Natural bone grafting and bone-conserving implant site preparation
About DENTSPLY Implants

Our vision – improving patient quality of life – requires commitment, creativity, and innovation. We are built upon the fundamental values of open-mindedness, a thorough scientific approach, a dedication to long-term clinical evidence, and a strong customer focus. This permeates and inspires everything we do, every day.

Comprehensive and integrated solutions
Our products are unique – they allow all the members of the treatment team the freedom to create predictable, lasting, patient-specific outcomes, and they are designed to help make your job easier without compromising reliability, long-term function, and esthetics.

The comprehensive product portfolio offers the dental implant lines ANKYLOS®, ASTRA TECH Implant System™, and XiVE®, digital technologies, such as ATLANTIS™ patient-specific CAD/CAM solutions and SIMPLANT® 3D virtual surgical planning and guides, regenerative bone solutions, and professional development programs.

Research and development
Documentation is an essential part of our investment in the development of our products and services. Our research and development efforts focus on all aspects of implant treatment, including more demanding and advanced compromised cases and simplified treatment procedures. The commitment to quality is further supported by an extensive pre-clinical and clinical studies program.

Professional development
Through documentation updates, seminars, training, and hands-on workshops, we offer education on the latest developments in implant dentistry.

As your partner of choice, we can support your practice and business development efforts with patient awareness and education material, and advertising and co-marketing collateral.

We invite you to join us on our journey to redefine implant dentistry.
Augmentation with FRIOS®

A successful implant restoration requires a stable foundation. In many cases, the implant placement must be accompanied by the buildup of missing bone. Only a sufficiently dimensioned and vital osseous base will ensure the unimpaired osseointegration of the implants and functional and esthetic long-term results. With the clinically proven FRIOS® products, you are best equipped – for a gentle and effective augmentation and the formation of new, stable bone.

... harvest autogenous bone
For many practitioners, autogenous bone is the material of choice. For simplified removal of bone, FRIOS® places the right instruments in your hands. Whether a bone block or bone chips: you are well-prepared for every clinical situation.

...surgical unit and instruments
With the FRIOS® Unit S/i, the hand motor and the specially adapted FRIOS® handpieces and contra-angle handpieces, DENTSPLY Implants presents a team, perfectly coordinated in function and handling – simple to use and reliable in operation – that delivers convincing results.

... build up bone
Bone augmentation materials have held a firm place in augmentative surgery for years. FRIOS® Algipore® is a classic biological grafting material based on resorbable hydroxyapatite with outstanding interconnecting porosity.

... secure the bone
Membranes are used for Guided Bone Regeneration (GBR) and for the fixation of bone chips and bone augmentation material. Today, various resorbable and non-resorbable materials are used for this. Its high mechanical stability and three-dimensional stability embody the outstanding additional value of FRIOS® BoneShields.
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.
Discover the difference:
Autogenous bone regeneration

Today, almost every second implant placement is accompanied by augmentative measures. A predictable, esthetically and functionally optimal result is the goal of every procedure. Augmentation using the patient’s own bone gives you the highest probability of reaching this goal – the gold standard in augmentation.

FRIOS® MicroSaw

Preparation of bone blocks and bone flaps – fast and atraumatic

- **Highest precision** – the 0.29 mm MicroSaw disc is constructed to produce an extremely accurate osteotomy line.
- **Fast** – rapid work with the FRIOS® straight and contra-angle handpieces. Even for the most difficult anatomical situations.
- **Easy** – with the FRIOS® angled handpiece the exact preparation can be made in the retromolar region, even with restricted mouth opening.
- **Atraumatic** – the hinged soft tissue protector is easy to attach and to remove again. Direct blade cooling prevents overheating during the procedure.
- **Proven** – in clinical use since 1986.

FRIOS® BoneCollector

Harvesting vital bone chips in parallel with the preparation of the implant site

- **Only one procedure** – implant placement and harvesting of valuable, vital bone chips.
- **Gentle on your patients** – no second operation site required.
- **Biocompatible material** – casing and filter made from pure, medical grade titanium.
- **Prevents contamination** – use of a second aspirator during the procedure.
- **Sterilisable** – the FRIOS® Bone-Collector can be sterilized; suction tube and titanium filter are single use items.
Best treatment results with the technology that will convince you

For the best treatment results and optional functioning of the FRIOS® Unit S/i, we recommend FRIOS® handpieces and contra-angle handpieces, specially adapted to the surgical motor.

