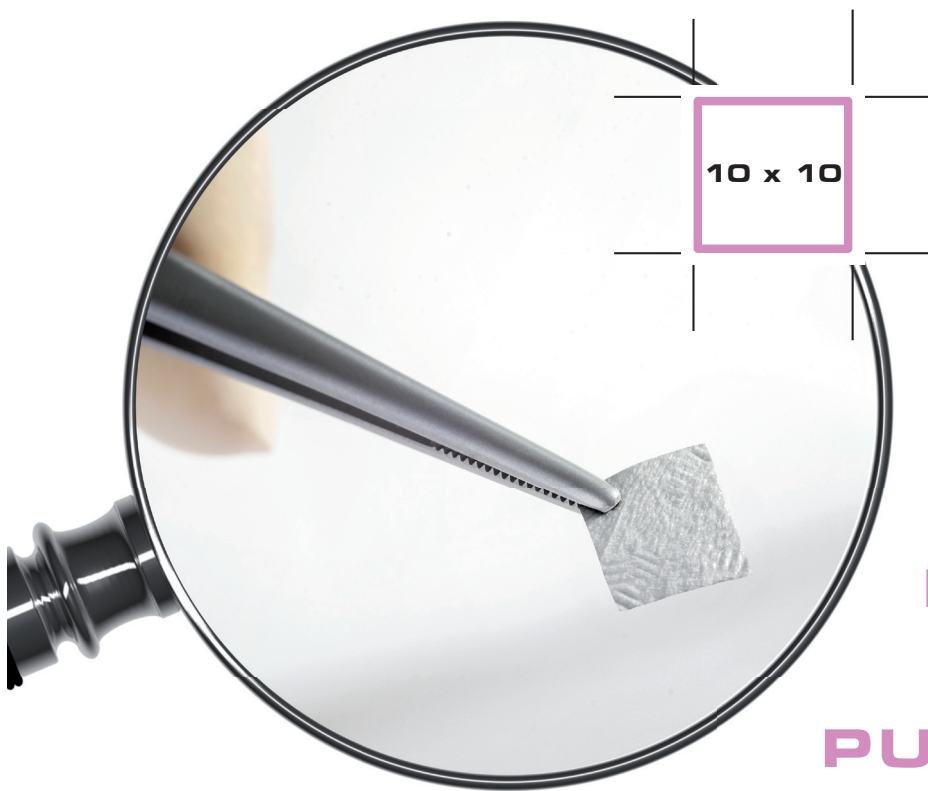


# SMARTBRANE

Resorbable Pericardium Membrane



**NEW!**  
**THE SMALLEST**  
**MEMBRANE**  
**10 x 10 mm**

**SIMPLE**

**RELIABLE**

**PURE**

**MORE ECONOMIC**

**NEW!**



10 x 10 mm



15 x 20 mm



20 x 30 mm



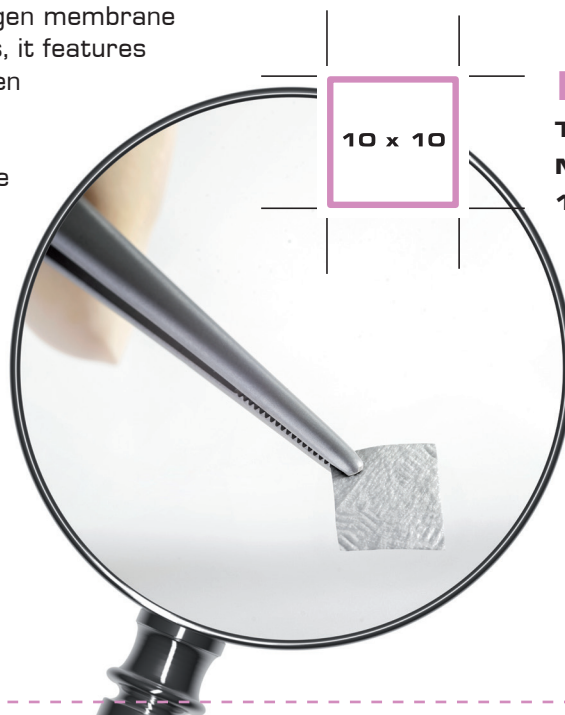
30 x 40 mm

## MORE ECONOMIC

10 x 10 mm – big enough to cover small defects

SMARTBRANE is a resorbable collagen membrane made from porcine pericardium. Thus, it features all benefits of a modern native collagen membrane.

