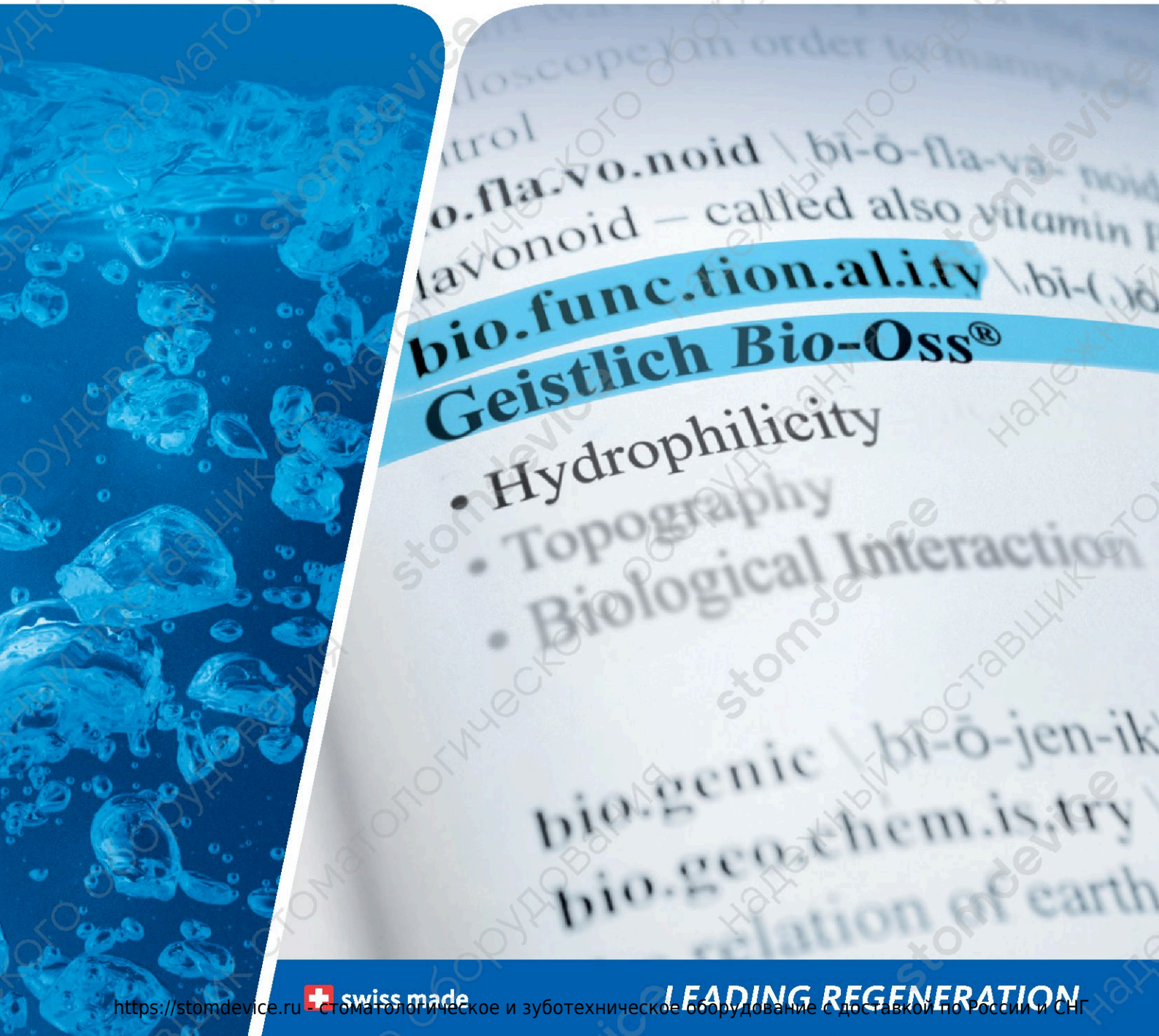
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Geistlich
Bio-Oss®

Hydrophilicity – a key factor for the Biofunctionality of Geistlich Bio-Oss®



swiss made

LEADING REGENERATION

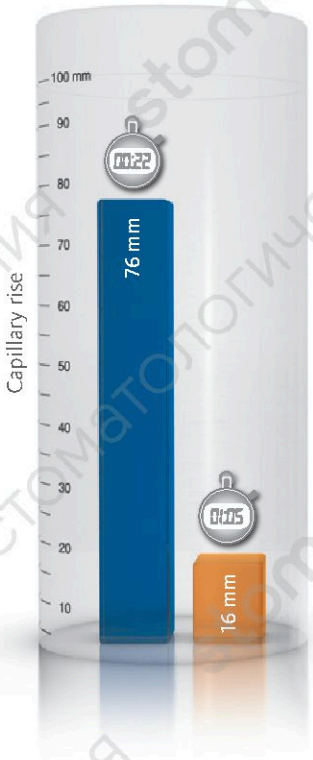
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Superior Hydrophilicity of Geistlich Bio-Oss®

