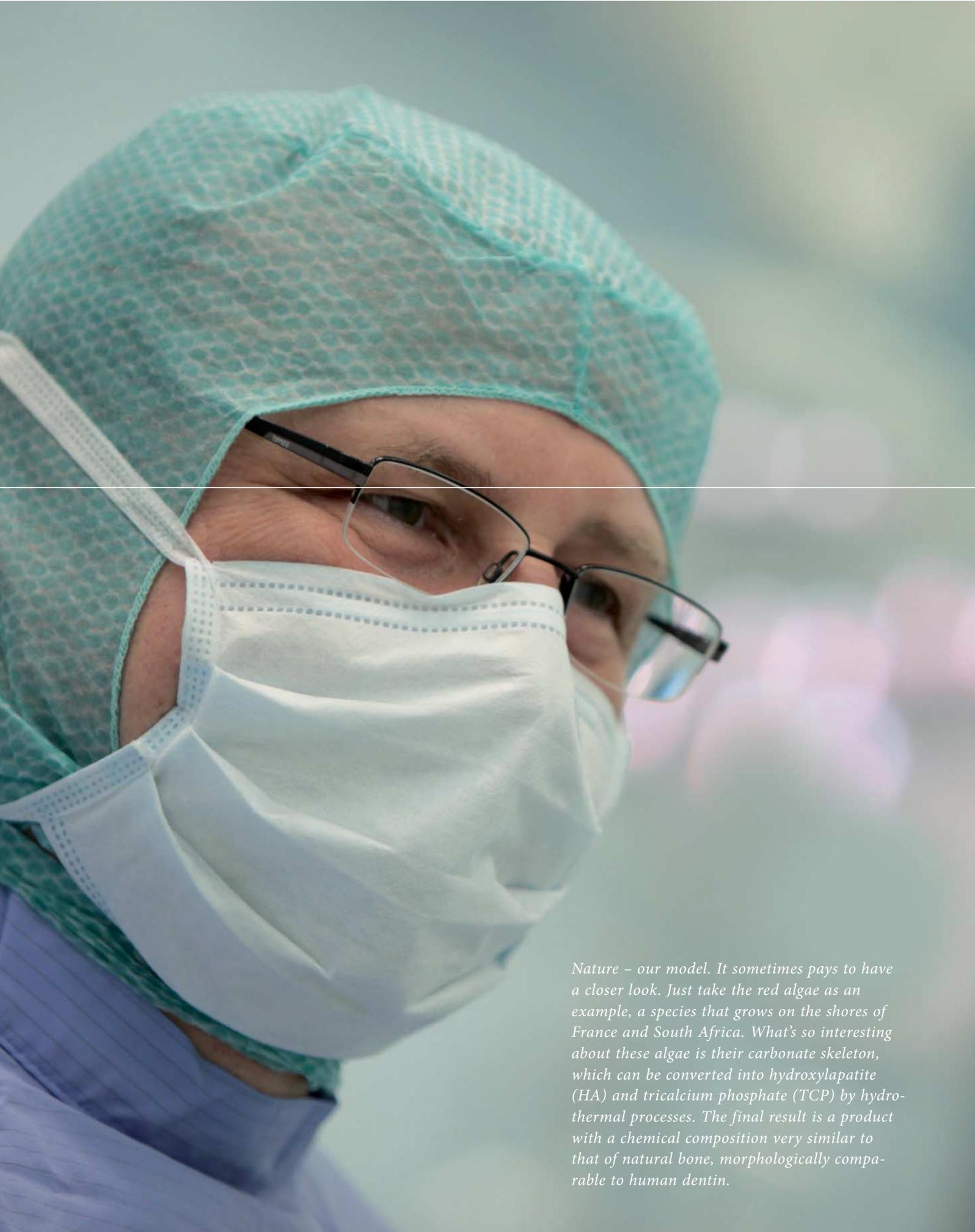


matrix

*A “sea” of options
for oral augmentation therapy*



Nature – our model. It sometimes pays to have a closer look. Just take the red algae as an example, a species that grows on the shores of France and South Africa. What's so interesting about these algae is their carbonate skeleton, which can be converted into hydroxylapatite (HA) and tricalcium phosphate (TCP) by hydrothermal processes. The final result is a product with a chemical composition very similar to that of natural bone, morphologically comparable to human dentin.

matrix

A “sea” of options for oral augmentation therapy

As a pioneer of mini-plate osteosynthesis, KLS Martin has made a significant contribution to the development of cranio-maxillofacial surgery. Apart from a variety of systems for diverse applications, important milestones also include the development of distraction osteogenesis and the globally unique resorbable materials used in conjunction with the SonicWeld Rx® technology.

The SonicWeld Rx® system with its resorbable elements to be inserted with ultrasound soon opened up new opportunities also for bone augmentation or Guided Bone Regeneration (GBR), specifically for the minimally invasive “shell technique”.

