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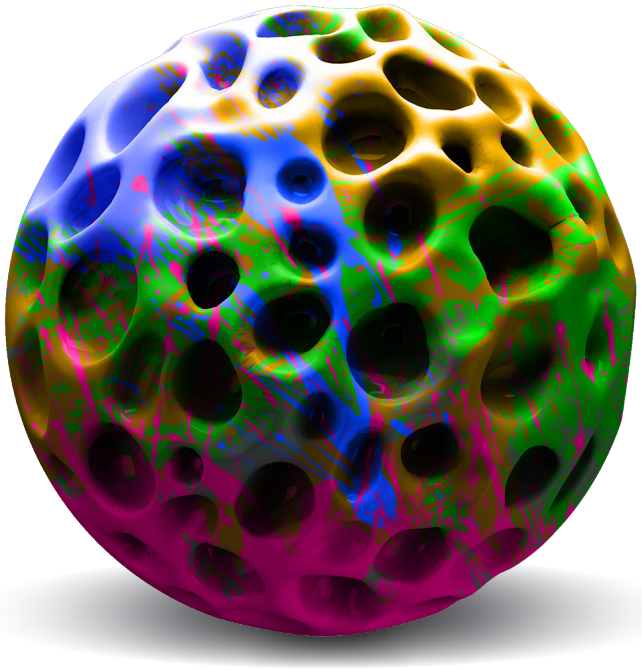
OSTEOFLO®

NanoPutty®

Bone Graft Substitute



Quadphasic™ Resorption Profile

Controlled resorption profile with nano-surface technology

Pre-clinical fusion assessment of OsteoFlo NanoPutty vs Novabone Putty

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Product Overview

OsteoFlo NanoPutty Bone Void Filler

OsteoFlo NanoPutty is a bone void filler that combines quadphasic osteoconductive scaffold with a unique blend of bioresorbable polymers (carrier) to provide a non-allograft bone growth solution.

Quadphasic Resorption Profile

Bone grows at different rates depending on the patient and condition. OsteoFlo NanoPutty features a unique blend of biomaterials to control resorption at different time points. Every particle is manufactured with a combination of bioglass, alpha tricalcium phosphate (α-TCP), beta-tricalcium phosphate (β-TCP) and hydroxyapatite(HA). This allows for controlled resorption at different phases due to each material possessing a unique resorption profile.

Nano-Surface Technology

OsteoFlo NanoPutty features true nanotechnology. The surface area of the quadphasic particles is increased by using nano and submicron topography which is considered to optimize cell recognition [2].

Bioresorbable Carrier

A unique blend of bioresorbable polymers are used as a carrier to enhance flowability and handling in surgery. These polymers are designed to be resorbed quickly in-situ.

Fusion Evidence

OsteoFlo NanoPutty has proven in GLP pre-clinical testing to show significantly greater bone growth at 4 weeks when compared to Novabone Putty[1]. This in an important feature when a race to achieve fusion is essential in getting patients back to activities of daily living.

