# IMPLANTOLOGY GLOBAL

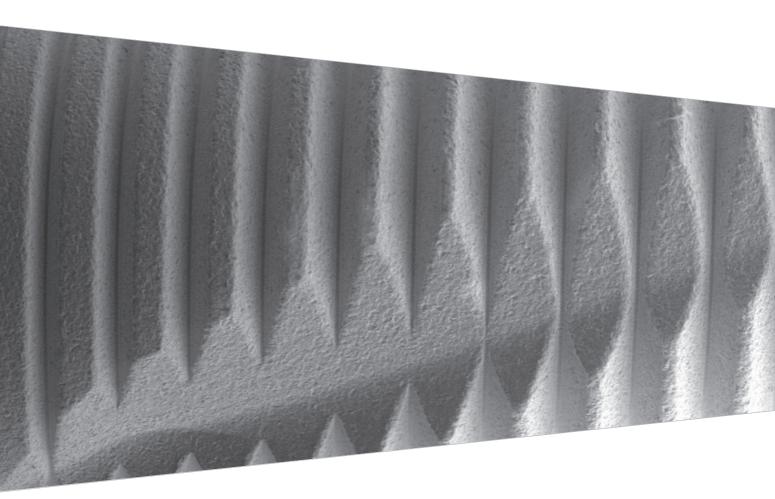


### IMPLANTOLOGY TABLE OF CONTENTS



Sweden & Martina develops and manufactures implant systems that offer excellent clinical functionality and perfect aesthetic results. The surfaces have been designed to give the best ratio between surface roughness of the titanium and bone healing speed. The surgical instruments are functional, user-friendly and ergonomic. Continuous training and refresher courses and widespread assistance characterise the

service and reliability which have made Sweden & Martina a leader in the Italian implantology market.





#### **Multi-function mounter:**

in addition to functioning as a carrier for implant placement in the mouth, the mounter is shaped in such a way to allow the fitting of a special cap for impressiontaking and for creating a temporary structure.

#### The Global dental implant system is suitable for:

- standard operating procedures which involve a one-stage or two-stage surgical phase; -
- immediate loading; -
- -
- post-extraction procedures; maxillary sinus lift and mini-lift techniques; \_
- platform switching.

#### **Root form morphology:**

the implant body has an almost cylindrical first section for stabilising the implant in the most cortical area, and a progressively conical apex that perfectly adapts to the morphology of the bone crests.

**Double octagonal connection:** the two overlapping octagonal wells have two functions: screwing during the surgical phase and prosthetic repositioning.

#### **Platform switching:**

the size of the double octagonal connection is the same for all diameters of the range, and allows applying the Platform Switching protocols with different mismatching.

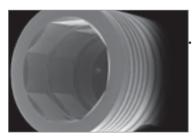


#### Scientific evidence:

the use of the Global system is supported by numerous publications that document its extreme versatility in 8 years of clinical success.

### Morphology

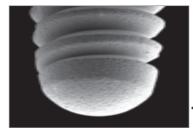
The morphology of the Global implants has many distinctive characteristics that make the system extremely versatile and safe. The **variable taper** is narrower in the neck and in the first middle section and thicker in the apical section. This distinctive profile makes the Global implant particularly suitable for the different surgical techniques.



Bevel for easy prosthetic insertion.

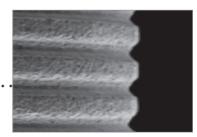


The two long **apical**, spiral and deep **incisions** permit adequate self-tapping of the bone, offer two decompression and release areas for the coagulation, improve primary stability by increasing the non-rotational aspect of the implant during the screwing and unscrewing operations of the components connected to it. However, in case of highly compact bone, preventive self-tapping of the bone is always required.



The **rounded apex** makes the implant suitable even for mini sinus lifts and for maxillary sinus lifts.





The **coronal micro-threading** has the same shape as the actual spire, but with half the pitch. The micro-threaded section of the implant neck and the continuity with the main thread give greater primary stability.



The **thread has a conical profile** with a pitch of 0.6 mm and depth of 0.4 mm to provide more contact surface where there is more cancellous bone.

The outer spire has a progressive profile with an angle of 60° and continues to the apex of the implant.

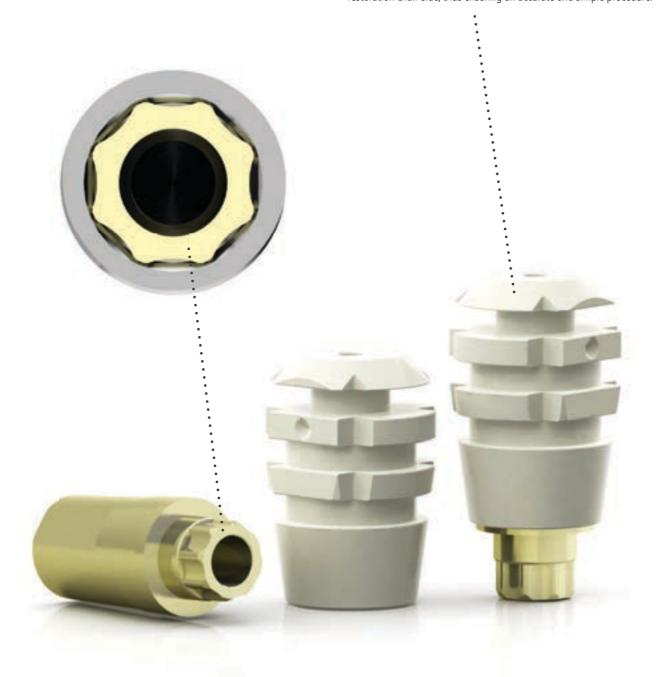




### Multi-function mounter

The implant comes with the mounter already assembled; its special size and design make it practical, functional and versatile. The connection works with a special kind of geometry specially designed to prevent deformation of the connection. Therefore, it is easier to remove once the implant has been positioned in the mouth.

Besides its usual function as a "carrier" used to position the implant, the shape of the mounter also allows it to be used to take an accurate impression thanks to a special cap in PEEK\* equipped with retentive tabs. These tabs allow securing the mounter firmly in the impression material.

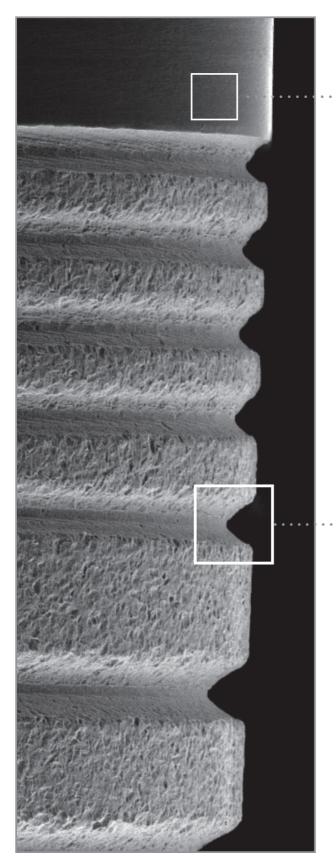


The cap, suitably sized and/or adapted to the morphology of the replaced element, also allows creating an immediate temporary restoration chair-side, thus ensuring an accurate and simple procedure.

#### **IMPLANT SYSTEM**

## Surface

It has been widely demonstrated that the closer the roughness is to the size of the fibroblasts, the more impact it has on cell behaviour, causing the platelet activity to increase compared to a smooth surface, thereby accelerating the repair and osseointegration processes: the roughness can guide the layout of the cells, alter their metabolism and proliferation, differentiate osteoblasts and modulate production of extra-cellular matrix.





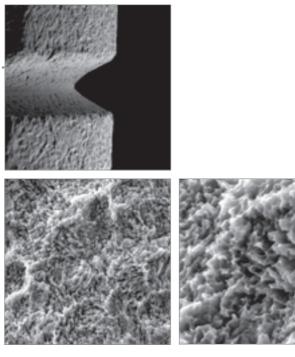
The **neck** is polished for a height of 0.3 mm to allow perfect control of the connection diameter and to prevent the accumulation of plaque in the area where it joins the post.

