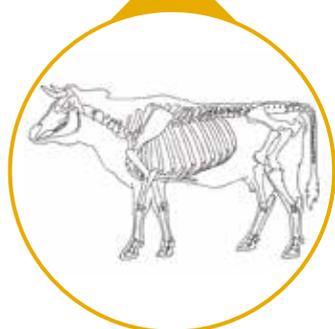
The high temperatures produce a solid network of apatite crystals and the very high mechanical strength of BEGO OSS.



1250°C



organic phase



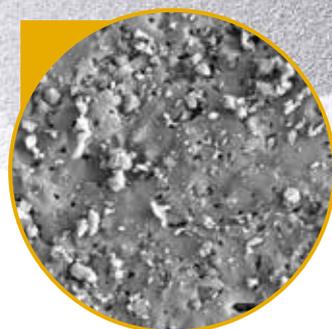
### Surface topography

The nanopore surface of BEGO OSS allows adhesion of proteins for immediate biological conditioning. As a result, osteoblasts can form new bone matrix with direct contact with the conditioned surface.

### The natural bone architecture

The open-pored trabecular architecture that is obtained corresponds to the structure of human bone. The macroporous structure allows unimpeded migration of bone cells and ingrowth of blood vessels and enables complete bone fusion with BEGO OSS.

Micropores for strong capillary forces



**Stable volume**

The natural trabecular architecture of BEGO OSS integrates into the newly formed bone and remains in place as scaffolding.

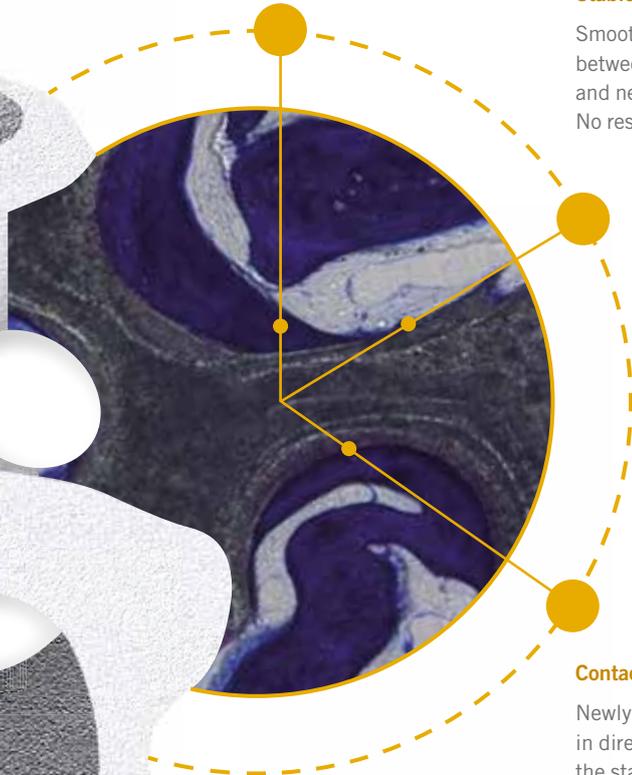


**Space for vascularisation and remodelling**

The medullary cavity can be accessed by blood vessels. Mature lamellar bone and immature woven bone bear witness to successful regeneration.

**Stable integration**

Smooth interface between BEGO OSS and new bone. No resorption lacunae.