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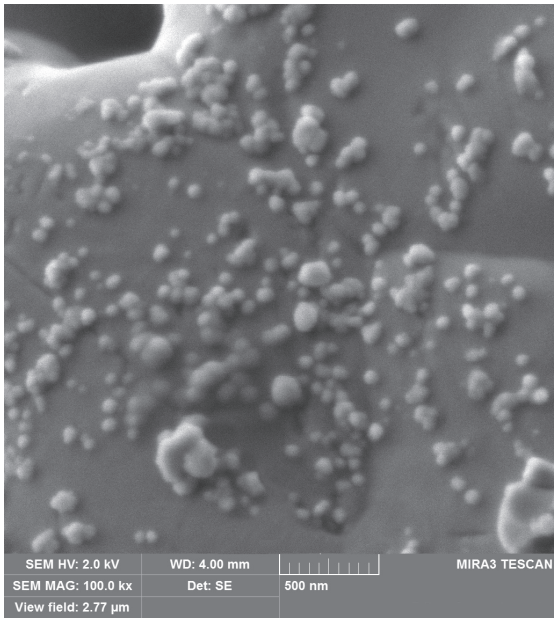
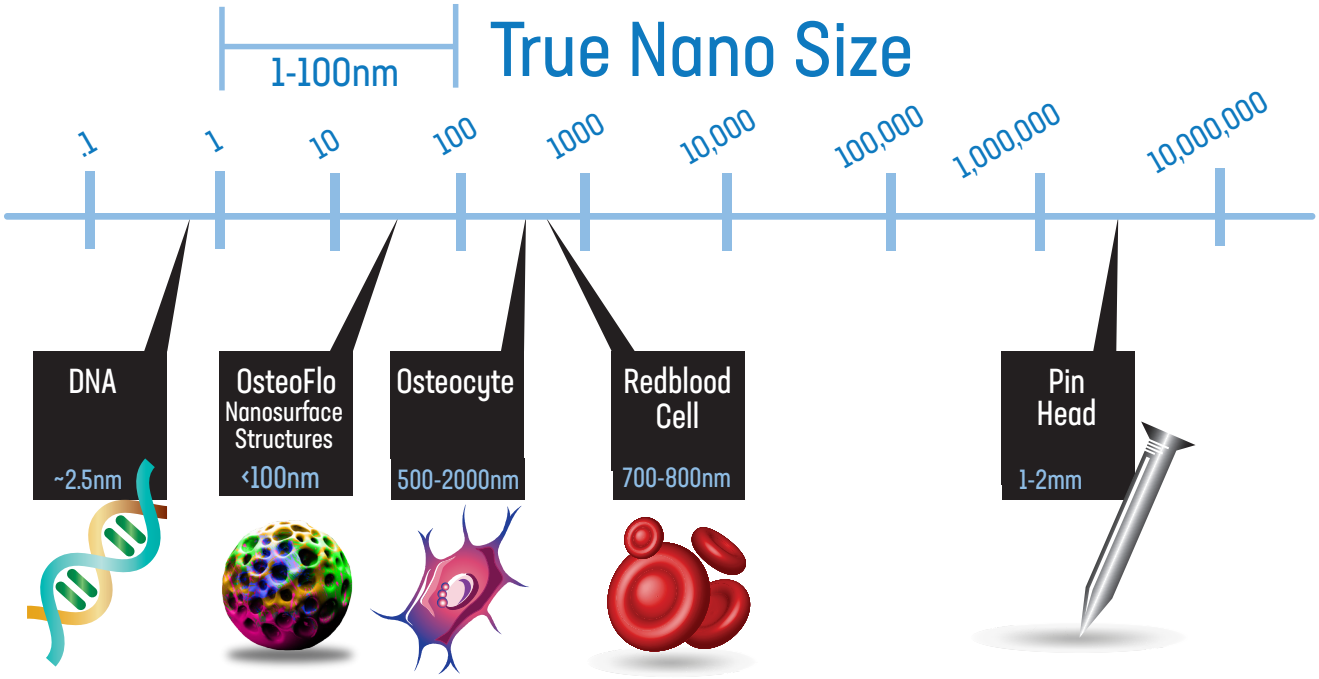
Surface Technology



Magnification of quadphasic particle at 100,000X shows nano-surface structures less than 100 nm

OsteoFlo NanoPutty has a large surface area that contains nano and submicron structures similar to bone

- True nano-structures must be less than 100 nanometers
- Nano-surface area increases surface area and optimizes cell recognition. Nano-topography is considered to have a great effect on proliferation, differentiation and adhesion of osteoblastic cells[2].



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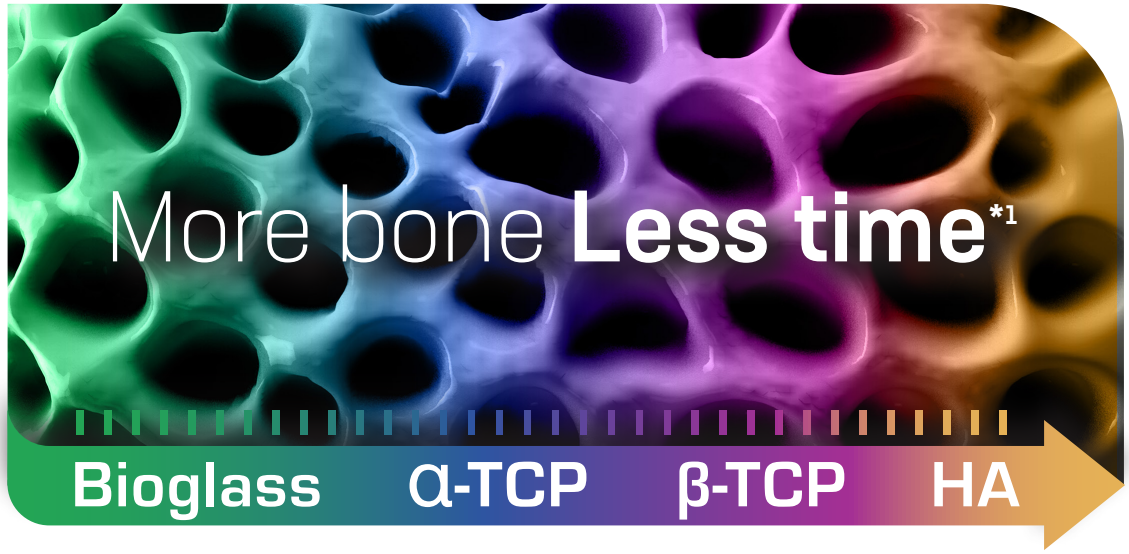
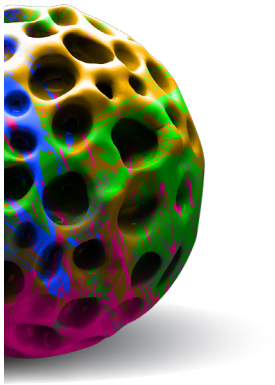
Resorption Matters