It has a roughness level of Ra 0.2.

#### ZirTi Surface

(Zirconium Sand-Blasted Acid Etched Titanium)

The implant body is treated with a ZirTi finish that greatly increases the contact surface between the bone and implant, and guarantees excellent primary stability. This new generation nanostructured surface is obtained with a proprietary process consisting of a sequence of phases ranging from sand-blasting with zirconium oxide to etching with mineral acids. The roughness and condition of the surface promotes osteoblastic proliferation and differentiation, as well as the formation and growth of bone tissue, and significantly increases the bone-implant contact surface. The ZirTi surface has shown to have a sublayer that promotes cell regrowth such to adequately boost differentiation. The roughness level is Ra  $(1.2 \div 1.3)$ .



ZirTi surface, magnified 4,000 and 10,000 times with scanning electron microscope: the macro and micro roughness obtained through the various surface treatments can be seen.





#### Photos showing new cell growth on the machined and ZirTi surfaces at 6 and 24 hours, in vitro

#### **6HOURS**

#### 24 HOURS

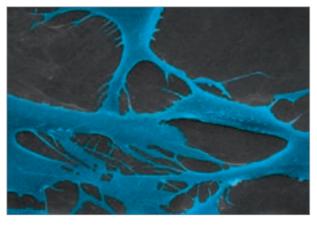


Photo 1 - Cell morphology on this surface is varied, in terms of the shape of the cells and their spreading capacity. The photo shows cells with clearly elongated bodies from which depart numerous and rather long filopodia and rarer lamellipodia.

#### MACHINED SURFACE

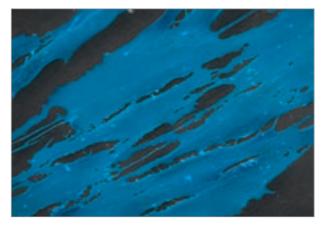


Photo 2 - Cell morphology at this experimental time is elongated. There is a high degree of cell spreading. The attachment of the cells to the substrate is primarily mediated by wide lamellipodia, however thin filopodia are also present. Intercellular contacts begin to be established.

#### ZirTi SURFACE

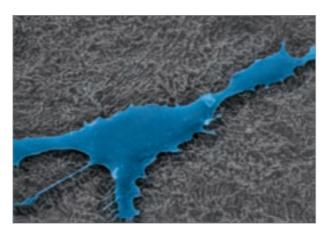


Photo 3 - The cells have a rather swollen body and some filopodia and lamellipodia are in close contact with the surface.

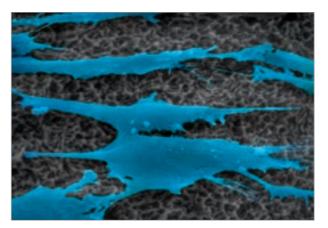


Photo 4 - The cells mainly have a polygonal shape, with a propensity to elongate and assume a spindle-shaped morphology, and establish contacts with the substrate via numerous short filopodia.

Photo and captions by kind permission of Prof. G. M. Macaluso, graphic processing by Sweden&Martina.

Bibliography Baffone GM., Botticelli D., Canullo L., Scala A., Beolchini M., Lang NP.; Effect of mismatching abutments on implants with wider platforms – an experimental study in dogs; Clinical Oral Implant Research, Early View First Published online on 2011, November 2nd DOI: 10.1111/j.1600-0501.2011.02320.x

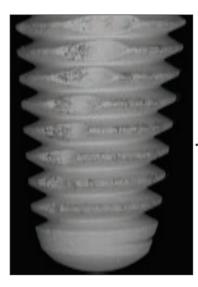
Galli C., Macaluso GM, Elezi E., Ravanetti F., Cacchioli A., Gualini G., Passeri G.; The effects of ER: YAG laser treatment on titanium surface profile and osteoblastic cell activity: an in vitro study; Journal of Periodontology, 82 (8): 1169-1177, 2011

Ricci M., Funel N., Orazio V., Bobbio A., Barone A., Covani U.; Analysis of osteoblastic gene dynamics in the early human mesenchymal cell response to an implant support: an in vitro study; Clinical Oral Implant Research, 22 (9), 2011:1071 DOI: 10.1111/j.1600-0501.2011.02271.x Passeri G., Cacchioli A., Ravanetti F., Galli C., Elezi E., Macaluso G.M.; Adhesion pattern and growth of primary human osteoblastic cells on five commercially available titanium surfaces; Clinical Oral Implant Research 21: 756-765, 2010

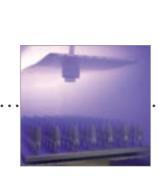
Elezi E., Galli C., Passeri G., Lumetti S., Manfredi E., Bonanini M., Macaluso G.M.; Human osteoblast behaviour on differently treated titanium surfaces; IADR General Session, 2007

### Cold plasma surface decontamination

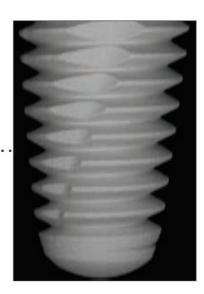
At the end of the surface treatments, the implants are carefully decontaminated by means of cold Argon plasma after first being cleaned of any large contaminants with numerous washing cycles in specific solvents. During the Argon treatment, the gas atoms are partially ionised, they gain energy and "bombard" the surface of the fixture violently. This so-called "atomic sanding" removes organic contaminants without leaving any traces or residues. As already known, Argon is an inert gas that does not react with the titanium surfaces. The condition of surface decontamination is checked regularly with randomised analysis of Bioburden residuals and a SEM visual examination on all the batches produced. This process activates the ionisation of the atoms on the surface of the titanium oxide which in turn increases the wettability of the fixture.



Implant before decontamination



Plasma reactor in operation during surface decontamination of the implants.



Implant after decontamination.

#### Surface composition of the implants

The better the processes of passivation, cleaning and decontamination of an implant surface, the greater the presence of pure titanium on its surface, which proportionally increases the possibilities of osseointegration. Accurate surface treatments and cold plasma decontamination processes have enabled Sweden & Martina to obtain an **extremely high titanium value in terms of atomic percentage** which has been proven by ESCA tests carried out randomly on production batches. Only implants subjected to these types of accurate treatments guarantee these excellent results, which offer the best chance of success and duration.



#### **Sterilisation**

Sterilisation is performed using **beta rays**. The sterilisation operations are carried out in accordance with the UNI EN ISO 13485 and UNI EN ISO 9001 quality standards. A beta ray sterilisation process was chosen because it has various advantages:

- the process takes place in a fully automated way with computerised control of all the phases;
- the process is fast, reliable and extremely easy to repeat with safety and precision;
- the process is completely eco-friendly, does not require the presence of radioactive sources and does not lead to the formation of toxic or radioactive products;
- beta rays are minimally invasive in relation to the packaging due to the rapidity of the treatment. This guarantees preservation of the product's sterility over time (certified duration of 5 years).

