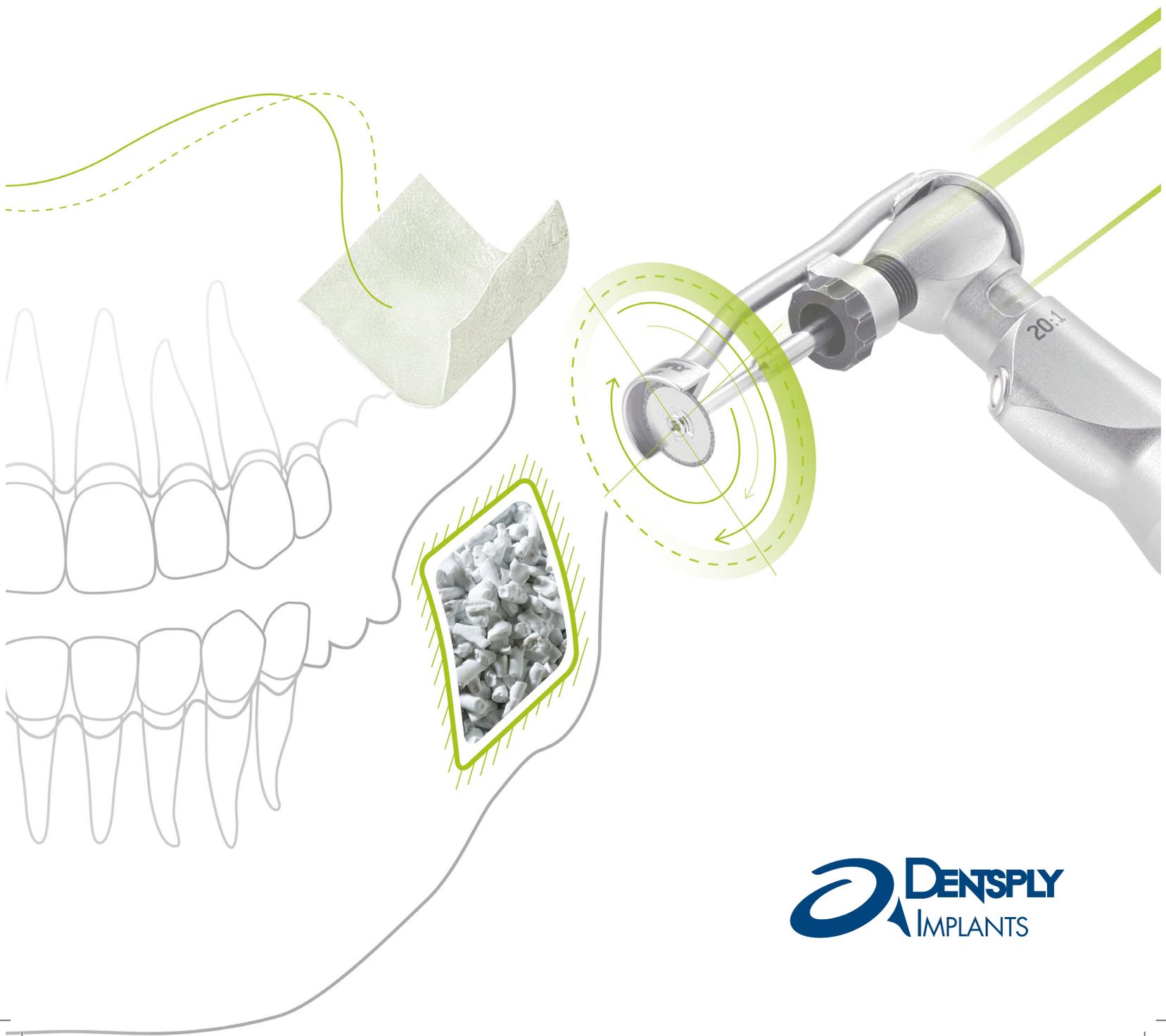


SYMBIOS[®]

Solutions for all your regenerative needs

Bone graft materials, membranes and instruments



DENTSPLY
IMPLANTS



Reliability and partnership for restoring quality of life and happiness—because it matters.

