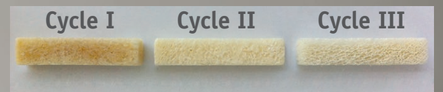
A **unique, innovative** deantigenation process

To deantigenate means to eliminate all elements that the immune system may recognise as antigens, thereby avoiding an undesired reaction.

The **Zymo-Teck® enzymatic treatment** is based on the application of latest-generation processes. A mixture of lytic enzymes in variable composition removes all antigenic components from the bone, making it completely biocompatible, yet preserving the collagen in its native conformation. This is why Bioteck® grafts have unique qualities, both in terms of biological response and clinical results.

Visual evaluation of the deantigenation process



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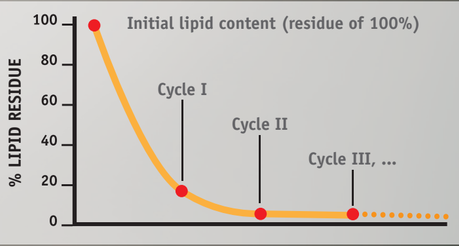
The images clearly show the efficacy of the first three cycles of the **Zymo-Teck®** deantigenation process in cleaning the bone trabeculae, when applied to a block of cancellous equine bone.

Quantification of the lipid content



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As can be seen from the graph, the first three treatment cycles of the **Zymo-Teck®** process already suffice to ensure that almost all the lipid content is removed.

BIOTECK®
The science of bone tissue

Bioteck S.p.A.

Headquarters:
Via E. Fermi 49 - 36057 Arcugnano (VI) - 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 (TO) - Italy

Headquarters

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. 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 manufacturing process and the intense scientific research carried out by its staff.

