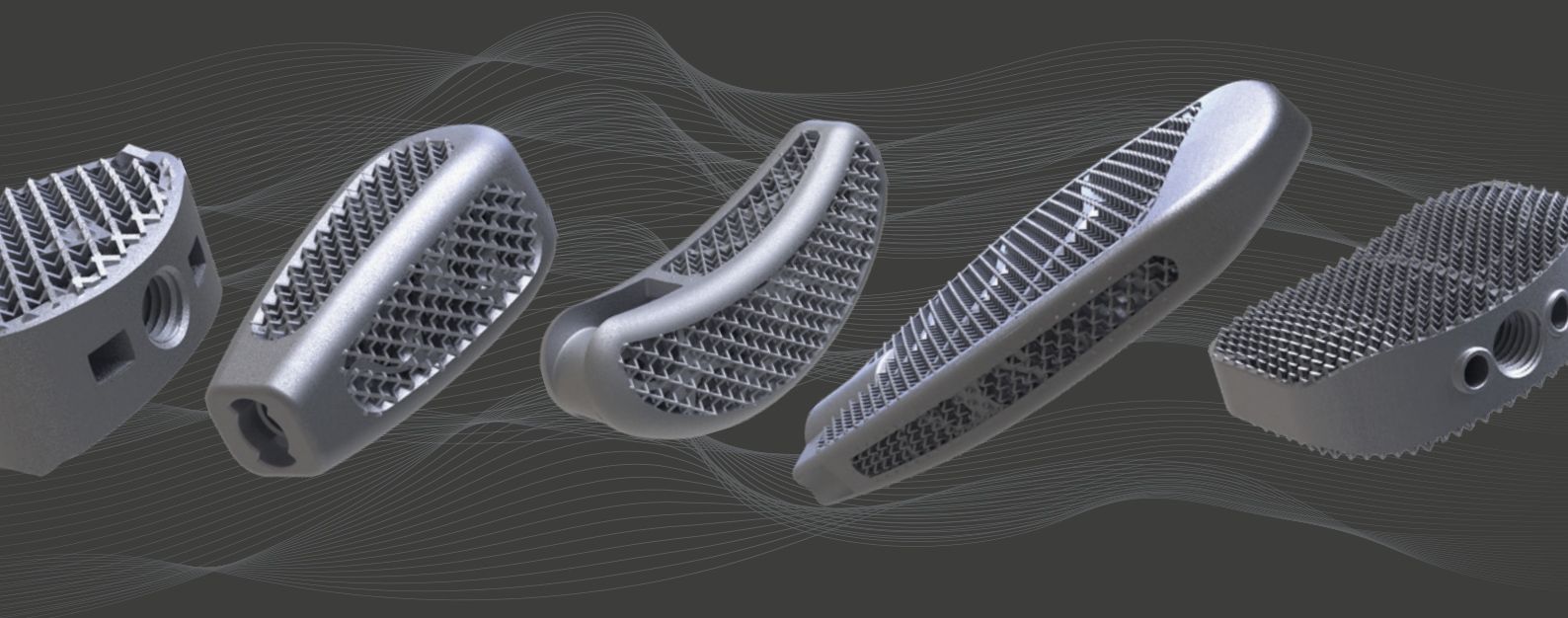


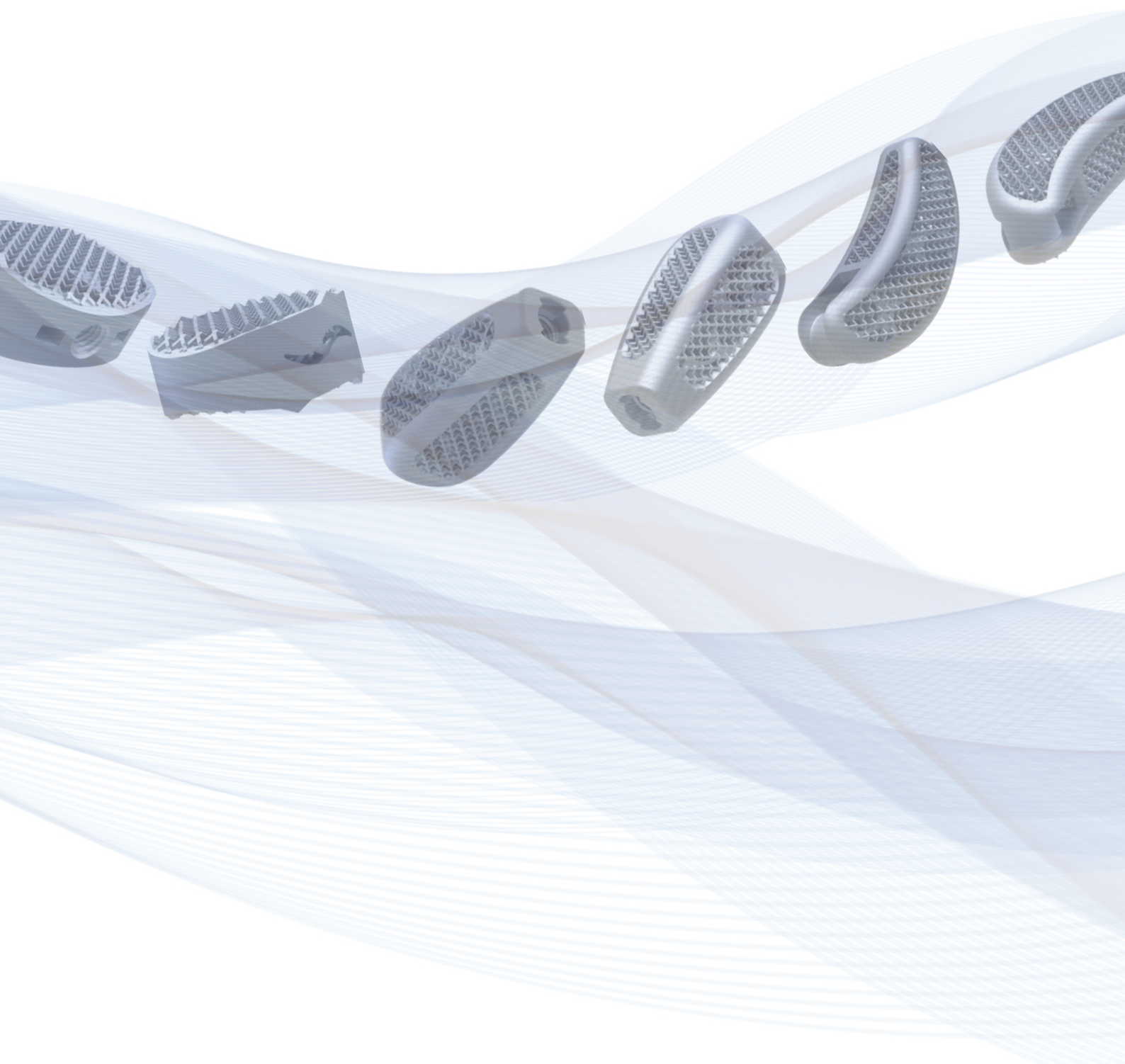
3D Printed Technology

IMPLANTS CATALOGUE

INTERBODY FUSION

TANTALUM CAGES





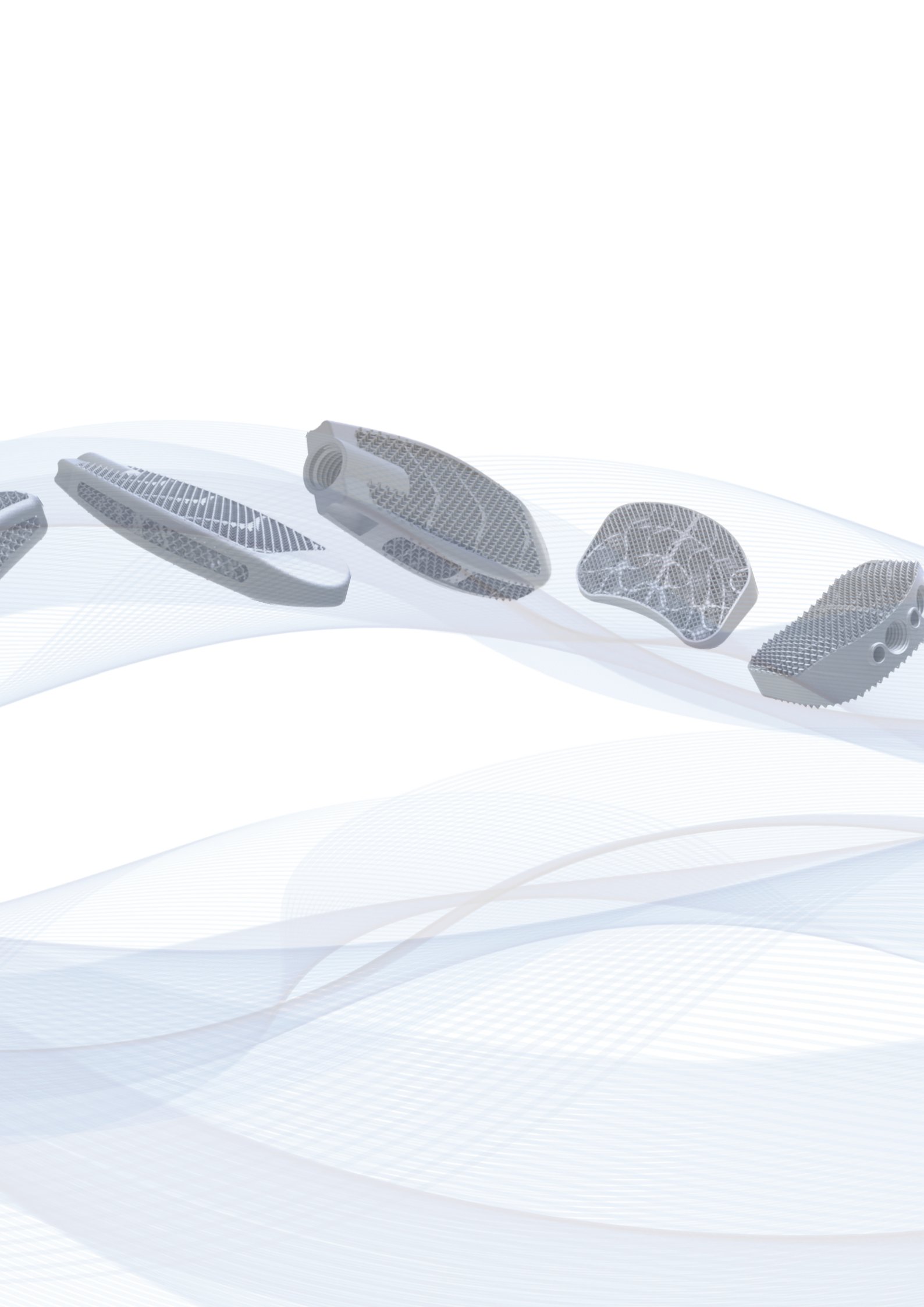


Table of Contents

The Wave Of Innovation..... 6

Interbody Fusion Cages..... 8

Tantalum Portfolio..... 10

 Capraia-T..... 12

 Pianosa-T..... 14

 Elba-T..... 16

 Stromboli-T..... 18

 Alicudi-T..... 20

The Wave of Innovation

Tsunami Medical is one of the leaders in Spine Technology innovation, focusing on additive manufactured solutions for spine surgery and diagnostic invasive procedures.