At **DENTSPLY Implants**, our vision of a world where everyone eats, speaks and smiles with confidence permeates and inspires everything we do.

Our research and development efforts focus on all aspects of implant treatment and are supported by extensive pre-clinical and clinical study programs.

As your partner of choice, we are committed to providing comprehensive solutions for all phases of implant therapy, including education for all members of the treatment team as well as practice and co-marketing support.

The result is predictable and patient-specific outcomes without compromise reliability, long-term function and esthetics.



STEPPS™



SIMPLANT®



SYMBIOS®



ANKYLOS®

ASTRA TECH
IMPLANT SYSTEM

XiVE



ATLANTIS™

Solutions for all your regenerative needs

The comprehensive portfolio for hard and soft tissue regeneration provides ease of use and safety for dental clinicians and their patients. SYMBIOS consists of a range of reliable bone graft materials, resorbable and non-resorbable membranes and instruments.

These solutions promote bone formation, volume and stability for predictable, long-term outcomes that patients and dental professionals can rely on.

Bone graft materials



Membranes



Instruments/ Accessories



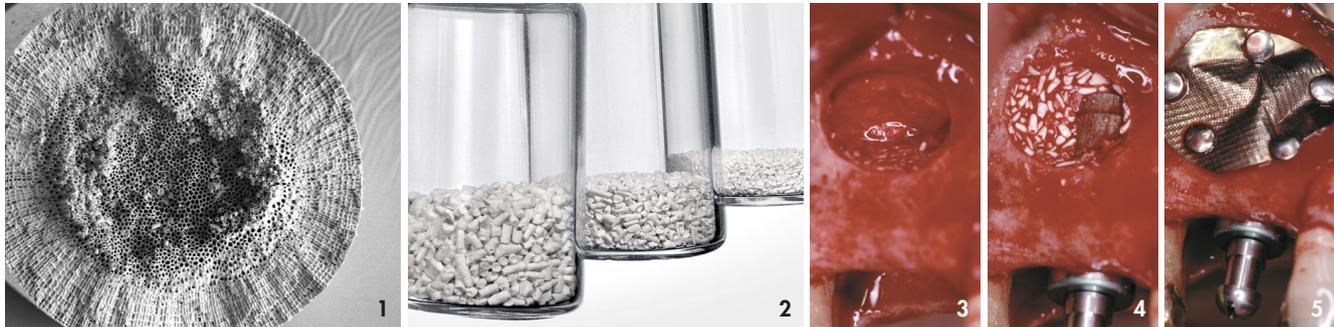
Bone graft materials

Slow resorption –
almost 100% HA

FRIOS Algapore – monophasic bone graft material (BGM)

FRIOS Algapore consists of almost 100% highly porous hydroxyapatite, a bone reconstruction material derived from red marine algae that is very similar to the hydroxyapatite of the natural bone. Thanks to the high porosity, the eminent absorption characteristics, and the large number of cell cavities, FRIOS Algapore can be characterized as an effective bone forming material.

