

GreenBone[®]

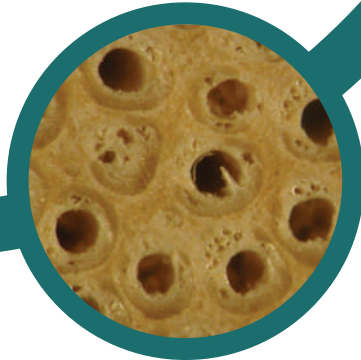
NATURAL
BONE
HEALING



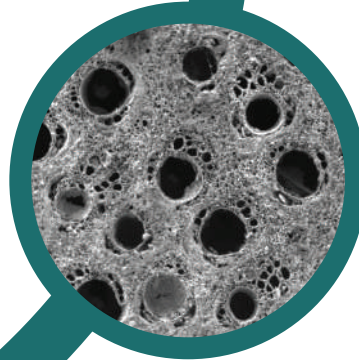
b.Bone[™]



Innovation to enhance bone healing



Typical human bone structure. Scale 200 µm.



b.Bone structure. Scale 200 µm.

BIOMIMETIC (1)

Rattan wood exhibits a morphology and hierarchical structure that closely resemble human bone. **b.Bone** is produced through a biomorphic transformation process, which maintains the original structure of rattan wood.

This biomimetic property enables effective cellular infiltration and vascularization within the graft material, promoting natural bone healing.

1. Tampieri A, Sprio S, Ruffini A, Celotti G, Lesci IG, Roveri N. From wood to bone: multi-step process to convert wood hierarchical structures into biomimetic hydroxyapatite scaffolds for bone tissue engineering. *J. Mater. Chem.*, 2009, 19, 4973–4980

BIOACTIVE (2)

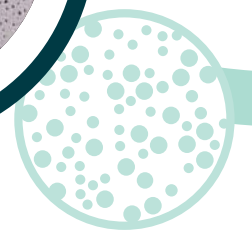
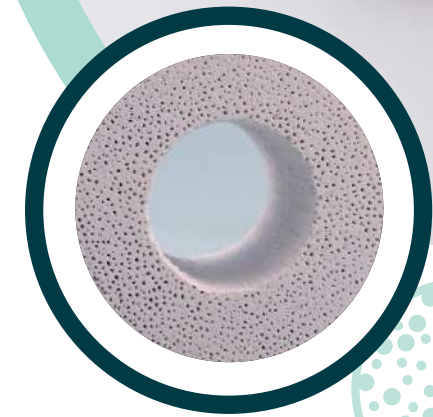
b.Bone structure, with its interconnected porosity and nanostructural properties, along with its composition of HA and β -TCP components, which include CO_3^{2-} , Mg^{2+} , and Sr^{2+} , mimics the structure of human bone.

This unique structure facilitates crosstalk between cells in the signaling pathway to enhance bone healing.

2. Tampieri A, Ruffini A, Ballardini A, Montesi M, Panseri S, Salamanna F, Fini M, Sprio S. Heterogeneous chemistry in the 3-D state: an original approach to generate bioactive, mechanically-competent bone scaffolds. *Biomater. Sci.*, 2019, 7, 307-321



Putting innovation into practice



NOVEL MULTI-STEP PROCESS able to transform rattan wood into inorganic biomaterial maintaining the original morphology and hierarchical structure of rattan.

OSTEOINDUCTIVE PROPERTIES (3)

The osteoinductive properties of **b.Bone** have been demonstrated through in vivo laboratory testing.

Note: the performance of these properties in humans has not yet been established.

3. Kon E., Salamanna F, Filardo G, Di Matteo B, Shabshin N, Shani J, Fini M, Perdisa F, Parrilli A, Sprio S, Ruffini A, Marcacci M, Tampieri A. Bone Regeneration in Load-Bearing Segmental Defects, Guided by Biomimetic, Hierarchically Structured Apatitic Scaffold. *Front Bioeng Biotechnol.* 2021 Sep 27;9:734486.

UNRIVALED EASE OF USE (4)

4. Bigoni D, Cavuoto R, Misseroni D, Paggi M, Ruffini A, Sprio S, Tampieri A. Ceramics with the signature of wood: a mechanical insight. *Mater Today Bio.* 2019 Oct 24;5:100032

CLINICAL EVIDENCE

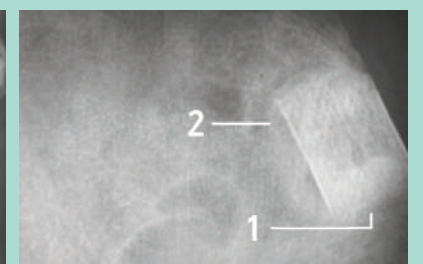
GreenBone conducts and promotes clinical research to introduce our technology through studies demonstrating safety and performance, and to provide long term clinical outcomes data.



