



Biogran®
Resorbable Synthetic Bone Graft

Biogran® Is The Ideal Graft Material Because It Is Effective, Resorbable And Easy.

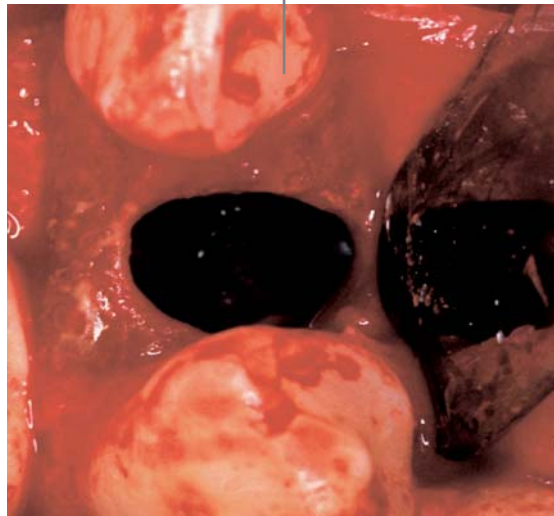
- ***Stimulates Bone*** - Biogran is osteostimulatory by providing the protective environment in which cells differentiate into osteoblasts and promoting osteogenesis at multiple sites throughout the osseous defect.^{1,2} Biogran allows more rapid bone cell repopulation than if left ungrafted.
- ***Replaced By Bone*** - Biogran is fully resorbable. No need for a 2nd surgery to remove product.
- ***Stabilizes Blood Clot*** - Biogran is hemostatic and can help prevent the occurrence of dry socket by forming a cohesive mass when mixed with blood or sterile saline solution.
- ***Ease Of Delivery*** - Biogran offers two delivery options, the uniquely curved syringe or pre-formed dappen dish.
- ***Easy To Handle*** - Biogran is hydrophilic and when mixed with blood or sterile saline will adhere to dental instruments for easy delivery to the surgical site and will not float out of the defect site, thus minimizing the amount of graft material that is lost.

Biogran Is Especially Appropriate For Extractions

Fast And Easy To Apply

After an extraction procedure, the alveolar ridge undergoes remodeling and resorption resulting in a loss of bone volume and the formation of a narrow ridge. As implant therapy has increasingly become the therapy of choice for tooth replacement, ridge preservation is becoming an ever more important treatment adjunct to extractions. Biogran is fast and easy to apply, adding minimum time to extraction procedures. Even if no implant or prosthesis is planned, ridge preservation has important patient benefits:

- ***Maintain Normal Facial Bone And Soft Tissue Contours***
- ***Assure Adjacent Teeth Are Not Compromised By Bone And Tissue Erosion***
- ***Avoid Costly Future Grafting Procedures***
- ***Reduce The Possibility Of A Dry Socket By Stabilizing The Blood Clot***



Biogran® Is The Right Choice For Small To Medium-Sized Bony Defects

Biogran Bioactive Glass is a leading technology for safe and effective bone regeneration in most oral applications, including periodontal defects, bony

defects, bone lesions, small to medium-size alveolar ridge augmentations and ridge preservation following extraction.

Biogran Is A Unique Innovation

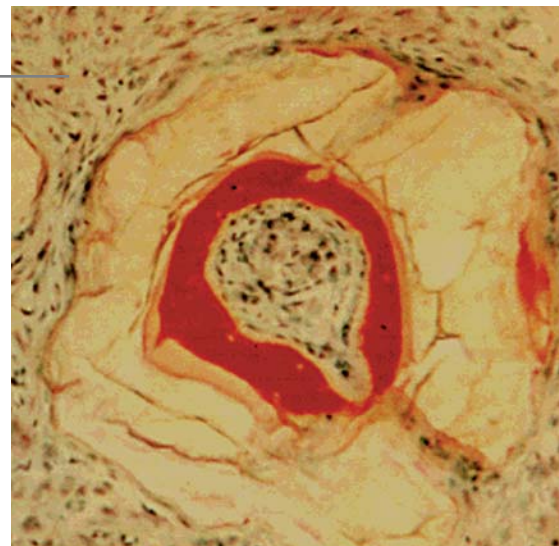
Biogran is a resorbable, synthetic bone-graft material consisting of an internal silica gel surrounded by a calcium phosphate shell. A proprietary manufacturing process assures that all granules are 300–350µm (50-45 mesh) in diameter, the optimal size range for a bioactive glass graft material. Why 300–350µm (50-45 mesh)? Because particles smaller than 300–350µm pack too densely and can cause inflammation; larger granules may not fully resorb, leaving unreacted glass particles in the graft site.