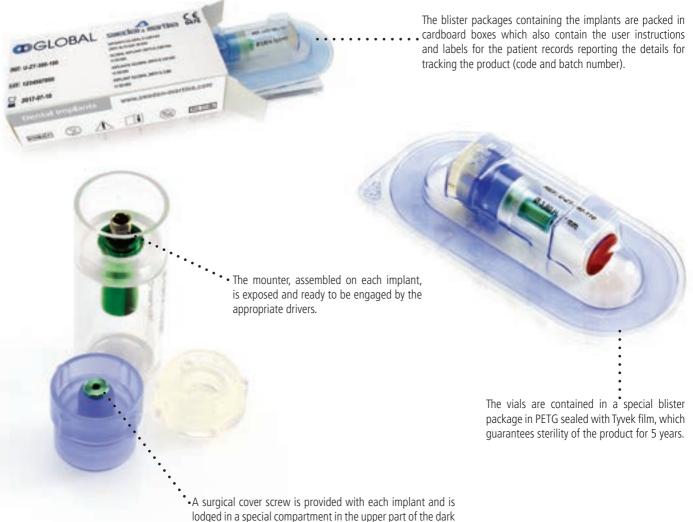
The sterilisation process was validated according to law. Validation was carried out in accordance with the method indicated and described in ISO 11137-(1-3):2006, ISO 11137-2:2012, UNI EN 552:2002, ISO/TS 13409:2002. Implant samples then undergo regular microbiological and biological testing to ensure that the validated sterilisation parameters do not change over time.





### Implant packaging

The implants are packaged in PMMA vials, inside of which they are housed in special titanium basket. This protects the surface of the fixture from potential recontamination. All the packaging materials have been suitably tested to check that they are suitable for sterilisation, conservation and medical use.



 A surgical cover screw is provided with each implant and is lodged in a special compartment in the upper part of the dark blue LDPE cap that closes the vial. A small, transparent cover in PMMA then seals the blue cap.

#### Legend of the implant codes

The implant codes are so-called "talking" codes, i.e. they allow easy identification of the piece. Below is a table reporting how the codes work using code "U-ZT-550-115" as an example.

Type of implant U-	Surface ZT-	Diameter 550	Length 115
		380: 3.80 mm	085: 8.5 mm
		430: 4.30 mm	100: 10 mm
		480: 4.80 mm	115: 11.5 mm
U: Global implant	ZT: ZirTi Surface	550: 5.50 mm	130: 13 mm
			150: 15 mm
		refers to the size of the implant's	
		diameter	refers to the length of the implan

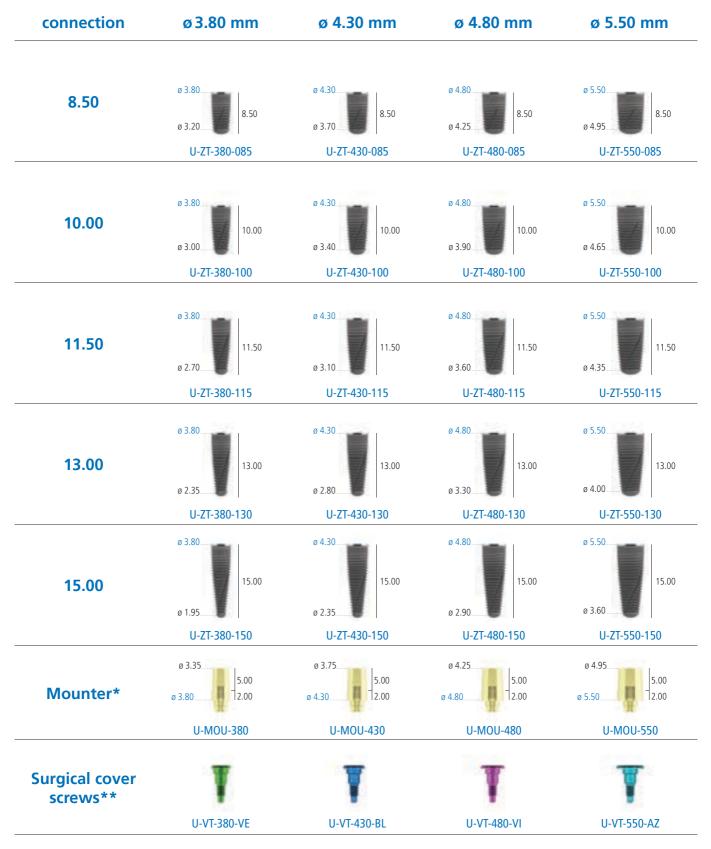
### **Global** implants

The root form morphology of the Global implants have a first section of 6 mm in height with a 2° taper, which is useful to stabilise the implant in the most cortical area of the host bone, and a 6° apical taper, with a variable length, so that it adapts better to the morphology of the bony ridges, thanks to the progressive reduction of the apical diameter.









\* The mounters are sold preassembled to implants with a corresponding diameter and are not available for individual sale. However, the mounter screw (code U-VMOU-180) that secures the mounter to the implant is also available as a spare part.

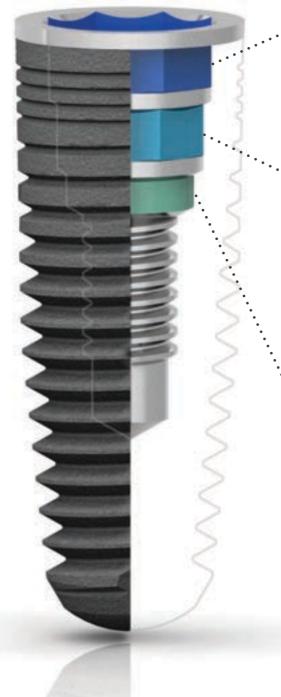
\*\* Each implant is sold with the respective surgical cover screw. The surgical screws in sterile packages are also available for individual sale.

#### **CONNECTION PLATFORM**

### The Global double octagon

The Global implants have a special internal connection consisting of two octagons that perform the separate functions of surgical screwing and prosthetic repositioning. This prevents the torsional forces applied at the time of implant insertion to affect the precision of the implant-prosthetic coupling. The dimensions of the double octagon connection are the same for all the diameters included in the range, which reduces the number of surgical instruments and prosthetic components and simplifies the whole procedure.

The single platform also allows implementing the Platform Switching protocol (page 16) which allows maintaining the bone levels around the implant.



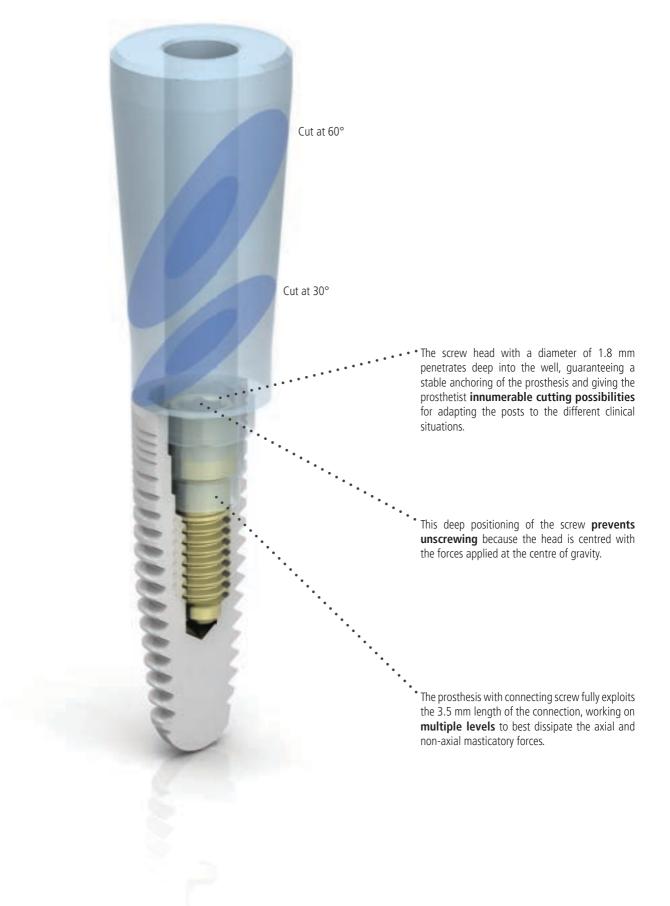
 PROSTHETIC REPOSITIONING OCTAGON: this is positioned at the crown and therefore offers greater visibility, making it easier to reposition the prosthesis, which exploits the octagon's internal angles of 135°. It is very versatile.