Quadphasic Synthetic Bone Graft

OsteoFlo NanoPutty has been intelligently engineered with a novel formulation of materials proven to grow bone. These 4 materials have been combined strategically to have a synergistic effect on bone growth at different time points. Bioglass, alpha tricalcium phosphate (α-TCP), beta-tricalcium phosphate (β-TCP) and hydroxyapatite(HA) are manufactured in one particle for homogenous distribution throughout the bone graft.

*In a GLP preclinical model comparing OsteoFlo NanoPutty to NovaBone bioglass putty at 4,8 and 12 weeks, OsteoFlo NanoPutty showed greater bone growth at all time points [1].

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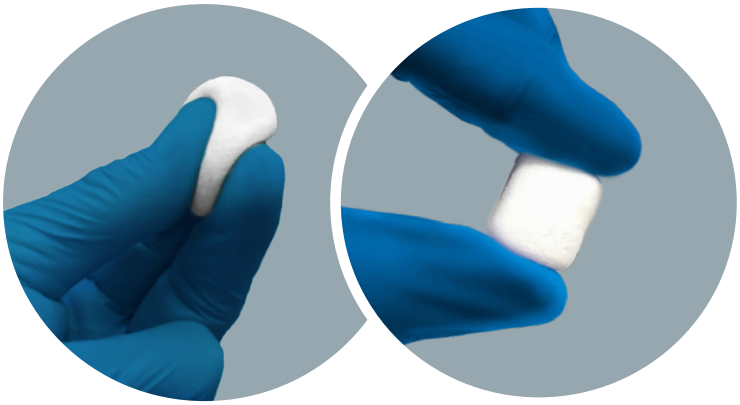
Optional Methods of Graft Delivery and Superior Handling

- Flowable; great for filling tight spaces
- Malleable putty
- Formable and moldable with no residue
- Preloaded cartridges or syringe
- Adheres in situ; will not wash away under irrigation
- Premixed (no mixing required)
- Radiopaque

OsteoFlo NanoPutty with GraftGun



Product Name	Catalog#
OsteoFlo Synthetic NanoPutty Cartridge - 5cc	ONP-T-500
OsteoFlo Synthetic NanoPutty Cartridge - 10cc	ONP-T-1000
OsteoFlo Synthetic NanoPutty Syringe - 1cc	ONP-S-01
OsteoFlo Synthetic NanoPutty Syringe - 2.5cc	ONP-S-02
OsteoFlo Synthetic NanoPutty Syringe - 5cc	ONP-S-05
OsteoFlo Synthetic NanoPutty Syringe - 10cc	ONP-S-10

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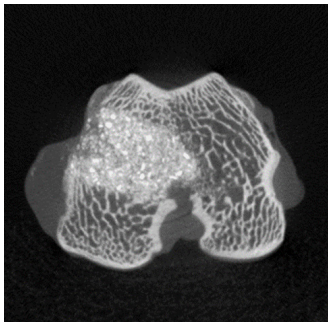
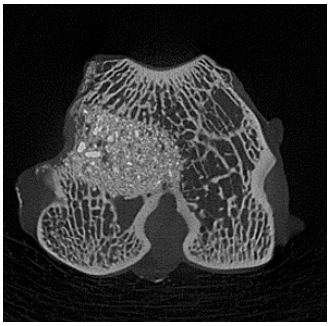
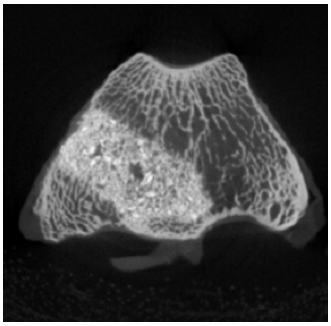
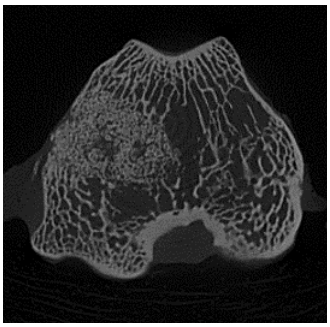
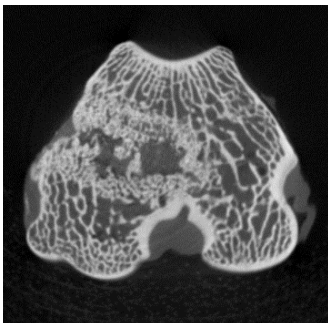
Clinical