Production and R&D Center

Quality and safety guarantee

Biochemical Laboratory/Quality Control

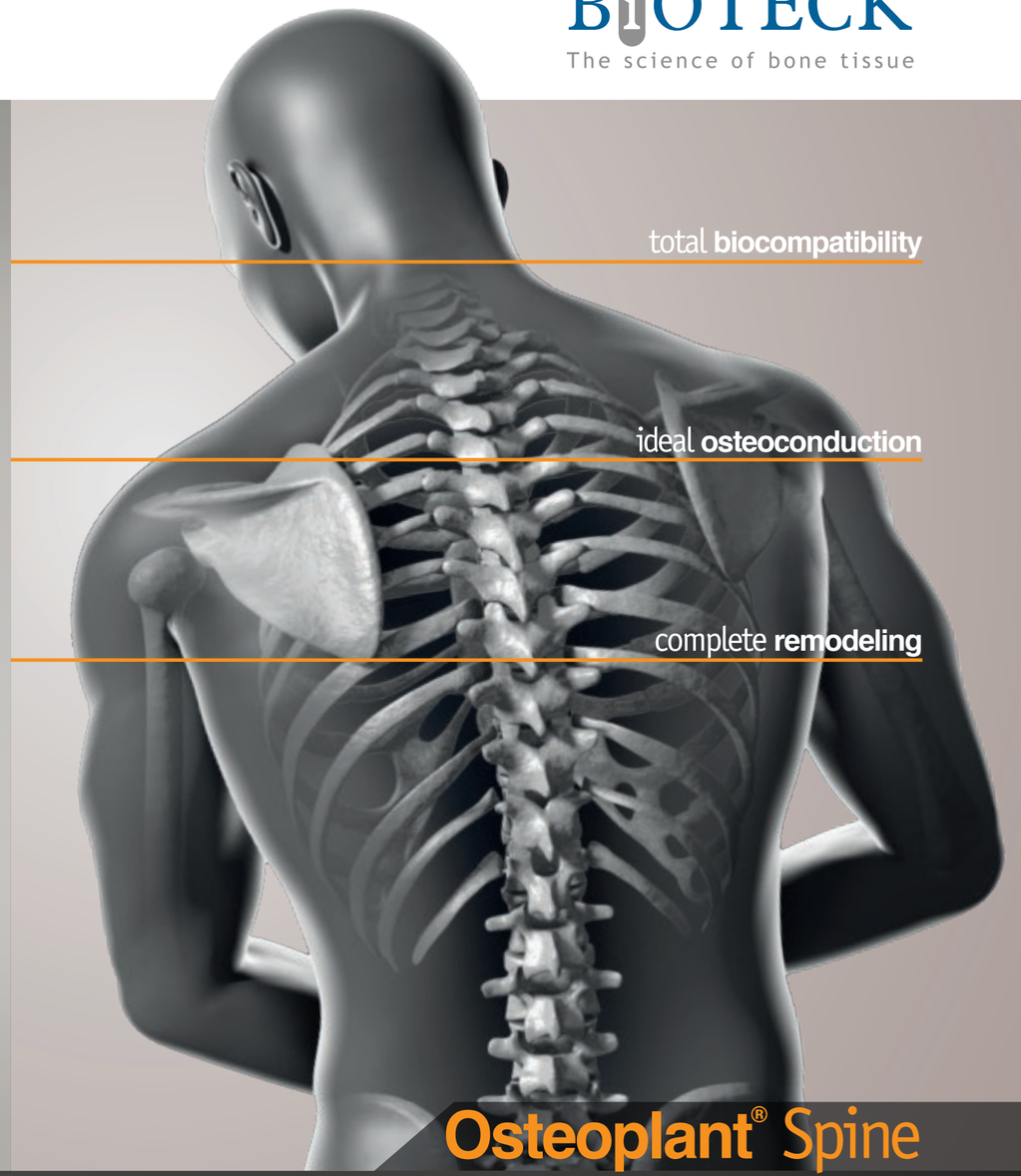
CE 0373

Osteoplant® - a complete range of cancellous and cortical bone grafts.
Osteoplant® Flex - a line of exclusive grafts that are partially demineralized to leave them soft and flexible.
Osteoplant® Activagen® and Angiostad® - bone pastes in syringe, malleable and injectable, with excellent osteoconductive and osteopromotion properties.

ISO 9001 ISO 13485

concept: mauro fortani - vi - cod. 20140516_ENG_DeplantOsteoPlant_Spine - printed by: www.abalit.it

BIOTECK®
The science of bone tissue



total **biocompatibility**

ideal **osteoconduction**

complete **remodeling**

Osteoplant® Spine

the biological choice

Osteoplant® Spine

the biological choice

Zymo-Teck®: the secret of quality grafts

Bioteck® bone grafts are obtained from equine bone tissue treated with the **Zymo-Teck®** system, an exclusive multi-step deantigenation process that, by using specific enzyme mixtures, enables the elimination of all antigen components, keeping the mineral phase and bone collagen unchanged in its native conformation.

The Zymo-Teck® process operates at controlled temperatures - so as not to alter the structural characteristics of the bone tissue - and without adding any chemical solvent, thereby guaranteeing total biocompatibility and maximum quality of the grafts, making them **the best alternative to autologous bone.**

The unmodified bone mineral component is recognised as endogenous by the osteoclasts, thereby allowing for the **total remodeling** of the graft, which is completely replaced, in physiological time, by new patient vital bone tissue.

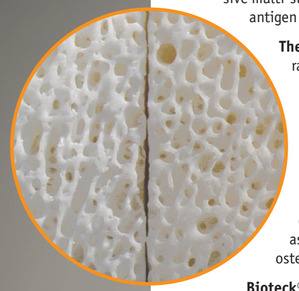
The collagen component, preserved in its native conformation, guarantees that the graft is extremely elastic and strong, just like natural bone; it also has important biological effects, such as the modulation of the action of certain growth factors and the promotion of osteoblast and osteoclast adhesion.

Bioteck® bone grafts therefore create an **environment** that is biologically **favourable to bone regeneration.** Standard, flexible and paste-form Osteoplant® grafts are particularly recommended for all spinal fusion surgery, precisely because of their extraordinary biological and biomechanical properties.

Standard grafts, such as granules, dowels and sticks, guarantee good integration and excellent mechanical resistance thanks to their fully-preserved collagen and mineral structure.

Flexible grafts, which undergo a special partial demineralization process, have a considerably exposed collagen matrix able to encourage cell proliferation and adhesion, significantly speeding up the graft remodeling and incorporation process.