• WORKING OCTAGON: the deeper octagon is for guiding the insertion of the implant. The deepest positioning of the working octagon allows compensating the leverage, which is normally applied via the mounter and/or drivers on the bone matrix to reduce mechanical stress.

GUIDE CYLINDER: positioned below the two octagons, this final collar makes it easier to centre the prosthetic components and to guide their insertion, while allowing greater stability of the prosthetic structures, which make use of a connection with a total length of 3.5 mm.



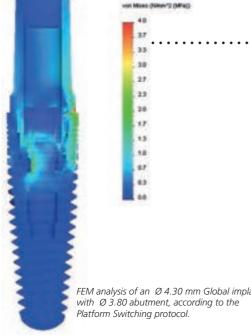




## **Platform Switching**

The words "Platform Switching" refer to a prosthetic rehabilitation technique widely supported by scientific literature that calls for the use of an abutment having a smaller diameter than the corresponding implant platform to preserve the tissues around the implant. Clinical evidence on the use of Sweden & Martina implants with the Platform Switching technique supports the application of this protocol on Global implants, with extremely successful experimental and clinical results.

#### Why does it work?



It improves the biomechanical distribution of the prosthetic load, limiting micro-stresses transmitted to the peri-implant bone.

FEM analysis of an Ø 4.30 mm Global implant

The implant/abutment joint, today considered one of the potential factors for inflammations, is no longer near the cervical bone. By following the Platform Switching protocol, the area affected by the response of any osteoclasts remains localised mainly on the "un-nickable" titanium surface, instead of the bone.





The portion of the connection platform not occupied by the prosthesis creates a support base for the connective tissue, thus stabilising the collagen fibres and minimising bone reabsorption.

#### **Experimental validation:**

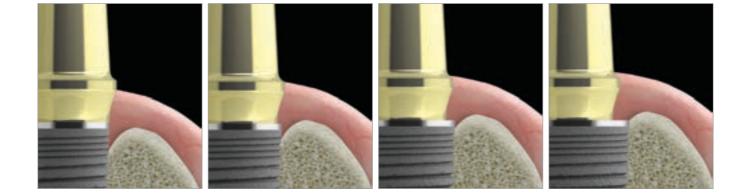
Among the many articles that have dealt with Platform Switching, a large number have examined the microbiological and histomorphometric aspects of the peri-implant tissues, • demonstrating that the protocol is safe and that the excellent aesthetic results obtained with this technique are attributable to the excellent health and maturation of the bone matrix in contact with the implant.

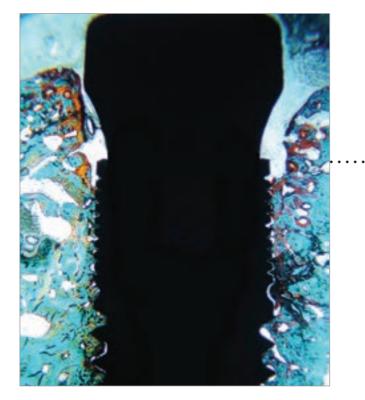
#### **Clinical validation:**

There are now numerous clinical findings on the use of Global implants with the Platform Switching technique, which show its effectiveness from all perspectives: from the use in post-extraction sites and/or sites subjected to regeneration, through to the combined use of this protocol with other prosthetic techniques such as the "one abutment - one time" technique. As demonstrated by the clinical experience mentioned above, there is a relationship between the extension of Platform Switching (mismatching) and preservation of the marginal bone dimensions. In fact, the greater the mismatch, the greater the volumes of hard and soft tissues around the dental implant.

The undeniable advantage of a single platform, which characterises the Global connection, is that it allows choosing the desired level of mismatching based on the aesthetic and functional needs of each individual case.

Peri-implant bone reabsorption of implants prosthesized with the Switching Platform technique is inversely proportional to the extent of the mismatching adopted.









#### SURGICAL INSTRUMENTS

### Surgical Kit

The surgical kit for the Global implant system was designed for maximum simplicity and ergonomics. The instrument codes are printed on the tray to allow dental assistants to easily reposition them after cleansing and cleaning. The kits contain the stops for safely using the drills (countersinks and bone profilers are not included). These stops are extremely practical because they allow manually inserting and removing drills in the direction of the tip -> shank. The instruments contained in the kit are all made of stainless steel for surgical use. To guarantee maximum duration of the pieces, it is advisable to follow the recommended cleansing and sterilisation procedures. The surgical kits also contain x-ray templates for graphically representing the implant sizes, to allow choosing the most suitable implant diameters and lengths using radiographic or tomographic methods. The kit also comes with a mock-up implant for practical exercises (not to be used on patients because it is anodized and non-sterile), a mounter with relative screw and the surgical manual relating to the Global implants.

A torque control ratchet kit is also supplied which includes the driver for quick adjustment of the torque and a tube of lubricant gel for maintenance of the dynamometric ratchet.



The kit is constituted by a practical Radel box containing a surgical tray designed to hold the instruments according to a guided procedure. The sequences for use of the instruments are indicated by coloured marks.





code	description
ZGLOBAL2*	Surgical kit complete with all the instruments necessary for Global implants.
GLO2-KIT*	Radel instrument tray for Global implants.
GROMMET-3	Kit with 5 spare silicone supports for surgical trays, for drills or instruments with right angle shanks.
GROMMET-4	Kit with 5 spare silicone supports for surgical trays, for instruments fitted with connection hexagon.
GROMMET-5	Kit with 5 spare silicone supports for surgical trays, for digital or manual handheld instruments.

\* The abbreviations ZGLOBAL2\* and GLO2-KIT\* are followed by a letter and number that indicate the revision of the surgical kit. The contents of the Surgical Kit can be updated and changed according to the most effective and innovative surgical techniques.

#### Colour code

A colour code system was defined inside the Global implant system to identify the diameter and/or connection of the components.

The surgical drills and drill stops in the surgical kit are colour coded (coloured ring on the shank) as follows:

Ø 2.20 WHITE Ø 2.80 BLACK Ø 3.80 GREEN Ø 4.30 BLUE Ø 4.80 MAGENTA Ø 5.50 LIGHT BLUE

The cap screw, transfers for impression-taking and the laboratory analogues also follow the same colour code to allow easy recognition of the platforms, even during the second surgical procedure and realisation of the prosthesis.

#### SURGICAL INSTRUMENTS

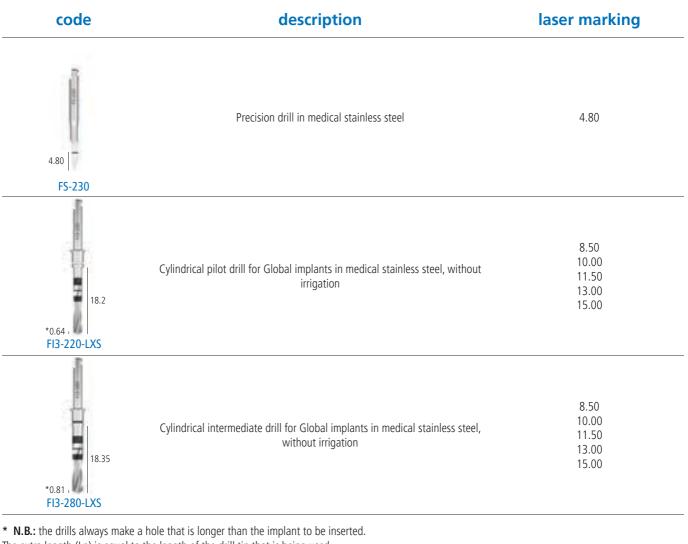
### Initial drills and stops

All the Sweden & Martina drills are made of corrosion and wear resistant stainless steel. The extreme accuracy of the design and manufacturing allow using these drills with no vibrations and oscillations.









The extra length (Lp) is equal to the length of the drill tip that is being used.

