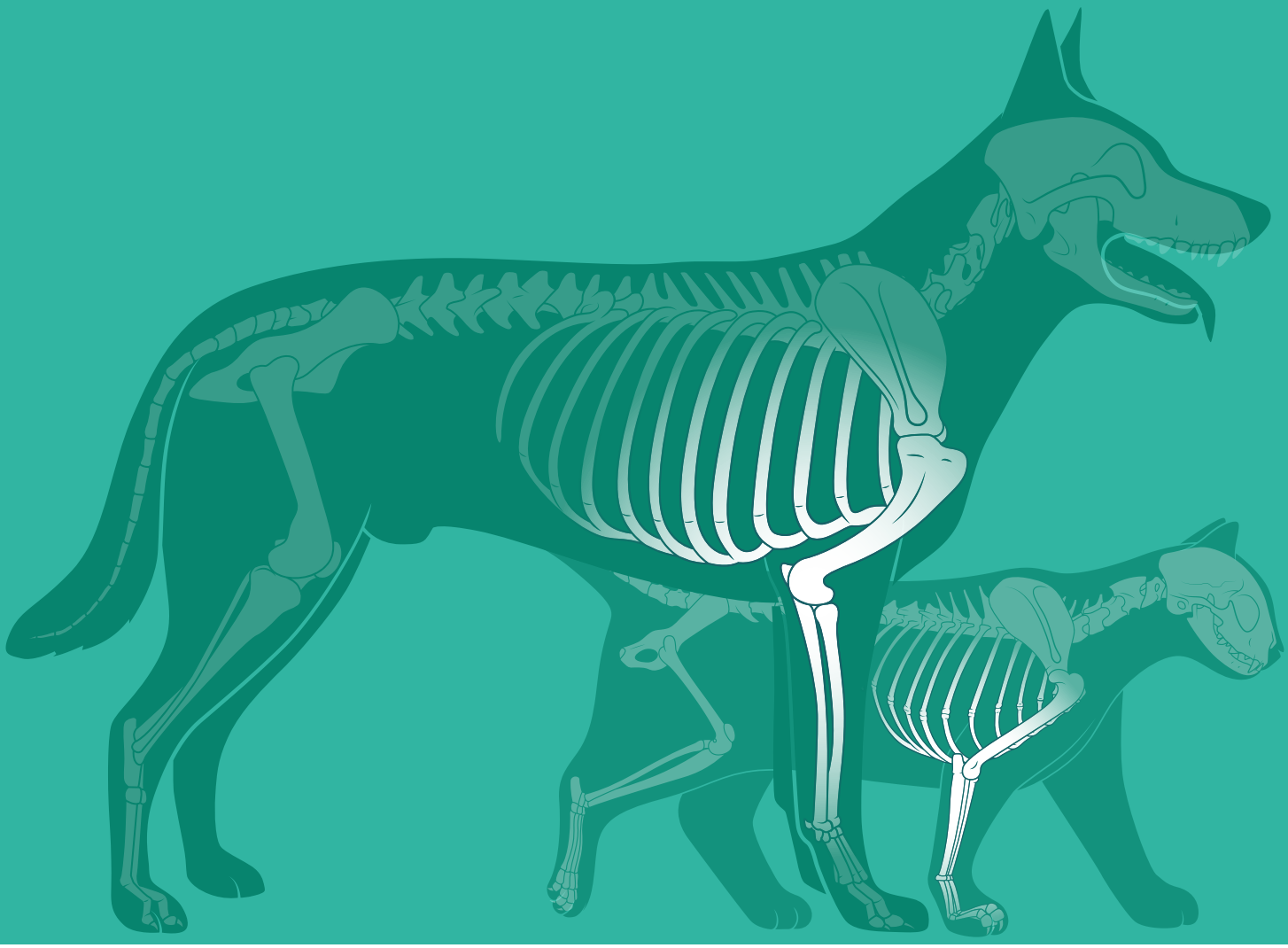
OssiVet®

Synthetic Adhesive Bone Substitute 3cc

Advanced Orthopedic Bioadhesive Solution for Veterinary Use



PBC BioVet

Where Innovation Meets Care

OssiVet®

PRODUCT DESCRIPTION

OssiVet® is a biomimetic, self-setting Calcium Phosphate-based bioadhesive bone substitute enhanced with phosphoserine. The unique components ensure OssiVet® provides adhesive and cohesive properties. Designed for veterinary orthopedic use, OssiVet® is indicated for reduction, provisional fixation, or void filling of bone fractures or defects in order to enhance structural stability where standard fixation alone cannot provide sufficient support for functional mobilisation.

OssiVet® contains Calcium salts including Calcium Phosphate and Calcium Silicate combined with Phosphoserine.