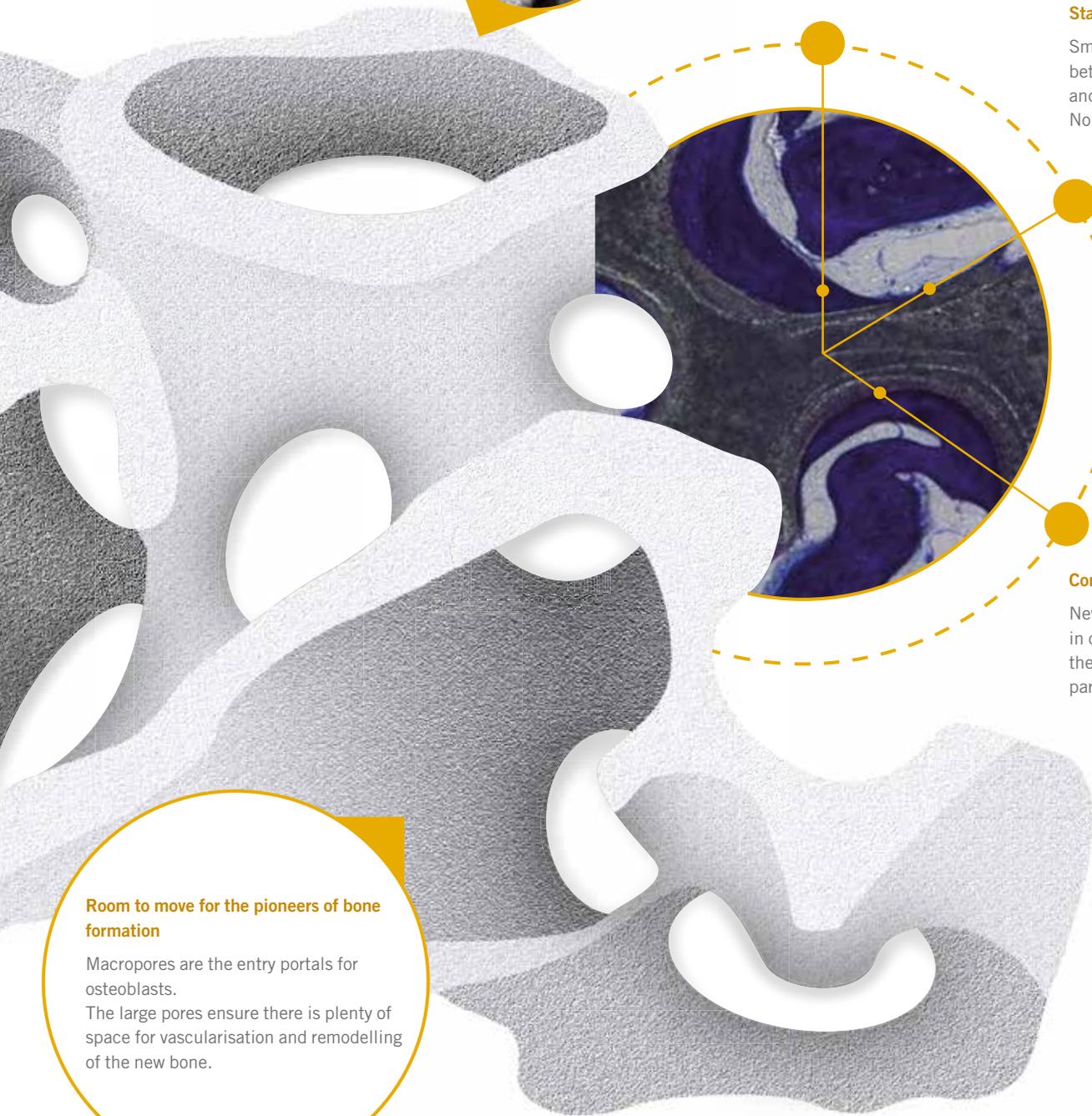


**Contact osteogenesis**

Newly formed bone is in direct contact with the stable BEGO OSS particles.

**Room to move for the pioneers of bone formation**

Macropores are the entry portals for osteoblasts. The large pores ensure there is plenty of space for vascularisation and remodelling of the new bone.



## BEGO OSS S

A range of materials are used in the development of alloplastic bone graft materials. Their properties and how they are processed contribute to the specific characteristics of the various bone graft materials. BEGO OSS S is a combination of two suitable materials

and creates a balance between the favourable influence of  $\beta$ -tricalcium phosphate on regeneration and the long-term scaffold function of hydroxyapatite for the newly formed bone.

### Tip

Autologous bone chips can be mixed together with BEGO OSS S and have a positive effect on the regeneration time and the new bone volume.

A healing phase of at least 5 months is recommended.

### Processing

BEGO OSS S is produced in a process chain of foaming and solidification from the two phases hydroxyapatite (HA) and  $\beta$ -tricalcium phosphate ( $\beta$ -TCP).

Granulation

Forming and solidification

Foaming



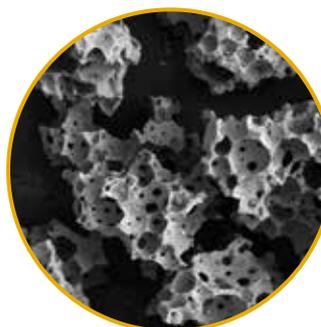
60%  
HA

40%  
 $\beta$ -TCP

### Morphological design

The design of BEGO OSS S is adapted to the natural cancellous architecture of the bone. The slow resorption profile of BEGO OSS S requires an open network of pores that allows the inward migration of osteoblasts.