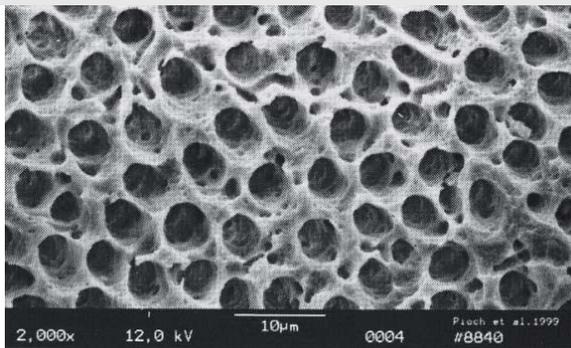
A logical and supplementary by-product of these developments is matrix, a bone regeneration material. matrix promotes and supports the growth of autologous bone by providing hydroxylapatite and β -tricalcium phosphate as a “scaffold” which – by interaction with autologous cells – stimulates the growth of new bone tissue.

The raw material from which matrix is made comes from two naturally growing marine red algae: *Corollina officinalis* and *Amphiroa ephedra*.

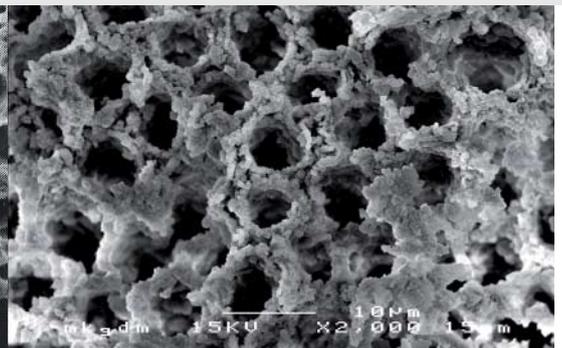


The KLS Martin SonicWeld Rx® solution is based on the BoneWelding® technology¹⁾ protected by the industrial property rights of WoodWelding AG, Switzerland, and licensed by this company.
¹⁾ “BoneWelding” is a registered Swiss trademark

Bone regeneration material
matrix



Human dentin



matrix

*Excellent base material
akin to human bone*

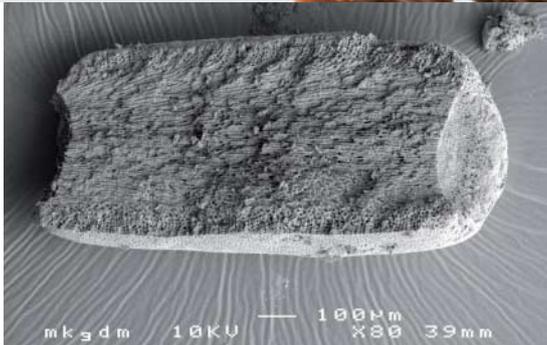
The carbonate skeleton of marine red algae is converted into hydroxylapatite (also called “hydroxyapatite”) (HA) and tricalcium phosphate (TCP) by hydrothermal processes. The final result is a product with a chemical composition very similar to that of natural bone, morphologically comparable to human dentin.

The basis we have chosen for our bone regeneration material *matrix* is a product that has been developed only recently: interconnecting, microporous biphasic tricalcium phosphate-hydroxylapatite (TCP-HA) composites with 60% TCP and 40% HA.

*matrix – multiple application options
for jawbone and cranial defects*

Depending on the indication, *matrix* can be used either alone or in combination with autologous bone or “platelet rich plasma” (PRP) to stimulate new bone formation.

The augmented region should be covered with a resorbable or non-resorbable membrane.



matrix

Excellent resorption properties

The TCP-HA composites combine the positive material properties of both phases: higher stability, the osteoconductive properties of apatite, and the superior solubility of β -TCP. The results are better resorption and faster bone regeneration.

Independent research has shown that the material has a significantly higher porosity than purely synthetic bone substitutes.

Sinus graft

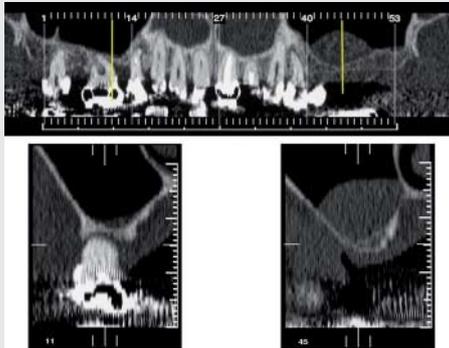


Fig. 1: Reformatted panoramic view of the dental computerized tomograph showing atrophy of the alveolar bone. The reformatted orthoradial slices 11 and 45 are shown at the bottom and indicate approximately 2 mm of vertical bone height.

