

NORAKER

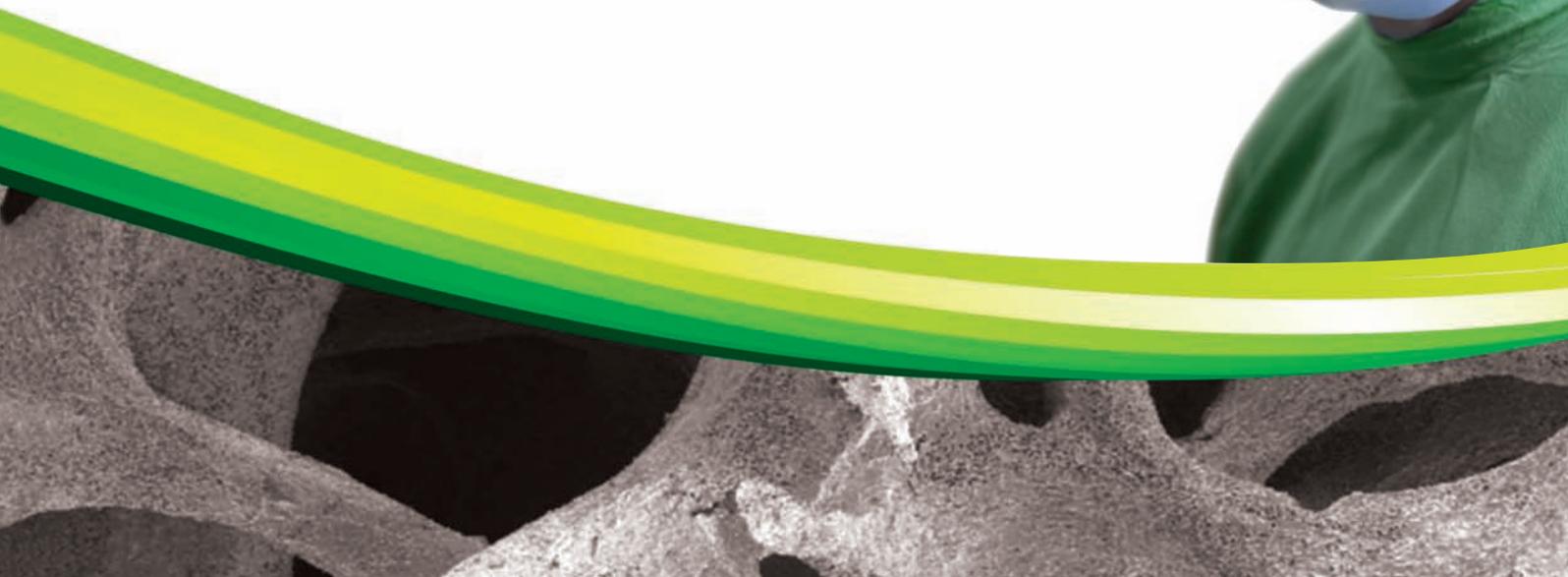
INNOVATIVE BIOMATERIALS

ActiviOSSTM

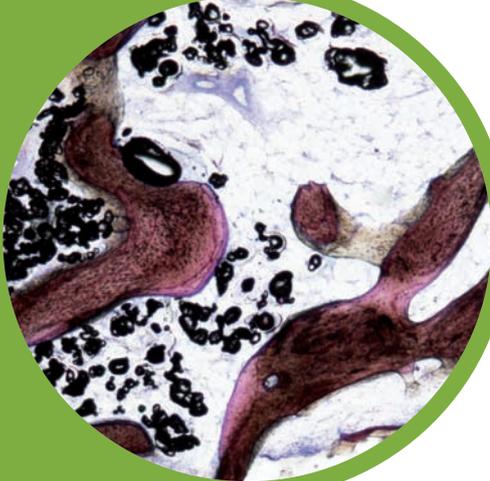
Bioactive bone substitute

Osteostimulative bone regeneration granules

Easy to use, ActiviOSSTM speeds up full bone regeneration two-fold, and inhibits bacterial proliferation locally.



BIOMATERIAL STIMULATING BONE REGENERATION



Tissue engineering is a science which, using biological mechanisms and biomaterials, stimulates deficient tissue regeneration. Noraker is involved in biomaterial development with the aim of becoming an innovative player in the field of tissue engineering.

The future of medicine is heading towards regenerative medicine.

What is Activioss™?

Activioss™ is a bioactive synthetic substitute, an osteostimulating bone regeneration biomaterial.¹

What does it consist of?

Activioss™ consists of 100% 45S5 bioactive glass. It stimulates bone regeneration and is progressively replaced by new bone tissue.

New technology?

45S5 bioactive glass has clinically proven its remarkable performance filling bone defects in orthopaedics and dental surgery on over one million patients.²

What is it used for?

Activioss™ replaces missing bone tissue and stimulates the bone regeneration process.

What makes it different?

