



bonalive

Smart **Healing**

Introducing a new
era of healthcare

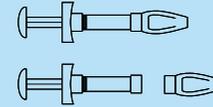
Our products

We offer a range of osteostimulative* technologies to efficiently and cost-effectively restore patient quality of life. Our products facilitate the filling, reconstruction and regeneration of bone defects in both adult and pediatric patients.

Smart Healing

Nr. 99.1
Nr. 99.2

Bonalive® granules



A unique bone regeneration technology that naturally inhibits bacterial growth and stimulates bone formation.

Indications

- Bone cavity filling
- Bone cavity filling in the treatment of chronic osteomyelitis
- Mastoid cavity obliteration

Composition

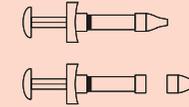
- 53% SiO₂
- 23% Na₂O
- 20% CaO
- 4% P₂O₅

Properties

- Inhibition of bacterial growth
- Osteoconductive, osteostimulative*

Nr. 99.3
Nr. 99.4

Bonalive® putty



A highly moldable, easy-to-apply bone regeneration technology that naturally stimulates bone formation.

Intended use

- Filling, reconstruction and regeneration of bone defects

Indications for use

- Bony voids and gaps

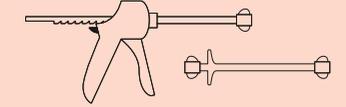
Composition

- 53% SiO₂
- 23% Na₂O
- 20% CaO
- 4% P₂O₅
- Polyethylene glycols (PEGs) and glycerol

Properties

- Osteoconductive, osteostimulative*

Bonalive® putty MIS



A smart bone regeneration technology, providing stable positioning and controlled access in minimally invasive surgery.

Intended use

- Filling, reconstruction and regeneration of bone defects

Indications for use

- Bony voids and gaps

Composition

- 53% SiO₂
- 23% Na₂O
- 20% CaO
- 4% P₂O₅
- Polyethylene glycols (PEGs) and glycerol

Properties

- Osteoconductive, osteostimulative*

* non-osteoinductive

Bonalive[®] granules

A unique bone regeneration technology that naturally inhibits bacterial growth and stimulates bone formation.

Bonalive[®] granules is a CE marked Class III medical device, providing a Smart Healing solution for bone infections and bone reconstruction. Bonalive[®] granules has been proven to naturally inhibit the bacterial growth up to 50 clinically relevant bacteria strains.*

The clinical efficacy and performance of the granules has been proven over the past 20 years in orthopedic, trauma, septic surgery and mastoid surgery. Bonalive[®] granules is verified as safe for use in pediatric surgery and consists only of elements that are naturally present in the human body.

By supporting the reconstruction of anatomical structures in the human body, the biodegradable S53P4 bioactive glass gets gradually resorbed and replaced by bone over a period of years. Bonalive[®] granules radio-dense quality enables post-operative evaluation, allowing surgeons to monitor the healing of their patients.

Gram positive bacteria

- *Bacillus cereus*
- *Bifidobacterium adolescentis*
- *Clostridium difficile*
- *Clostridium perfringens*
- *Clostridium septicum*
- *Corynebacterium ulcerans*
- *Enterococcus faecalis*
- *Enterococcus faecium*
- *Eubacterium lentum*
- *Listeria monocytogenes*
- *Micrococcus sp.*
- *Peptostreptococcus anaerobius*
- *Propionibacterium acnes*
- *Propionibacterium propionicus*
- *Staphylococcus aureus*
- *Staphylococcus epidermidis*
- *Streptococcus agalactiae*
- *Streptococcus mutans*
- *Streptococcus pneumoniae*
- *Streptococcus pyogenes*
- *Streptococcus sanguis*

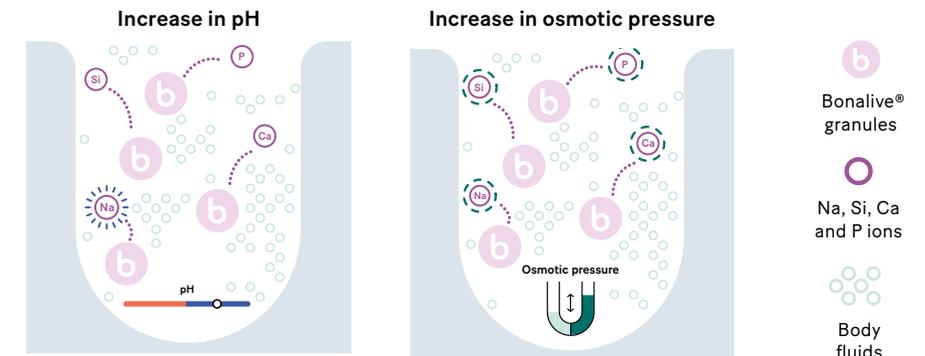
Methicillin-resistant bacteria

- *Pseudomonas aeruginosa*
- *Staphylococcus aureus (MRSA)*
- *Staphylococcus epidermidis (MRSE)*

