NORAKER

INNOVATIVE BIOMATERIALS

GlassBONE™

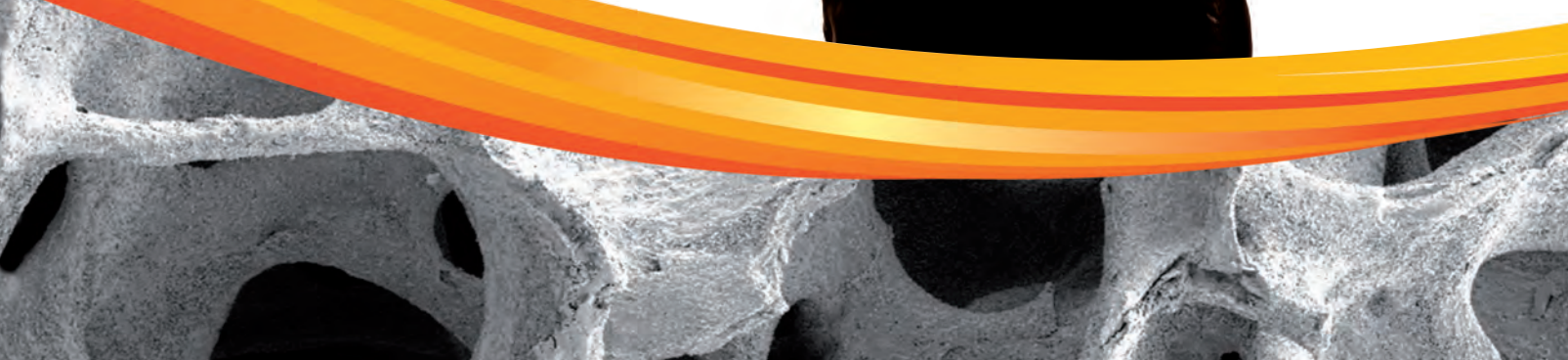
Bioactive bone substitute

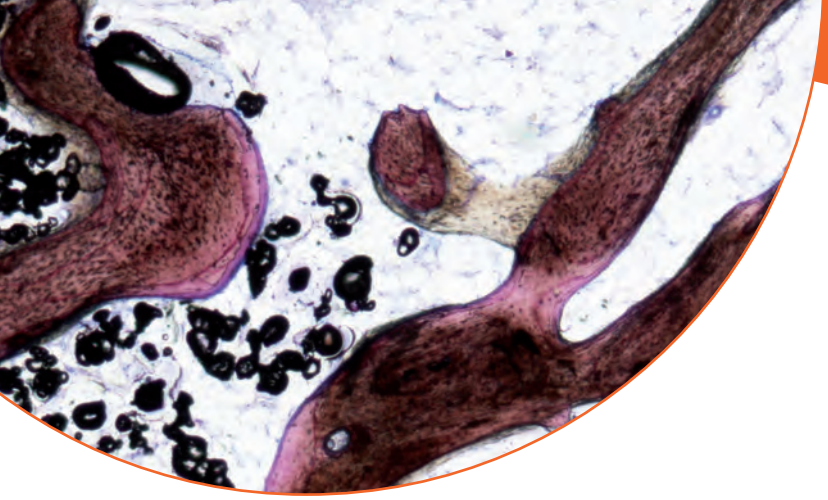
Osteostimulative bone regeneration granules

Easy to use

Osteostimulating

Antibacterial





A good solution

for easy filling, effective bone regeneration.

Indicated in regenerative medicine, GlassBONE™ combines a natural biological action and optimum safety for reliable and reproducible results.

Ease of handling

Highly hydrophilic and cohesive

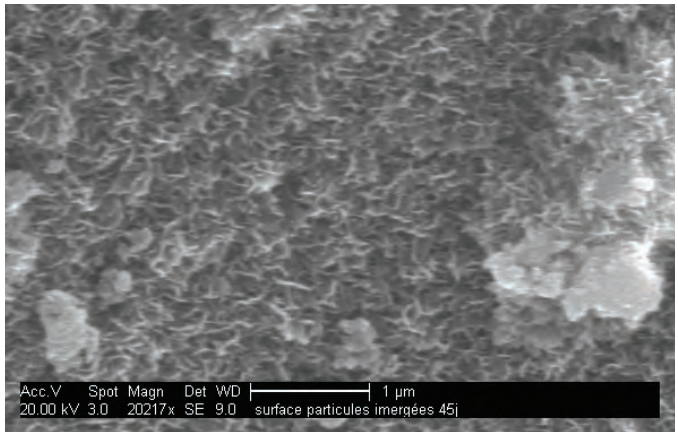
GlassBONE™ has a strong affinity for biological fluids, facilitating its handling. When mixed with the patient's blood or physiological saline solution, it forms a cohesive mass enabling easy implantation in the patient's mouth.

