



ACTIVABONE[®]
NEXT REGENERATION TECHNOLOGY

New generation
visco-modulated
bone pastes

Packed with technology

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The line of **Activabone®** bone pastes stems from a unique technological combination. The equine origin bone substitutes obtained through the exclusive **Zymo-Teck®** enzymatic process are now associated to the innovative adjustable viscosity polymer hydrogel **Exur®** developed by Bioteck R&D.

Exur-Teck®

The hydrogels provide a structural grid able to promote three-dimensional and consistent distribution of bone particles within defects of any size or shape. The hydrogels are able to mimic the chemical-



Exur-Teck®

Hydrogel technology by BIOTECK

physical environment of the extracellular matrix (ECM) and, after grafting, they represent the ideal microenvironment for cell proliferation and differentiation allowing excellent physical integration into the defect.

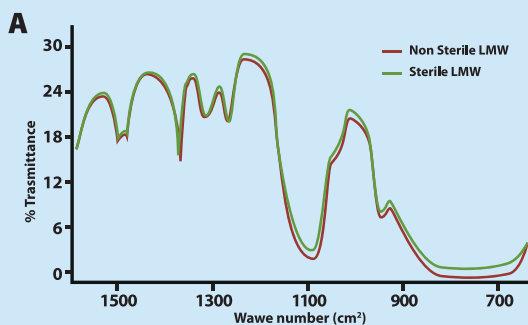
Modulating the degree of polymerization and density of polymer crosslinking means being able to rely on highly versatile and adaptable biomaterials. Exactly by virtue of its polymerization, **Exur®** ensures no granule dispersal occurs during procedures and assures excellent product consistency for perfect filling of the defect.

The C factor

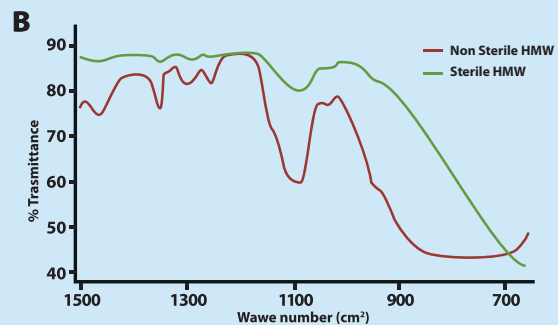
The C factor

Exur-Teck® represents the peak technology in this sector. An ancillary amount of Vitamin C, acting as visco-modulator agent, has been added to hydrogels with low (LMW) and high (HMW) molecular weight to regulate their polymerization and final visco-elasticity.

Vitamin C limits or prevents intra- and inter-molecular reorganization of PEG/PEO and HPMC polymer chains within the hydrogel component during the β ray sterilization process.



During the sterilization stage, Vitamin C prevents the polymerization in formulas containing hydrogel with low molecular weight (LMW). By suitably modulating the amount of Vitamin C, it is therefore possible to obtain varyingly viscous bone pastes (injectable, mouldable, crunch).



By reducing the amount of Vitamin C in formulas with high molecular weight (HMW) it is possible to achieve a certain degree of PEO and HPMC polymerization, obtaining pre-shaped biomaterials featuring high viscoelasticity.

Zymo-Teck®

Zymo-Teck®

The **Zymo-Teck®** process, unlike others based on high temperature treatments or using chemical solvents, uses enzymes, i.e. natural proteins able to precisely and selectively remove the various unwanted substances.

Zymo-Teck® makes it possible to obtain perfect cleaning while retaining the physical and morphological features of the bone tissue, avoiding the use of chemicals potentially harmful to health. The choice of enzymes used for the **Zymo-Teck®** process preserves the useful molecules, such as collagen in its natural conformation.



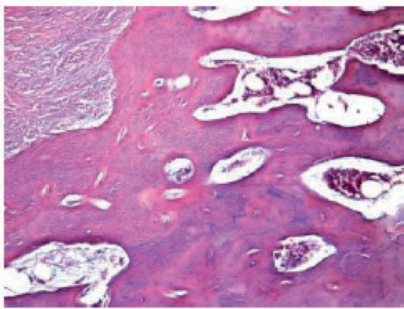
Zymo-Teck®
PROCESS

Surgical advantage

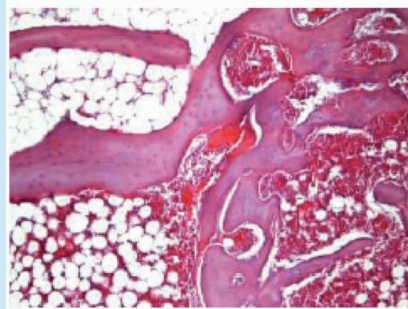
Surgical advantage

Bone pastes based on first generation *carriers* (standard), often feature rheological properties unsuited to assure good *handling* or to withstand leaching during grafting in a bloody environment.