Gram negative bacteria

- *Acinetobacter baumannii*
- *Bacteroides fragilis*
- *Bacteroides thetaiotaomicron*
- *Chryseobacterium meningosepticum*
- *Enterobacter aerogenes*
- *Enterobacter amnigenus*
- *Escherichia coli*
- *Fusobacterium necrophorum*
- *Fusobacterium nucleatum*
- *Haemophilus influenzae*
- *Klebsiella pneumoniae*
- *Moraxella catarrhalis*
- *Neisseria meningitidis*
- *Pasteurella multocida*
- *Porphyromonas gingivalis*
- *Prevotella intermedia*
- *Prevotella melaninogenica*
- *Proteus mirabilis*
- *Pseudomonas aeruginosa*
- *Salmonella typhimurium*
- *Shigella sonnei*
- *Veillonella parvula*
- *Yersinia enterocolitica*

The bacterial growth inhibiting feature of Bonalive[®] granules is triggered during the granules "Activation" phase, presented on page 8. This phase consists of two simultaneous chemical and physical processes, occurring once the bioactive glass reacts with body fluids.



1. Sodium (Na) is released from the surface of the bioactive glass and induces an **increase in pH** (alkaline environment), which is not favorable for the bacteria inhibiting their growth.

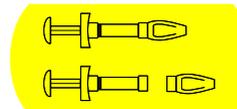
2. The released Na, Ca, Si and P ions give rise to an **increase in osmotic pressure** due to an elevation in salt concentration, i.e. an environment where bacteria cannot grow.

INDICATIONS

- Bone cavity filling
- Bone cavity filling in the treatment of chronic osteomyelitis
- Mastoid cavity obliteration

SPECIFICATIONS

- CE marked
- Class III medical device
- **Sterilized**
- Available in different granule and unit sizes



For orthopedic, trauma and septic surgery

Unit size	Granule size	Ref. no.
5 cc prefilled applicator	1.0-2.0 mm	13330 Nr. 99.1
10 cc prefilled applicator	1.0-2.0 mm	13340 Nr. 99.2

For ear surgery

Unit size	Granule size	Ref. no.
2.5 cc prefilled applicator	0.5-0.8 mm	13120
5 cc prefilled applicator	0.5-0.8 mm	13130

* Leppäranta et al. 2008; Munukka et al. 2008. See references on page 22.

Drago et al. Antimicrobial activity and resistance selection of different bioglass S53P4 formulations against multidrug resistant strains. Future Microbiol. 2015;10(8):1293-9. / Drago et al. In vitro antibiofilm activity of bioactive glass S53P4. Future Microbiol. 2014;9(5):593-601.

Bonalive[®] putty and Bonalive[®] putty MIS



A highly moldable, easy-to-apply bone regeneration technology that naturally stimulates bone formation.

Bonalive[®] putty and Bonalive[®] putty MIS are bioactive, osteoconductive and osteostimulative* synthetic CE marked Class III medical devices. The putty is a synthetic bone graft substitute delivered as a sterile and ready-to-use paste, requiring no mixing, moistening or other preparation. The putty is available in an applicator and in a dispenser delivery system.

The putty consists of S53P4 bioactive glass in addition to a synthetic binder, i.e. a blend of polyethylene glycols (PEGs) and glycerol. The binder allows the putty to stay in place during surgery. Following its application, the binder is absorbed in a few days, leaving behind only the bioactive glass, thus permitting tissue infiltration between the bioactive glass to facilitate bone regeneration.

The putty's radio-dense quality enables post-operative evaluation, allowing surgeons to follow the healing of their patients. Bonalive[®] putty and Bonalive[®] putty MIS have not been verified as inhibiting bacterial growth.

* non-osteoinductive

Bonalive[®] putty

INTENDED USE

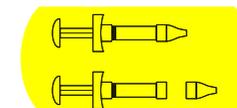
- Filling, reconstruction and regeneration of bone defects

INDICATIONS FOR USE

- Bony voids and gaps

SPECIFICATIONS

- CE marked
- Class III medical device
- Sterilized
- Available in different unit sizes



For orthopedic, trauma, hand and spine surgery in small and medium size defects.

Unit size	Ref. no.
1 cc prefilled applicator	16110
2.5 cc prefilled applicator	16120
5 cc prefilled applicator	16130 Nr. 99.3
10 cc prefilled applicator	16140 Nr. 99.4

Bonalive[®] putty MIS

INTENDED USE

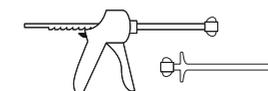
- Filling, reconstruction and regeneration of bone defects

INDICATIONS FOR USE

- Bony voids and gaps

SPECIFICATIONS

- CE marked
- Class III medical device
- Sterilized



For minimally invasive (MIS) bone surgery, especially hard to reach defects.

Unit size	Ref. no.
1 x 5 cc prefilled cartridge with dispenser	18100
1 x 5 cc prefilled cartridge	18131