Osteostimulation—Why Biogran Works So Well

Phagocytes enter through cracks in the outer shell and remove the silica core. A calcium phosphate hollow bone growth chamber (protective pouch) is formed, which enables the osteoprogenitor cells to differentiate into osteoblasts and lay down bone in the center of the Biogran Granule. Bone tissue then grows from granule to granule. **This is a unique phenomenon that occurs with Biogran and no other graft material.**

The Biogran Glass Granule is fully resorbable by the body and eliminated through the Krebs cycle.



Consistent, Safe Results, Proven By Clinical Studies

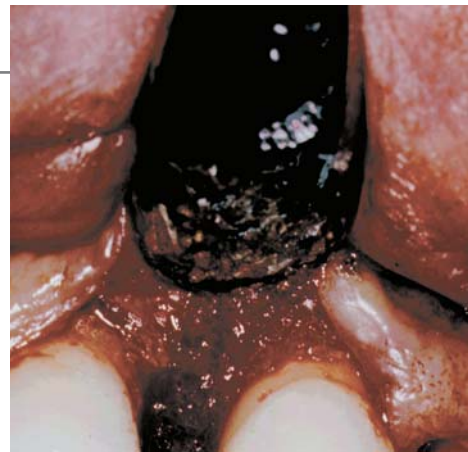
A clinical study using Biogran® in 87 patients with 106 defects, including periodontal defects and extraction sites, indicated that Biogran is an effective treatment for oral bone defects. The bone restored

with Biogran was maintained during the full three years of this multi-center study. Biogran has also been the subject of more than six years of implant studies with similar results.²

Periodontal Defects

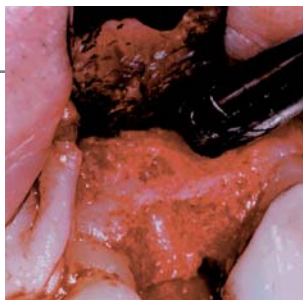


(BEFORE)
Debrided periodontal defect

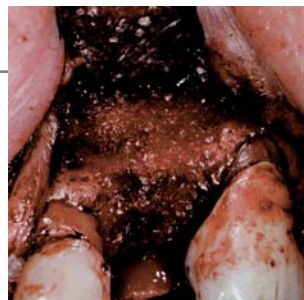


(AFTER)
Biogran wets easily with blood, contours easily to fill defect and will resist migration

Extraction Sites



(BEFORE)
Debrided periodontal defect



(IN SITU)
Easily contoured, hemostatic



(AFTER)
Complete bone fill at six-month re-entry

Consistent, Safe Results, Proven By Histology

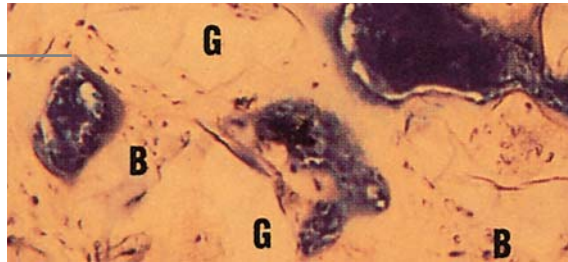
No other bone graft product on the market compares to Biogran® and BIOMET **3i** has the research to prove that Biogran promotes bone

growth safely and consistently. Extensive animal studies show that Biogran is replaced by new, remodeled bone.^{3,4,5}

Biogran Surrounded By New Bone After Two Months

(G=Biogran, B=bone, original magnification x 50, Paragon stain)

Intraosseous Alveolar Ridge Defect



Biogran Incorporated Into Remodeling Bone After Two Years

An osteon is present within the excavated remnants of a Biogran Granule.

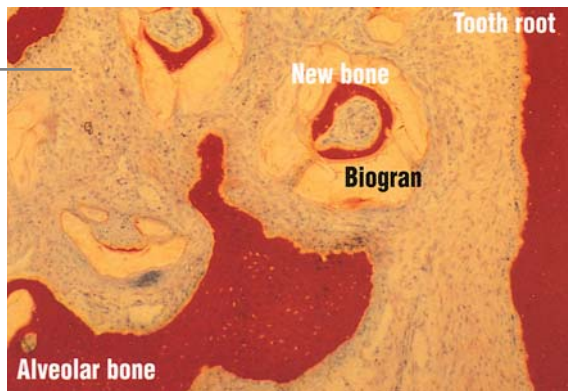
(G=Biogran, B=bone, O=Osteon, original magnification x 100, Giemsa stain)



Periodontal supra-Bony Defect

New bone growth taking place at multiple ossification sites throughout the defect within Biogran Modules after three months.