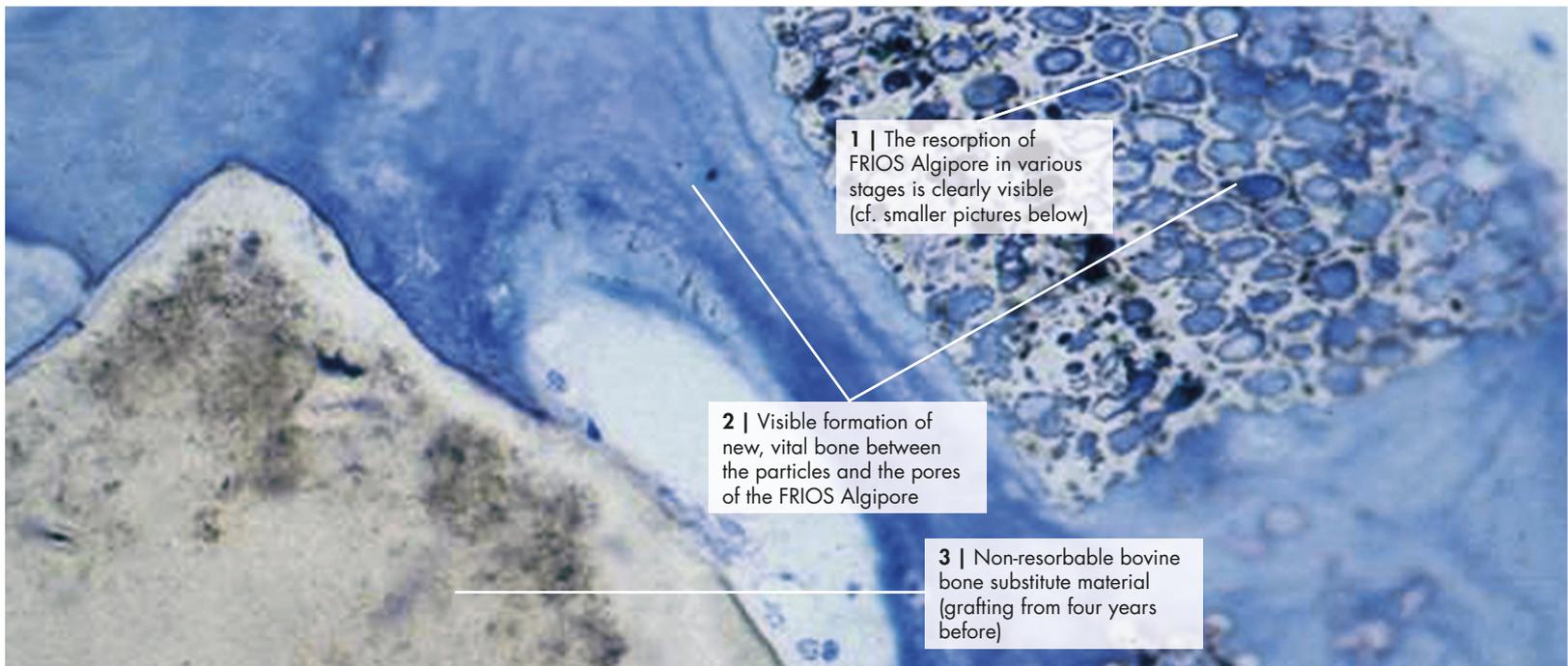
- **Osteoconductive** – Bone analogous properties and interconnecting pores.
- **Volume stability** – The resorption properties create a scaffold with a stable form during the whole bone formation phase.
- **Straightforward application** – Saturation with the patient's blood and an addition of autogenous bone chips support healing.
- **Almost complete resorption** – FRIOS Algapore is a material with resorption kinetics in the sense of restitutio ad integrum.
- **Over 25 years clinical experience** – FRIOS Algapore has been successfully used since 1989.
- **Available in three grain sizes** –
 - 0.3 mm – 0.5 mm**
e.g., for filling in defects up to 0.5 cm³
 - 0.5 mm – 1.0 mm**
e.g., for augmentation of lateral defects up to 1.0 cm³
 - 1.0 mm – 2.0 mm**
e.g., for augmentation following a sinus graft from 1.0 cm³



1 | Cross-section of a FRIOS Algapore granule shows the porosity. 2 | Different grain sizes can be selected, depending on the volume and type of the bone defect. 3-5 | Sinus lift using FRIOS Algapore.