Bone paste grafts are not only indisputably practical to use, but also have all the molecular signals typical of demineralized bone matrix and able to actively stimulate the neo-osteogenesis process, making them the ideal choice for the most critical situations



The sections of equine bone, used to manufacture Bioteck® bone substitutes, are carefully selected to guarantee an average size of the trabeculae that is entirely comparable with that of human bone. This can be seen by observing the image obtained under the stereo microscope, comparing human bone (left) with a Bioteck® bone substitute (right).

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enzymatic deantigenation

total **biocompatibility**

preserved **bone collagen**

high resistance to loads

complete **remodeling**

cancellous bone **microgranules**

OGS-03A	Cancellous bone granules	0.5 - 1 mm	1 btl	*3.0 cc*
OGS-05A	Cancellous bone granules	0.5 - 1 mm	1 btl	*5.0 cc*

cortical-cancellous bone **sticks**

OSP-20B	Cortical-cancellous bone stick	50 x 5 x 8	mm	*2 pcs*
OSP-30	Cortical-cancellous bone stick	100 x 5 x 8	mm	*2 pcs*
OSP-40	Cortical-cancellous bone stick	60 x 5 x 8	mm	*1 pcs*

cancellous bone **dowels**

OMC-03	Cancellous bone dowel	ø 12 x 20	mm	*1 pc*
OMC-04	Cancellous bone dowel	ø 14 x 20	mm	*1 pc*
OMC-05	Cancellous bone dowel	ø 16 x 20	mm	*1 pc*

flexible cancellous bone **disc**

OMC-05S	Flexible cancellous bone disc	ø 16 x 5	mm	*1 pc*

flexible cancellous bone **strips**

OTC-S9	Flexible cancellous bone strip	100 x 10 x 8	mm	*2 pcs*
OTC-S9A	Flexible cancellous bone strip	100 x 10 x 8	mm	*1 pc*
OTC-S15	Flexible cancellous bone strip	100 x 12 x 3	mm	*2 pcs*

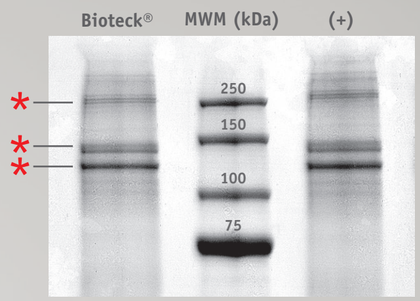
mouldable bone **paste**

OGS-ACM40	Mouldable bone paste	1 syringe	*0.5 cc*
OGS-ACM1	Mouldable bone paste	1 syringe	*1.0 cc*
OGS-ACM2	Mouldable bone paste	1 syringe	*2.0 cc*

Enzymatic deantigenation preserves some important biological properties of bone

Preserved collagen

Protein characterisation by means of electrophoretic separation on denaturing gel (SDS-PAGE). The first column corresponds to a **Bioteck®** bone substitute obtained by means of the **Zymo-Teck®** process. The second shows proteins with molecular weight markers (MWMs) and the third, a standard purified type I collagen (+). **The specific bands for this protein (*) are very visible in the graft obtained by means of the Zymo-Teck®** process, confirming the presence of collagen in its native conformation.



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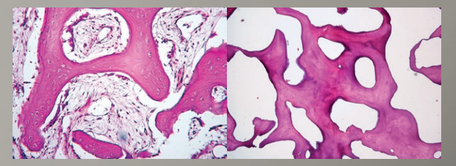
Decellularization

The **Zymo-Teck®** deantigenation process completely eliminates the cell component, leaving the natural trabecular structure unchanged.

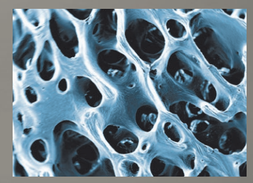


Histological preparation of human bone tissue (left) and Bioteck® cancellous bone substitute (right).

Florence University, Italy
Biology Laboratory, Prof. Pennelli, Padua, Italy

The pink compact structures correspond to the bone trabeculae. The darker points seen in the left-hand image highlight the cell component.

There are no visible cells in the image to the right (Bioteck® bone substitute), nor in the image below.



Bioteck® cancellous bone substitute under the scanning electron microscope

Padua University, Biology Department, Electron Microscopy Service