Fast and complete hydration through unique characteristics

Capillary action of Geistlich Bio-Oss®



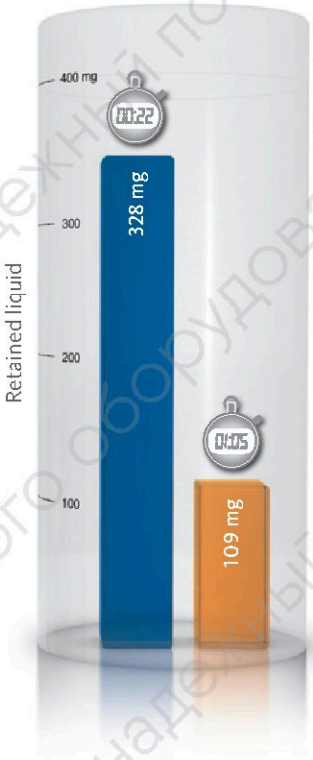
Capillary rise in Geistlich Bio-Oss® is 5 times higher than in a ceramic material.[1]

The strong capillary action of Geistlich Bio-Oss® enables fast and efficient permeation of blood through Geistlich Bio-Oss®.

- Geistlich Bio-Oss® 320 mg ≙ ca. 0.7 cc
- Ceramic material 590 mg ≙ ca. 0.7 cc

The same filling level

Blood retained in Geistlich Bio-Oss®



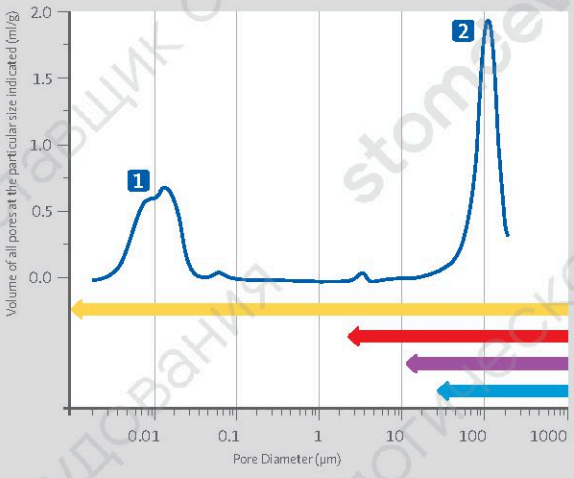
The amount of liquid retained in Geistlich Bio-Oss® is 3 times greater than in a ceramic material.[1]

The total fluid uptake capacity of Geistlich Bio-Oss® together with its efficient permeation leads to excellent osseointegration of the biomaterial.

- Geistlich Bio-Oss® 320 mg ≙ ca. 0.7 cc
- Ceramic material 590 mg ≙ ca. 0.7 cc

The same filling level

Bimodal pore structure: the basis for excellent Hydrophilicity



The unique micro- and macropore structure of Geistlich Bio-Oss® is an important factor contributing to high Hydrophilicity:

1. The micropores ensure the high capillary action, and consequently the fast liquid uptake in Geistlich Bio-Oss®.
2. The interconnected macropores allow blood cells and proteins to enter into the Geistlich Bio-Oss® particles enabling effective osseointegration of Geistlich Bio-Oss® particles.

- Tissue fluids
- Blood cells
- Osteoblast (15 µm–20 µm)
- Osteoclast (40 µm–100 µm)

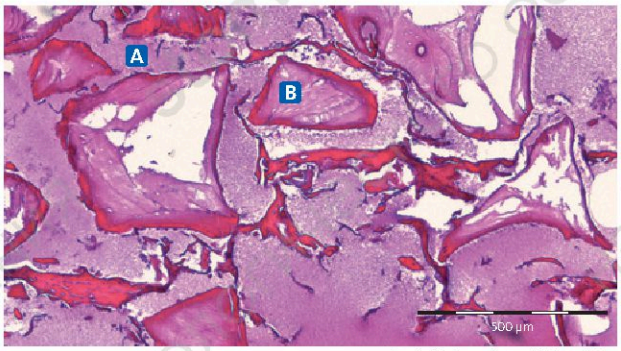
[1] Bufler MA, material analysis, department of analytical research, Geistlich Biomaterials, Wolhusen, Switzerland.
[2] Schäfer B, department of core technology, Geistlich Biomaterials, Wolhusen, Switzerland.
[3] Berglundh T, Lindhe J: Healing around implants placed in bone defects treated with Bio-Oss®. An experimental study in the dog. Clin Oral Implants Res 1997; 8(2): 117–24.
[4] Cardaropoli G, et al.: Dynamics of bone tissue formation in tooth extraction sites. An experimental study in dogs. J Clin Periodontol 2003; 30(9): 809–18.
[5] Aghaloo TL, Moy PK: Which Hard Tissue Augmentation Techniques Are the Most Successful in Furnishing Bony Support for Implant Placement. Int J Oral Maxillofac Implants 2007; 22(Suppl): 49–70.