By adapting the design to the structure of the bone, all the morphological requirements for a slowly resorbing bone graft material are met to ensure successful bone regeneration.



### Interconnectivity in the pore system

The macroporous matrix is one of the building blocks for good osteoconductive function of BEGO OSS S. It enables migration of osteoblasts into the material as well as the new growth of blood vessels.

### Contact osteogenesis

New bone is formed in direct contact with BEGO OSS S. The integration of BEGO OSS S into the new bone coordinates with the slowly progressing resorption process.

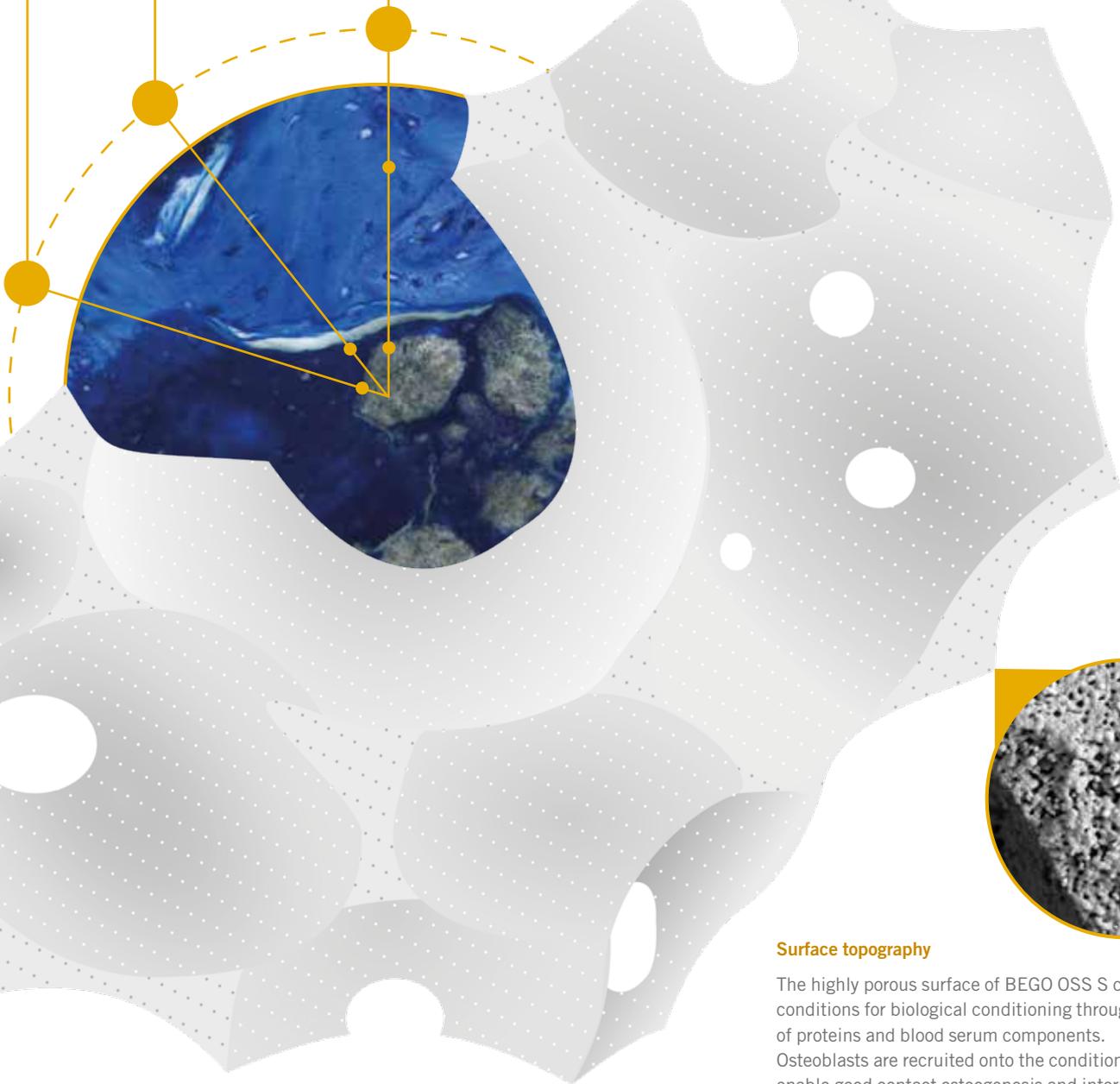


### Remodelling

The resorption process of BEGO OSS S during bone maturation creates the space for functional adaptation of the bone to new loads. Remodelling in the new bone can proceed unimpeded.