Activioss™ is more reactive than inert materials such as hydroxyapatite, β -TCP or BCP.⁷ After reacting with biological fluids, Activioss™ quickly binds with the bone and progressively releases perfectly biocompatible substances that will activate a mechanism promoting bone growth.

Over time, Activioss™ is fully absorbed and replaced by bone tissue. Activioss™ is thus an ideal filling biomaterial, since it makes it possible to fill the bone defect and be progressively replaced by the patient's own tissue.

Furthermore

Activioss™ is a biomaterial capable of inhibiting bacterial proliferation.^{9 10}

Ease of handling

Highly hydrophilic and cohesive

Activioss™ 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.



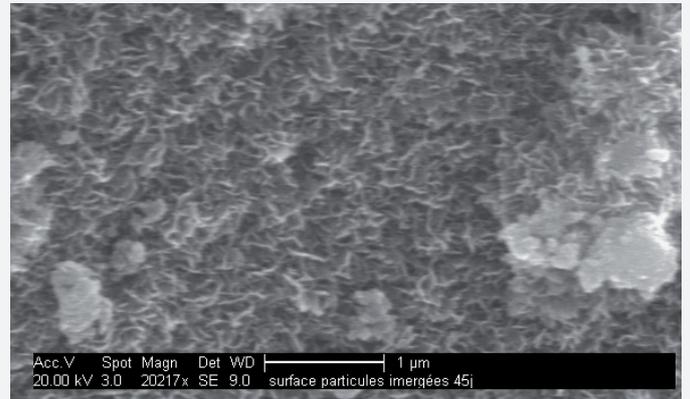
See the comparative cohesiveness test on the website www.activioss.com

Stabilises bone filling

Bioactive

Natural remodelling of the patient's bone is a key factor for the osteointegration of dental implants. Activioss™ enables this natural bone remodelling through its bioactivity, defined as the sequence of biological binding and osteogenesis stimulation.¹

The dissolution of Activioss™ 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.⁵

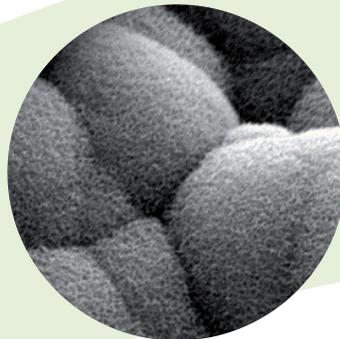


Scanning Electron Microscope characterisation of the mineral layer formed on Activioss™ granules.

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.



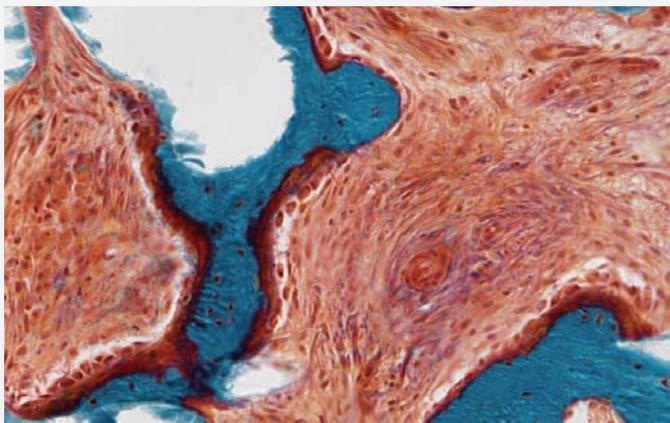
Osteostimulation
Cellular phase.
The increase in the silicium ion concentration genetically stimulates the differentiation and proliferation of osteoblasts, which are involved in bone regeneration.

Speeds up bone regeneration by a factor of 2

Osteostimulating

The release of silicon 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.^{4,6,8} This innovative technology offers a safe and effective solution for dental surgeons and for their patients.

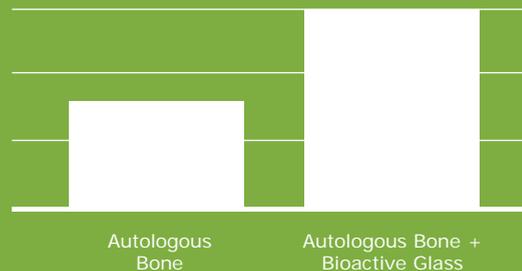


Histological section at 26 weeks of the filling of a sinus floor in a human.

50 μ m

Did you know?