Bioteck has developed **Activabone®**, a line of new generation heterologous bone pastes, featuring extraordinary balance between rheological and biological properties.



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2

1 - Formation of fibrous tissue due to use of quickly dissolving bone pastes

2 - Perfectly regenerated bone tissue thanks to the use of **Activabone®** pastes

Perfect adaptability: the right graft for every defect

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The innovative **Exur-Teck®** technology makes it possible to produce composite biomaterials with variable textures, malleability and rheological properties (specifically, injectable, mouldable and pre-shaped bone pastes), by virtue of the adjustable visco-elasticity of the hydrogel component.

By suitably modifying the dose of **Vitamin C** (visco-modulating), it is possible to obtain extremely

versatile and functional bone substitutes, having specific biological, texture, malleability and adhesiveness, such as to adapt perfectly to the specific geometry of the bone defects of any dimension or shape, as well as with the ability to be shaped extemporaneously in the operating room with the aid of scissors.

Optimal dissolution

Optimal dissolution

Scientific research (*) has shown how quickly dissolving bone pastes pose problems already in the surgery stage due to the excessive physical instability of the material that tends to disperse in contact with blood.

Excessively long dissolution rates -- two weeks -- hinder neo-vascularization of the graft and the osteogenesis process. On the other hand, dissolution rates lower than 8 hours cause the formation of an unstable clot, leading to the formation of fibrous tissue.

Activabone® bone pastes have been formulated on the basis of a polymer gel able to dissolve in a time range that is ideal to assure complete regeneration of bone defects.

Intended use:

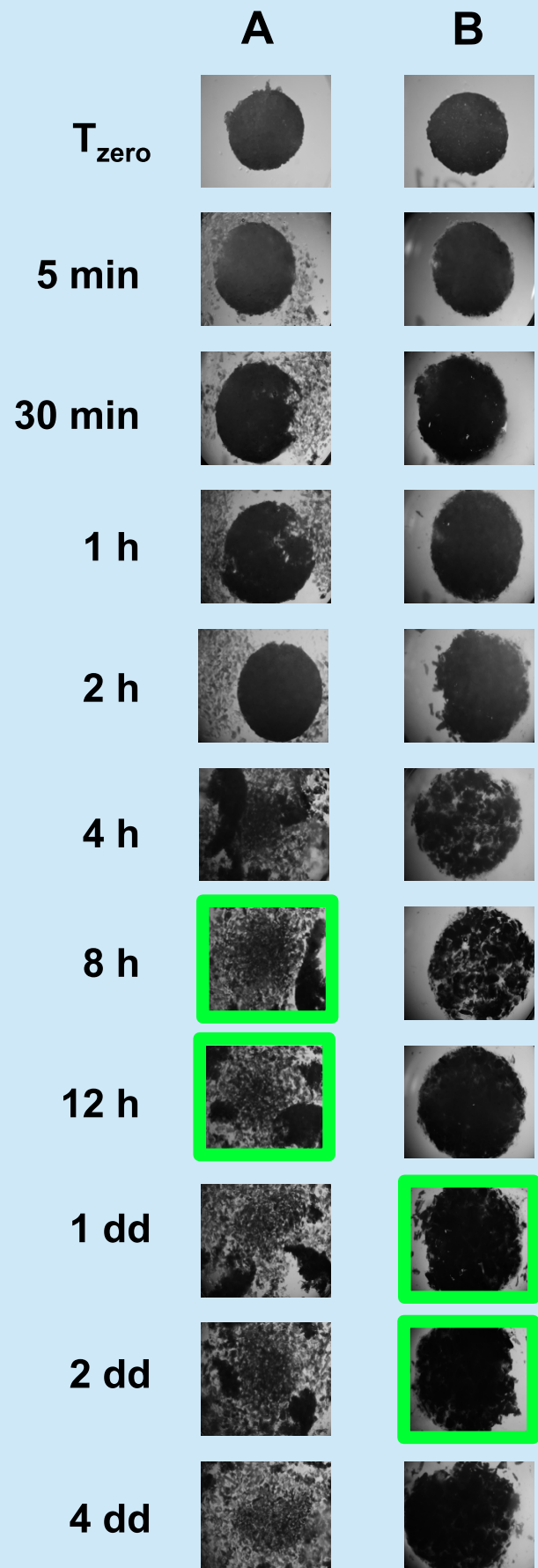
Intended use:

The **Activabone®** pastes act as osteoconductive and osteoprotective collagenated bone substitutes in Regenerative Medicine procedures.

Dissolving rates of various formats in the **Activabone®** line

In vitro dissolution test (excerpt from Giannoni et al., 2016, Rheological properties, biocompatibility and in vivo performance of new hydrogel-based bone fillers. Biomaterials Science, 2016, 4:1691-1703)

A - Injectable **Activabone®** bone paste
B - **Activabone®** pre-shaped



(*) D. Barbieri et al. Influence of different polymeric gels on the ectopic bone forming ability of an osteoinductive biphasic calcium phosphate ceramic. Acta Biomaterialia, 2011, 7:2007-2014.