STOP3-220/280-085

Lt: Total length of the working part, including the tip. Lt Lp: Length of the tip. This measurement must be added to the length of the preparation hole. N.B.: The drills always make a hole that is longer than the implant to be inserted. The extra length (Lp) is equal to the length of the drill tip that is being used. 8.5 10.0 11.5 13.0 15 height: 8.50 mm 10.00 mm 11.50 mm 13.00 mm 15.00 mm stop for cylindrical drills

STOP3-220/280-115

STOP3-220/280-130

STOP3-220/280-100

STOP3-220/280-150

#### SURGICAL INSTRUMENTS

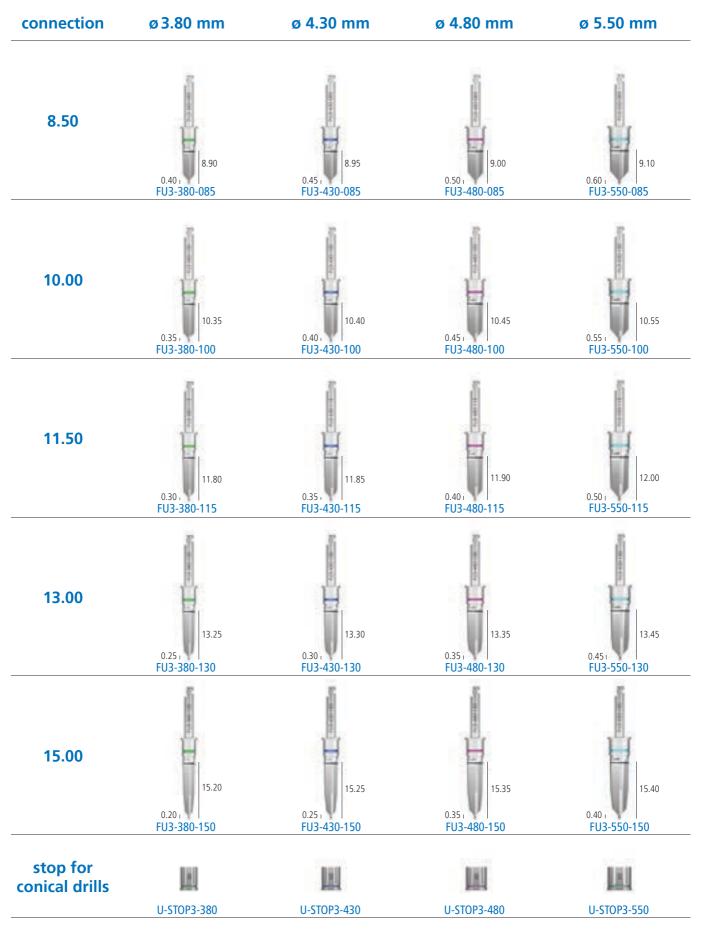
### Conical drills and stops

The conical drills are also made of corrosion and wear resistant stainless steel. They have a number of cutters proportional to the diameter of the hole, so as to allow continuous and even cutting and greater stability of the instrument during the operating phases. This leads to very precise implant preparations which are the key to the success of conically shaped implants.





GLOBAL



All sizes are in millimetres, unless otherwise indicated

#### SURGICAL INSTRUMENTS

#### Bone taps



The portion of the implant in contact with the most corticated bone is the one with a cylindrical profile. For this reason, there is only one bone tap for each platform with a laser marking at 8.00 mm from the tip of the instrument, which helps to identify with precision the section common to all the heights of one same implant diameter.

#### 00000

A kit with 5 spare O-rings is available, which can be ordered with the code ORING180-088.

#### Drivers

code	description
U-BLP-OT275	Long driver, full, non-retentive, for screwing Global implants of any diameter and height partially inserted in the surgical site.
U-BC-OT275	Short octagonal driver, retentive, for mountless procedures, for Global implants of any diameter and height.
U-BL-OT275	Long octagonal driver, retentive, for mountless procedures, for Global implants of any diameter and height.
U-BC-OT275-CA	Short octagonal right angle driver, retentive, for mountless procedures, for Global implants of any diameter and height.
U-AVV3-MOU-CA	Octagonal right angle driver with, for mounters of Global implants of any diameter and height.
U-AVV-MOUC	Short octagonal driver for mounters of Global implants of any diameter and height.





#### Screwdrivers

code	description	
HSMXS-20-DG	Screwdriver for connecting screws, digital, extra-short.	
HSM-20-DG	Screwdriver for connecting screws, digital, short.	
HSML-20-DG	Screwdriver for connecting screws, digital, long.	
HSM-20-CA	Screwdriver for connecting screws, for right angle.	
HSM-20-EX	Digital screwdriver, for connecting screws, to be used with torque control ratchet, short.	
HSML-20-EX	Digital screwdriver, for connecting screws, to be used with torque control ratchet, long.	
HSMXL-20-EX	Digital screwdriver, for connecting screws, to be used with torque control ratchet, extra long. (Not included in the surgical kit, to be purchased separately).	
AVV2-CA-DG	Screwdriver for right angle instruments, digital.	

#### SURGICAL INSTRUMENTS

#### Accessories

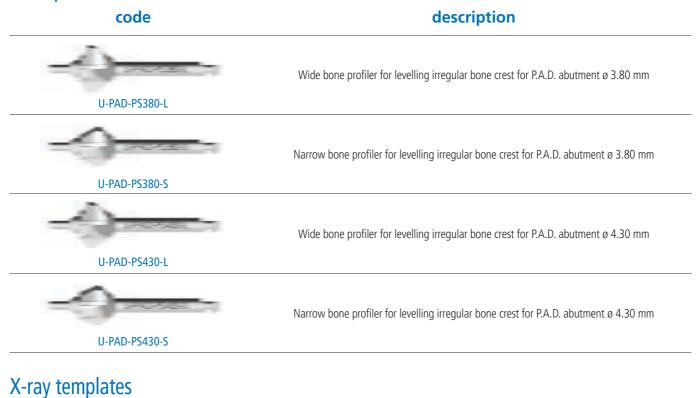
code	description	
PROF- PROF-CAL2	Extension for surgical drills.	
B-AVV-CA3	Right angle connector.	
BPM-15	Extension for drivers, bone taps, mounters, screwdrivers and manual drivers.	
AVV3-MAN-DG	Hand knob for mounters, bone taps, drivers and screwdrivers.	
<b>OOOOO</b> ORING180-088	Kit with 5 spare O-rings for drivers and bone taps.	
<sup>346</sup> 43 46 55 OOOOOO	Support for the removing the mounter from Global implants for mountless technique, not included in the surgical kit.	
CMD	Mounter stop key.	
CRI5-KIT	Kit containing a torque control ratchet that acts as both a dynamometric key and fixed key, and accessories for quick adjustment of the torque and periodic maintenance (driver and lubricant) The ratchet has a torque limit of 35 to 70 Ncm, with lines at 10-20-25-30-35-50-70 Ncm (supplied with the Global surgical kit).	
Parallelism pins	description	
U-PP-220	Parallelism pin ø 2.20 mm (x 3 pieces); lines at 8.5, 10, 11.5, 13 and 15 mm.	
	Parallelism pin ø 2.80 mm (x 3 pieces); lines at 8.5, 10, 11.5, 13 and 15 mm.	

U-PP-280





#### Bone profilers





### Drills for distal sectors



### SURGICAL INSTRUMENTS

### **Global Osteotomes**

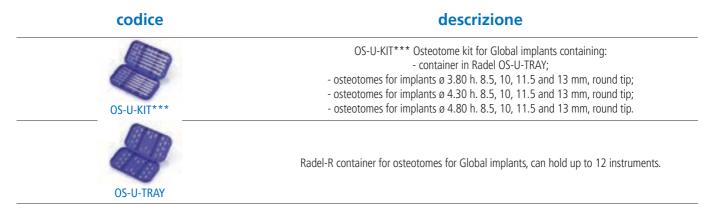
A set of steel osteotomes is available which is useful for expanding and lifting the maxillary sinus floor via the crestal bone. The special design of the tips, which follows the profile of each implant in the range, allows creating extremely accurate sites, even after the compaction of very cancellous bone matrix.