Stabilises bone filling

Bioactive

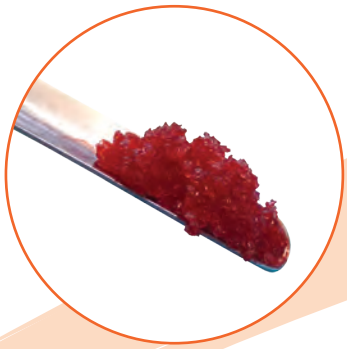
The dissolution of GlassBONE™ induces ion exchanges with biological fluids enabling the formation of a mineral layer, direct biological binding between the biomaterial and the bone. This mineral layer prevents any micromovements of granules in the bone defect, which impede their osteointegration.[1 4 6]

Osteointegration of the biomaterial provides stabilization of bone defect in respect of the anatomical alignment and reduces the migration of the product.

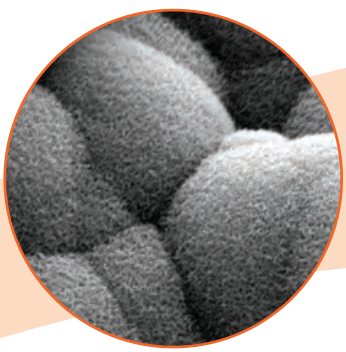


Scanning Electron Microscope characterisation of the mineral layer formed on GlassBONE™ granules.

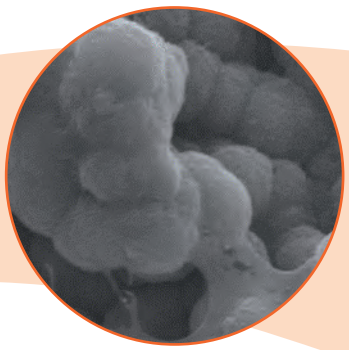
Mechanism of action



Hydrophilic properties and cohesiveness
Affinity with biological fluids, favourable for handling.



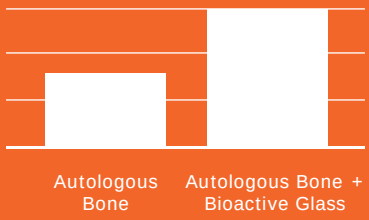
Bioactivity
Mineral phase.
Formation of an active biological mineral layer, responsible for direct binding of the biomaterial and the bone.



Osteostimulation
Cellular phase.
The increase in the silicium ion concentration genetically stimulates the differentiation and proliferation of osteoblasts, which are involved in bone regeneration.

Did you know?

When mixed with autologous bone, GlassBONE™ multiplies natural bone regeneration two-fold, enables easier handling of the bone substitute-autologous bone mixture and inhibits local bacterial growth.[5 7]



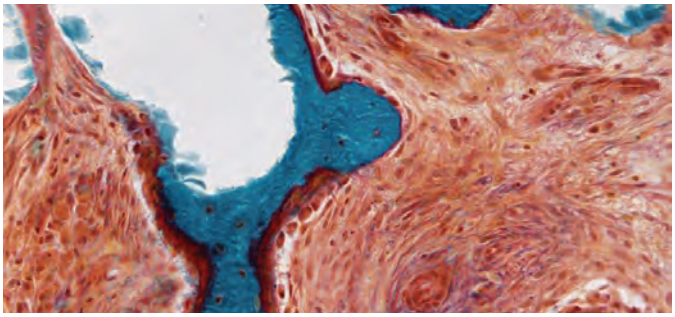
Speeds up bone regeneration by a factor of 2

Osteostimulating

The ability to osteostimulation of GlassBONE™ induces the vascularization of bone defect and recruitment of osteoblasts to promote the stimulation of bone regeneration.

The release of silicium ions makes it possible to genetically stimulate the recruitment and proliferation of stem cells, and the differentiation and proliferation of osteoblasts in the defect with a view to full natural bone remodelling.[2 3]

The intrinsic properties of 45S5 bioactive glass give it the ability to promote the natural bone regeneration process by releasing mineral ions.[5]



50 µm

Histological section at 26 weeks of the filling of a sinus floor in a human.