10 YEARS OF RESEARCH & DEVELOPMENT

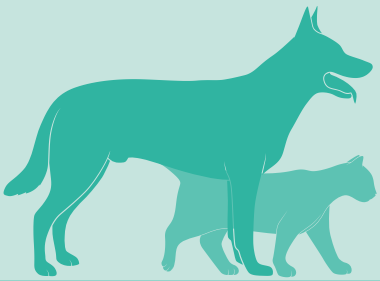
OssiVet® is the result of more than a decade of product development and academic research, leading to clinical application of bone substitutes in the veterinary industry.

SUCCESSFUL ADHESIVE OUTCOMES

The unique properties of OssiVet® aims to reduce failure rate throughout orthopedic procedures. Far too often, procedures don't go as planned due to a lack of stability within the bone, unexpected fragmentation and voids.

SETTING IN 10 MINUTES

OssiVet® offers an in-surgery (10 minutes setting time) adhesive for the augmentation of implants, stabilisation of fragments, filling voids, and arthrodesis.



OssiVet® has osteoconductive properties to aid in bone remodelling.

INDICATIONS

OssiVet® is a structural, mechanically enhanced bone adhesive suitable for reduction, provisional fixation, or void filling of bone fractures or defects in order to enhance structural stability where standard fixation alone cannot provide sufficient support for functional mobilisation.

OssiVet® IS INTENDED FOR:

- Osteosynthesis procedures to augment the stability of orthopedic implants (e.g., bone screws);
- Filling bone defects after removal of orthopedic implants such as bone screws;
- Arthrodesis (e.g., carpal or tarsal joint);
- Bone fractures with bone defects (e.g., fractures of the tibia, ulna, or femur in conjunction with appropriate stabilisation hardware);
- Bone defects following resection of benign bone tumors or bone cysts.
- OssiVet® is designed and intended to be implanted into well vascularised and non-infected bone defects.

OssiVet® supports quick and strong recovery from bone injury.

OssiVet®

BENEFITS

1. Remodels into new bone through a natural cell-mediated process, thereby maintaining micro-stability at the fracture interfaces to ensure no loss of structural integrity throughout the healing process.
2. Provides adherent properties to fragments on Nanoscale level which enables stabilisation to multi fragmentary and conventional screw fixation.
3. Cohesive properties enhance the adjunctive structural stability for the internal fixation of the affected bone, promoting proper alignment and healing.
4. This load sharing feature of OssiVet® will improve surgically efficiency, fracture construct stability leading to earlier mobilisation and weightbearing resulting in an improvement in functional outcomes.
5. As OssiVet® material is radiopaque surgeons can confirm adequate placement and filling of the defect allowing precise application to optimise fit and stability of the injured area.
6. OssiVet® mitigates micromotion between unstable small bone fragments and secondary inflammation thereby making the zone of injury at the fracture less prone to infection.
7. Can provide stability for osteochondral fractures and for a combination of cancellous and cortical components.
8. Wet environment compatible
9. OssiVet® is biocompatible.

FEATURES

1. **Enhanced Stability with Load Sharing and Support:** The foremost advantage of OssiVet® is the ability to provide enhanced stability to fractures fragments and defects. Standard fixation techniques might not achieve adequate stability in complex fractures, especially in cases with compromised bone quality (Thomas A. Russell, 2008). OssiVet® is known to rapidly remodel to new bone through a natural cell-mediated response which ensures maintenance of structural stability and integrity through the healing process.

2. **Customised Application:** The versatility in application of OssiVet® allows orthopedic surgeons to tailor its use to each patient's unique anatomical needs. Whether for fracture reduction, provisional fixation, or void filling, OssiVet® can be precisely applied to optimise the fit and stability of the injured area. This personalised approach is particularly advantageous in complex fractures that demand individualised treatment strategies.

3. **OssiVet® acts to supplement Standard Fixation:** In cases where traditional fixation methods like screws, plates, or pins are not enough to ensure stable healing, OssiVet® acts as an additional layer of support and adjunctive structural stability to internal fixation. The adhesive properties stabilise the small osteochondral fragments. This can be critical for fractures or defects that involve multiple bone fragments or complex geometries. Controlled loading of the fracture site will ensure stability and may also have an osteostimulative effect on bone repair during the healing period.

4. **Better screw hardware engagement:** Cohesive properties allow for drilling and screw placement directly into OssiVet® during the curing period. Better hardware engagement can be obtained with OssiVet® to enhance structural support.

5. **Provisional fixation of the fracture fragments:** Using the adhesive structural proprieties of OssiVet® to provisionally hold the reduction obtained with bone clamps, allows the removal of the bone clamps after the application of OssiVet®. The radiopaque OssiVet® will hold the reduced fracture fragments in place without obscuring the bone anatomy. This feature allows access for plates and screws with rapid application of definitive fixation without loss of reduction.