### Resorption and volume stability

The rapid release of  $\beta$ -TCP has a favourable effect on bone regeneration. The HA creates the long-term volume stability of BEGO OSS S. The newly formed bone volume is maintained during bone maturation as a result.



### Surface topography

The highly porous surface of BEGO OSS S creates the right conditions for biological conditioning through the adhesion of proteins and blood serum components. Osteoblasts are recruited onto the conditioned surface and enable good contact osteogenesis and interpenetration of BEGO OSS S with living bone.

There is a steady equilibrium in the bone between synthesis, migration and resorption. In situations where this equilibrium is disrupted, restrictions develop or there is loss of function.

This leads to life-style changes and a reduction in the quality of life.

## Haemostasis

- Blood enters the wound space
- Molecules are released
- The surfaces of the materials bind important molecules

## Inflammation

- A fibrin network stops the bleeding and embeds the material
- Blood vessels grow into the matrix
- Migrating cells interact with the materials



The regeneration potential of the bone forms the foundation of implant dentistry. The loss of tissue structure can be compensated for using regenerative methods and materials and is an important component in the restoration of function and aesthetics.



## Regeneration

- The equilibrium between synthesis and resorption develops in the regenerated bone
- The implanted materials can form part of the regenerated bone structure or be integrated into the natural remodelling process of the bone
- The regenerated bone structure now serves to restore the function