Comparison of two different bone augmentation materials

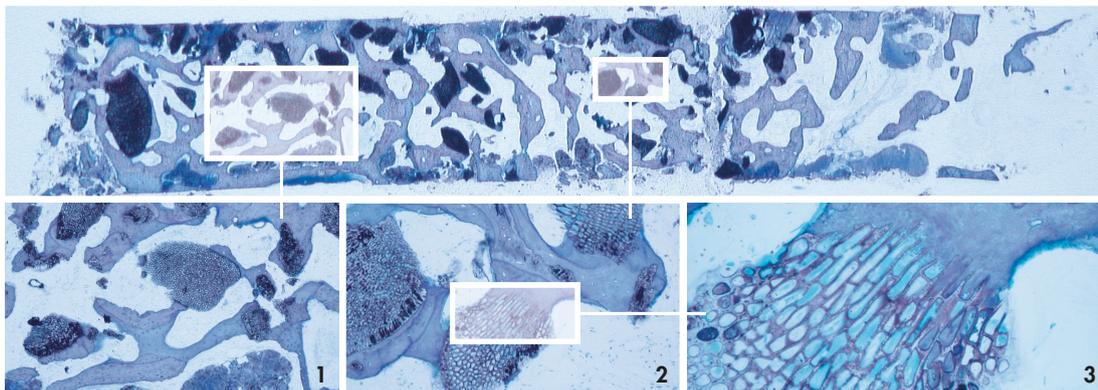
Human biopsy after sinus floor augmentation using FRIOS Algipore next to a non-resorbable bovine material



1 | The resorption of FRIOS Algipore in various stages is clearly visible (cf. smaller pictures below)

2 | Visible formation of new, vital bone between the particles and the pores of the FRIOS Algipore

3 | Non-resorbable bovine bone substitute material (grafting from four years before)



Overview of an undecalcified thin-section specimen. (after 11½ months in situ, thionine staining)
Magnification object lens: 1 x

Zoom image 1:

Trabeculae of newly formed bone with interspersed medullary tissue. Bridge formation between the FRIOS Algipore granules.
Magnification object lens: 4 x

Zoom image 2:

Along with the formation of trabeculae, the growth of bone into the pore structure of the granules and early resorption can be discerned. The bone is still partially reticulated, partially already functionally lamellar in structure. Magnification object lens: 10 x

Zoom image 3:

Detailed view of the mineralization zone with newly formed bone and mature osteocytes. Within the pore structure of the FRIOS Algipore, still immature, uncalcified bone tissue (osteoid). Magnification object lens: 40 x

Histology: Prof. R. Ewers, Vienna, Austria

Bone graft materials

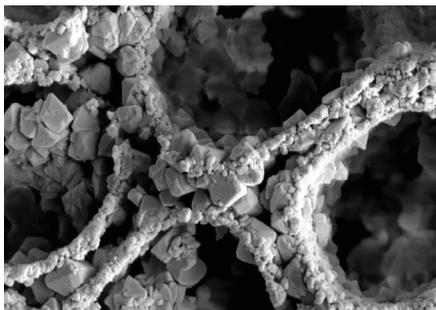
Fast resorption –
20% HA / 80% β -TCP

SYMBIOS Biphasic Bone Graft Material (BGM)

SYMBIOS Biphasic Bone Graft Material is a resorbable inorganic bone-forming material in granular form derived from red marine algae. The chemical composition of this interconnected porous biological product is similar to the inorganic part of the human bone. SYMBIOS Biphasic BGM is a composition of 20% hydroxyapatite (HA) and 80% β -tricalciumphosphate (β -TCP). The higher the tricalciumphosphate content of the product is, the faster it will be resorbed.

- **Osteoconductive** – Bone analogous properties and interconnecting pores.
- **Volume stability** – The resorption properties enable volume stability during bone formation.

- **Straightforward application** – Saturation with the patient's blood and an addition of autogenous bone chips improve healing.
- **Almost complete resorption** – The SYMBIOS Biphasic BGM is a material with resorption kinetics in the sense of restitutio ad integrum. Material degradation and bone remodeling/healing are balanced.
- **Available in two grain sizes** –
 - 0.2 mm to 1.0 mm**
e.g., augmentation of small defects
 - 1.0 mm to 2.0 mm**
e.g., augmentation of lateral defects and sinus floor elevation

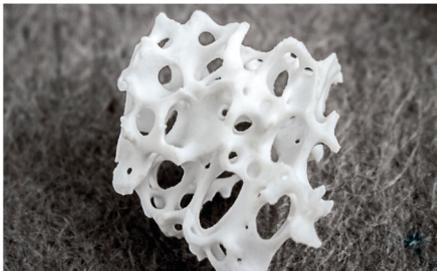


A cross section of the Biphasic Bone Graft Material 20/80 HA/ β -TCP. The biphasic structure shows the β -TCP and the HA in close connection, but still distinguished in two different phases (Spasova E et al. 2007).