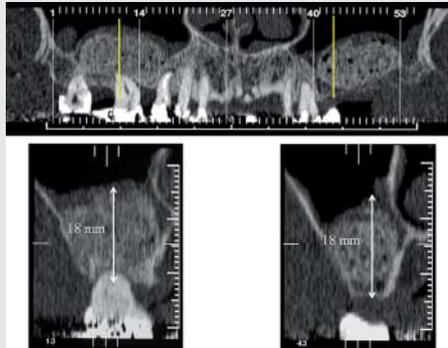


Fig. 2: Reformatted panoramic view of the dental computerized tomography immediately after filling the maxillary sinus with algae derived bone augmentation material. At the bottom, the reformatted orthoradial slices 13 and 43 show that 18 mm vertical height has been gained with the augmentation material; Immediately postoperatively bone density is still low because of the small quantity of HA material due to its porosity. Slight bubbling is caused by the addition of platelet-rich plasma and thrombin.

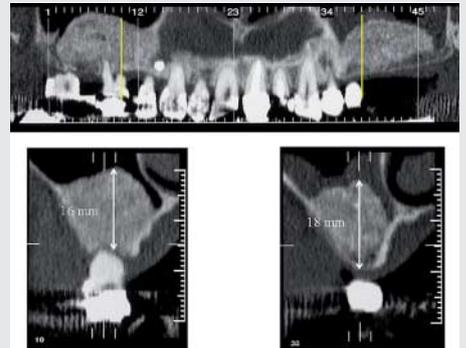


Fig. 3: Reformatted panoramic view of the dental computerized tomograph six months postoperatively and filling the maxillary sinus with algae derived bone augmentation material. At the bottom, the reconstructed orthoradial slices 10 and 38 show the 16 and 18 mm vertical bone height gained as a result of the augmentation material. In 6 months, the augmentation material has become more radiopaque as a result of calcification. The bubbles have disappeared and the material appears homogeneously ossified.



Fig. 4: After removal of the non-resorbable membrane, the algae derived bone augmentation material has completely integrated and remodeled into the newly formed bone; a fresh extraction socket 24 can be seen.



Fig. 5: Obtaining a bone trephine specimen for histological examination before insertion of the implant in region 25 and after insertion of an immediate implant in region 24.



Fig. 6: Removing the bone trephine specimen for histological examination.



Fig. 7: Undecalcified hard tissue ground section of a bone trephine specimen under two-fold magnification of the whole section, showing good osteoneogenesis in the area around the algae derived bone augmentation material in this 56-year-old patient. Six months of healing time followed augmentation with 4 ml algisorb, 0.5 ml autogenous collector bone, 1.5 ml platelet-rich plasma and 0.5 ml thrombin. The implant (right) is inserted in the resulting trephine hole after widening with bone condensers.

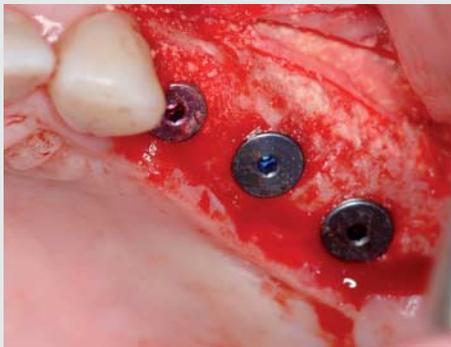


Fig. 8: Situation after removal of the insertion and filling the cavity around the immediate implant in region 24 with algae derived bone augmentation material.

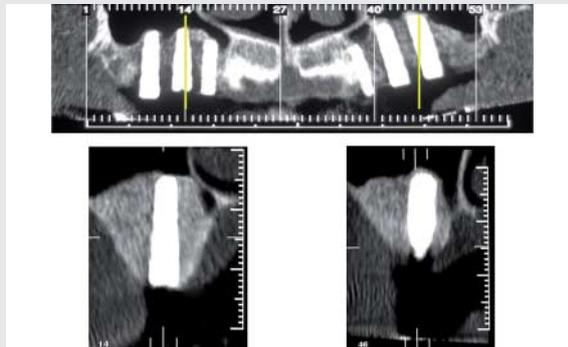


Fig. 9: Reformatted panoramic view of the dental computerized tomograph after implant insertion. The images below show the orthoradial slices 14 (with a 4.3 mm thick and 16 mm long implant) and 46 (with a 5 mm thick and 16 mm long implant).



Fig. 10: Six years after loading of the implants with single crowns (courtesy: Dr. Fahrenholz, Vienna).

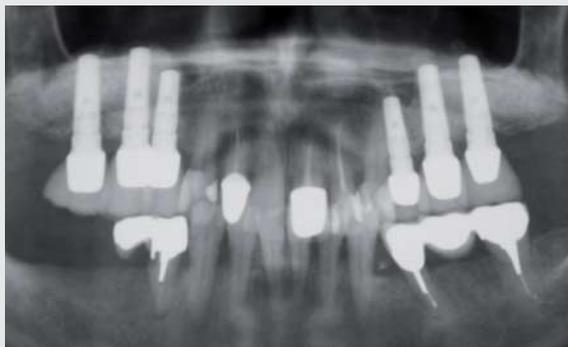


Fig. 11: Panoramic radiograph six years after completion of the treatment.