Company History

The company has been founded in 1997, active in medical device manufacturing with a core business in biopsy needles and invasive diagnostic systems.

1997

2007

20

In 2007 the company has entered the spinal market with Vertebroplasty and Kyphoplasty needle kit.

Company Profile

Located in the heart of Italy's "Biomedical Valley", the company employs 20+ highly trained technicians and engineers who are in charge of the entire manufacturing process, from the design to the final product.

Tsunami Medical S.r.l. Quality System is UNI EN ISO 13485:2016 certified and it is in compliance with the Medical Devices Directive 93/42/EEC.

*The company offers the largest portfolio
of differentiating surgical solutions for
Spinal Fusion.*

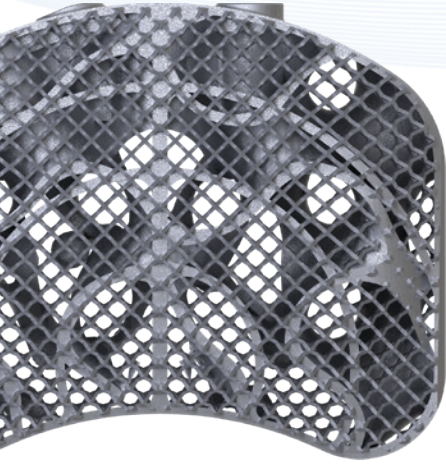
In 2011 starts the development of
Spinal Implants manufactured with
3D printing technology.

In 2021, upon certificates
reception, Tsunami Medical
launches a set of innovations in its
spinal catalogue.



In 2017 a dedicated
company has been
established with the official
name of Tsunami Medical
S.r.l., where all the spinal
activity has been moved.

Introduction



The development of 3D printing technology has transformed various industries, including aerospace, automotive, medical, and manufacturing, by enabling the creation of complex geometries and custom designs with high precision.

One of the most exciting applications of 3D printing is in the medical field, particularly for the production of implants and cages used in spinal and orthopedic surgeries. In the broader orthopedic field, Tantalum, also known under the commercial name trabecular metal, is showing promising results as the metal backing of Acetabular cups and Knee implants.

There has been an attempt before to manufacture Tantalum Spinal cages, but these are specifically known for being too porous and thus weak, as well as dangerous: former spinal Tantalum cages had sharp edges; during implantation many times soft tissue attached to these sharp edges, which was highly undesirable, especially while passing the dura.

Among the materials used for 3D printing medical devices, Tantalum and Titanium stand out due to their superior mechanical properties, biocompatibility, and corrosion resistance. However, while Tsunami Medical uses both materials to manufacture 3D printed cages, Tantalum offers several advantages over and facts compared to Titanium when it comes to creating high-performance, biocompatible implants.

1. Superior Biocompatibility and Osteointegration

Tantalum is known for its exceptional biocompatibility, which makes it an ideal material for use in medical implants, particularly in bone-related applications. Tantalum has a higher surface roughness than Titanium that encourages osteointegration—the process by which bone cells attach to the implant surface and promote natural healing.

The rougher surface of Tantalum promotes better bone cell attachment, thus facilitating the process of osseointegration more effectively than Titanium. This characteristic can lead to a higher success rate in patients, as Tantalum implants may more easily integrate with the surrounding bone tissue, providing better long-term stability and functionality.

2. Corrosion Resistance

Tantalum is highly resistant to corrosion, particularly to the body's biological fluids, which can be an essential factor in the longevity of implants. Unlike Titanium, which can sometimes be prone to corrosion in aggressive environments, Tantalum remains inert in most environments, including the acidic and saline conditions inside the human body.

3. Plasticity

Plasticity is defined as the quality of being soft enough to be changed into a new shape: whereas Titanium cages may deform and even break under heavy load, Tantalum cages, despite its porous internal structure, will show a new shape without any breakages. Tantalum has an excellent fatigue resistance, meaning it can withstand repeated stress cycles without failing. This property is crucial for implants that are subjected to constant mechanical stresses, such as spinal cages.

4. Elasticity

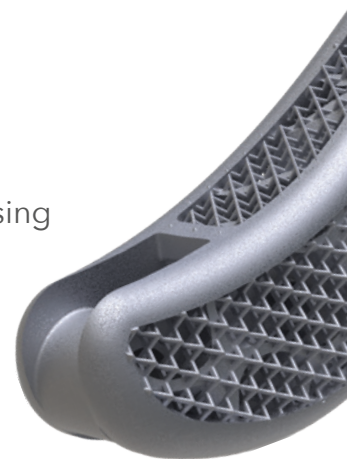
Similar to Tsunami Medical's Titanium cages, the structural elasticity of Tantalum cages are "as elastic as PEEK alternatives" and thus as close to the elasticity characteristics of natural bone. Because Tantalum is softer than Titanium, it requires 4 times more material and an internal structure inside the cage to guarantee similar stability. It is also for this reason Tantalum cages are heavier than their Titanium alternatives.

