BENEFITS

- Ready-to-use
- Moldable and non-hardening nature allows easy mixing with bone graft
- Controlled delivery in demanding surgery
- Easy to dispense, 0.25 cc per press cycle
- Reaching 16 cm in depth (8 mm outer diameter)
- Exchangeable, prefilled cartridges

COMPOSITION

- **Bioactive glass S53P4:** 53%, SiO_2, 23% Na_2O, 20% CaO, 4% P_2O_5
- **Absorbable, synthetic and water-soluble binder:** Polyethylene glycols (PEGs) and glycerol

Ref. No	BonAlive® putty MIS
18100	Dispenser with 1 x 5cc Prefilled Cartridge
18131	1 x 5cc Prefilled Cartridge

OUR PURPOSE

"To inspire the world with innovations that empower patient healing"

BonAlive® BIOMATERIALS LTD

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BonAlive® putty MIS

Controlled access and delivery

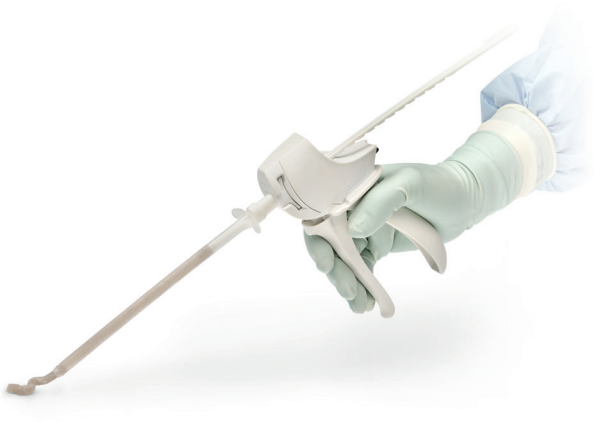
– where precision is needed –

WHAT IS BONALIVE® PUTTY MIS?

BonAlive® putty MIS is designed especially for minimally invasive surgery providing a surgical solution to access bone voids and gaps that are difficult to reach.

INDICATIONS AND INTENDED USE

BonAlive® putty MIS is a synthetic bone graft substitute indicated for filling of bony voids and gaps. BonAlive® putty MIS is used for reconstruction and regeneration of bone defects.



Controlled delivery and user-friendly handling ensures easy use of BonAlive® putty MIS in demanding surgeries.

OSTEOINTEGRATION

The bioactive glass will enhance a cascade of reactions in the vital bony environment resulting in bone bonding and osteointegration.

Natural hydroxyaptite formation on the surface of the bioactive glass will promote bone forming.

Firm bone bonding and the osteoconductive nature permit tissue infiltration between bioactive glass and bone ingrowth.

Promotion of osteogenic cells (osteostimulation*) increases the remodeling rate of bone.

The bone regeneration and remodeling restores the bone anatomy.

The bioactive glass resorbs and is replaced with bone during the healing process.

**non-osteoinductive*

CLINICAL EVIDENCE

The clinical use of BonAlive® putty MIS is supported by several preclinical, prospective clinical and randomized prospective clinical trials that have been conducted with bioactive glass S53P4 in orthopedic[3], trauma[4] and spine surgery[5,6].

1. **Molecular basis for action of bioactive glasses as bone graft substitute.** Välimäki VV, Aro HT. Scand J Surg. 2006;95(2):95-102.
2. **Histomorphometric and molecular biologic comparison of bioactive glass granules and autogenous bone grafts in augmentation of bone defect healing.** Virolainen P, Heikkilä J, Yli-Urpo A, Vuorio E, Aro HT. J Biomed Mater Res. 1997;35A(1):9-17.
3. **A prospective randomized 14-year follow-up study of bioactive glass and autogenous bone as bone graft substitutes in benign bone tumors.** Lindfors NC, Koski I, Heikkilä JT, Mattila K, Aho AJ. J Biomed Mater Res. 2010;94B(1):157-164.
4. **Bioactive glass S53P4 and autograft bone in treatment of depressed tibial plateau fractures. A prospective randomized 11-year follow-up.** Pernaa K, Koski I, Mattila K, Gullichsen E, Heikkilä J, Aho AJ, Lindfors N. J Long-term Eff Med Impl. 2011;21(2):139-148.
5. **Posterolateral spondylodesis using bioactive glass S53P4 and autogenous bone in instrumented unstable lumbar spine burst fractures - A prospective 10-year follow- up study.** Rantakokko J, Frantzén J, Heinänen J, Kajander S, Kotilainen E, Gullichsen E, Lindfors N. Scan J Surg. 2012;101(1):66-71.
6. **Instrumented spondylodesis in degenerative spondylolisthesis with bioactive glass and autologous bone. A prospective 11-year follow-up.** Frantzén J, Rantakokko J, Aro H, Heinänen J, Kajander S, Koski I, Gullichsen E, Kotilainen E, Lindfors N. J Spinal Disorder Tech. 2011;24(7):455-461.