AMES MEDICAL

OsteoSinter®
Vet-TTA implants

Porous titanium wedges with attachment plate
for treatment of canine cranial cruciate ligament rupture
using **the tibial tuberosity advancement (TTA) technique**

VETERINARY

Description

OsteoSinter® Vet-TTA implants are porous titanium wedges with a fixing plate, used for the treatment of canine cranial cruciate ligament rupture using the tibial tuberosity advancement technique (TTA).

These implants are indicated for osteotomies of the tibial tuberosity, which aim to modify the biomechanics of the knee to stabilise the joint and compensate for the loss of the cranial cruciate ligament.

An OsteoSinter® Vet-TTA implant consists of an OsteoSinter® porous titanium spacer integrated with an anodised titanium plate using screws made of grade 5 titanium. The plate is fixed to the bone with osteosynthesis screws.

- **The spacer, made of OsteoSinter®** material, is highly porous and induces osteointegration of the surrounding bone through the interconnected porosity, so that the implant becomes firmly fused.
- **The plate is made of grade 2 anodised titanium with a thickness of 1 mm.** It is both strong and deformable. Anodising eliminates the risk of corrosion between plate, spacer and screws.
- **The connecting screws between plate and spacer are made of grade 5 titanium.**

OsteoSinter® Vet-TTA implants allow very precise control of the amount of tibial tuberosity advancement, are easy and safe to fit, do not require cerclage, and provide the surgeon with great versatility and convenience in the procedure.

The product is interchangeable and can therefore be used on both hind legs.

OsteoSinter® Vet-TTA implants are initially delivered in an autoclavable kit containing the 15 sizes of spacer and plate, a Torx T5 key, an Hx 0.9 key and a saw guide. Used sizes are restocked in unit packaging in a plastic bag.

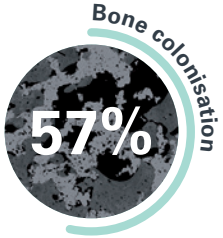
General specifications

Commercial name **OsteoSinter® Vet-TTA implant**	Spacer manufacturing technology **Powder metallurgy**
Spacer material **OsteoSinter® porous titanium under patent EP 3 122 497 B1, based on CP Ti (Commercially Pure Titanium)**	Plate and screw manufacturing technology **Machining**
Plate material **Grade 2 titanium**	Sterilisation method **Steam autoclave** **Delivered NON-sterile**
Screw material **Grade 5 titanium**	Storage conditions **Must be stored in a clean and dry environment, protected from sunlight and extreme temperatures**

OsteoSinter® material

Rapid osteointegration

The interconnected porosity of the OsteoSinter® material enhances the osteointegration of the surrounding bone.



AFTER 4 WEEKS

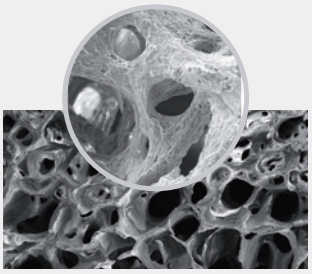
The result is a very fast osteointegration, reaching 57% bone colonisation.

High primary fixation

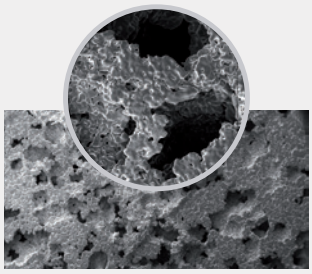
The porous structure of the material spacer provide a high primary fixation to the bone.

Trabecular bone mimicry

The OsteoSinter® material is biocompatible **pure titanium,** manufactured by means of Powder Metallurgy technology.



Trabecular bone



OsteoSinter® material

A special design of the manufacturing process allows to obtain a product with high interconnected porosity (62-66% in volume) and with great stochasticity of pores distribution, favoring the osteointegration of the surrounding bones.

The result is a **material that mimics the structure and characteristics of the bone,** especially the elastic modulus and the porosity shape, while providing good mechanical and fatigue resistance.

The manufacturing process of the OsteoSinter® material guarantees a high homogeneity of porosity and material characteristics piece by piece in large serial production.

Excellent mechanical properties

The OsteoSinter® material exhibits a **mechanical behaviour very similar to bone,** both in elastic modulus as in compression and fatigue strength.

It also has a **high friction coefficient,** which ensures high primary fixation to the bone, **and great wear resistance.**

Property	Material	
	OsteoSinter®	Trabecular bone [1, 2, 3]
Elastic modulus (GPa)	2.5 - 3.5	2.0
Compressive yield strength (MPa)	40 - 45	10 - 30
Compressive fatigue limit	5 M cycles at >18 MPa without failure	-
Friction coefficient	0.38	0.44 - 0.63
Abrasion (% of weight loss at 1,000 N)	0.34	-

[1] ADVANCE® BIOFOAM™ Cancellous Titanium_Tibial implants_Technical Monograph.