5. Clinical Experience

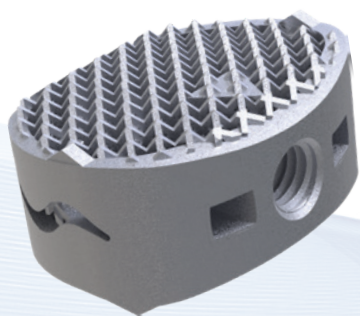
Tantalum is relatively newer in spinal implants, but it has shown promising results, especially in promoting bone growth and fusion. Titanium has been used in spinal surgery for a long time, and its safety and effectiveness are well-established. It has a long track record of clinical success.

6. Costs

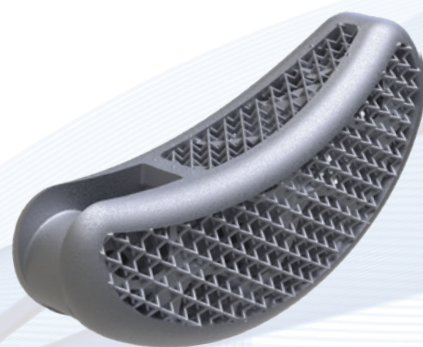
Tantalum is generally more expensive than titanium due to its rarity and more complex processing. Titanium tends to be less expensive and more widely available than tantalum.



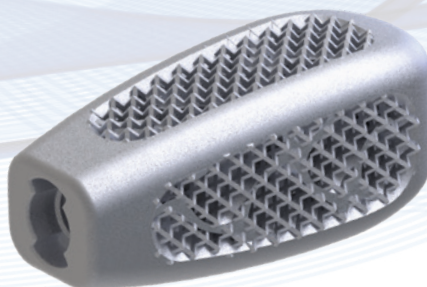
TANTALUM PORTFOLIO



Capraia-T



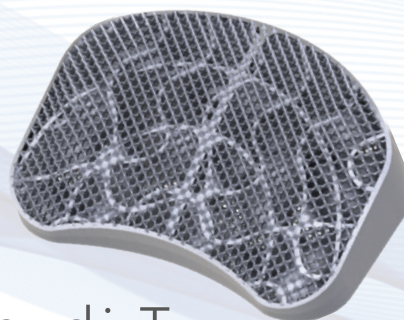
Elba-T



Pianosa-T



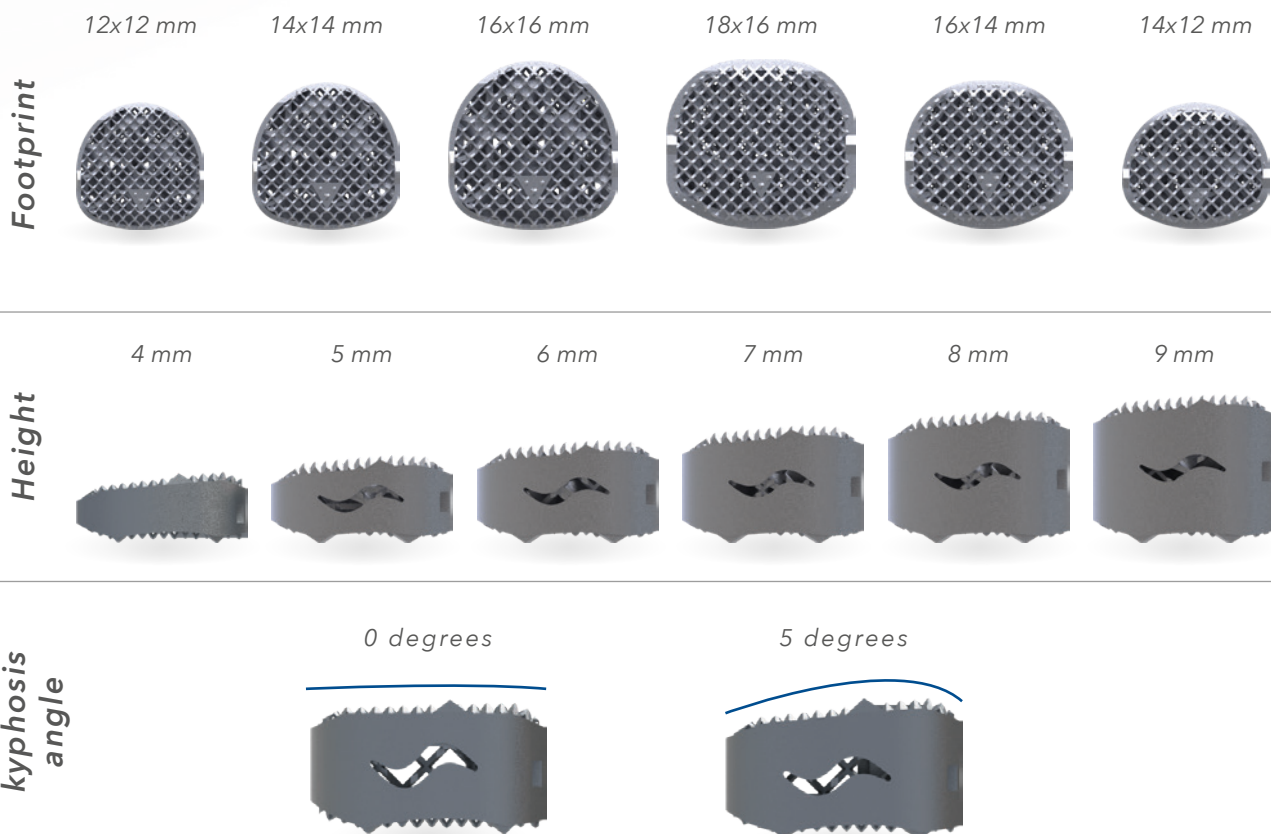
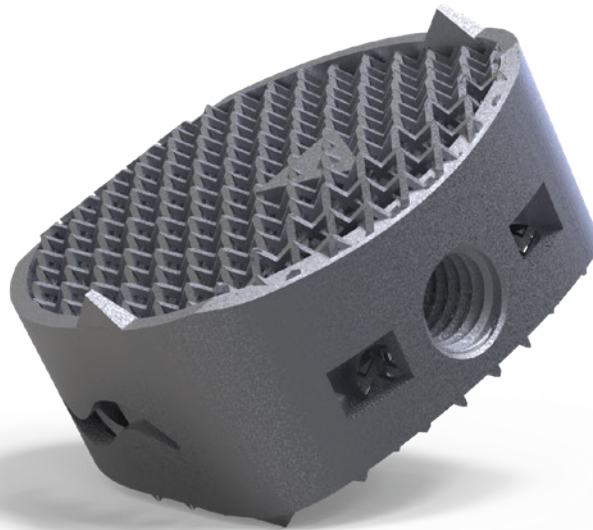
Stromboli-T