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Effective new bone formation for your clinical success

Storage of proteins and growth factors

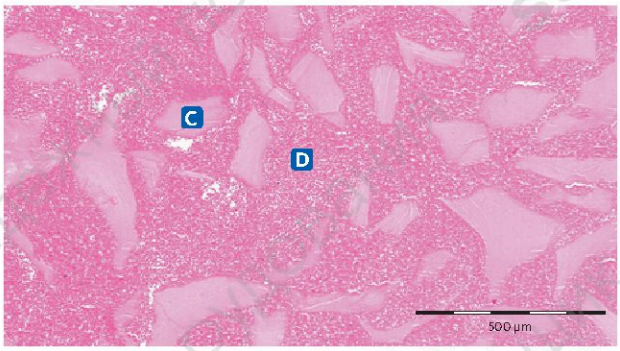


decalcified specimen, H&E staining

A Blood serum components
B Geistlich Bio-Oss®

A provisional matrix consisting of blood serum components surrounds Geistlich Bio-Oss®. Protein deposits are found between the biomaterial particles. The Geistlich Bio-Oss® pores are filled with serum proteins and serve as a reservoir for growth factors.[2]

Complete penetration with blood

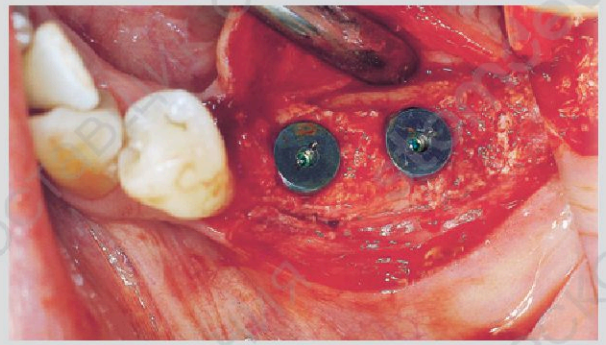


decalcified specimen, H&E staining

C Geistlich Bio-Oss®
D Blood

Red blood cells are found in intimate contact with Geistlich Bio-Oss® particles in a culture with human blood. Normal blood coagulation occurred in the presence of the biomaterial.[2] *In vivo* the blood coagulum develops into granulation tissue, then into woven bone, and finally into lamellar bone.[3, 4]

Your success with Geistlich Bio-Oss®: predictable and reliable clinical results



The biofunctional characteristics of Geistlich Bio-Oss®, such as excellent Hydrophilicity, are the basis for the proven clinical success realized with Geistlich Bio-Oss®.

This has been demonstrated in a great variety of indications, such as for example in this case: optimal bone support for implant insertion was achieved 6 months after augmentation with Geistlich Bio-Oss® (Case: Prof. Dr. C. Maiorana).

With Geistlich Bio-Oss® high reliability and predictability are achieved, as evidenced by detailed scientific and clinical documentation.[5]

› Geistlich Bio-Oss® exhibits excellent hydrophilicity
› Proven fast uptake and effective retainment of blood
› This allows for effective new bone formation and clinical success
› Therefore, Hydrophilicity is a key factor for the...

Biofunctionality of Geistlich Bio-Oss®

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Geistlich
Biomaterials



Geistlich Bio-Oss® spongiosa granules



Geistlich Bio-Oss® Collagen

Hydrophilicity – a key factor for the **Biofunctionality of Geistlich Bio-Oss®**

The Biofunctionality of Geistlich Bio-Oss® is the sum of its characteristics and is the basis for its clinical success. One of the most important biofunctional characteristics is Hydrophilicity. Geistlich Bio-Oss® has a high Hydrophilicity, which is a result of its unique and interconnecting porous structure, but also of many other chemical and physical factors, such as its ability to build hydrogen bonds, or its suitable surface charge.[1]

The capillary action of Geistlich Bio-Oss® is strong, and enables a much faster and better uptake of blood than in other bone substitute materials.[1] Due to the very fast uptake, the material is completely permeated by blood before coagulation starts. Without this fast uptake, the coagulated blood would block the pores, and hinder the complete permeation of the material and the effective blood retainment.

These factors are important for new bone formation and consequently for the clinical success. It is known that the coagulated blood develops into granulation tissue, then woven bone, and finally into lamellar bone.[3,4] The effective osseointegration of Geistlich Bio-Oss® leads to predictable and reliable clinical results.

Hydrophilicity is not the only characteristic that determines the Biofunctionality of Geistlich Bio-Oss®. Other characteristics, such as Topography and Biological Interactions play a crucial role and lead to a continuation in the story of the Biofunctionality of Geistlich Bio-Oss®.

Biofunctionality of Geistlich Bio-Oss®
Clinical success through unique characteristics

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