\* Osteotomes for implants with diameters of 5.50 mm and all heights are not contained in the kit and must therefore be purchased separately. \*\* Osteotomes for implants with diameters of 3.80, 4.30 and 4.80 and height of 15 mm are not contained in the kit and must therefore be purchased separately. \*\*\* The code OS-U-KIT is followed by a letter and number which refer to the revision of the kit.

## Transgingival healing caps

The transgingival healing caps in Grade 5 titanium are identified by a laser-marking which indicates their diameter, emergence profile and height. In case of transgingival healing caps with straight emergence profile, the laser marking only indicates the platform diameter and height. The transgingival healing caps must be tightened at 10 Ncm using the HSM\* screwdrivers, whose complete details and codes can be found in page 25.









### Impression-taking and model-making

The components for the impression and for creating the model are made using the same machines that produce the implants. This guarantees maximum precision and allows faithfully reproducing the clinical situation. The open tray and closed tray transfers are made of Grade 5 titanium anodised according to the colour code of the reference platform, which allows easy identification of the different diameters used. The pull-up transfer is made of radiopaque PEEK to allow verifying the correct insertion in the implant platform.

### •

**Closed tray transfer with PEEK cap supplied:** very convenient when there is sufficient parallelism

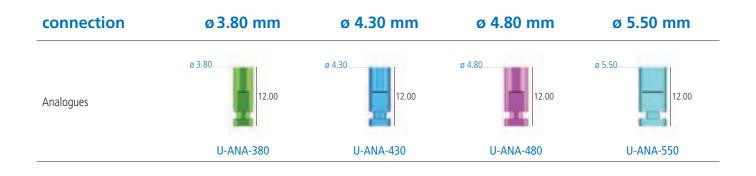
between the implants.

**Open tray transfer:** the design of the upper portion guarantees excellent retention and therefore, extremely stable anchorage in the impression.

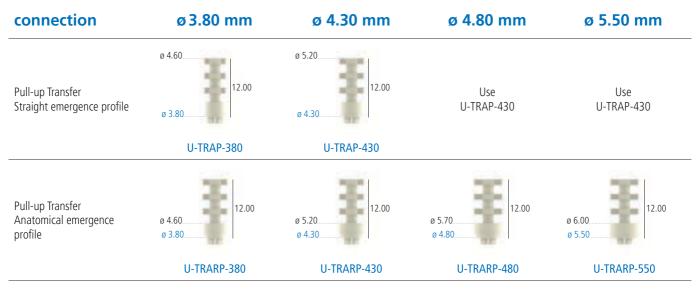
**Closed tray transfer:** the connection with tabs clicks inside the connecting octagon of the implant, without the need for screws.

**Implant analog:** anodisation according to the colour code guarantees easy identification and simplifies the laboratory phases.



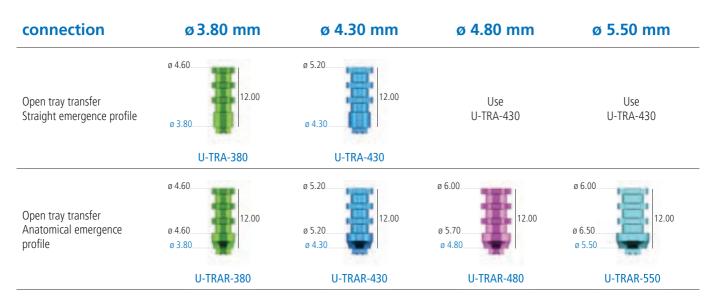


GLOBAL



PLEASE NOTE: The transfers are made of polymeric materials, therefore it is recommended to use a new one each time an impression is taken in order to guarantee accuracy.

#### **PROSTHETIC COMPONENTS**



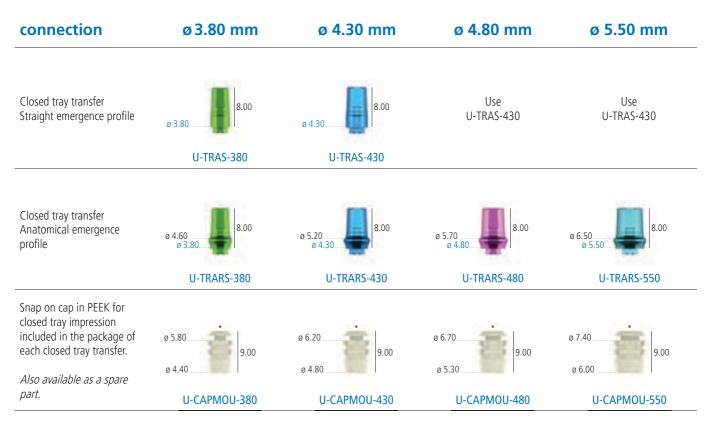
ATTENTION: In case of prostheses on more than one post, it is recommended to glue the transfers together with resin to ensure stability and solidity of the impression.



U-VTRAL-180 connecting screw included Recommended tightening torque: 20-25 Ncm. Also available as a spare part, in single packages or in packages of 10 pieces (U-VTRAL-180-10).







ATTENTION: In case of prostheses on more than one post, it is recommended to glue the transfers together with resin to ensure stability and solidity of the impression.

\* The cap, suitable also for the multi-function mounter, has one side with small circular incisions that make it easy to identify the reference platform and the correct insertion side with respect to the anti-rotational face of the mounter:

U-CAPMOU-380 does not have an incision, but the retention tabs are flat to connect to the anti-rotational face of the mounter

U-CAPMOU-430 1 stamp

U-CAPMOU-480 2 stamps

U-CAPMOU-550 3 stamps



U-VTRAS-180 connecting screw included Recommended tightening torque: 20-25 Ncm. Also available as a spare part, in single packages or in packages of 10 pieces (U-VTRAS-180-10).

### SIMPLE temporary posts

The Simple prosthetic protocol calls for practical and simple solutions to create provisionals.

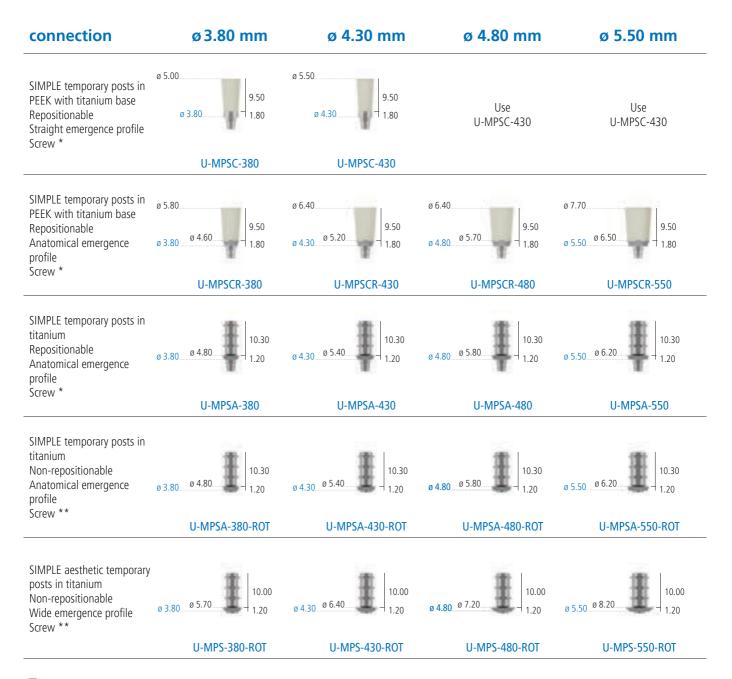
The provisionals can be used in a conventional way after the bone healing period, or immediately after the implants have been surgically inserted, if the conditions exist for immediate loading. They can also be used as an alternative to traditional transgingival healing caps for reconditioning the soft tissues, depending on the prosthetic protocol adopted.