Alicudi-T

CAPRAIA-T

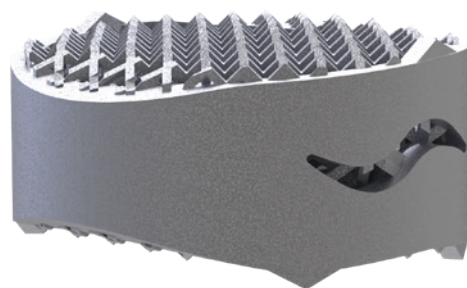
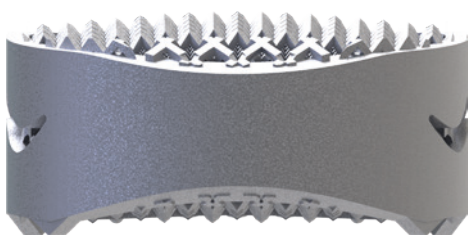
ACIF 3D Printed Tantalum Cage



Product Reference Codes

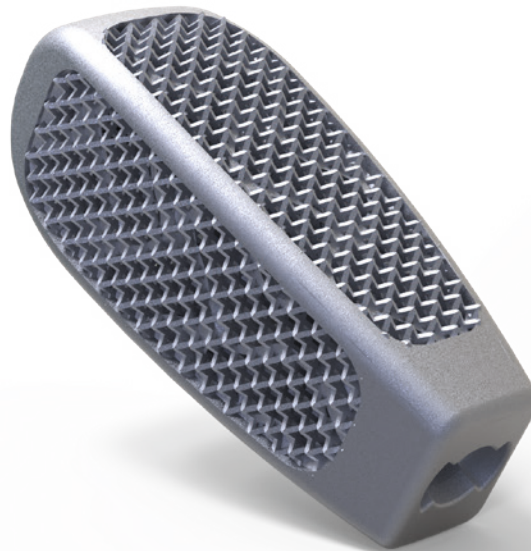
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TACC1414**00	Footprint Size 14x14mm - Angle 0° Range of Heights [mm] 04, 05, 06, 07, 08, 09
TACC1414**05	Footprint Size 14x14mm - Angle 5° Range of Heights [mm] 04, 05, 06, 07, 08, 09
TACC1616**00	Footprint Size 16x16mm - Angle 0° Range of Heights [mm] 04, 05, 06, 07, 08, 09
TACC1616**05	Footprint Size 16x16mm - Angle 5° Range of Heights [mm] 04, 05, 06, 07, 08, 09
Rectangular footprints	
TACC1412**05	Footprint Size 14x12mm - Angle 5° Range of Heights [mm] 04, 05, 06, 07, 08, 09
TACC1614**05	Footprint Size 16x14mm - Angle 5° Range of Heights [mm] 04, 05, 06, 07, 08, 09
TACC1816**05	Footprint Size 18x16mm - Angle 5° Range of Heights [mm] 04, 05, 06, 07, 08, 09

** Choose preferred height and use it instead of the asterisks to get the final reference.



PIANOSA-T

PLIF 3D Printed Tantalum Cage



24x10 mm

29x10 mm

Footprint



Height

7 mm

8 mm

9 mm

10 mm

11 mm

12 mm

13 mm

14 mm



Lordosis
angle

0 degrees

5 degrees

8 degrees



Product Reference Codes

Ref. Code	Dimensions
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TACP2410**08	Footprint Size 24x10mm - Angle 8° Range of Heights [mm] 07, 08, 09, 10, 11, 12, 13, 14
TACP2910**00	Footprint Size 29x10mm - Angle 0° Range of Heights [mm] 07, 08, 09, 10, 11, 12, 13, 14
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TACP2910**08	Footprint Size 29x10mm - Angle 8° Range of Heights [mm] 07, 08, 09, 10, 11, 12, 13, 14

** Choose preferred height and use it instead of the asterisks to get the final reference.



ELBA-T

TLIF 3D Printed Tantalum Cage



Footprint

26x9 mm

29x9 mm

32x9 mm

32x10 mm



Height

7 mm

9 mm

11 mm

13 mm

15 mm



8 mm

10 mm

12 mm

14 mm



Lordosis
angle

0 degrees

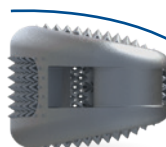
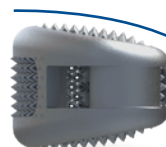
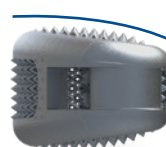
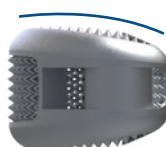
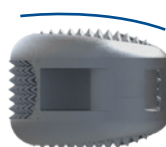
5 degrees

8 degrees

15 degrees

20 degrees

25 degrees



15, 20 and 25 degrees are available for 32x10 mm footprint only.