6. **Early Weight-Bearing and Mobilisation:** The rapid setting time allows drilling and insertion of the definitive fixation devices such as screws to enhance the stability of the fracture fixation. OssiVet® allows for earlier weight-bearing and mobilisation compared to cases relying solely on traditional fixation methods. This early mobility promotes improved joint function, facilitates faster rehabilitation, and aids in preventing joint stiffness.

7. **Targeted Structural Support:** OssiVet® is designed to provide specific and targeted support to peri-articular fractures and defects, which are areas around joints that are often complex and delicate. By providing stability and support to peri-articular fractures or defects, OssiVet® can help preserve joint function and prevent further joint damage. This is particularly relevant for conditions such as post-traumatic arthritis, where joint degeneration contributes to debilitating symptoms. This support enhances the adjunctive structural stability for the internal fixation of the affected bone, promoting proper alignment and healing.

8. **Minimised Soft Tissue Disruption:** Unlike traditional fixation methods often require extensive soft bone and soft tissue dissection to accommodate hardware placement, OssiVet® application is less invasive. This minimises disruption to surrounding tissues due to ease of application inside bone and reduces the risk of complications such as wound healing delays, infection, and soft tissue irritation.

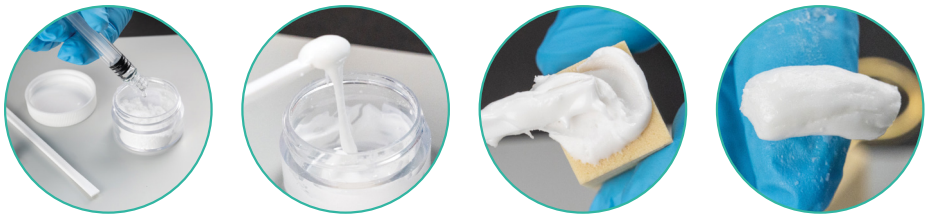
9. **Reduced Complications:** OssiVet® can minimise the risk of complications associated with traditional fixation devices, hardware irritation, due to its less invasive, load sharing features and the potential to minimise the volume of hardware required.

Reference: Thomas A. Russell, M. a.-B. (2008). *Comparison of Autogenous Bone Graft and Endothermic Calcium Phosphate Cement for Defect Augmentation in Tibial Plateau Fractures.* THE JOURNAL OF BONE AND JOINT SURGERY

OssiVet®

MIXING & APPLICATION INSTRUCTIONS

Depending on the clinical need, OssiVet® can be applied in different forms described below:	
Low viscosity form (<2 minutes mixing time)	Once the powder and hydration solution has been mixed to homogenous mixture (20-30 seconds), the OssiVet® mixture will remain in a low viscosity state for approximately 2 minutes. Within this 2-minute window, OssiVet® can be transferred into the supplied plastic delivery syringe and implanted using the supplied cannula, if required. Accounting for residual material in the cannula, the delivered volume will be approx. 2.5cc.
High viscosity paste (~2-4 minutes mixing time)	After 2 minutes of continued mixing the hydration solution and powder, OssiVet® will start to form a highly viscous paste that can be applied to the defect site with the spatula. Place OssiVet® on the target site, pressing gently to ensure proper implantation.
Putty (~4-6 minutes mixing time)	After 4 minutes of continued mixing the hydration solution and powder, OssiVet® will form into a putty that can be manually manipulated and implanted into the desired location by hand or using surgical tools.

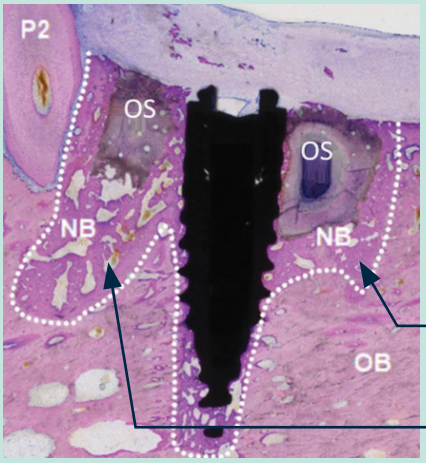


OssiVet

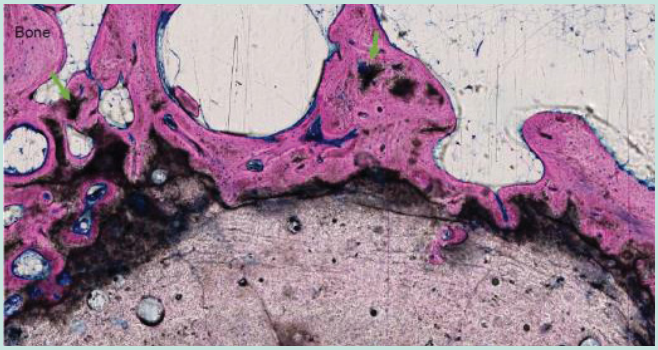
Mix to desired consistency. Highly workable compound for ease of use in a surgical environment

Complete Instructions for Use (IFU) are available upon request.