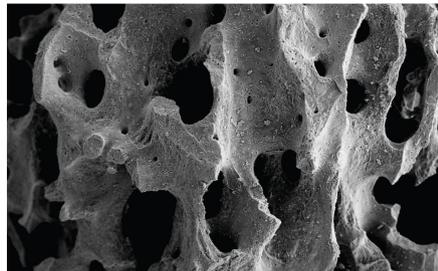
SYMBIOS Xenograft Granules Porcine Bone Graft Material (BGM)

SYMBIOS Xenograft Granules is a porcine bone mineral indicated for periodontal, oral and maxillofacial surgery. The use of Symbios Xenograft Granules may be considered when autogenous bone is not indicated or is insufficient in quantity to fulfill the needs of the proposed surgical procedure. The anorganic bone matrix of Symbios Xenograft Granules has an interconnecting macro- and microscopic pore structure that supports the formation and ingrowth of new bone.

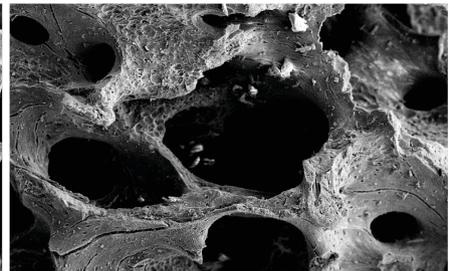
- **Interconnecting macro- and microscopic pore structure** – Supports vascularization, bone ingrowth and nutrition
- **Highly porous with 88% to 95% empty space** – More space for new bone deposition
- **Rough surface texture** – Facilitates cell adhesion and bone ingrowth
- **Carbonate apatite** – Aids remodeling of the healing bone
- **Granules hold together upon hydration** – Ease of handling and placement in the defect site
- **Available in a jar or syringe and in a range of volumes** – Greater clinician choice
- **Available in two grain sizes** –
0.25 mm to 1.0 mm
1.0 mm to 2.0 mm



Magnification 6x



Magnification x50



Magnification x75



SYMBIOS Xenograft Granules Syringe and Jar

Resorbable membranes

Predictable
resorption time:
26–38 weeks

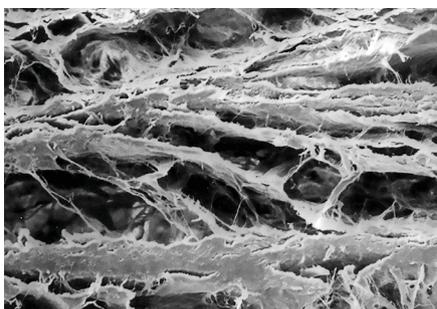
SYMBIOS Collagen Membrane SR

SYMBIOS Collagen Membrane SR (slow resorbable) is a bioresorbable material. It is manufactured from a highly purified collagen type I derived from bovine Achilles tendon. It is intended for use in oral surgery as a material for placement in the area of dental implants, bone defect or ridge reconstruction to aid in wound healing post dental surgery.

- **Safe for the patient** – Manufactured from highly purified collagen type I derived from bovine Achilles tendon.
- **You can suture or tack the membrane in place without tearing** – Unique fiber orientation provides high tensile strengths.
- **Prevents epithelial downgrowth** – Cell occlusive.
- **Stiff enough for easy placement, yet easily drapes over ridge** – Optimized flexibility. Placed either dry or hydrated.