FRIOS® Unit S/i
Induction drive unit with preset programming for augmentation and implant placement

- **Practice oriented** – four preset programs for all implant surgical treatment stages can be accessed directly on the instrument or by using the foot control. If required, the programs can be easily modified. The most recently selected setting is automatically stored.
- **Tapping function** – direct thread cutting function, selected at the push of a button for optimal workflow.
- **Irrigation supply** – the irrigation pump facilitates a consistent, precise regulation of the irrigation supply. This has three settings for the FRIOS® Unit S/i: 65, 80 and 100 ml/min.
- **Surgical motor** – the brushless, maintenance-free surgical motor of the FRIOS® Unit S/i features an efficient power transmission with the highest degree of smooth operation. A very compact, light motor provides good handling and effortless working.

**Program 1 – Dento-alveolar surgery**
1:1 ratio, factory setting 20,000 rpm, variable from 300 – 40,000 rpm

**Program 2 – Drill 1**
20:1 ratio, factory setting 800 rpm, variable from 15 – 2,000 rpm

**Program 3 – Drill 2**
20:1 ratio, factory setting 1,500 rpm, variable from 15 – 2,000 rpm

**Program 4 – Implant insertion**
20:1 ratio, 30 Ncm torque, variable from 5 – 50 Ncm, clockwise 15 rpm (fixed), counter-clockwise 30 rpm (fixed), irrigation supply switched off

**Program 5 – Thread-tapping**
20:1 ratio, 50 Ncm torque, variable from 5 – 50 Ncm, clockwise 15 rpm (fixed), counter-clockwise 30 rpm (fixed)
The FRIOS® handpieces and contra-angle handpieces feature high-quality stainless steel and a slim but nevertheless robust construction. They are optimally coordinated at every stage with the FRIOS® MicroSaw.

Straightforward hygiene, all products can be sterilized at up to 135 °C and can be thermodisinfected – for easy compliance with the strictest hygiene regulations.

**FRIOS® handpieces and contra-angle handpieces**

The FRIOS® contra-angle handpieces are available in three different versions (WI-75, WS-75 demountable, WI-75 LED G), and have the following advantages:

- **Patented hexagonal clamping system** – gives you trouble-free operation, as there is no deformation or obstruction of rotary instruments at torques of more than 30 Ncm.
- **Highest product safety** – even at high torques, for example when placing implants into hard bone.
- **Longer service life** – of the contra-angle clamping system and of the rotary instruments with the hexagonal connection.

The FRIOS® WS-75 contra-angle handpiece (demountable) also delivers:

- **Straightforward handling** – the FRIOS® WS-75 contra-angle handpiece can be demounted easily by hand – without using a tool.
- **Better access to the surgical site** – thanks to the head, rotatable in 90° steps.

The FRIOS® handpieces and contra-angle handpiece with LED features:

- **Operating in daylight quality** – neutral white LED light with higher light intensity and a wider field of illumination than conventional halogen lamps.
- **Power supplied by its own drive** – the power for the LED light is independently supplied by the generator integrated into the instrument.
- **Compatible** – with every motor with ISO coupling.

The FRIOS® handpieces are available in three different versions (straight/demountable, angled/demountable, LED).

- **Ergonomic design** – ideal for use in the posterior region, for sinus floor elevation and for harvesting autogenous bone.

Please note: The available drills and implant drivers with ISO shaft can, of course, be used furthermore. All new implant drivers in the ANKYLOS® and XIVE® range have been adapted to the system.
1 | The resorption of FRIOS® Algipore® in various stages is clearly visible.

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

3 | Non-resorbable bovine bone substitute material.