The wider flaring of the transgingival profile, adaptable to any anatomy by milling, simplifies the immediate aesthetic conditioning of the mucous membranes. PEEK is an extremely resistant and highly biocompatible polymer that is easy to drill, even chair-side. The titanium base, with straight or anatomical emergence profile, guarantees maximum connection precision.

The cylinder inscribed in the octagon of the connection makes it easy to create multiple temporary structures to screw directly to the implants, even in the presence of severe disparallelism. The octagon, which guarantees the anti-rotational aspect, makes this post perfect for creating individual provisionals.







1

\*U-VM-180 connecting screw included

Recommended tightening torque: 20-25 Ncm.

Also available as a spare part, in single packages or in packages of 10 pieces (U-VM-180-10).

\*\*U-VMOU-180 connecting screw included

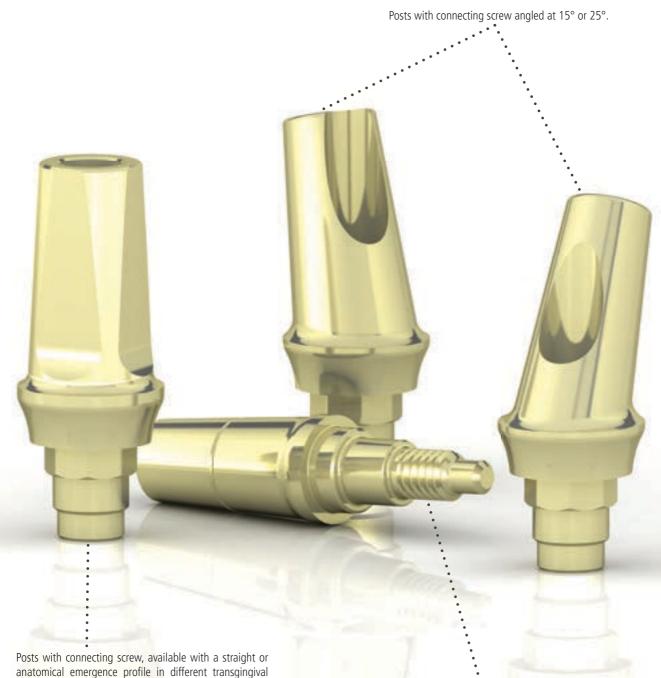
Recommended tightening torque: 20-25 Ncm.

Also available as a spare part, in single packages or in packages of 10 pieces (U-VMOU-180-10).

### **PROSTHETIC COMPONENTS**

# Pre-made posts

Made of Gr. 5 titanium, these abutments are subjected to a controlled passivation process that changes the colour of their surface. The result is a characteristic golden pale yellow colour. This colour is obtained through an oxidation process which means there is no type of coating, offering the advantages of a highly biocompatible surface and aesthetically-pleasing prosthetic reconstructions.

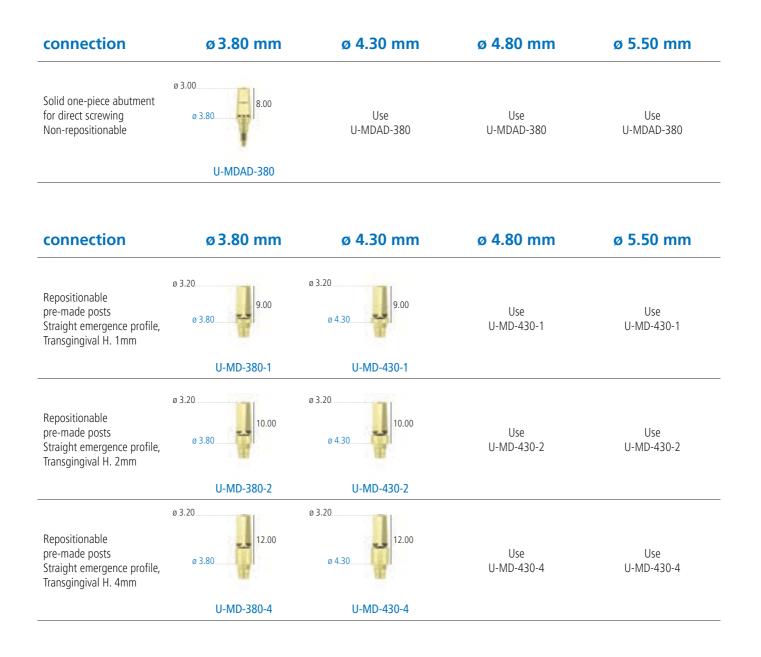


heights.

Posts for direct screwing, ideal for securing titanium stabilisation bars in the mouth for immediate loading rehabilitations as this technique guarantees absolute immobility of the prosthesis and implant. They are also useful for cementing multiple prostheses on parallel implants.







U-VM-180 connecting screw included Recommended tightening torque: 20-25 Ncm. Also available as a spare part, in single packages or in packages of 10 pieces (U-VM-180-10).

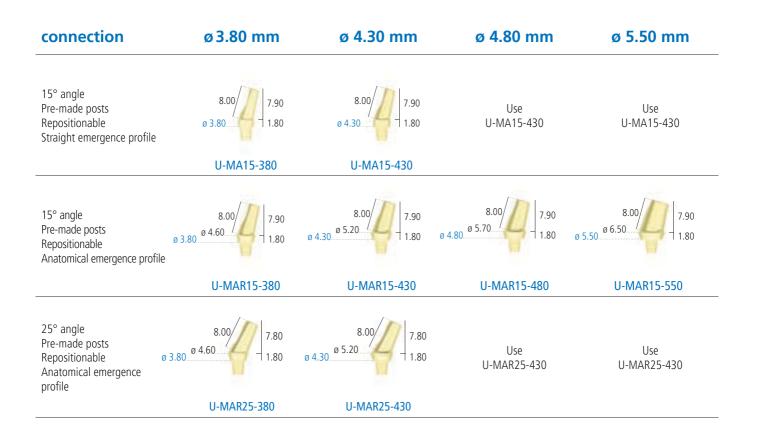
### **PROSTHETIC COMPONENTS**



U-VM-180 connecting screw included Recommended tightening torque: 20-25 Ncm. Also available as a spare part, in single packages or in packages of 10 pieces (U-VM-180-10).







U-VM-180 connecting screw included Recommended tightening torque: 20-25 Ncm. Also available as a spare part, in single packages or in packages of 10 pieces (U-VM-180-10).

### **PROSTHETIC COMPONENTS**

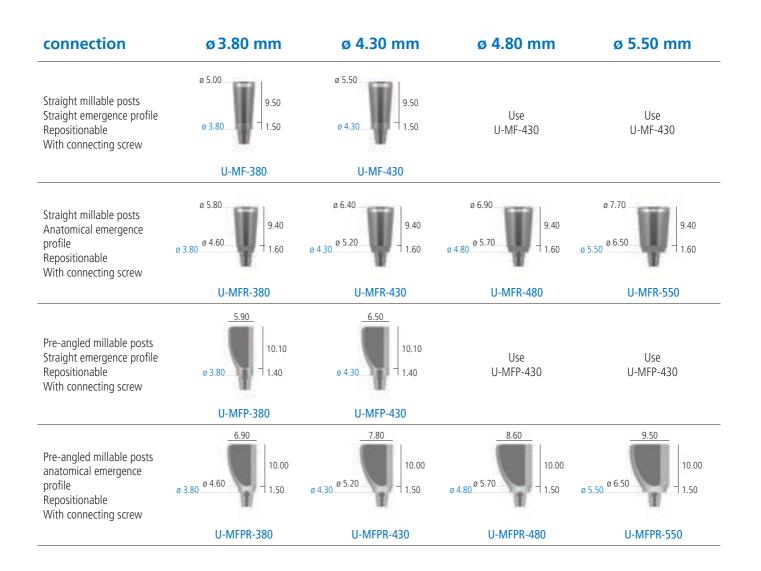
# Standard Millable Posts

They are made of Grade 5 titanium and they allow to meet the most complicated anatomic needs in terms of small prosthetic spaces and misaligned implants.