[2] Bobyn, J. D., Stackpool, G. J., Hacking, S. A., Tanzer, M., & Krygier, J. J. (1999). Characteristics of bone ingrowth and interface mechanics of a new porous tantalum biomaterial. The Journal of Bone and Joint Surgery. British Volume, 81-B(5), 907–914.

[3] Shirazi-Adl A1, Dammak M, Paiement G. Experimental determination of friction characteristics at the trabecular bone/porous-coated metal interface in cementless implants. J Biomed Mater Res. 1993 Feb;27(2):167-75.

Advantages

OsteoSinter® Vet-TTA implants offer a number of advantages over other solutions currently available on the market.

- **The OsteoSinter® Vet-TTA implant is an integral solution** consisting of the spacer with the attached plate. Consequently, it is easy and quick to position, is surgically less invasive, and avoids pivoting or unwanted movement of the spacer in the early stages of ossification.
- **The OsteoSinter® material of the spacer is porous and osteointegrable.** It provides the spacer with greater osteointegration ability than the lattice or reticular geometries typically obtained by additive manufacturing, and a much higher metallurgical quality of the material.
- **The shape of the plate provides the surgeon with different attachment options** to improve the adaptation of the implant to each patient, thereby providing optimal angulation to be adapted to the specific tibia type and much greater surgical versatility than current solutions.
- **The plate is designed to compensate biomechanically the traction of the patellar tendon and avoid the requirement for a cerclage.**
- **The plate and spacer can be assembled.** It is possible to remove the plate without touching the spacer if complications arise.
- **Its 15 sizes** cover the entire anatomical spectrum and **allow two advancement measurements to be made with the same osteotomy depth.**
- It is implanted with **standard osteosynthesis screws.**
- **An OsteoSinter® Vet-TTA implant is fitted with three specific instruments included in the starter kit.** Only a scalpel, saw blade, bone distractor, pliers and general surgical material are needed, all of which are available to the veterinarian in the operating room.

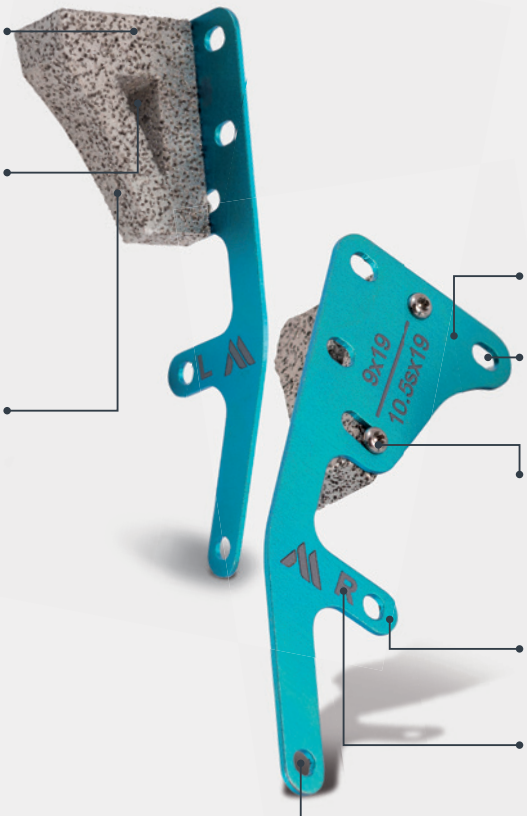
Design-related advantages of the OsteoSinter® Vet-TTA implant

OsteoSinter® porous titanium spacer

High contact surface area and excellent primary fixation, which prevents the spacer from pivoting after placement.

Spacer hollowed out in the middle to shorten the osteointegration path **and facilitate the osteons movement, to prevent unwanted infections,** and to enable the placement of bone cement or filler at the surgeon's discretion.

Curved posterior geometry of the spacer that mimics the contralateral tibia and prevents wedge protrusion.



Anodised grade 2 titanium plate

Plate design aimed at resisting existing stresses on the tibia and improving load distribution.

NOTE: Fatigue studies show that the plate withstands more than 1 million fatigue cycles without failure, whereas similar implants manufactured using additive technologies fail after 200,000 cycles.

Easily deformable plate, which makes it very easy for the surgeon to adapt the implant to the specific case.

3 slotted holes to attach the plate: these allow the screws to be tilted and to find the ideal area of bone fitxation, which allows the implant to adapt anatomically.