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**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 the 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

**Human biopsy post sinus floor augmentation using FRIOS® Algipore®**

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

Histology: Prof. R. Ewers, Vienna, Austria
Natural bone formation with the vitality of the ocean

Thanks to the unique porosity, the excellent absorption characteristics, the large number of cell cavities and the positive resorption kinetics that later enable biomechanical bone loading, FRIOS® Algipore® can be characterized as, effectively, a bone formation promoting and regenerative material.

FRIOS® Algipore®

The biological framework for dependable new bone formation

- **Highly porous hydroxyapatite** – vegetable bone reconstruction material derived from seaweed and with a high analogy to the hydroxyapatite of the natural bone.
- **Promotes bone formation** – osseoconduction due to the interconnecting pores and coarse surface.
- **Resorbs almost completely** – FRIOS® Algipore® is a bone regeneration material in the sense of a restitutio ad integrum.
- **Stable volume** – The ideal resorption kinetics create a scaffold with a stable form during the whole bone formation phase.
- **Suitable for the indication** – available in three various grain sizes.
- **Straightforward application** – mixed with the patient’s blood. The addition of autogenous bone chips improves the healing.
- **Over 25 years clinical experience:** FRIOS® Algipore® has been successfully used since 1988, has carried the CE mark since 1998 and has had US FDA approval since 2003.

1 | Cross-section of a FRIOS® Algipore® 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® Algipore®.

FRIOS® Algipore® Due to its outstanding biological characteristics and interconnecting porosity, FRIOS® Algipore® exhibits a strong attraction for bone-forming cells and growth factors. Hence, FRIOS® Algipore® provides the ideal base for mixing with autogenous bone, the patient’s blood or PRP.
Coordinated systems for long-term esthetic results

**FRIOS® BoneShields**

Dimensionally stable pure titanium with laser perforation: permeable to oxygen and immune defenses. FRIOS® BoneShields can be used both with autogenous bone material and in combination with bone regeneration materials.

- Membranes made from dimensionally stable pure titanium – for high mechanical, three-dimensional stability.
- **Biocompatible** – made from pure medical grade titanium, with laser perforation for excellent oxygen permeability and free migration of immune defenses.
- **Golden yellow anodizing** – prevents the dark opacity where the mucosa is thinner in the anterior region.
- **Adjustable** – available in various forms and sizes. Adjusted to any situation by trimming and molding.
- **Simple to affix** – using FRIOS® 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.

1 | Secure fixation using FRIOS® membrane tacks
2 | Thanks to the laser perforation, FRIOS® BoneShields are oxygen-permeable – immune defenses can migrate unimpeded
3 | FRIOS® Bone-Shields – durable stability that protects and shapes
**FRIOS® FixationSet**

A complete instrument set for precise positioning of FRIOS® membrane tacks

- **Fast and precise** – accurately coordinated instrument set for the placement of FRIOS® membrane tacks.
- **Finest disposable drills** – for pre-drilling into very hard bone.
- **Complete** – the tray also contains the FRIOS® drilling and positioning tool.

**FRIOS® SinusSet**

Sinus floor elevation – ergonomically and esthetically. All preparation steps for an open sinus lift can be performed with this titanium set.

- **Clearly displayed** – all instruments are color-coded and arranged in order of use.
- **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.
About DENTSPLY Implants
DENTSPLY Implants is the union of two successful and innovative dental implant businesses: Astra Tech Dental and DENTSPLY Friadent. DENTSPLY Implants offers a comprehensive line of implants, including ANKYLOS®, ASTRA TECH Implant System™ and XIVE®, digital technologies such as ATLANTIS™ patient-specific CAD/CAM solutions, SIMPLANT® guided surgery, regenerative bone solutions, and professional development programs. DENTSPLY Implants creates value for dental professionals, and allows for predictable and lasting implant treatment outcomes, resulting in enhanced quality of life for patients.

About DENTSPLY International
DENTSPLY International Inc. is a leading manufacturer and distributor of dental and other healthcare products. The Company believes it is the world’s largest manufacturer of professional dental products. For over 110 years, DENTSPLY’s commitment to innovation and professional collaboration has enhanced its portfolio of branded consumables and small equipment. Headquartered in the United States, the Company has global operations with sales in more than 120 countries.