Post op x-rays: pelvic fusion and SI joints. Replacement of left iliac crest bone defect with b.Bone.

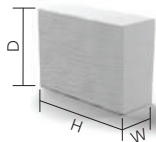


Post op x-rays at 6 months follow up.



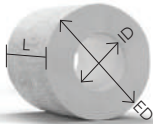
Magnification at 6 months follow up demonstrates complete integration of the graft material (1) with mineralization similar to the pelvic bone texture (2).

Courtesy of prof. P. Giannoudis (Leeds, UK)



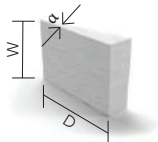
BLOCKS

HEIGHT (H) mm	20	30	40
0,5 mm WIDTH (W) - 10 mm DEPTH (D)			
PRODUCT CODE	HP200510PS	HP300510PS	HP400510PS
0,5 mm WIDTH (W) - 20 mm DEPTH (D)			
PRODUCT CODE	HP200520PS	HP300520PS	HP400520PS
10 mm WIDTH (W) - 10 mm DEPTH (D)			
PRODUCT CODE	HP201010PS	HP301010PS	HP401010PS
10 mm WIDTH (W) - 20 mm DEPTH (D)			
PRODUCT CODE	HP201020PS	HP301020PS	HP401020PS



CYLINDERS

LENGTH (L) mm	10	20	30	40	50	60
10 mm EXTERNAL DIAMETER (ED) - 0 mm INTERNAL DIAMETER (ID)						
PRODUCT CODE	HC100010PS	HC100020PS	HC100030PS	HC100040PS	HC100050PS	HC100060PS
15 mm EXTERNAL DIAMETER (ED) - 0,6 mm INTERNAL DIAMETER (ID)						
PRODUCT CODE	HC150610PS	HC150620PS	HC150630PS	HC150640PS	HC150650PS	HC150660PS
20 mm EXTERNAL DIAMETER (ED) - 10 mm INTERNAL DIAMETER (ID)						
PRODUCT CODE	HC201010PS	HC201020PS	HC201030PS	HC201040PS	HC201050PS	HC201060PS
25 mm EXTERNAL DIAMETER (ED) - 13 mm INTERNAL DIAMETER (ID)						
PRODUCT CODE	HC251310PS	HC251320PS	HC251330PS	HC251340PS	HC251350PS	HC251360PS
30 mm EXTERNAL DIAMETER (ED) - 15 mm INTERNAL DIAMETER (ID)						
PRODUCT CODE	HC301510PS	HC301520PS	HC301530PS	HC301540PS	HC301550PS	HC301560PS



WEDGES

ANGLE (α)	9°	11°	13°
30 mm DEPTH (D) - 15 mm WIDTH (W)			
PRODUCT CODE	WE093015PS	WE113015PS	WE133015PS
40 mm DEPTH (D) - 30 mm WIDTH (W)			
PRODUCT CODE	WE094030PS	WE114030PS	WE134030PS



GRANULES

QUANTITY (g)	5	10	15
SIZE RANGE 0,5 - 1 mm			
PRODUCT CODE	GR051005PS	GR051010PS	GR051015PS
SIZE RANGE 1 - 2 mm			
PRODUCT CODE	GR102005PS	GR102010PS	GR102015PS
SIZE RANGE 2 - 4 mm			
PRODUCT CODE	GR204005PS	GR204010PS	GR204015PS
SIZE RANGE 4 - 7,1 mm			
PRODUCT CODE	GR407105PS	GR407110PS	GR407115PS

b.Bone is intended for use as a bone graft for voids or gaps that are not intrinsic to the stability of the bony structure.

The device can be soaked up or combined with biological materials such as blood and bone marrow aspirate. **b.Bone** granules configuration could be used to expand the volume of autologous bone graft.

It is indicated in the treatment of surgically created osseous defects or osseous defects resulting from traumatic injury to the bone.

b.Bone is intended to be implanted into bony voids or gaps of the skeletal system as a bone substitute, in the extremities and pelvis.

GreenBone® is a patented technology (WO 2021/063201 and WO 2017/021894). The design and production processes of the product comply with EN ISO 13485:2016/A11:2021 requirements.

GreenBone
NATURAL BONE HEALING

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