



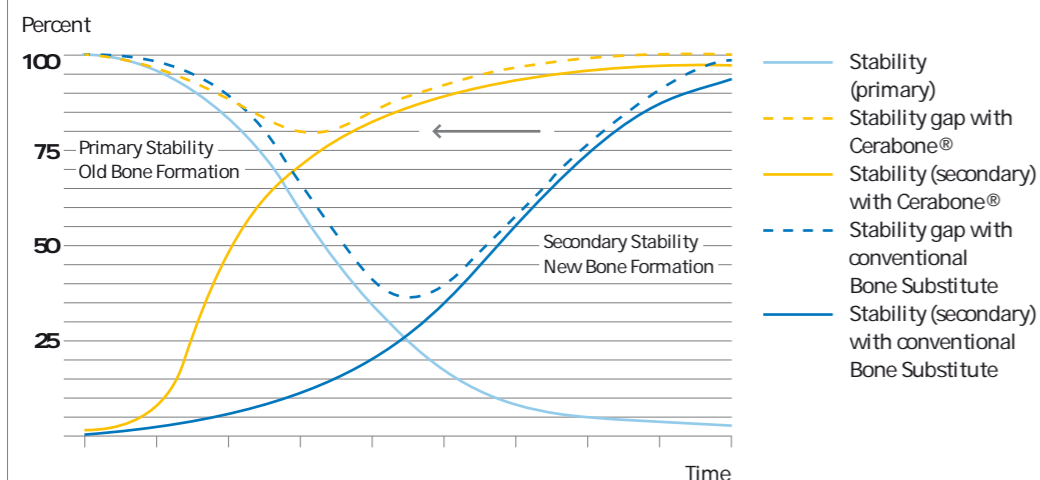
## Beauty comes from within. Stability too.

Clinical routine shows that stability plays an important role during the early stages of implantology treatment. The quicker and more intensive the osseointegration process, the higher the implant stability. Cerabone® is an incomparably stable, highly purified, and well-established spongiosa bone graft material of bovine origin. It goes further towards satisfying the requirements for increased safety and better predictability. The material is used for oral guided bone regeneration (GBR) in the management of simple and complicated defects to build up the bone bed. The mineral composition, the crystalline structure, and the spongiosa structure of Cerabone® are very similar to those in the human body<sup>1</sup>. Therefore, Cerabone® achieves approximately the same elasticity, strength and stability in the patient's jaw after integration as the body's own jaw bone. Cerabone® is eminently suitable for all augmentation techniques for building up a strong implant bed and treating periodontal defects. Cerabone® is the material of choice for functional and aesthetic reconstructions for natural, reliable, simple and economic bone regeneration. In combination with autologous bone and other bone graft materials as well. Thanks to the particularly high degree of purity of the hydroxyapatite of bovine origin and the pH of 8.2, the outstanding homogeneity of the hydroxyapatite structure and the interconnecting macropores of the natural bone, Cerabone® is superior to other hydroxyapatite ceramics<sup>2</sup>.

1 Hing KA et al., J Mater Sci Mater Med. 1999 Mar; 10(3): 135-45  
2 Hing KA et al., J Mater Sci Mater Med. 1997 Dec; 8(12): 731-6.

Mechanical properties of Cerabone®		
	Cerabone® block 20x 20x 40mm <sup>3</sup>	Cerabone® block 20x 20x 40mm <sup>3</sup>
Compressive force [N]	1670 +/- 120	4510 +/- 770
Compressive strength [N/cm <sup>2</sup> ]	420 +/- 32	564 +/- 96
Shear force [N/cm <sup>2</sup> ]	124 +/- 35	338 +/- 200