Periodontal defect filling

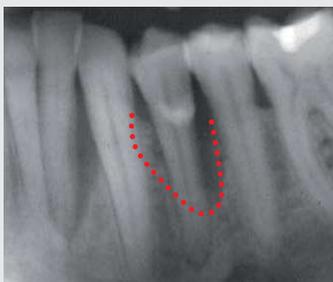


Fig. 1: Dental film with marginal bone defect tooth 34.

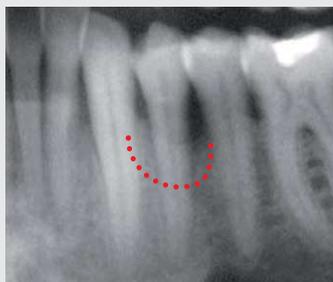


Fig. 2: Dental film tooth 34 three months after filling with algae derived bone augmentation material.

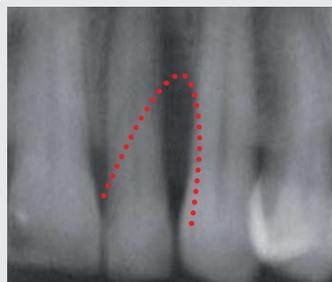


Fig. 3: Dental film with marginal bone defect between teeth 22 and 23.

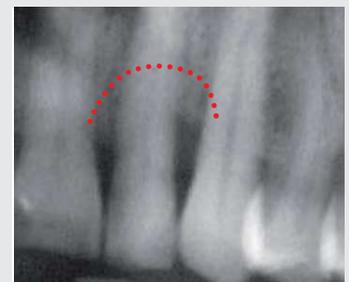


Fig. 4: Dental film five months after filling the defect between tooth 22 and 23 with algae derived bone augmentation material.

Extraction socket filling



Fig. 1: Section of the panoramic radiograph two weeks after extraction of tooth 15.



Fig. 2: Condition after socket fill with algae derived bone augmentation material.



Fig. 3: Placing the implant after socket widening with condensers.



Fig. 4: Section of the panoramic radiograph seven years later without any signs of peri-implant bone resorption and excellent ossification of the augmentation material.



Fig. 5: Dental film twelve years after socket fill with algae derived bone augmentation material and implant insertion in position 15 and nine years later of immediate implant insertion in position 14.



Fig. 6: Situation twelve years later with healthy peri-implant mucosa.

Alveolar ridge preservation after filling a cyst cavity

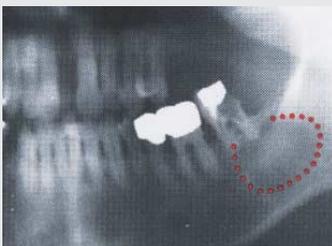


Fig. 1: Lateral section of panoramic radiograph showing a large periapical cyst tooth 37.

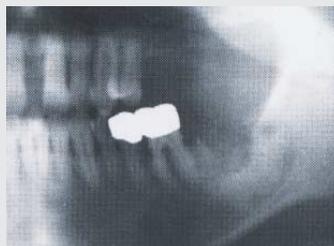


Fig. 2: Lateral section of panoramic radiograph after extraction of tooth 37 and filling the cystic cavity with algae derived bone augmentation material. Due to the porosity and the slender quantity of HA augmentation material the bone density is still low.



Fig. 3: Lateral section of panoramic radiograph twelve years later after extraction of tooth 37 and filling the cystic cavity with algae derived bone augmentation material with complete ossification of the augmentation material and satisfying ridge preservation in region 37.

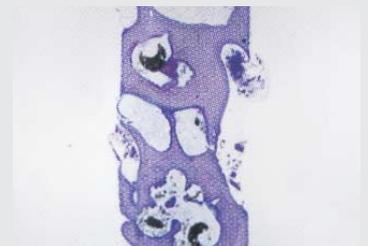


Fig. 4: Undecalcified hard tissue ground section of a bone trephine specimen taken from the former filled cyst area region 37 under two-fold magnification of the whole section with complete ossification of the algae derived augmentation material with only little remnants in the marrow region after 12 years of material remodelling.



maratrix
Bone grafting material

	Contents
52-701-01-04	1.0 cm ³
52-701-02-04	2.5 cm ³
52-701-05-04	5.0 cm ³

Grain size 0.3 - 1.0 mm

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Sinus augmentation with phycogene hydroxyapatite: histological and histomorphometrical results after 6 months in humans. A case series
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Comparative histological results of different biomaterials used in sinus augmentation procedures: a human study at 6 months
Clin. Oral Impl. Res. 0, 2011 / 1-8
- J. Lambrecht (Editor), A. Dunsche, R. Ewers, A. Filippi, B. Hoffmeister, Th. Keusch, K. Wangerin,
Oral and Implant Surgery: Principles and Produces, Quintessence Publishing Co. Ltd., Chapter 8 "Implant Surgery, 8.4 Augmentation" R. Ewers p. 306 - 377.