Optimum safety

Antibacterial

The dissolution of GlassBONE™ gives rise to the release of silicium ions causing the pH and the osmotic pressure to rise in the defect, inducing local antibacterial activity.[7 8]

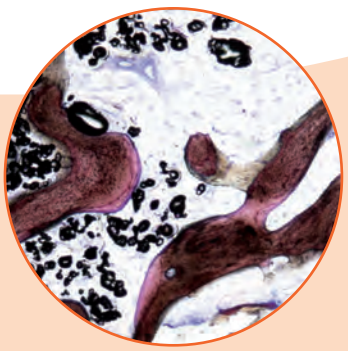
100% bioactive glass, 100% synthetic

Reliable, Predictable and Reproducible Results

GlassBONE™ is a member of the bioactive glass family consisting of natural elements naturally present in the human body and known to play a physiological role in the bone formation and mineralisation process.[2 3]

This composition prevents pathogenic agent transmission risks, postoperative pain associated with an extraction site, and guarantees a high level of safety for patients and surgeons.

Antibacterial
Increase in pH and osmotic pressure.



Volume maintenance
Dissolution in biological fluids, absorption in proportion to bone formation for very satisfactory bone volume maintenance.

Fully regenerated natural bone GlassBONE™ offers to your patients, safety during implantation with a natural and effective bone restoration in the intraoperative filling of interbody arthrodesis cages and the surrounding space, or posterolateral arthrodesis.

Ref.	Granule size	Volume ≈ Weight
Bioactive Bone Substitute Osteostimulative granules to bone regeneration		
GB05.1/5	0.5 – 1.0 mm	5.0 cc ≈ 5.0 g
GB1.3/5	1.0 – 3.0 mm	5.0 cc ≈ 5.0 g
GB1.3/10	1.0 – 3.0 mm	10.0 cc ≈ 10.0 g
GB1.3/16	1.0 – 3.0 mm	16.0 cc ≈ 16.0 g

References

1. *Hench, L.L. The story of Bioglass. J Matter Sci: Matter Med. Springer Science, 2006, Vol. 17, pp. 967- 978.*
2. *Xynos, I.D. and al. Bioglass 45S5 stimulates osteoblasts turnover and enhances bone formation in vitro: implications and applications for bone tissue engineering. Calcif Tissue Int. Springer, 2000, Vol. 67, pp. 321-9.*
3. *Jell, G. and al. Gene activation by bioactive glasses. J Mater Sci: Mater Med. Springer Science, 2006, Vol. 17, pp. 997-1002.*
4. *Tsigkou, O. and al. Differentiation of fetal osteoblasts and formation of mineralized bone nodules by 45S5 Bioglass conditioned medium in the absence of osteogenic supplements. Biomaterials. Elsevier, 2009, Vol. 30, pp. 3542-50.*
5. *Oonishi, H. and al. Quantitative comparison of bone growth behavior in granules of Bioglass, A-W glass ceramic and hydroxyapatite. J Biomed Mater Res. John Wiley & Sons, Inc., 2000, Vol. 51.*
6. *Jones, J.R. Review of bioactive glass: from Hench to hybrids. Acta Biomaterialia. Elsevier, 2013, Vol. 9, pp. 4457-4486.*
7. *Allan, I., Newman, H. and Wilson, M. Antibacterial activity of particulate Bioglass against supra- and subgingival bacteria. Biomaterials. Elsevier, 2001, Vol. 22, pp. 1683-1687.*
8. *Eberhard, J. and al. The effect of the topical administration of bioactive glass on inflammatory markers of human experimental gingivitis. Biomaterials. Elsevier, 2005, Vol. 26, pp. 1545-51.*
9. *Ameri E., and al. Bioactive Glass versus Autogenous Iliac Crest Bone Graft in Adolescent Idiopathic Scoliosis Surgery. Acta Medica Iranica 2009; 47(1): 41-45.*
10. *Illarreborde B., and al. Bioactive Glass as a bone substitute for spinal fusion in adolescent idiopathic scoliosis. J Pediatr Orthop 2008;28:347-351.*
11. *Shapoff C, and al. Evaluation of Bioactive Glass as a bone graft extender in sinus elevation surgeries. International Journal of Oral Implant and clinical res 2010;1:33:155-162.*

The synthetic bone graft substitute GlassBONE™ is indicated in the filling temporary of bone defects caused of traumatism, pathology or surgery in order to bone remodeling:

- Vertebral Arthrodesis,
- Filling bone defects (after tumour resection, after removing iliac bone…),
- Prosthesis revision,
- Traumatology,
- Tibial Osteotomy.

If you are looking for more information on the product, request the scientific and clinical information file or download the iPad app.

GlassBONE™, bone graft substitute is a medical device class III, manufactured by NORAKER SAS and whose conformity assessment was conducted by LNE / G-MED (0459). GlassBONE™ is indicated for filling bone defects.
Read the instructions supplied with the product for complete information on indications, cons-indications, warnings and precautions, and adverse effects

NORAKER is a French manufacturer specialised in the research and development of innovative products based on 45S5 bioactive glass for medical applications.

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