### Implant stability with Cerabone® and competitive bone substitute

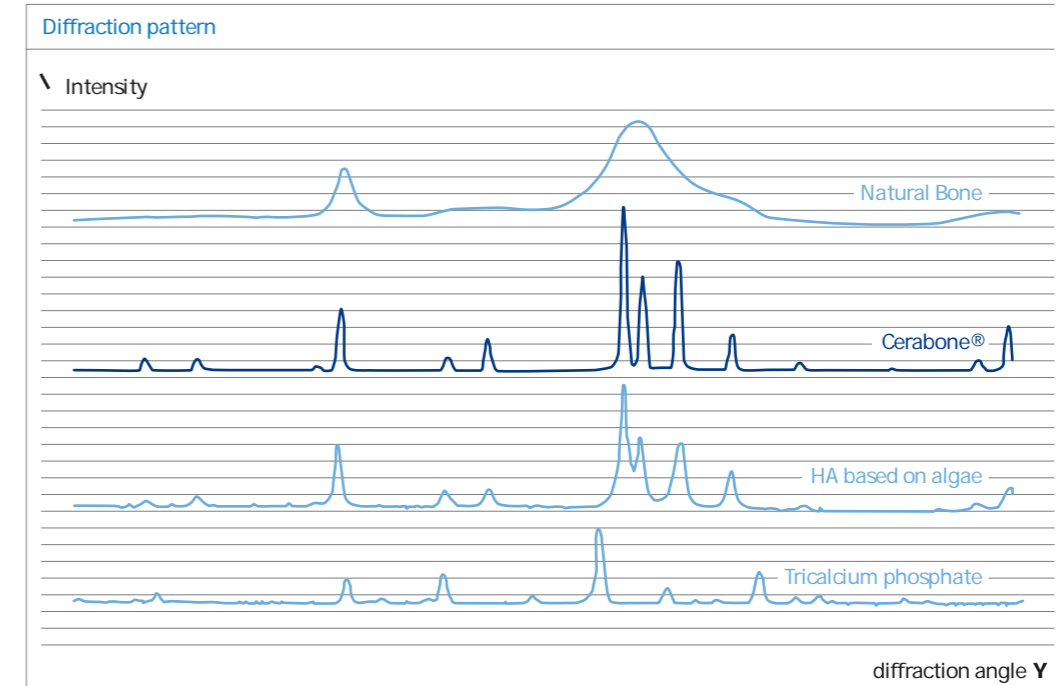


## Perfection is rare. Purity too.

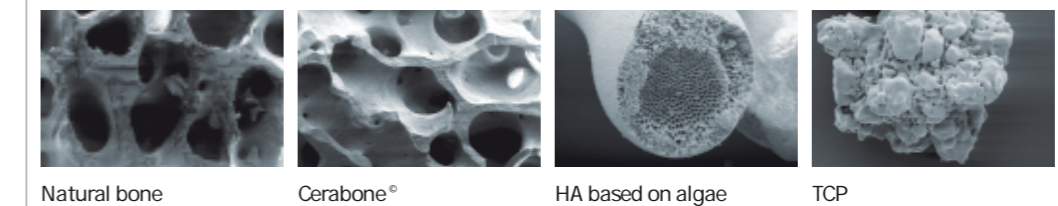
The development of a single-phase hydroxyapatite such as Cerabone® was prompted by the trend towards increased safety and better predictability. The focus on the body's biological healing processes demanded a material that does not contaminate the healing process in the body with phase impurities<sup>3</sup>. The phase content of Cerabone® as measured by X-ray diffractograms shows phase pure hydroxyapatite. Cerabone® is pure and 100% safe (BSE) and 100% protein-free. Thus Cerabone® does not contain any phase constituents that impair the healing process. This means better clinical safety for therapist and patient alike. In this way, Cerabone® exploits the natural and perfect healing potential of the human body right from the start<sup>4</sup>.

3 Jensen SS et al., Int J Oral Maxillofac Implants. 1996 Jan-Feb; 11(1): 55-66.

4 Huber FX et al., Arch Orthop Trauma Surg. 2006 Oct; 126(8): 533-40.



### Scanning electron microscope pictures



## Therapies need acceptance. Performance too.

### Cerabone®- Biofunctionality

The excellent acceptance and biocompatibility of hydroxyapatite and Cerabone® spring from its material properties. The other properties of Cerabone® are based on the open interconnecting pore structure. This is identical to the biological characteristics of the bovine starting material and arises from the physiological structure of the human body. Cerabone®'s macroporous structure is ideal in its osteoconductive function and promotes the ingrowth of blood vessels and nerves. The adhesion and spread of osteoblasts over the Cerabone® surface creates an open, interconnecting pore structure, which prompts a bioactive reaction with bone tissue formation, bone tissue strengthening and bone tissue interlinking leading to the restoration of the bone and its function. The osteoconductive properties of hydroxyapatite ceramic have been demonstrated without doubt by biopsies<sup>5</sup>.

### Cerabone®- Long-term success

The very good acceptance of Cerabone® is seen in its efficacy. Hydroxyapatite of bovine origin has been successfully used in clinical medicine since 1989. Radiological follow-ups after 3 and 6 months showed consolidation of the defects that was consistent with the healing phase. Biopsies retrieved from clinical grafts showed that the ceramic had almost completely been surrounded by bone and that newly formed bone had also been deposited inside the ceramic pores. The long-term results were also confirmed by a large number of studies and clinical applications<sup>6</sup>.

### Cerabone®- Tolerability

The bone graft material Cerabone® is extremely well tolerated. Its pH of 8.2 matches approximately the physiological levels, which is particularly important during the early stages of implantation. Cerabone® does not contain any pharmacologically active constituents. Large patient populations have confirmed the good biocompatibility of hydroxyapatite ceramic. Not one single rejection reaction has been reported to date<sup>7</sup>.