2 holes to secure the plate to the wedge, one of which is slotted to tilt the plate and easily find the distal fixation.

Lateral arm with end hole to attach the plate, improving load distribution and avoiding the need for cerclage.

Reversible plate, valid for both hind legs. (R=right, L=left).

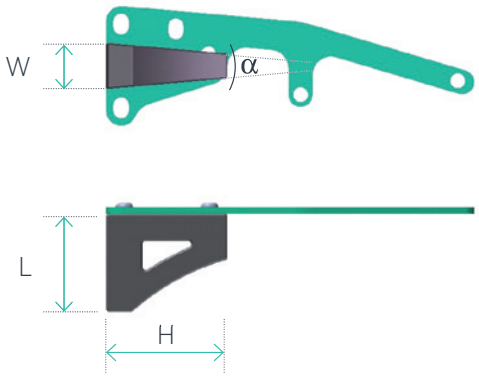
Hole in the lower end of the plate for the distal anchoring of the implant.

PATENTED DESIGN

Sizes

OsteoSinter® Vet-TTA implants are available in a wide range of sizes to cover the full anatomical spectrum. The sizes are distinguished by different plate colours.

Each plate allows 2 spacer sizes (established and superior) to be installed without varying the extension of the osteotomy, thereby achieving greater advancement.



Reference	Designation	Plate	Measurements				Range (Kg)	Wedge-plate screw	ø osteosynthesis screw	
			W (mm)	α (°)	L (mm)	H (mm)			Recommended	Maximum
P00601	OsteoSinter® Vet-TTA 4.5W x 12L x 15H		4.5	8	12	15	7 - 12	Hexagonal M1,2 (ref. C1003235)	2.1	2.4
P00609	OsteoSinter® Vet-TTA 6sW x 12L x 15H		6	10.7						
P00602	OsteoSinter® Vet-TTA 6W x 16L x 20H		6	8.5	16	20	12 – 16			
P00610	OsteoSinter® Vet-TTA 7.5sW x 16L x 20H		7.5	10.6						
P00603	OsteoSinter® Vet-TTA 7.5W x 16L x 20H		7.5	10			16 – 23	Torx M2 (ref. C1003234)	2.4	2.7
P00611	OsteoSinter® Vet-TTA 9sW x 16L x 20H		9	12						
P00604	OsteoSinter® Vet-TTA 9W x 19L x 25H		9	10.3	19	25	23 – 32			
P00612	OsteoSinter® Vet-TTA 10.5sW x 19L x 25H		10.5	12						
P00605	OsteoSinter® Vet-TTA 10.5W x 19L x 25H		10.5	11.2			32 – 35			
P00613	OsteoSinter® Vet-TTA 12sW x 19L x 25H		12	12.8						
P00606	OsteoSinter® Vet-TTA 12W x 22L x 30H		12	11.2	22	30	> 35		2.7	3.5
P00614	OsteoSinter® Vet-TTA 13.5sW x 22L x 30H		13.5	12.6						
P00607	OsteoSinter® Vet-TTA 13.5W x 22L x 30H		13.5	12						
P00615	OsteoSinter® Vet-TTA 15sW x 22L x 30H		15	13.3						
P00608	OsteoSinter® Vet-TTA 15W x 22L x 30H		15	12.5						

Packaging

OsteoSinter® Vet-TTA implants are initially delivered in an autoclavable kit containing:

- **The 15 implant sizes,** distinguishable by the different colours of the attachment plate.
- **A stainless steel saw guide** used to facilitate the correct positioning of the osteotomy.
- **A hexagonal Hx 0.9 key** to tighten the screws joining the plate to the spacer for small sizes.
- **A Torx T5 key** to tighten the screws joining the plate to the spacer for medium and large sizes.
- **A bag with 4 Torx M2 screws and 2 hexagonal M1.2 screws.**

Used sizes are restocked packed in a plastic bag, labelled with identifying information, and delivered in a clean condition so that they can be sterilised in-situ at the time of the procedure.

Instruments and screws are available for purchase separately.

AMES MEDICAL

A division of AMES Group

www.ames-medical.net

AMES Medical Prosthetic Solutions, S.A.U.

Ctra. Laureà Miró, 388. 08980 Sant Feliu de Llobregat, Barcelona (Spain)

+34 93 685 51 11 info.amesmedical@ames.group

AMES MEDICAL is certified for the production and sale of medical devices according to EN ISO 13485:2016 standard with certificate no. Q5 104088 0002.

OsteoSinter® Vet-TTA implants are protected under patent no. W0 2021/160901 A1.

The OsteoSinter® material is protected under patent no. EP 3 122 497 B1.

8 435078 721243

Rev. 08/2022