mar**trix** and SonicWeld **Rx**[®]

*... Make more of your augmentate
with the unique ...*

SonicWeld **Rx**[®] technology

*More volume and superior dimensional
stability – no bone grafts required!*

Metal-free reconstruction of major alveolar defects with significantly enhanced three-dimensional stability is possible with the “shell technique” according to Dr. Iglhaut of Memmingen, Germany. The miniaturized SonicPins Rx[®] and ultra-thin yet stable foils or perforated membranes, all made of pure PDLA, provide for excellent wound healing along with reliable degradation of the material, with no residues left in the body once the metabolic process has been completed.

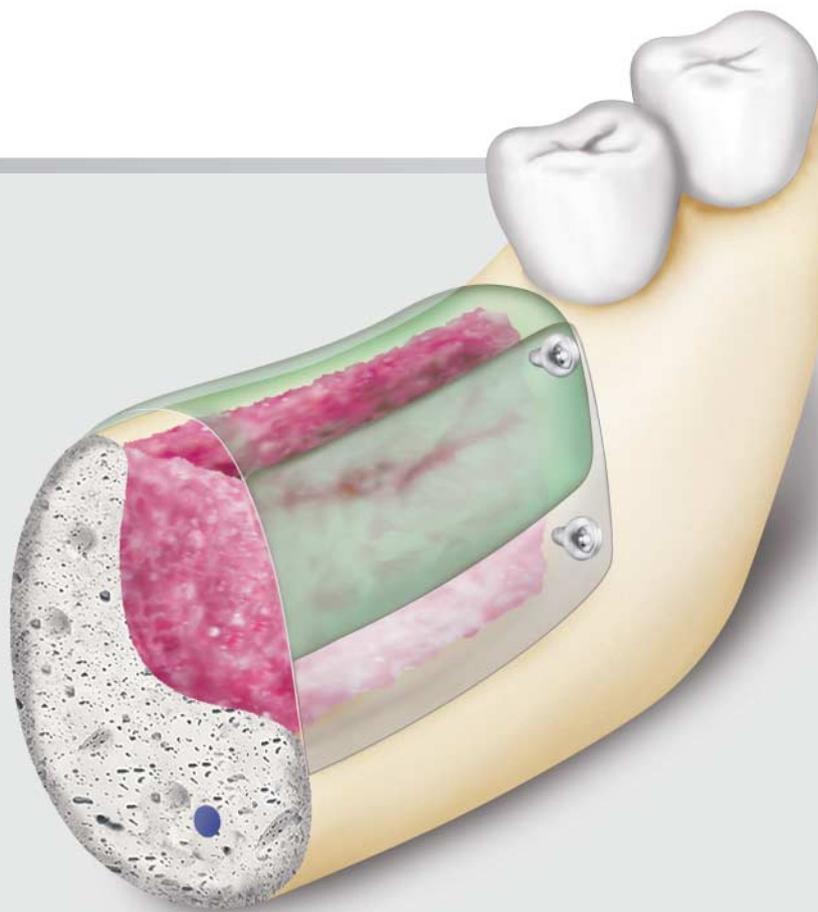
*Easy and straightforward insertion
with ultrasound*

First of all, the pins are positioned in the bone base before the transparent foil or membrane is then welded in place on the pins in a second step. Drilling holes into the foil at any time thereafter is just as easily possible as drilling out pins that have been placed wrongly.

No need to remove any metal parts

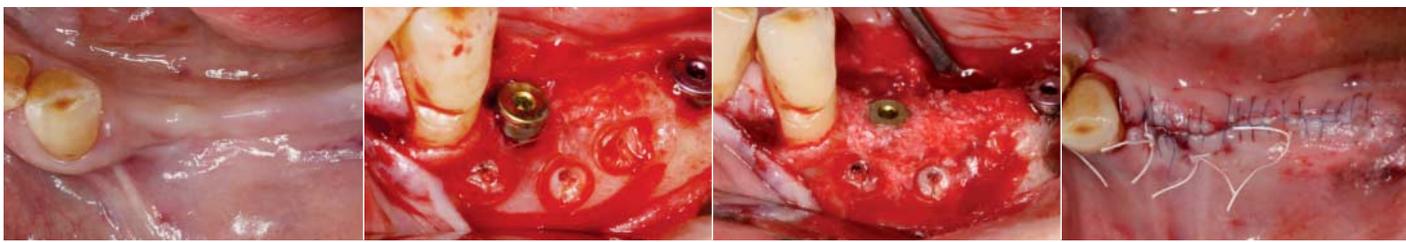
Problems with broken screws and pins, titanium foils that have grown in, time-consuming removal of metal components – such troubles belong to the past!