ACTIVABONE®

NEXT REGENERATION TECHNOLOGY

Line of new generation bone pastes



Equine derived bone substitutes, combined with modulated visco-elasticity polymer hydrogel.

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ACTIVABONE® DBM GEL - Demineralized bone matrix (DBM), Exur® with low molecular weight (LMW).

Surgical indications: mixing with granular grafts (1:1 ratio – in weight) or spreading on the surface of block grafts.

ACT-GEL005 **Activabone DBM gel** **1 syringe** **0.5 cc**

ACTIVABONE® CLX GEL - Type I collagen from equine Achilles tendon, equine cancellous bone micro-granules, Exur® with low molecular weight (LMW).

Surgical indications: grafting in small periodontal and/or peri-implant defects.

ACT-CLX010 **Activabone CLX gel** **1 syringe** **1.0 cc**

ACTIVABONE® INJECTABLE PASTE - Demineralized bone matrix (DBM), equine cancellous bone micro-granules, Exur® with low molecular weight (LMW).

Surgical indications: grafting in medium-sized periodontal and/or peri-implant defects, sinus lift through the crestal approach.

ACT-INJ005 **Activabone DBM injectable paste** **1 syringe** **0.5 cc**
ACT-INJ010 **Activabone DBM injectable paste** **1 syringe** **1.0 cc**

ACTIVABONE® MOULDABLE PASTE - Demineralized bone matrix (DBM), equine cancellous bone micro-granules, equine cancellous bone granules (diameter 0.5-1 mm), equine cortical bone granules (diameter 0.5-1 mm), Exur® with low molecular weight (LMW).

Surgical indications: socket preservation, GBR (even in combination with titanium mesh), grafting in large-sized periodontal and/or peri-implant defects, sinus lift through the lateral approach.

ACT-MLD005 **Activabone DBM mouldable paste** **1 syringe** **0.5 cc**
ACT-MLD010 **Activabone DBM mouldable paste** **1 syringe** **1.0 cc**

ACTIVABONE® CS MIX - Equine cancellous and cortical bone granules (1:1 ratio) (diameter 0.5-1 mm), equine cancellous bone micro-granules, Exur® with low molecular weight (LMW).

Surgical indications: sinus lift through the lateral approach, GBR.

ACT-CMX025 **Activabone Mix granules in syringe** **1 syringe** **0.25 cc**
ACT-CMX050 **Activabone Mix granules in syringe** **1 syringe** **0.5 cc**

ACTIVABONE® PUTTY - Type I collagen from equine Achilles tendon, equine cancellous bone granules (diameter 0.5-1 mm), equine cancellous bone micro-granules, Exur® with low molecular weight (LMW).

Surgical indications: socket preservation, grafting in contentive defects.

ACT-PTY005 **Activabone putty** **1 piece** **0.5 cc**
ACT-PTY010 **Activabone putty** **1 piece** **1.0 cc**

BiOTECK®

Bioteck S.p.A.

Headquarters:

Via E. Fermi 49 - 36057 Arcugnano (Vicenza) - Italy
Tel. +39 0444 289366 - fax: +39 0444 285272
info@bioteck.com - www.bioteck.com

Production and R&D Center:

Via G. Agnelli, 3 - 10020 Riva Presso Chieri (Turin) - Italy.

Bioteck® is an Italian company producing bone substitutes and protective membranes that are successfully used in orthopaedics, neurosurgery, oral and maxillofacial surgery.

Founded in 1995, the company continues to grow constantly and now operates in more than 50 countries around the world.



bioteck.com

A firm commitment to scientific research forms the basis for the innovative solutions offered by **Bioteck®** products. The company collaborates on numerous national and international research projects, which have driven the basic research and helped in writing important chapters in bone biology.

The in-depth knowledge acquired by **Bioteck®** through its research ensures the absolute quality of its products, which are subjected to strict environmental and quality controls, thereby guaranteeing a product meeting the highest quality and safety standards.

Bioteck® applies a policy of total transparency, opening up the doors of its Production and R&D Center for the monitoring of its innovative process and the intense scientific research carried out by its staff.



bioteckacademy.com

In over twenty years of scientific research and clinical practice, **Bioteck®** has made an important contribution to the clinical/scientific knowledge in the field of tissue biology.

The **Bioteck Academy** is the meeting place of all the excellences that continuously contribute to the development of this knowledge and **Bioteck®** products.

The Academy has developed a culture of sharing scientific knowledge aimed at the **dissemination of best techniques and practices in the various areas of regenerative surgery** and is open to all professionals who decide to participate in this activity by sharing their surgical experience.

More information on the activities of the Academy can be found at: www.bioteckacademy.com.