When mixed with autologous bone, Activioss™ multiplies natural bone regeneration two-fold, enables easier handling of the bone substitute-autologous bone mixture and inhibits local bacterial growth.^{7,9}

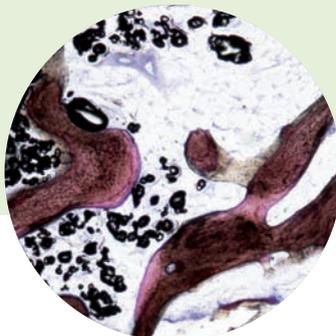


More information on the website
www.activioss.com



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

Antibacterial

Inhibits bacterial proliferation

	Bacteria	Kill of bacteria (%)
Anaerobics	<i>P. gingivalis</i>	91.2
	<i>E. nucleatum</i>	95.0
	<i>P. intermedia</i>	100
	<i>A. actinomycetemcomitans</i>	98.6
Aerobics	<i>S. sanguis</i>	71.1
	<i>S. mutans</i>	83.1
	<i>A. viscosus</i>	72.7

The dissolution of Activioss™ gives rise to the release of silicium ions causing the pH and the osmotic pressure to rise in the defect, inducing local antibacterial activity. This local antibacterial effect has been demonstrated on supra- and sub-gingival bacteria.^{9 10}

Bone volume maintenance

Effective absorption for full remodelling

Your patients' expectations in terms of aesthetics are possible through bone volume restoration and preservation. Bone volume maintenance is the result of the proportion of bone substitute absorption and natural bone remodelling induced. The absorption of Activioss™ is ensured by dissolution during implantation initiating natural bone remodelling.

100% bioactive glass, 100% synthetic

Reliable, Predictable and Reproducible Results

Activioss™ 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.

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.

Ref.	Granules size	Volume ≈ Weight
Bioactive Bone Substitute Osteostimulative Bone Regeneration Granules		
ACT-GS0.5	S	0.04 - 0.5 mm
		0.5 cc ≈ 0.5 g
ACT-GS1.0	S	0.04 - 0.5 mm
		1.0 cc ≈ 1.0 g
ACT-GM0.5	M	0.5 – 1.0 mm
		0.5 cc ≈ 0.5 g
ACT-GM1.0	M	0.5 – 1.0 mm
		1.0 cc ≈ 1.0 g
ACT-GL1.0	L	1.0 – 3.0 mm
		1.0 cc ≈ 1.0 g

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

- Ridge augmentation,
- Sinus floor augmentation,
- Periodental / Infrabony defects,
- Filling tooth sockets for ridge maintenance following extraction,
- Filling bone defects such as cyst or dental granuloma.

References

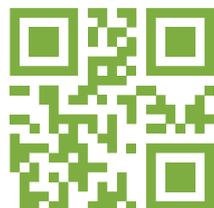
1. Hench, L.L. *The story of Bioglass*. J Mater Sci: Mater Med. Springer Science, 2006, Vol. 17, p. 967-978.
2. Jones, J.R. *Review of bioactive glass: from Hench to hybrids*. Acta Biomaterialia. Elsevier, 2013, Vol. 9, pp.4457-4486.
3. Jell, G. and al. *Gene activation by bioactive glasses*. J Mater Sci: Mater Med. Springer Science, 2006, Vol. 17, pp.997-1002.
4. Xynos, I.D. and al. *Ionic products of bioactive glass dissolution increase proliferation of human osteoblasts and induce insulin-like growth factor II mRNA expression and protein synthesis*. Biochemical and Biophysical Research Communications. 2000, Vol. 276, 2, pp. 461-5.
5. Hench, L.L. *Genetic design of bioactive glass*. Journal of the European Ceramic Society. Elsevier, 2009, Vol. 29, pp. 1257-1265.
6. 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.
7. 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.
8. Hoppe, A., Nusret, S.G. and Boccaccini, A.R. *A review of the biological response to ionic dissolution products from bioactive glasses and glass-ceramics*. Biomaterials. Elsevier, 2011, Vol. 32, pp. 2757-2774.
9. 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.
10. Manukka, A. and al. *Bactericidal effects of bioactive glasses on clinically important aerobic bacteria*. J Mater Sci: Mater Med. Springer Science, 2008, Vol. 19.
11. Mengel R, and al. *Bioabsorbable Membrane and Bioactive glass in the Treatment of Intra-bony Defects in Patients with Generalized Aggressive Periodontitis: Results of a 5-year Clinical and Radiological Study*. J Periodontol (2006) 77 (10) : 1781-7.
12. Col VB Mandlik, and al. *Comparative evaluation of bioglass with calcium sulphate β -hemihydrate for the treatment of intraosseous defects—a clinico-radiological study*. MJAFI 2012;68:42-47.
13. Sumer, and al. *Autogenous cortical bone and bioactive glass grafting for treatment of intraosseous periodontal defects*. Eur J Dent 2013;7:6-14.
14. Tadjedin ES, and al. *Histological observations on biopsies harvested following sinus floor elevation using a bioactive glass material of narrow size range*. Clin Oral Impl Res 2000: 11:334-344.

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



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



www.activiOSS.com

Distributed by:



Made in France by
NORAKER
INNOVATIVE BIOMATERIALS

13 Av. Albert Einstein
69100 Villeurbanne
France
Tél : +33 (0)4 78 93 30 92
Fax : +33 (0)4 72 35 94 37
contact@noraker.com
www.noraker.com

1412-ACT051-1.0