- Collagen membrane as a diffusion-open crestal cover
- PDLLA membrane for lateral support and protection (shell technique)

*Case example 1**

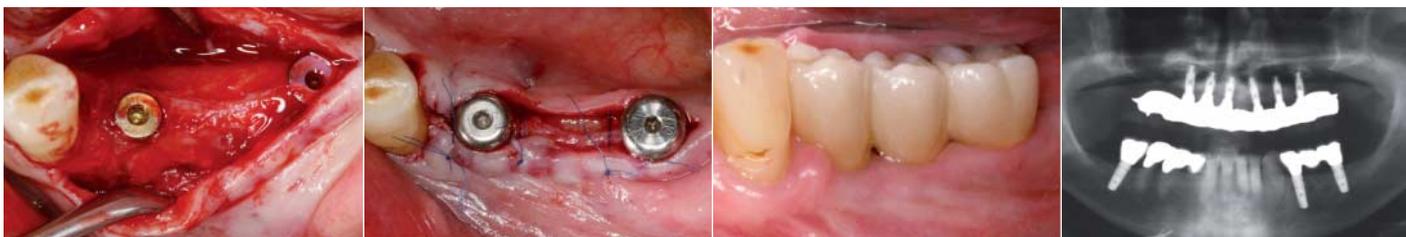


Initial situation of a buccal defect in region 34-36

Immediate implantation, laterally supported with 0.1-mm thick PDLLA membrane

Complete 3D volume reconstruction

Tension-free wound closure is key



Stable reconstruction result even 6 months after the operation

Advancement flap plasty for stable soft tissue structure

Prosthesis in place

OPG one year after the operation

*Case example 2***



Sinus lift procedure with SonicWeld Rx®. First of all, the windows technique is used for sufficient preparation of the sinus.

Then SonicPins Rx® are welded in place around the sinus.

Only now is the augmentate inserted into the sinus. Subsequently, the site is securely closed with a thin, 0.1-mm membrane. In the process, the membrane is welded onto the inserted pins.

* "Shell technique" case photos by courtesy of Dr. Iglhaut, Memmingen/Germany

** "Sinus lift" case photos by courtesy of Dr. Ulrich Volz, Constance/Germany

Discover our new achievements!
Alveolar protector

The resorbable alveolar protector is an innovation that offers a completely new approach to reconstructing single-tooth defects.



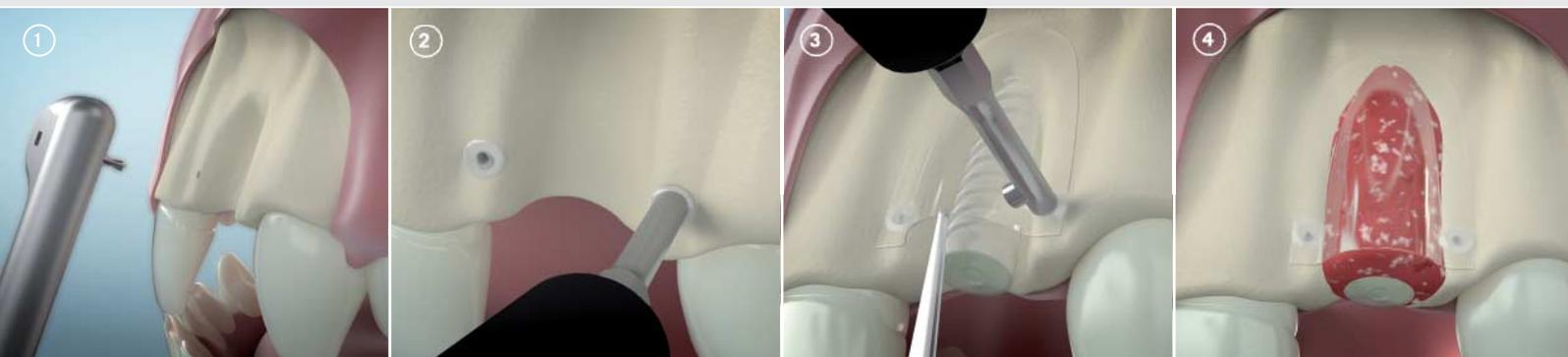
52-301-07-04
Resorb x[®] alveolar protector

User advantages:

- Optimal, dimensionally stable reconstruction of the convex alveolar structure thanks to the protector's finger nail design
- Preformed protector shortens operating times
- Easy reduction/adaptation to anatomical conditions
- Secure fixation with the proven SonicWeld Rx[®] technology

Patient advantages:

- Excellent imitation of the natural structure guarantees a perfect aesthetic result
- Low infection risk and reduced trauma as no bone grafting and therefore no second surgical site is required (unlike bone block technique)
- Resorbable material eliminates the need for a second intervention
- Low-cost reconstruction due to lower material requirements (2 SonicPins Rx[®] usually sufficient)



And this is how the alveolar protector is fixed in place with SonicWeld Rx®: After predrilling the hole (1), the SonicPin Rx® is put in place and caused to glide into the bone by applying ultrasound and a little pressure (2). The alveolar protector is then placed over the reconstruction site and bonded to the already inserted SonicPins Rx® using ultrasound again (3). Thereafter, the resulting pocket is filled with autologous bone or a bone regeneration material (4).