Early Bone Growth Matters: OsteoFlo NanoPutty was tested versus NovaBone Putty (Bioglass) assessing 55 animals

OsteoFlo NanoPutty vs Novabone Putty pre-clincal testing revealed a rapid healing response. GLP rabbit distal femur (BVF) study was carried out at 4, 8 and 12 weeks. Micro CT scans and histology was used to asses for new bone formation. OsteoFlo NanoPutty and Novabone Putty were both used stand-alone without the addition of autograft. OsteoFlo exhibited greater bone growth at all three time points and twice the amount of bone growth at 4 weeks[1].

Product	4 Weeks	8 Weeks	12 weeks
OsteoFlo			
NovaBone			

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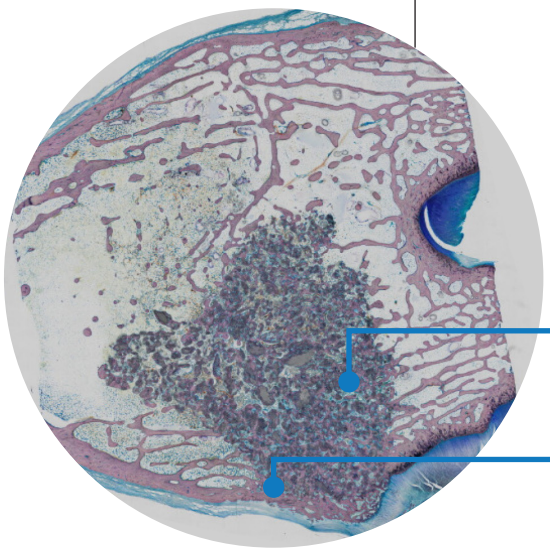
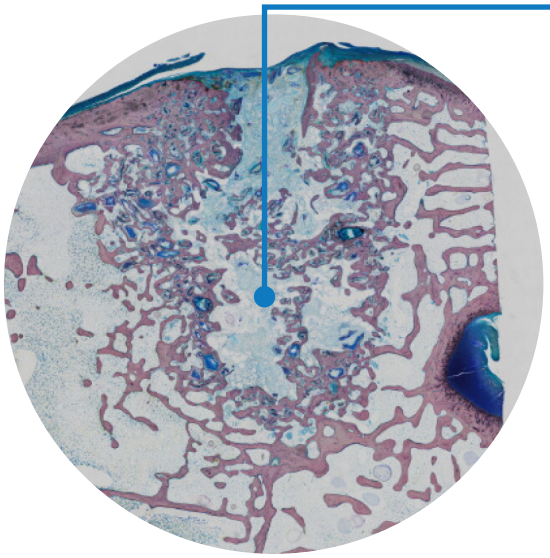
Histological Review of OsteoFlo NanoPutty Compared to NovaBone® at 4, 8, and 12 Weeks Post-Op (assessing 55 animals)

4 Weeks	8 Weeks	12 Weeks
2x Bone Growth compared to NovaBone Putty[1]	Sustained and higher bone growth rate when compared to NovaBone Putty[1]	No resorption pockets and continued bone growth at a higher rate when compared to NovaBone Putty[1]



OsteoFlo



NovaBone

Histology

Bone growth and graft material

Fused cortical rim

Resorption

Bone

Graft Material

1. Data on File
2. Ravichandran, Rajeswari et al. "Effects of nanotopography on stem cell phenotypes." World journal of stem cells vol. 1, 2009.
3. Cesarano, Joseph, et al. "Customization of Load-Bearing Hydroxyapatite Lattice Scaffolds." ACerS, John Wiley & Sons, Ltd, 2005.