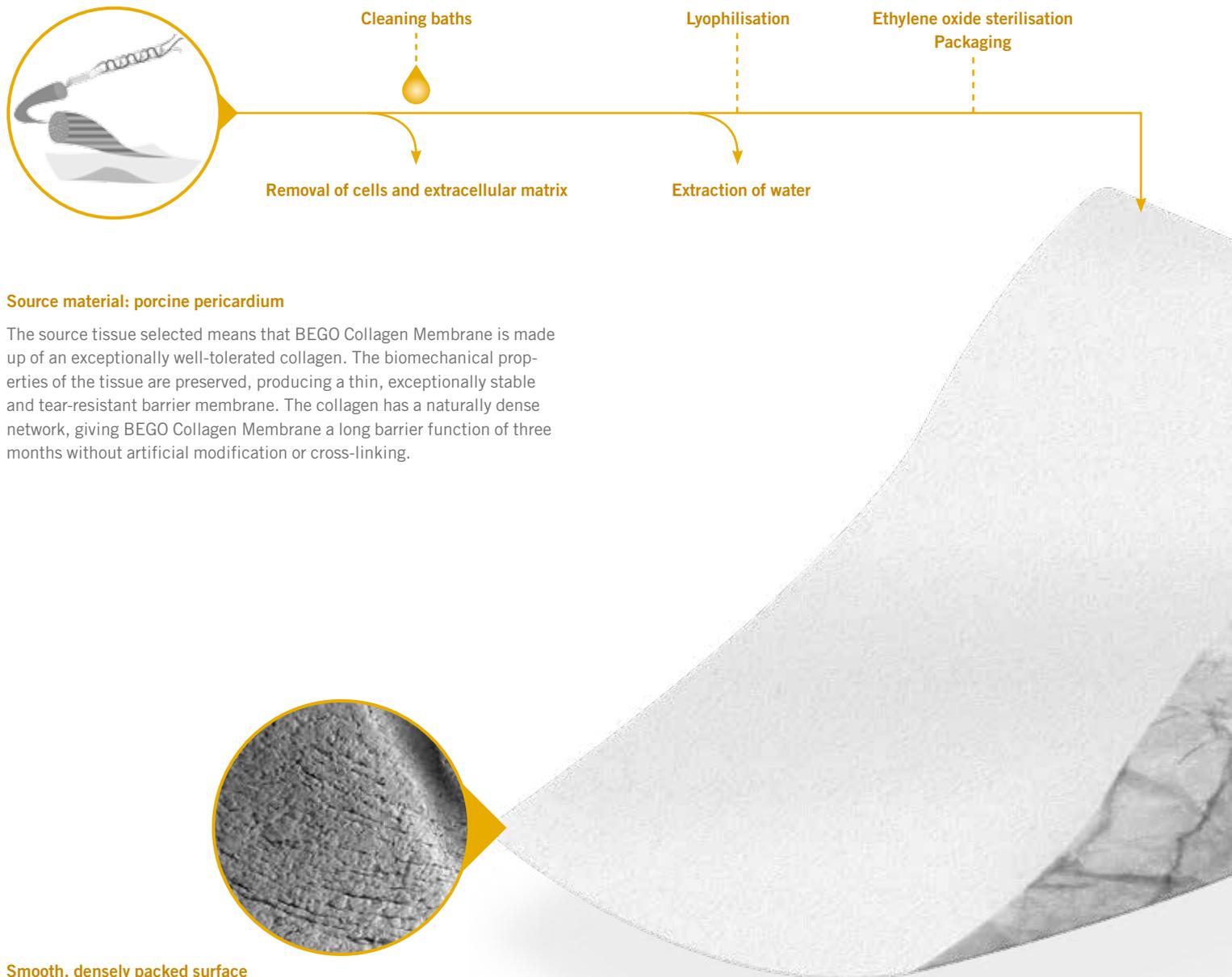
## Proliferation

- Osteoblasts migrate to the material surface
- Formation of new bone matrix begins
- The immature bone matures to form its functional structure

## BEGO Collagen Membrane

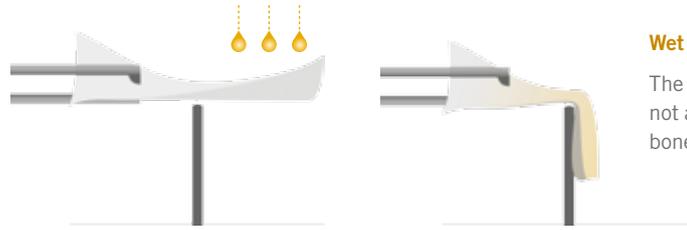
Collagen membranes are widely used in implant dentistry. Highly conserved throughout evolution, xenogeneic collagen is very similar to that of humans and is tolerated exceptionally well as a rule. The various membranes differ in several important features and the donor species, the source tissue and the network of collagen

fibres all determine the character of the individual membranes. BEGO Collagen Membrane has the tear-resistant, stable character of the pericardium. The native collagen of the pericardium and its arrangement give the membrane its long barrier function and good tolerability.



### Dry – stable and tear resistant

Either cut and apply the membrane dry or wet it before applying.