SYMBIOS Collagen Membrane SR



Scanning electron micrograph (SEM): Cross-section of SYMBIOS Collagen Membrane SR consisting of a collagen fiber matrix (x.5000).

Non-resorbable membranes

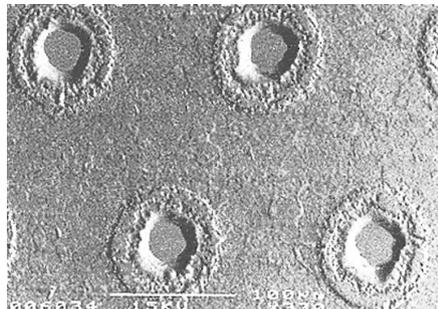
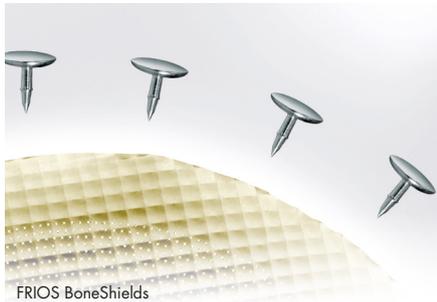
FRIOS BoneShields

Dimensionally stable pure titanium with laser perforation: permeable to oxygen and the immune system. FRIOS BoneShield can be used both with autogenous bone-forming and in combination with bone regenerative materials and can provide a high mechanical, three-dimensional stability.

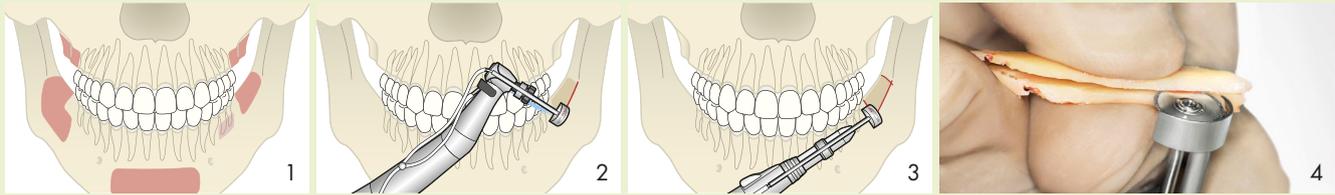
- **Biocompatible** – Made from pure medical grade titanium with laser perforation for excellent oxygen-permeability and free migration of the immune system.

- **Prevents dark opacity under mucosa in the anterior region** – Golden yellow anodized material.
- **Adjustable** – Available in various forms and sizes. Adjusted to any situation by trimming and molding.
- **Simple to affix** – Using FRIOS membrane tacks.

Non-resorbable



Thanks to the laser perforation, FRIOS® BoneShields are oxygen-permeable – immune defenses can migrate unimpeded.



1-4 | Harvesting of autogenous bone – precise and safe.

Prof. Fouad Khoury, Olsberg, Germany

Harvesting autogenous bone blocks requires experience and sets a high standard for the treatment outcome. The flexibility of the FRIOS MicroSaw simplifies vertical and horizontal osteotomies – even in difficult anatomical situations.

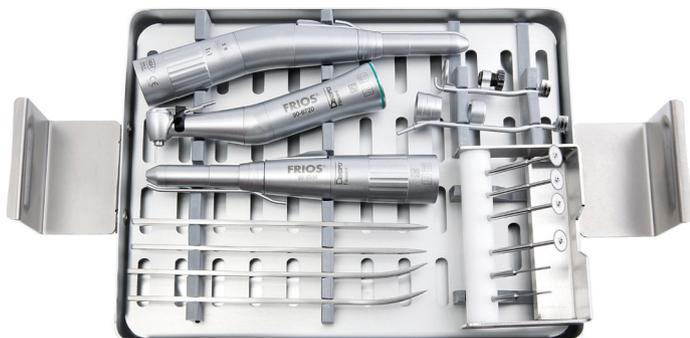
Instruments for autogenous bone harvesting

Today, almost every other implant placement is accompanied by some type of bone augmentation procedure. A predictable, esthetically and functionally optimal result is the goal of every procedure. Augmentation using the patient's own bone is the gold standard in augmentation.