In addition to the standard membrane sizes, it is available in a mini format of 10 x 10 mm. This offers a more economic membrane solution especially for regeneration of small bone defects optimizing your cost-benefit structure.



10 x 10

**NEW!**  
**THE SMALLEST  
MEMBRANE  
10 x 10 mm**

**B**

## SIMPLE

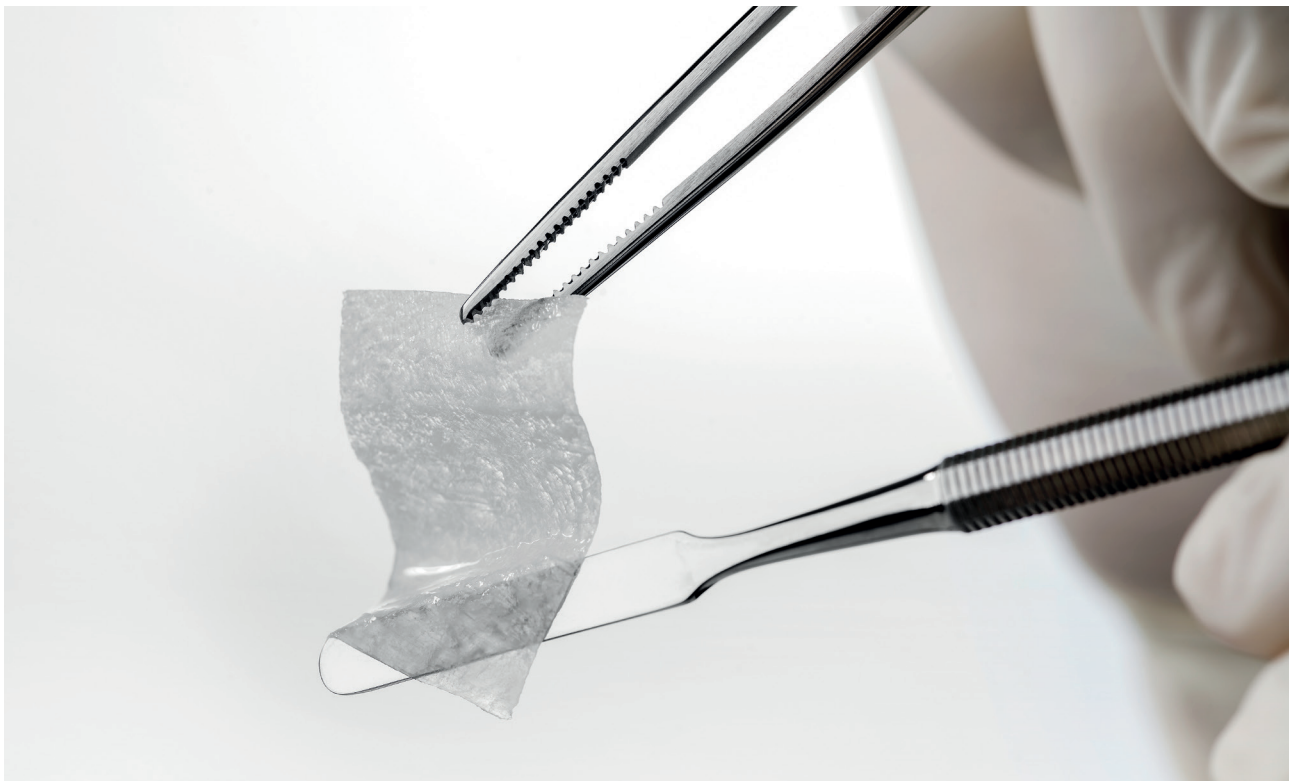
Optimized handling properties ensuring straight-forward application

The supercritical carbon dioxide (scCO<sub>2</sub>) cleaning process gently removes unwanted materials (e.g., cells, lipids) while preserving the natural collagen matrix and optimizing the natural cross-linking of the collagen fibers.<sup>1,2</sup>