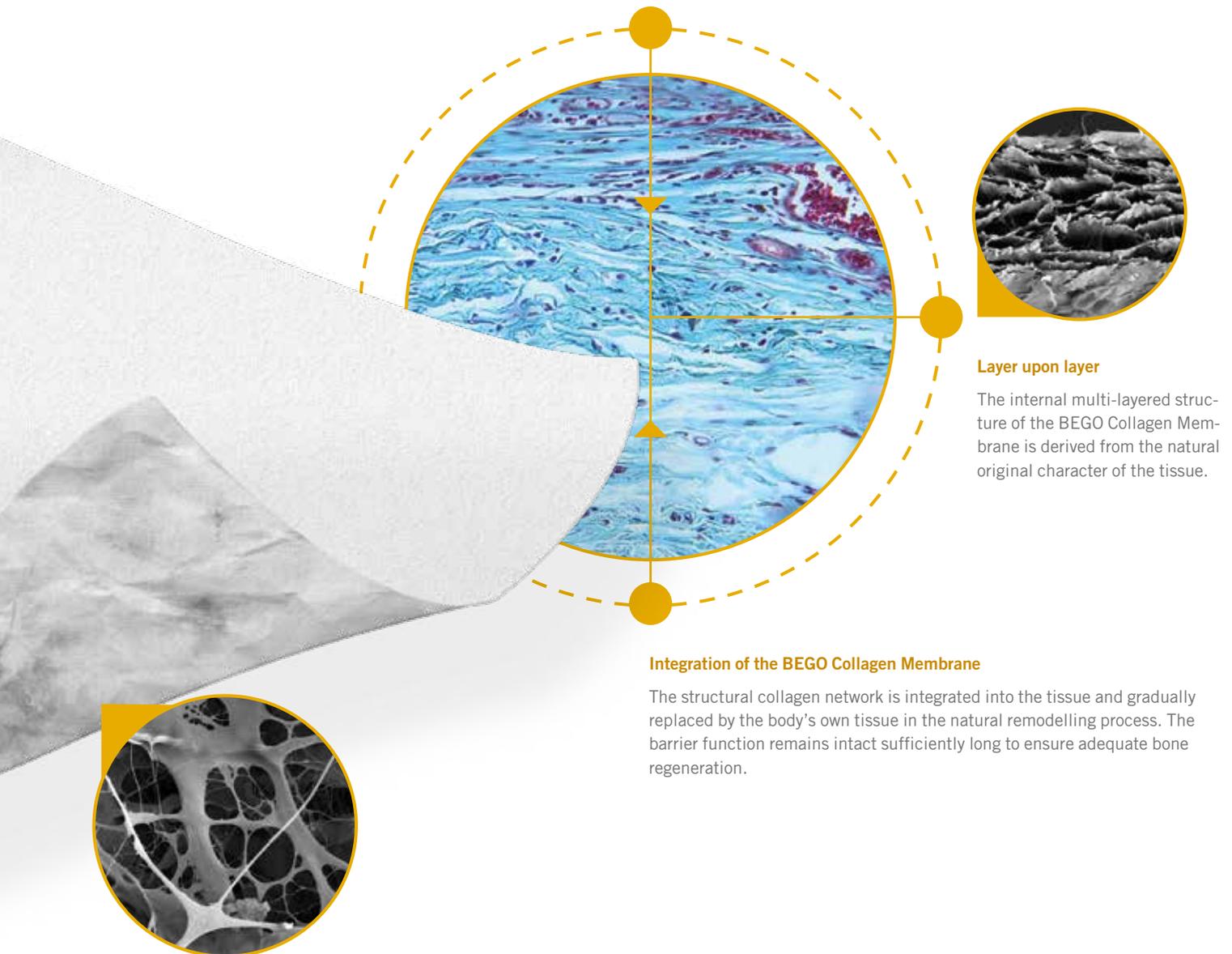


### Wet – supple and adhesive

The wetted BEGO Collagen Membrane does not adhere to itself but does adhere to the bone surface.

### Implant bed with BEGO Collagen Membrane

The membrane body can be detected histologically 8 weeks after implantation and is integrated free of inflammation into the tissue. New blood vessels penetrate through the implant bed.

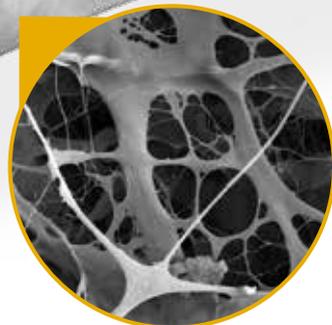


### Layer upon layer

The internal multi-layered structure of the BEGO Collagen Membrane is derived from the natural original character of the tissue.

### Integration of the BEGO Collagen Membrane

The structural collagen network is integrated into the tissue and gradually replaced by the body's own tissue in the natural remodelling process. The barrier function remains intact sufficiently long to ensure adequate bone regeneration.



### Porous surface profile – a complex collagen matrix

The open woven structure of the collagen fibres encourages the penetration of the osteoblasts into the membrane body.

## BEGO Collagen Fleece

In the area of collagen products the focus tends to be on barrier membranes. However, collagen is also used as a short-term matrix that combines the haemostatic action of collagen with stabilisation of the blood clot. BEGO Collagen Fleece is one such effective

haemostyptic. As a stabilising matrix, it supports the clot in the initial steps of wound healing and is completely resorbed after two to four weeks.



### Collagen matrix from xenogeneic dermis

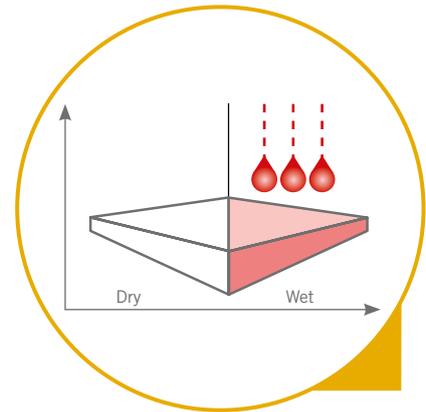
BEGO Collagen Fleece is derived from the connective tissue of xenogeneic dermis. The tissue is cleaned and any non-collagenous proteins and cells are removed in the process. The collagen is converted to the open-pored fleece structure by grinding, soaking and lyophilisation.