### Cerabone®- Administration

The Cerabone® material is very hydrophilic and can easily be mixed with the patient's blood before insertion. The Cerabone®/blood mixture demonstrates excellent coagulation properties and can be taken off the spatula confidently and applied with pinpoint accuracy. Bone regeneration can be promoted in combination with autologous blood and bone<sup>8</sup>.

<sup>5</sup> Huber FX et al., J Mater Sci Mater Med. 2007 Jun 14

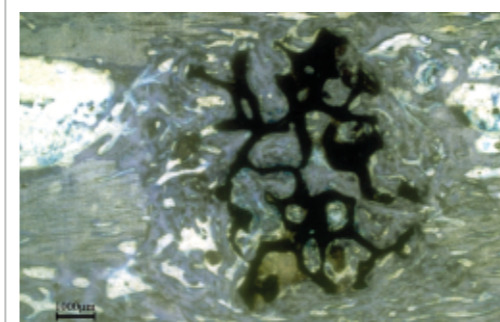
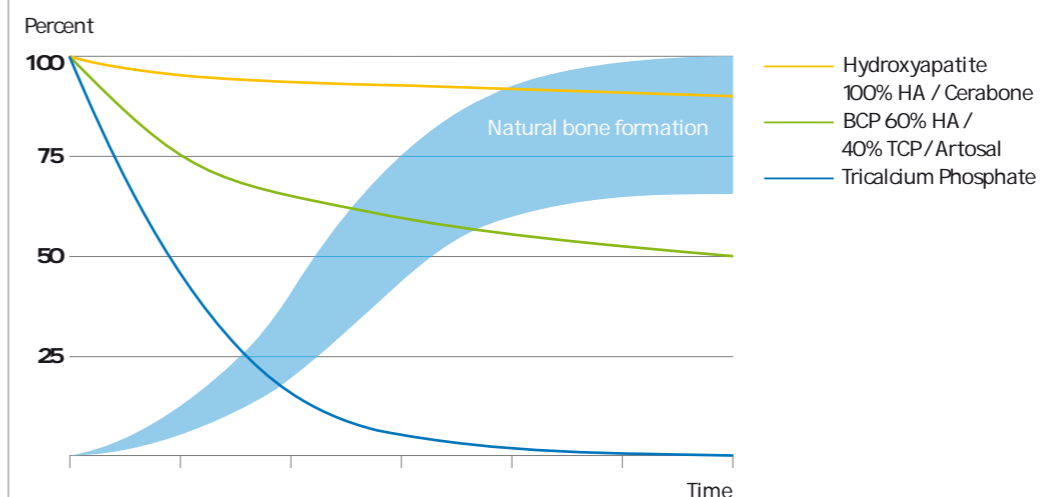
<sup>6</sup> Briem D et al., Unfallchirurg. 2002 Feb; 105(2): 128-33

<sup>7</sup> Helber MU et al., Unfallchirurg. 2000 Sep; 103(9): 749-53

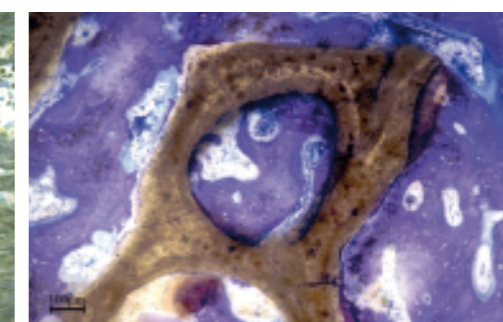
<sup>8</sup> Laschke MW et al., J Biomed Mater Res B Appl Biomater. 2007 Aug; 82(2): 494-505

### Comparison Material Class and Growth

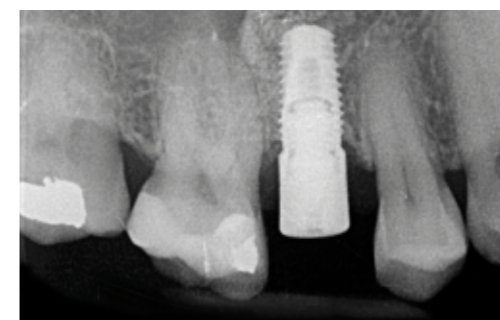
Solubility of Cerabone® Artosal® and Tricalciumphosphate compared to new bone formation.



The good integrated HA-ceramic fragments are visible macroscopically.