FRIOS MicroSaw

Preparation of bone blocks and bone flaps

- **Precise** – The 0.29 mm MicroSaw disc is constructed to produce an extremely accurate osteotomy line.
- **Easy** – With the FRIOS angled handpiece the exact preparation can be made even in the retromolar region and with restricted oral cavity.
- **Atraumatic** – With adjustable soft-tissue protector and direct cooling of the saw blade.
- **Proven** – In clinical use since 1986.



FRIOS MicroSaw ExpertSet

Instruments for autogenous bone harvesting

FRIOS BoneCollector

Harvesting vital bone chips parallel to the preparation of the implant site – for multiple use

- **Only one procedure** – Implant placement and harvesting of valuable, vital bone chips.
- **Gentle on your patients** – No operation on a second donor site required.
- **Prevents contamination** – Use of a second aspirator during the procedure.
- **Efficacy** – The FRIOS BoneCollector can be sterilized; suction tube and titanium filter are single-use items.

BoneTrap

Harvesting vital bone chips parallel to the preparation of the implant site – for single use

- **Simplified procedure** – Instrument allows for convenient collection and use of autologous bone.
- **Efficacy and predictability** – Helps to eliminate the immunological reactions associated with bone substitute materials.
- **Cost effective** – Reduces the need for costly artificial material.
- **Time saving** – Delivered sterile and is disposable.



Instruments and Accessories

FRIOS FixationSet

A complete instrument set for fast and precise positioning of FRIOS Membrane Tacks

- **Finest disposable micro drills** – For pre-drilling in every dense bone.
- **Drilling and positioning tool** – For utmost precision.
- **Accurate and secure** – Fixation of membranes.
- **Seating instruments** – Taking up and positioning the Membrane Tacks.

FRIOS Membrane Tacks

For perfect membrane fixation

- **Perfect hold** – Well attached membranes prevent the dislocation of the material and promote the formation of new bone.
- **Biocompatible** – Fabricated from a titanium alloy and gamma sterilized.
- **Universal** – FRIOS Membrane Tacks can be used with all resorbable and non-resorbable membranes.
- **Insertion** – FRIOS FixationSet for placement of the tacks.
- **Perfect complement** – For fixation of FRIOS BoneShields.

FRIOS SinusSet

All preparation steps for an open sinus lift can be performed with this titanium set

- **Preparation of the lateral bone window** – From large, diamond-coated round drills to fine fissure drills. All rotary instruments are on hand.
- **Mobilization of the sinus mucous membrane** – With a range of angled elevators.
- **Blending the augmentation material** – In the stable surgical-blending beaker.
- **Filling the maxillary sinus** – Using various surgical applicators.



FRIOS FixationSet



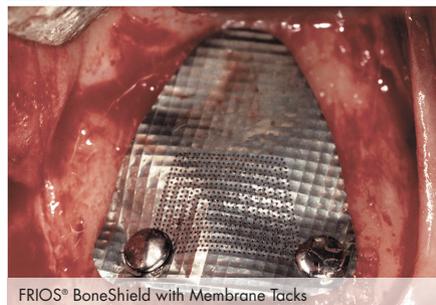
FRIOS Membrane Tacks



FRIOS SinusSet



Temporary storage of Membrane Tacks



FRIOS® BoneShield with Membrane Tacks



FRIOS Drill Set

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About DENTSPLY Implants

DENTSPLY Implants offers comprehensive solutions for all phases of implant therapy, including ANKYLOS®, ASTRA TECH Implant System™ and XiVE® implant lines, digital technologies, such as ATLANTIS™ patient-specific CAD/CAM solutions and SIMPLANT® guided surgery, SYMBIOS® regenerative solutions, and professional and business development programs, such as STEPPS™. DENTSPLY Implants creates value for dental professionals and allows for predictable and lasting implant treatment outcomes, resulting in enhanced quality of life for patients.

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