Cleaning baths

Lyophilisation

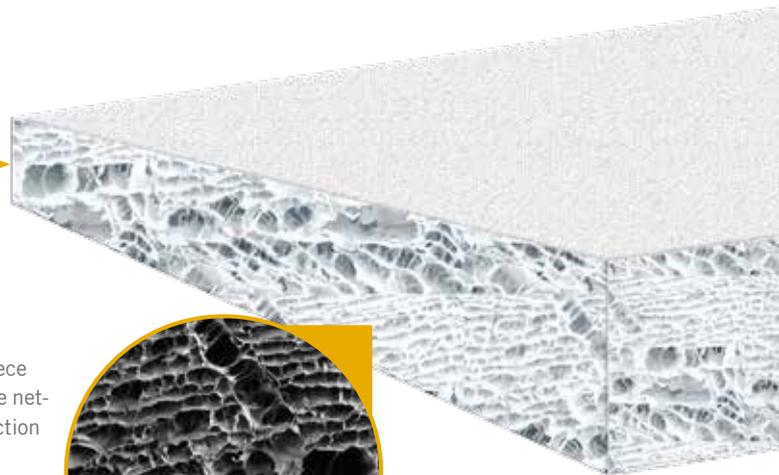
Gamma sterilisation

Packaging



### Dimensionally stable short-term matrix

BEGO Collagen Fleece absorbs many times its own weight in liquid, remaining dimensionally and structurally stable without changing its size.



### Native collagen in porous fleece structure

BEGO Collagen Fleece is an open-pored fleece matrix made of native collagen. The delicate network of collagen fibres has a haemostatic action and stabilises the blood clot.

### Tip

#### Cut dry

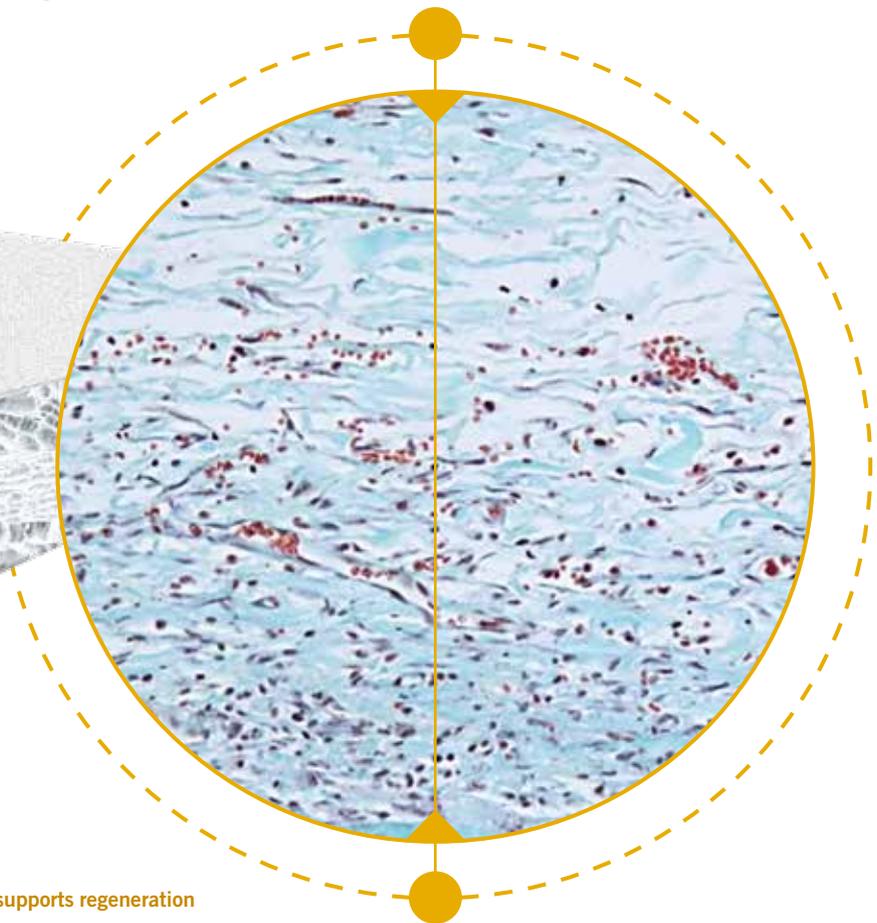
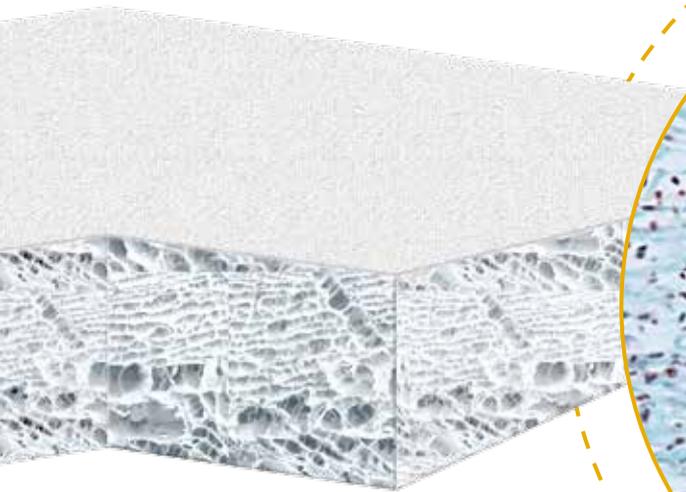
Adapt the fleece to the size of the defect while dry and then apply. The BEGO Collagen Fleece absorbs many times its own weight in blood *in situ* and forms a highly viscous gel that stabilises the wound space. When the BEGO Collagen Fleece is wet, it develops into a pressure-sensitive gel form.