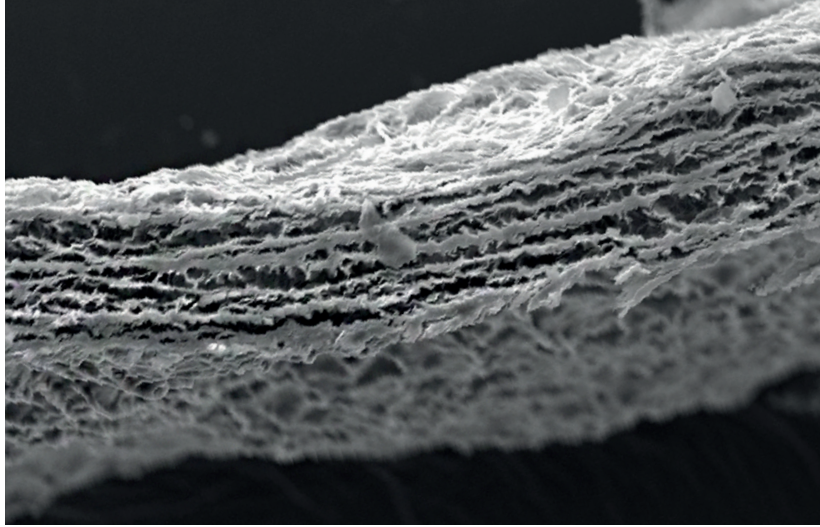
As a result, SMARTBRANE is characterized by optimal material stability as the biomechanical characteristics of porcine pericardium tissue are preserved.<sup>3</sup>

## SMARTBRANE...

- adequate tensile strength;
- adaptable to bony surfaces without sticking to the graft or instrument;
- less than 0.4 mm thin for facilitated augmentation and wound closure.



SMARTBRANE rehydrated: excellent adaptation to surfaces without sticking to graft or instrument.



SMARTBRANE cross-section  
(magnification x 40) featuring intact  
structure and a natural interconnective  
porous system.

## RELIABLE

Natural collagen matrix preserved by  $scCO_2$  cleaning technology for enhanced graft performance

SMARTBRANE is made from porcine pericardium thus presenting optimal matrix composition and a naturally dense 3D-network collagen structure optimally preserved after  $scCO_2$  purification.

The preserved natural collagen matrix plays an important role in blood clotting and promotes cell attachment.<sup>5</sup>

The membrane has a resorption time of 8–12 weeks providing adequate barrier function for usage in standard GBR cases.<sup>6</sup>

B

## PURE

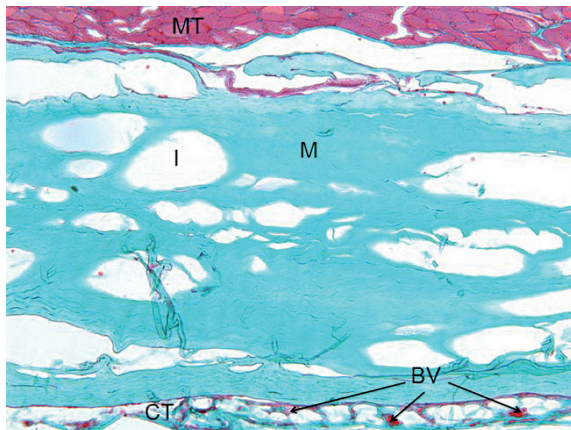
Excellent biocompatibility for improved wound healing

SMARTBRANE is manufactured using an innovative and highly effective cleaning technology based on supercritical carbondioxide (scCO<sub>2</sub>).

