Competitor Fact Sheet: ᵝBeta-bsm® & ᵞGamma-bsm®

Biocomposites

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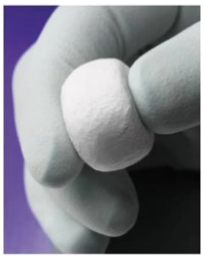

Feature	genex®	ᵝBeta-bsm® Injectable ᵞGamma-bsm® Moldable Putty Zimmer Biomet (Manufactured by Etex®)
Composition	Powder: 50% β-tricalcium phosphate, 50% $CaSO_4$ hemihydrate Mixing solution: Sterile water[1]	Powder: 50% α-tricalcium phosphate, 50% Dicalcium phosphate dihydrate Mixing solution: 0.9% Sodium chloride solution[4-9]
Scaffold type	Osteoconductive with negative surface charge for accelerated bone restoration[2]	Osteoconductive[4,6]
Available sizes	5cc, 10cc	2.5cc, 5cc, 10cc[4-7]
Setting time	15 minutes[1]	Isothermally sets hard in 3-5 minutes[8,9]
Temperature sensitive setting	No[1]	Yes[4,6]
Drillable when fully set	Yes[1]	Yes - during or after setting[4,6]
Versatility	Moldable, packable, injectable[1]	• Beta-bsm: Injectable[4] • Gamma-bsm: Moldable[6]
Injection flexibility	• Luer Lock syringe with narrow plastic cannula included for hard-to-reach defects • OsteoPrecision™ Graft Delivery Device available to withstand insertion pressure	• Beta-bsm: Syringe with 16g needle included[4] • Gamma-bsm: Not injectable
Impurities	No[1]	Unknown

Feature	genex®	ᵝBeta-bsm® Injectable ᵞGamma-bsm® Moldable Putty Zimmer Biomet (Manufactured by Etex®)
Claimed absorption rate	Up to 12 months[3]	Not specified. Expected to be >6 months[1]
Fully absorbs	Yes[1]	May not fully absorb[1]
Dry compressive strength	15MPa[1]	• Beta-bsm: 30 MPa[4] • Gamma-bsm: 35 MPa[6]
Radiopaque	Yes[1]	Yes[12]
Key selling points and weaknesses	(+) Precisely balanced β-tricalcium phosphate/calcium sulfate hemihydrate[1] (+) Contains no Hydroxyapatite (HA) or insoluble impurities[1] (+) Fully absorbed within 12 months[3] (+) Not temperature sensitive[1] (+) Provides flexibility with options for molding, packing and injecting (+) Drillable when fully set[1] (+) Radiopaque[1] (+) Negatively charged surface chemistry accelerates bone growth up to 5x normal levels[2] (+) Restores bone to normal trabecular structure in 36 weeks[3] (+) Comprehensive support network for our customers and hospitals	(+) Gamma-bsm putty hardens in a wet environment[4,6] (+) Can be drilled during or after setting[4,6] (-) Calcium phosphate converts to a poorly crystalline HA during setting[1,4] (-) HA has a slow and incomplete absorption rate[1] (-) HA can cause a long-term nidus for infection[1] (-) Contraindicated for infected sites[10,11] (-) Temperature sensitive - setting time is an inverse function of local body temperature[4,6,7,10,11] (-) Must use different products when injecting or molding

* (+) = competitor selling points
(-) = competitor weaknesses

References:

1. Biocomposites, Data on file.
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3. Yang HL et al. Bone healing response to a synthetic calcium sulfate/beta-tricalcium phosphate graft material in a sheep vertebral body defect model. J Biomed Mater Res B Appl Biomater 2012;100B(7):1911-21.
4. Zimmer Biomet ᵝBeta-bsm® Injectable Bone Substitute Material Flyer. 1671.1-US-en. 2017.
5. Zimmer Biomet ᵝBeta-bsm® Injectable Bone Substitute Material Mixing Chart. 0919.1-GLBL-en-REV0718. 2018.
6. Zimmer Biomet ᵞGamma-bsm® Moldable Putty Bone Substitute Material Flyer. 1672.1-US-en. 2017.
7. Zimmer Biomet ᵞGamma-bsm® Moldable Putty Bone Substitute Material Mixing Chart. 0918.1-GLBL-en-REV1018. 2018.
8. https://www.zimmerbiomet.com/medical-professionals/biologics/product/beta-bsm-injectable-bone-substitute-material.html
9. https://www.zimmerbiomet.com/medical-professionals/biologics/product/gamma-bsm-moldable-putty.html
10. ETEX Corporation, Zimmer GmbH ᵝBeta-bsm® Injectable Bone Substitute Material Instructions for Use. 50-1478v05.
11. ETEX Corporation, Zimmer GmbH ᵞGamma-bsm™ Moldable Bone Substitute Material Instructions for Use. 50-1441v04.
12. Russell T.A., Leighton R.K. and on behalf of the Alpha-BSM Tibial Plateau Fracture Study Group, Comparison of Autogenous Bone Graft and Endothermic Calcium Phosphate Cement for Defect Augmentation in Tibial Plateau Fractures. A Multicenter, Prospective, Randomized Study. J Bone Joint Surg Am. 2008;90:2057-2061.

For indications, contraindications, warnings and precautions see Instructions for Use.

Patents granted: EP 1390086 B1, US 8632796, CN ZL02809194.9, US 8496955

MA0332R1