### ***In situ haemostatic***

The collagen acts as a haemostyptic agent, encouraging the aggregation of platelets and the secretion of signalling molecules that lead to haemostasis and the formation of a stable blood clot. In small bone defects, which determine the shape, BEGO Collagen Fleece maintains and stabilises the blood clot during the early stages of healing.

### **Regeneration and enzymatic breakdown**

The delicately interwoven collagen network of BEGO Collagen Fleece stabilises the blood clot. Cells migrate into the matrix, blood vessels enter the wound space and new tissue matrix is formed. BEGO Collagen Fleece is completely broken down after two to four weeks by specific collagenases.



### **The short-term matrix supports regeneration**

In the implant bed BEGO Collagen Fleece serves as a densely interwoven, highly vascularised collagen matrix 14 days after surgery.

## FURTHER INFORMATION

### BEGO Biomaterials

#### Specifications

Description	REF	Size	Contents
<b>BEGO OSS</b> Bovine bone graft material	57212	0.5–1.0 mm	0.5 ml
	57213	0.5–1.0 mm	1.0 ml
	57214	0.5–1.0 mm	3.0 ml
	57215	1.0–2.0 mm	2.0 ml
	57216	1.0–2.0 mm	5.0 ml
<b>BEGO OSS S</b> Synthetic bone graft material	57217	0.5–1.0 mm	0.5 ml
	57218	0.5–1.0 mm	1.0 ml
	57219	0.8–1.5 mm	2.0 ml
<b>BEGO Collagen Fleece</b> Short-term regeneration matrix	57220	20 × 20 mm	12
<b>BEGO Collagen Membrane</b> Pericardium-derived barrier membrane	57221	15 × 20 mm	1
	57222	20 × 30 mm	1
	57223	30 × 40 mm	1



The full literature collection is available here.

**Therapeutic indications**

Major augmentations	Minor augmentations	Sinus floor elevation	Periodontal defects	Peri-implant defects	Extraction sockets
	✓		✓	✓	✓
	✓		✓	✓	✓
✓		✓			
✓	✓	✓			
✓		✓			
	✓		✓	✓	✓
	✓		✓	✓	✓
✓	✓	✓			
		✓	✓	✓	✓
	✓		✓	✓	✓
✓	✓	✓		✓	✓
✓		✓			





[www.bego.com](http://www.bego.com)

**BEGO Implant Systems GmbH & Co. KG**  
Wilhelm-Herbst-Str. 1 · 28359 Bremen, Germany  
Tel. +49 421 2028-246 · Fax +49 421 2028-265  
Email [info@bego-implantology.com](mailto:info@bego-implantology.com) · [www.bego.com](http://www.bego.com)