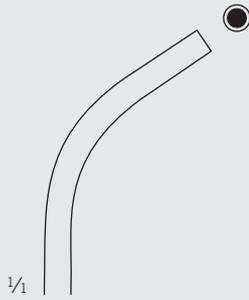
Instruments

Bone carriers, suction cannulas, bone collector



1/2

38-040-02-07 -
38-040-08-07
Bone carrier



1/1

Fig. 01
38-040-02-07
2.5/3.5 mm

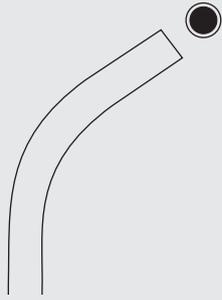


Fig. 02
38-040-04-07
3.5/4.5 mm



Fig. 03
38-040-06-07
4.5/5.5 mm

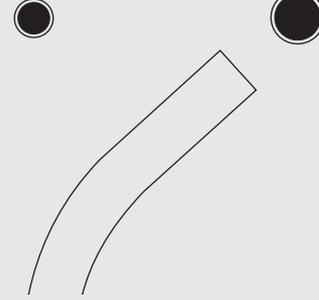
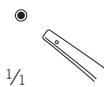


Fig. 04
38-040-08-07
6/7 mm



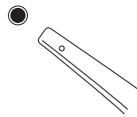
1/2

18-501-14-07 - 18-506-18-07
Suction cannula

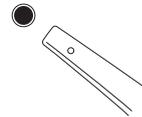


1/1

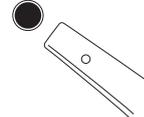
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14.5 cm / 5 5/8"
1.5 mm Ø



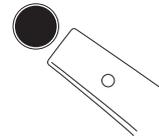
18-502-14-07
14.5 cm / 5 5/8"
2.5 mm Ø



18-503-14-07
14.5 cm / 5 5/8"
3 mm Ø



18-504-14-07
14.5 cm / 5 5/8"
4 mm Ø



18-506-14-07
14.5 cm / 5 5/8"
6 mm Ø

18-501-18-07
18 cm / 7 1/8"
1.5 mm Ø

18-502-18-07
18 cm / 7 1/8"
2.5 mm Ø

18-503-18-07
18 cm / 7 1/8"
3 mm Ø

18-504-18-07
18 cm / 7 1/8"
4 mm Ø

18-506-18-07
18 cm / 7 1/8"
6 mm Ø



1/2

38-025-00-07
Bone collector
consisting of cup, cover, ejector, and 1 filter insert

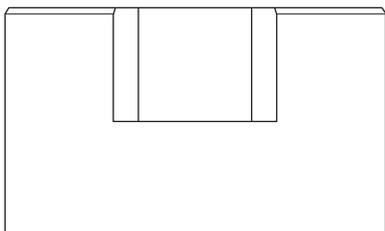
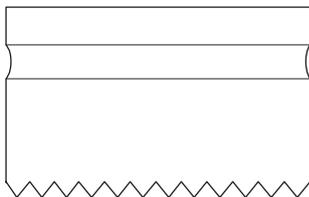
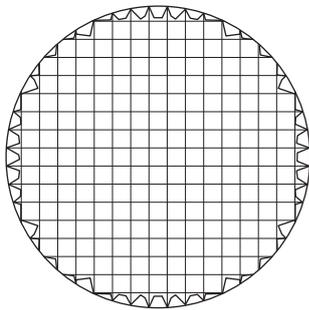


1/2

38-025-01-07
Bone filter for single use



Bone crusher,
bone mill



1/1



1/2

38-018-01-07
Bone crusher

Ti

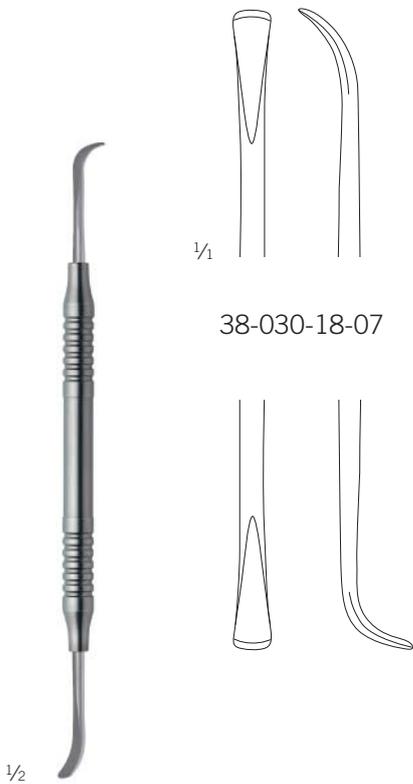
Titanium mill work



1/2

38-019-01-07
16.5 cm / 6 4/8"
Bone mill for small and medium quantities

Instruments
Sinus lift cures



1/1

38-030-18-07

1/2

Iglhaut
38-030-18-07
18 cm / 7 1/8"