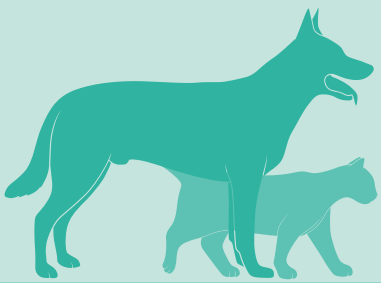
NEW BONE FORMATION



Histological section with outline (dotted line) of the original extraction socket and the implant bed prepared in the mandibular bone. As can be observed, OssiVet® material is undergoing a turnover process through which the material is being replaced by new bone (NB). After 8 weeks the resorption process is largely complete as can be observed by the two areas of OssiVet® (OS), remaining on either side of the implant.



Observations show surface degradation of OssiVet®. Image depicting OssiVet® implant with irregular degrading surface and replacement by new bone. Fragments of implant indicate original surface (Internal study in porcine model).

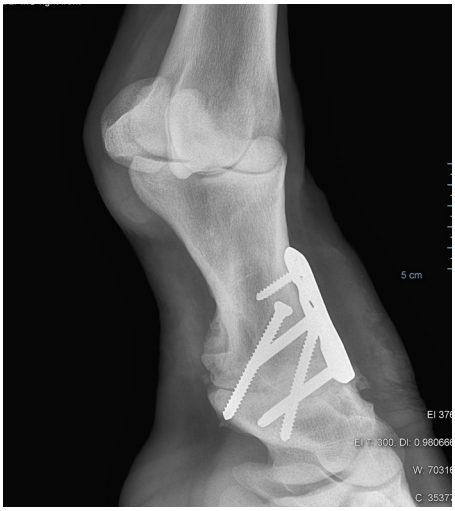


CASE STUDY: TIBIAL FRACTURE

Pre Surgery	Post Surgery	Day 45	Day 56	Day 103

- OssiVet® was used in paste format to support the realigned bone fragments. Additional support was achieved using only a surgical cable tie.
- Post surgery there was no excessive swelling, heat or inflammation. The patient was weight-bearing immediately post-op.
- Excessive product showed resorption from 20 weeks post-surgery and complete resorption was evident at 100 days post-surgery.
- Remodeling of both cortical and medullar bone was observed.

CASE STUDY: INTERPHALANGEAL JOINT ARTHRODESIS



OssiVet® can be used for arthrodesis where its adhesive and cohesive properties can be used to provide immediate stabilisation and bridging of the bone to be fused. Its superior compressive strength gives additional support to orthopedic implants to share loading which will minimise motion at the fusion site resulting in a more comfortable patient and higher surgery success rate.

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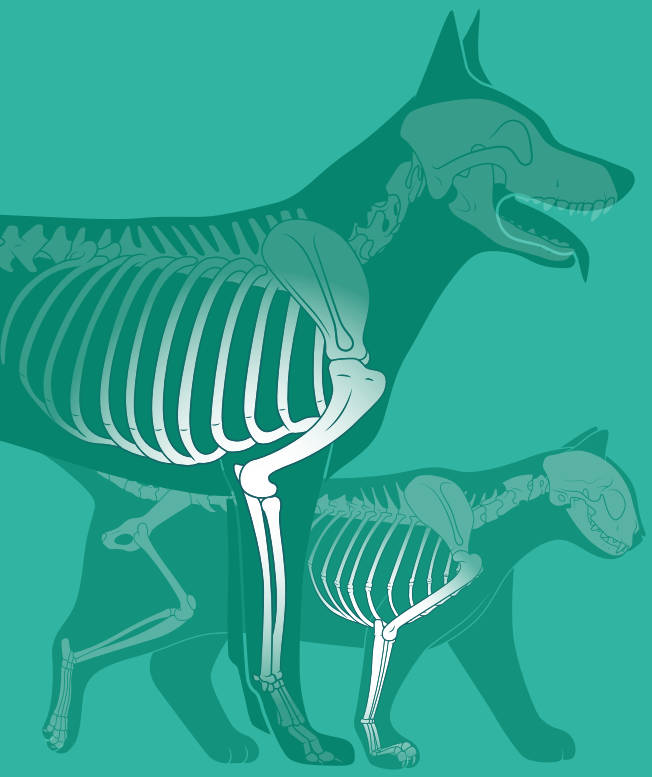

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Please scan the QR code below for more information.

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