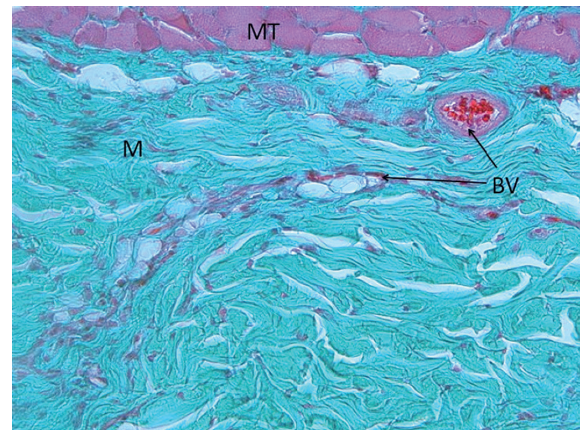
This process results in a high purity and creates a biocompatible base for immediate new bone ingrowth.<sup>1,2</sup>

It provides highest possible biocompatibility characteristics due to its porcine origin and the scCO<sub>2</sub> cleaning process.

### Histological examination in vivo<sup>4</sup>



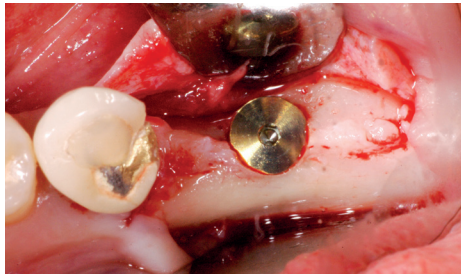
One week after subcutaneous implantation in a rat muscle: SMARTBRANE (M) is already connected to the muscular tissue (MT), no signs of inflammatory reactions.



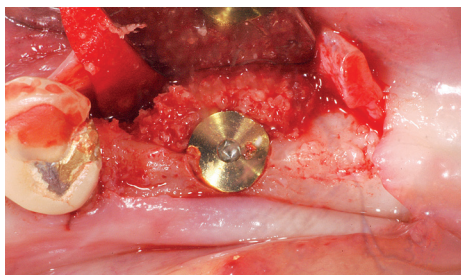
Two weeks after implantation: the first blood vessels (BV) are sprouting into SMARTBRANE (M), no signs of inflammatory reactions.

## CASE REPORT

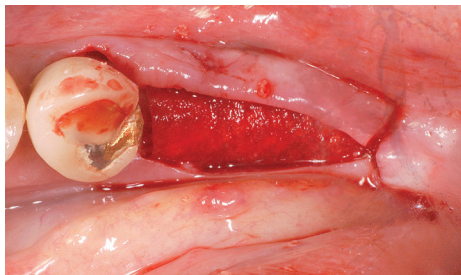
Augmentation of a dehiscence-type defect around dental implant



Surgery  
Dehiscence defect around bone level implant.



Augmentation with xenograft bone.



Coverage of bone graft material with SMARTBRANE –  
the membrane can easily be positioned and adapts  
ideally to the defect geometry.



Suture removal  
Optimal initial healing pattern: no signs of irritation.

## TECHNOLOGY

scCO<sub>2</sub> cleaning process as basis for optimal matrix properties and maximal graft safety



### STEP 1

#### Supercritical Carbon Dioxide (scCO<sub>2</sub>) Processing

- Carbon dioxide is in its supercritical state when both the temperature and pressure equal or exceed the critical point of 31°C and 73 atm.
- In this supercritical state, CO<sub>2</sub> has both gas-like and liquid-like qualities.
- By its effective tissue perfusion and removing capabilities of unwanted substances it provides ideal conditions for cleaning and sterilizing tissues.<sup>1,2</sup>
- Additionally, scCO<sub>2</sub> is known to be highly efficient against all kinds of pathogens.<sup>7</sup>

### STEP 2

#### Chemical Treatment

- Various chemical treatment steps are applied to provide a pure membrane matrix by inactivating and removing residual non-collagenous proteins and enzymes. This results in a further increased safety level for pathogen inactivation.<sup>8</sup>

### STEP 3

#### Freeze-Drying

- Freeze-drying allows gentle preservation, retaining the original 3D structure of the native tissue.
- After freeze-drying, products can be stored at room temperature and generally have a longer shelf life.

### STEP 4

#### γ-Sterilization

- The combination of the scCO<sub>2</sub> cleaning process and terminal gamma-sterilization provides highest possible viral and bacterial inactivation and results in a sterile (SAL>10<sup>-6</sup>) and highly biocompatible membrane.<sup>1,9</sup>



## REFERENCES

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Clinical pictures by courtesy Dr. Kai Fischer (Germany).

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