1/1

Fig. 1
38-017-01-07
19 cm / 7 4/8"

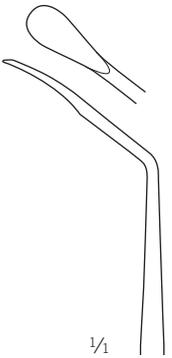
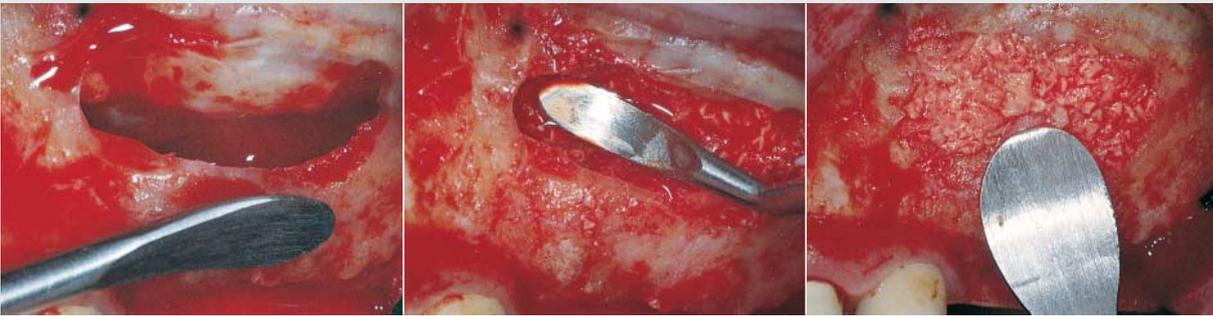
1/2

Körner-Westermann
38-017-01-07 - 38-017-05-07

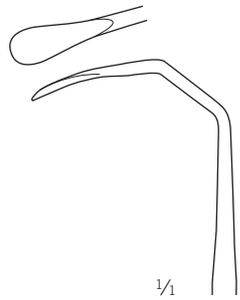


1/1

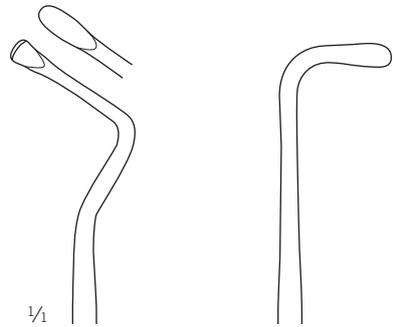
Fig. 2
38-017-02-07
20 cm / 7 7/8"



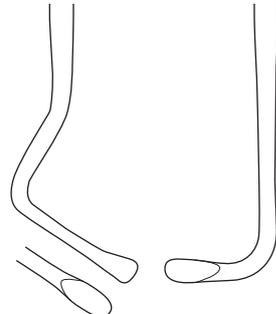
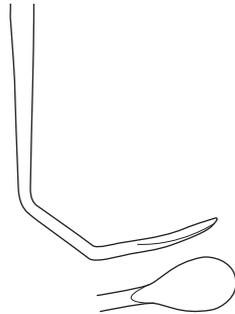
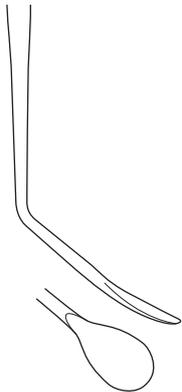
1/1
 Fig. 3
 38-017-03-07
 19 cm / 7 4/8"



1/1
 Fig. 4
 38-017-04-07
 17 cm / 7 6/8"



1/1
 Fig. 5
 38-017-05-07
 18 cm / 7 1/8"



Hook-type sinus retractor acc. to Lindorf

- Keeps the cheek soft tissues and the mucosal flap securely out of the way
- Designed for effortless, single-handed use
- Designed for space-saving handling
- Provides perfect overview of surgical site
- Minimizes risk of contamination



Drilling a pilot hole in the zygomaticoalveolar crest

Sinus lift preparation

Sinus floor augmentation



1/2

Lindorf
38-527-01-07
19.5 cm / 7 5/8"

Hook-type sinus retractor, left side



1/2

Lindorf
38-527-02-07
19.5 cm / 7 5/8"

Hook-type sinus retractor, right side

Should you have any queries ...
 ... we'll be glad to answer them!

Our dental catalog contains the complete range of KLS Martin dental instruments

Printed version CD version
 90-138-48-06 90-138-38-07



For more detailed information, visit our website or order our special brochure, "SonicWeld Rx®, guided bone regeneration and prosthetic augmentation".

Of course, you can reach us in person at your convenience – either via e-mail or through our customer hotline.

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