Product Reference Codes

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TACT2609**08	Footprint Size 26x09mm - Angle 8° Range of Heights [mm] 07, 08, 09, 10, 11, 12, 13, 14, 15
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TACT2909**05	Footprint Size 29x09mm - Angle 5° Range of Heights [mm] 07, 08, 09, 10, 11, 12, 13, 14, 15
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TACT3209**00	Footprint Size 32x09mm - Angle 0° Range of Heights [mm] 07, 08, 09, 10, 11, 12, 13, 14, 15
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TACT3209**08	Footprint Size 32x09mm - Angle 8° Range of Heights [mm] 07, 08, 09, 10, 11, 12, 13, 14, 15
TACT3210**15	Footprint Size 32x10mm - Angle 15° Range of Heights [mm] 08, 09, 10, 11, 12, 13, 14, 15
TACT3210**20	Footprint Size 32x10mm - Angle 20° Range of Heights [mm] 07, 08, 09, 10, 11, 12, 13, 14, 15
TACT3210**25	Footprint Size 32x10mm - Angle 25° Range of Heights [mm] 07, 08, 09, 10, 11, 12, 13, 14, 15

** Choose preferred height and use it instead of the asterisks to get the final reference.



STROMBOLI-T

DLIF 3D Printed Tantalum Cage



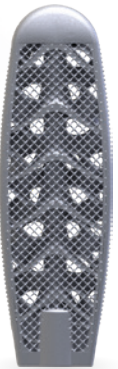
42x18 mm

48x18 mm

52x18 mm

58x18 mm

Footprint



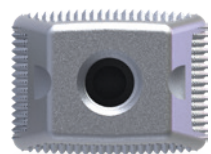
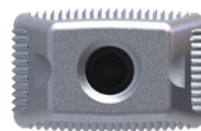
7 mm

9 mm

11 mm

13 mm

Height



0 degrees

5 degrees

8 degrees

14 degrees

Lordosis
angle



Product Reference Codes

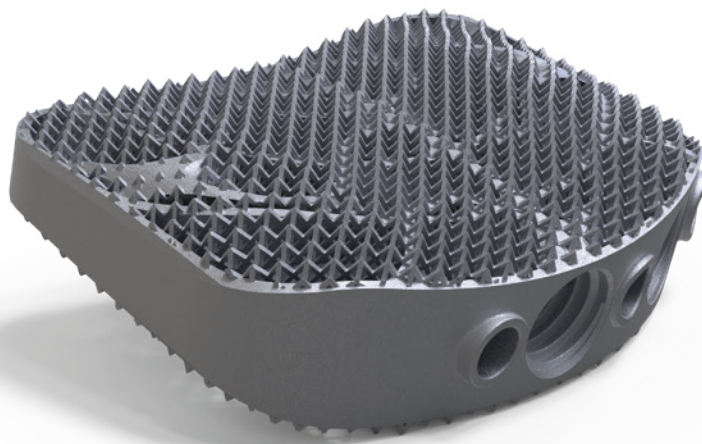
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TACX4218**14	Footprint Size 42x18mm - Angle 14° Range of Heights [mm] 07, 09, 11, 13
TACX4818**00	Footprint Size 48x18mm - Angle 0° Range of Heights [mm] 07, 09, 11, 13
TACX4818**05	Footprint Size 48x18mm - Angle 5° Range of Heights [mm] 07, 09, 11, 13
TACX4818**08	Footprint Size 48x18mm - Angle 8° Range of Heights [mm] 07, 09, 11, 13
TACX4818**14	Footprint Size 48x18mm - Angle 14° Range of Heights [mm] 07, 09, 11, 13
TACX5218**00	Footprint Size 52x18mm - Angle 0° Range of Heights [mm] 07, 09, 11, 13
TACX5218**05	Footprint Size 52x18mm - Angle 5° Range of Heights [mm] 07, 09, 11, 13
TACX5218**08	Footprint Size 52x18mm - Angle 8° Range of Heights [mm] 07, 09, 11, 13
TACX5218**14	Footprint Size 52x18mm - Angle 14° Range of Heights [mm] 07, 09, 11, 13
TACX5818**00	Footprint Size 58x18mm - Angle 0° Range of Heights [mm] 07, 09, 11, 13
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TACX5818**14	Footprint Size 58x18mm - Angle 14° Range of Heights [mm] 07, 09, 11, 13

** Choose preferred height and use it instead of the asterisks to get the final reference.



ALICUDI-T

ALIF 3D Printed Tantalum Cage



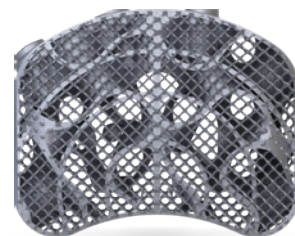
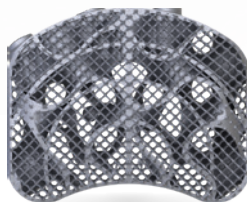
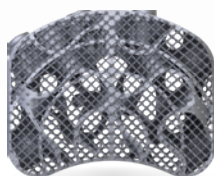
30x24 mm