Staining with toluidin blue. Well structured trabecular bone with numerous osteoblasts on the trabecular and ceramic surface



Showing the regenerated bone situation 5 months post-operatively after sinus floor augmentation and immediate insertion of the implant.  
Clinician: Dr. Daniel Rothamel

#### Implantology

- Sinus floor augmentation
- Ridge augmentation
- Vertical augmentation
- Periimplantitis indications
- Extraction Sockets
- Oral surgery
- Maxillofacial surgery

#### Periodontology

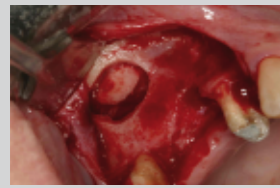
- Intra osseous defects
- Furcations defects (class I, II)

#### Endodontics

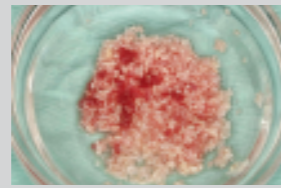
- Intraoral bony defects after cystectomies
- Root tip resections

## Clinical Cases

### Sinus Lift Augmentation with Cerabone® Case by Ziv Mazor D. M. D



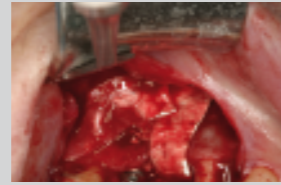
1 Window preparation and sinus membrane elevation.



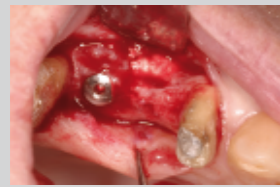
2 Cerabone® granules rehydrated with saline and autogenous bone chips.



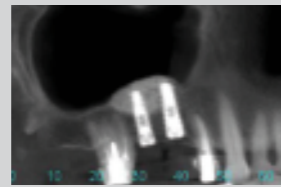
3 Sinus filled with Cerabone® and implant placement.



4 Collagen membrane covering the lateral window.

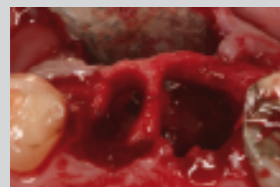


5 Uncovering of Implants 6 months post operatively. Note complete bone fill on top of implant cover screw.

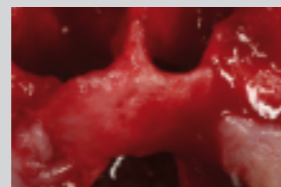


6 CT scan of the sinus augmented with Cerabone®.

### Ridge Augmentation with Cerabone® Case by Ziv Mazor D. M. D



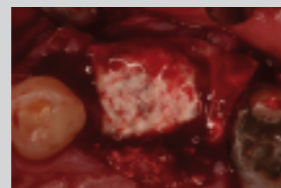
1 Extraction of teeth # 24-25.



2 Alveolar ridge after extractions. Note buccal fenestration.



3 Sockets filled with Cerabone®.



4 Collagen membrane covering buccal and occlusal aspects of the ridge.



5 Soft tissue healing of the augmented area.



6 Implants placed into the augmented sockets 6 months post augmentation.

## Eff cacy makes sense. Safety too.

The clinical application of Cerabone® guarantees the highest possible safety and predictability. The spongiosa bone graft material of bovine origin Cerabone® covers a broad spectrum of indications and offers so many options for effective and safe prognoses in everyday clinical routine.

Cerabone® is produced by a specially developed method under clean-room conditions using a validated production process. aap Biomaterials GmbH & Co. KG satisfies the requirements of a quality management system in accordance with EN ISO 13485:2003 and EN ISO 9001:2000. The product Cerabone® fulfills the requirements laid down in Annex II.4 of Directive 93/42/EEC and Directive 2003/32/EC.

### Cerabone® – Safety

The unique manufacturing process with a two-stage heating process removes unwanted fractions such as fat, cells, antigen structures and inactivated pathogens. The specific retrieval of bovine donor spongiosa is the reason for the balanced ratio of porosity and density of Cerabone® and offers an incomparably firm bond between the ceramic crystals and unique mechanical strength. The controlled further processing with wide-ranging chemical purification processes and specific high-temperature stages inactivates all organic elements and eliminates all immunological processes: Cerabone® is 100% safe (BSE), 100% protein-free<sup>9</sup>.

Cerabone® is a hydroxyapatite ceramic that consists entirely of inorganic material which is available as granules of various sizes or pre-formed shapes. Cerabone® is superior to other hydroxyapatite ceramics due to its particularly high degree of purity, the physiological pH, the homogeneity of the hydroxyapatite structure and the inter-connecting macropores<sup>10</sup>.

<sup>9</sup> Seidel P et al., Mat.-wiss. U. Werkstofftech. 2004; 35(4): 208

<sup>10</sup> Dingeldein E et al., Cerabone Knochenersatzmaterial. 2001: 25-9.