(Original magnification x 40, Alizarin Red stain)





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Biogran® Ordering Information 100% Synthetic Resorbable Bone Graft Material

Description		Item Numbers
Mixing Cups (500mg)	7-Pack	2100-0003
Mixing Cups (750mg)	7-Pack	2100-0004
Mixing Cups (1500mg)	7-Pack	2100-0005
Syringe and Cup (750mg)	1-Pack	2100-0750*

*Currently not available outside the United States.

More Information About Biogran

The following published research is available from BIOMET 3i by calling 800-342-5454:

- * J. A. Leonetti, H. M. Rambo, R. R. Thronson, *Osteome Sinus Elevation and Implant Placement With Narrow Size Bioactive Glass*, in *Implant Dentistry*, Volume 9, Number 2 2000. (ART 763)
- * R. R. Thronson, *The Use of Bioactive Glass Particles of Narrow Size Range in the Third Molar Site*, in *Dental Implantology Update*, Volume 11, Number 1 2000. (ART 734)
- * E. Schepers, L. Barbier, P. Ducheyne, *Implant Placement Enhanced by Bioactive Glass Particles of Narrow Size Range*, in *The International Journal of Oral & Maxillofacial Implants*, Volume 13, Number 5 1998. (ART 686)
- * T. Furusawa, K. Mizunuma, S. Yamashita, T. Takahashi, *Investigation of Early Bone Formations Using Resorbable Bioactive Glass in the Rat Mandible*, in *The International Journal of Oral & Maxillofacial Implants*, Volume 13, Number 5. (ART 687)
- * E. J. G. Schepers, P. Ducheyne, *Bioactive Glass Particles Of Narrow Size Range For The Treatment Of Oral Bone Defects: a 1–24 month experiment with several materials and particle sizes and size ranges*, in *The Journal of Oral Rehabilitation*, Volume 24 1997. (ART 662)
- * T. Furusawa, K. Mizunuma, *Osteoconductive Properties and Efficacy of Resorbable Bioactive Glass as a Bone-grafting Material*, in *Implant Dentistry*, Volume 6, Number 2 1997. (ART 660)
- * E. J. G. Schepers, P. Ducheyne, L. Barbier, S. Schepers, *Bioactive Glass Particles of Narrow Size Range: a new materials for the repair of bone defects*, in *Implant Dentistry*, Volume 2, Number 3 1993. (ART 656)
- * E. S. Tadjoeidin, G. L. de Lange, P. J. Holzmann, L. Kuiper, E. H. Burger, *Histological Observations on Biopsies Harvested Following Sinus Floor Elevation Using a Bioactive Glass Material of Narrow Size Range*, in *Clinical Oral Implants Research*, Volume 11, Number 4 2000. (ART 764)

¹P. Ducheyne, P. Bianco, S. Radin, E. Schepers, *Bioactive Materials: Mechanisms and Bioengineering Considerations*, in *Bone-Bonding Biomaterials*, edited by P. Ducheyne, T. Kokubo, C.A. van Blitterswijk, Reed Healthcare Comm., The Netherlands, 1992, 1-12.

²E.J.G. Schepers, P. Ducheyne, L. Barbier, S. Schepers, *Bioactive Glass Particles of Narrow Size Range: A New Material for the Repair of Bone Defects*, *Implant Dent.* 2:151-156, 1993.

³E. Schepers, M. De Clercq, P. Ducheyne, et al., *Bioactive Glass Particulate Material as a Filler for Bone Lesions*, *J. Oral Rehabil.* 18:439-452, 1991.

⁴E.J.G. Schepers, P. Pinruethai, *A Comparative Study of Bioactive Glass and Porous Hydroxyapatite Particles in Periodontal Bone Lesions*, in *Bioceramics*, Volume 6, edited by P. Ducheyne and D. Christiansen, Butterworth Heinemann Ltd., 1993, 113-116.

⁵E.J.G. Schepers, P. Ducheyne, *The Application of Bioactive Glass Particles of Narrow Size Range as a Filler Material for Bone Lesions: a 24 Month Animal Experiment*, in *Bioceramics*, Volume 6, edited by Ducheyne and D. Christiansen, Butterworth-Heinemann Ltd., 1993, 401-404.