32x22 mm

36x24 mm

38x28 mm

Footprint



Height



6 mm



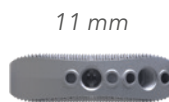
8 mm



9 mm



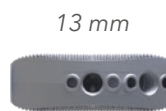
10 mm



11 mm



12 mm



13 mm



14 mm

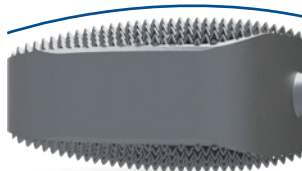


15 mm

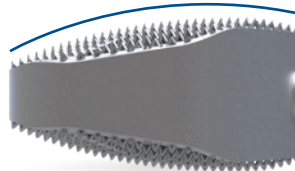
Selected heights come only in selected footprints and angles.

Lordosis
angle

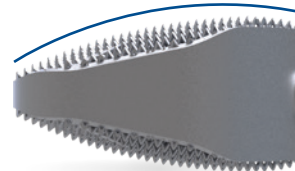
5 degrees



8 degrees



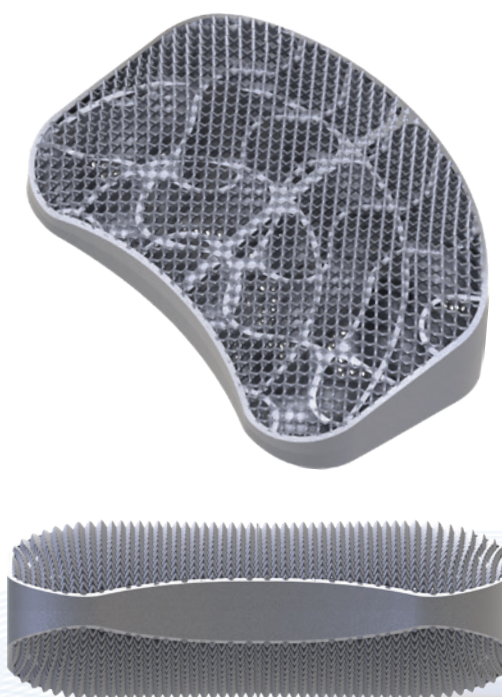
14 degrees

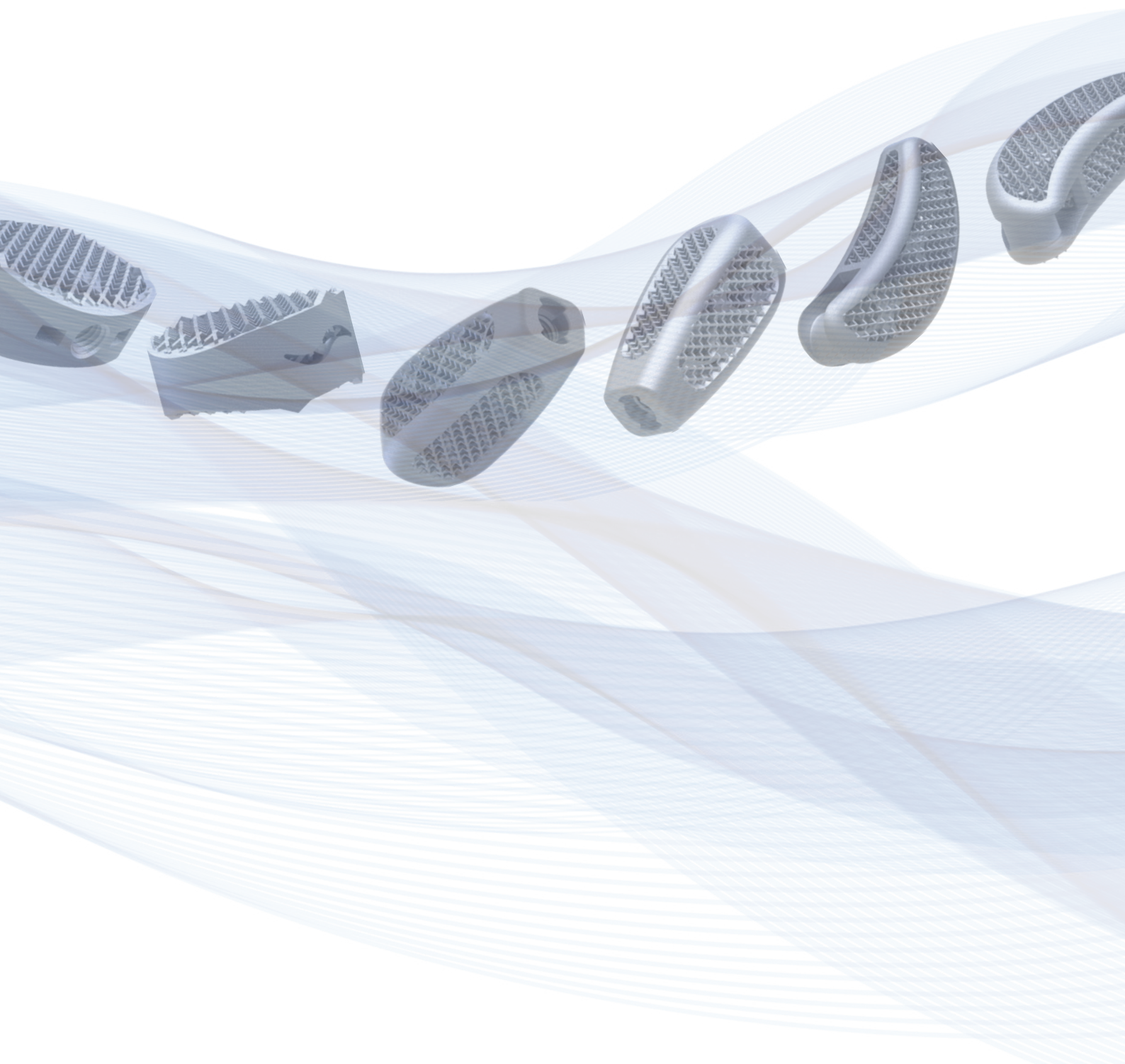


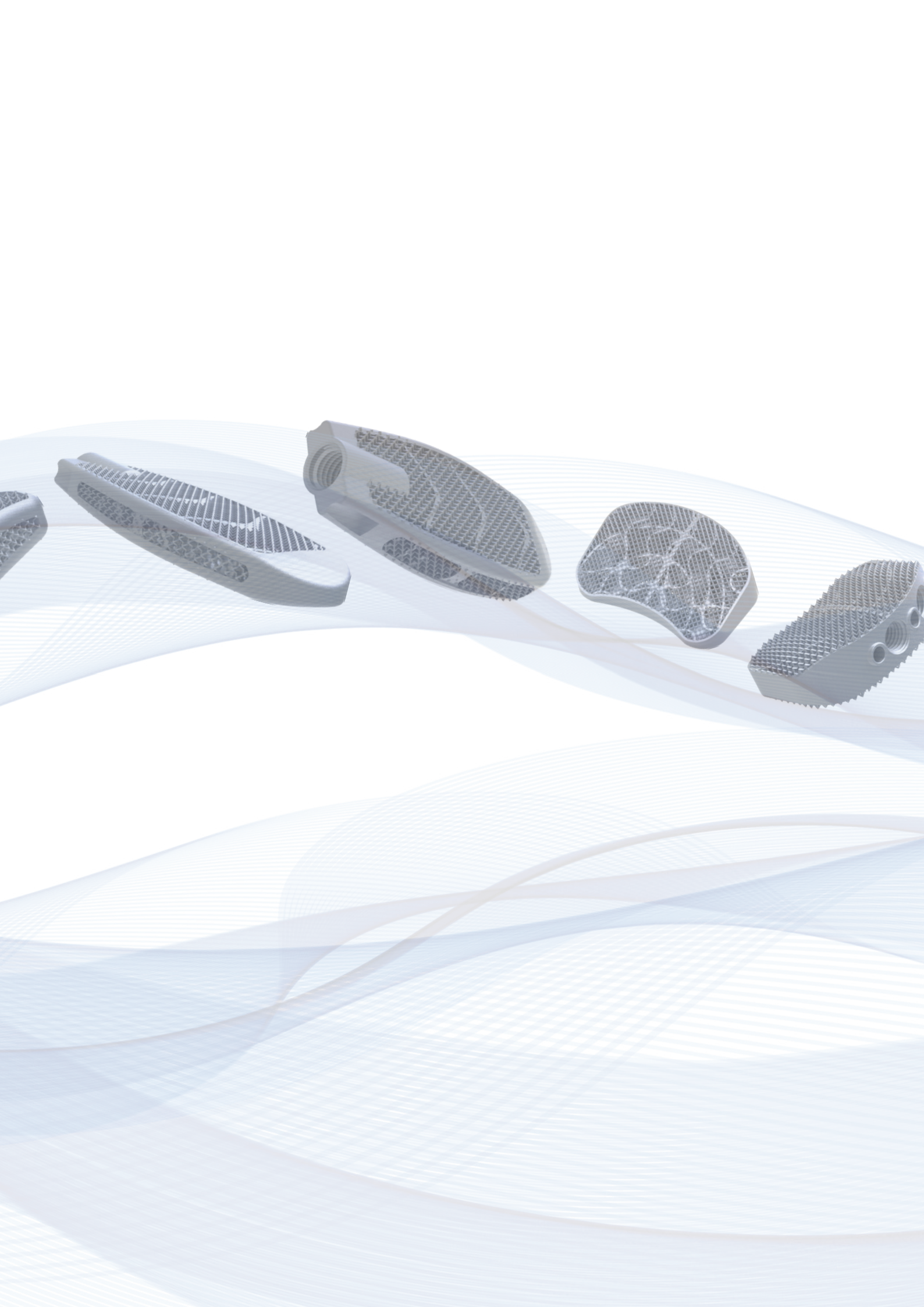
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TACA3222**08	Footprint Size 32x22mm - Angle 8° Range of Heights [mm] 06, 08, 10, 12, 14
TACA3222**14	Footprint Size 32x22mm - Angle 14° Range of Heights [mm] 06, 08, 10, 12, 14
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TACA3828**05	Footprint Size 38x28mm - Angle 5° Range of Heights [mm] 09, 10, 11, 12, 13, 14, 15
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TACA3828**14	Footprint Size 38x28mm - Angle 14° Range of Heights [mm] 09, 10, 11, 12, 13, 14, 15

** Choose preferred height and use it instead of the asterisks to get the final reference.









Made in Italy

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