U-VM-180 connecting screw included Recommended tightening torque: 20-25 Ncm. Also available as a spare part, in single packages or in packages of 10 pieces (U-VM-180-10).

# Millable posts: excellent solutions

In addition to traditional prosthetic protocols, Sweden & Martina has developed innovative solutions in collaboration with renowned professionals and universities. One of these solutions is the **SIMPLE Technique**, which allows perfect conditioning of the mucous membranes starting from the provisionals (see page 36) and includes a large millable abutment for creating an custom-made final prosthesis.

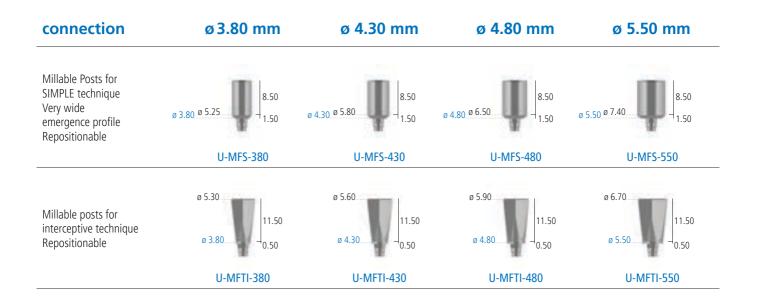
Instead, the **Interceptive Technique** includes posts featuring two large faces which ensure the unequivocal repositioning on a model made from an impression taken directly on the abutments themselves.



The millable posts for the Interceptive Technique have an emergence profile that simplifies impression taking with a closed tray technique, while the two large faces guarantee unequivocal repositioning.







U-VM-180 connecting screw included Recommended tightening torque: 20-25 Ncm. Also available as a spare part, in single packages or in packages of 10 pieces (U-VM-180-10).

#### **PROSTHETIC COMPONENTS**

# Castable posts with alloy base

This solution combines the simplicity of the castable solutions with a highly biocompatible and corrosion-resistant gold alloy base. The casting point of the alloy is such to protect the base from dimensional alterations during the over-casting of the castable part.

The repositionable version is suitable for creating single elements.

The non-repositionable version has a cylinder that inscribes itself in the connection octagon, thus guaranteeing easy insertion of multiple structures.







\*U-VM-180 connecting screw included Recommended tightening torque for intra-oral fixing: 20-25 Ncm. Recommended tightening torque for fixing on the model before casting: 8-10 Ncm. Also available as a spare part, in single packages or in packages of 10 pieces (U-VM-180-10).

\*\*U-VMOU-180 connecting screw included Recommended tightening torque: 20-25 Ncm. Also available as a spare part, in single packages or in packages of 10 pieces (U-VMOU-180-10).

ATTENTION: it is recommended to always use test screws for the laboratory phases and to keep the new screw supplied for securing the implant in the mouth.

For the technical specifications of gold alloy "1", refer to page 73.

All sizes are in millimetres, unless otherwise indicated.

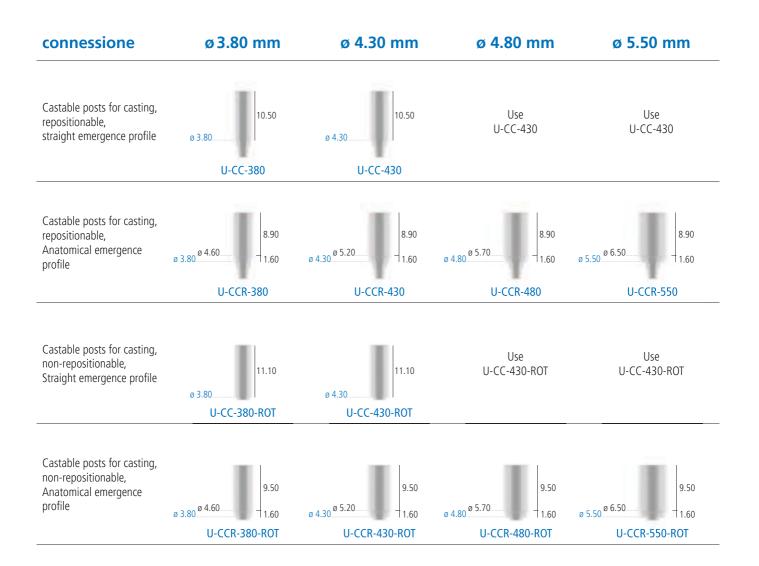
# Entirely castable posts

The posts made entirely of PMMA, a resin that does not leave any residues during casting, are not made by forging but by turning. Just like all the Sweden & Martina prosthetic components, they comply with the micrometric tolerances that allow obtaining a precise connection even after the casting process. The stop of the connecting screw head offers extremely versatile prosthetic solutions.









\*\*U-VMOU-180 connecting screw included Recommended tightening torque: 20-25 Ncm. Also available as a spare part, in single packages or in packages of 10 pieces (U-VMOU-180-10).

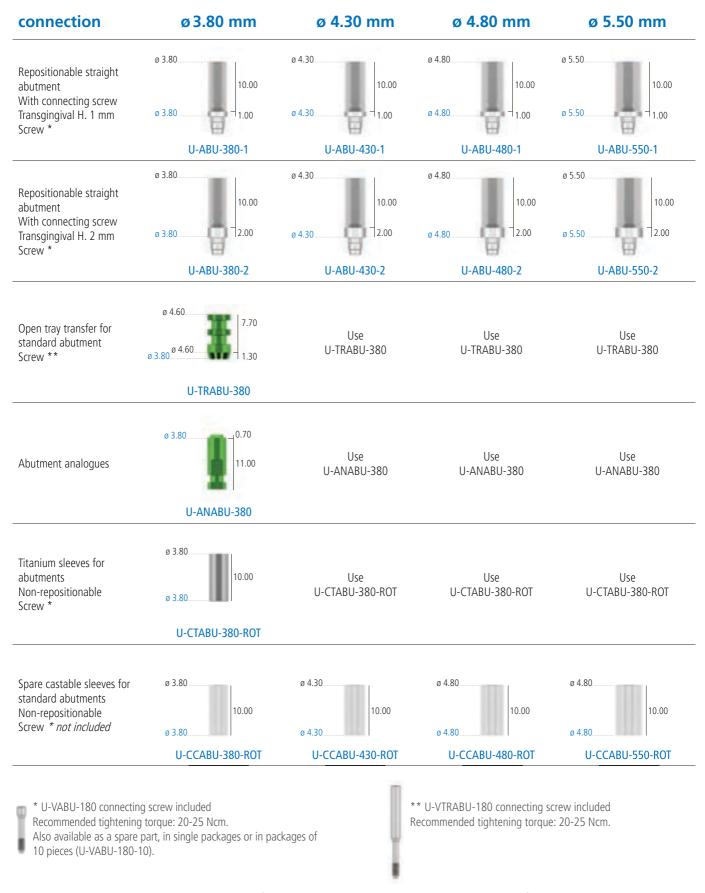
# Prosthesis on intermediate abutments

These abutments have a straight emergence profile and consist of a titanium repositionable base, featuring a small upper cone with a height of 0.70 mm, equal for all the connection diameters, which allows easy insertion and removal of the over-structures, even in the presence of slight disparallelism. The abutment is supplied with the castable sleeves for modelling and casting the over-structure and with the connecting screw, which has the function to connect both the over-structure and abutments to the implants at once. Normally, when these abutments are used, the impression is taken directly on the implants with the use of the transfers. However, when the titanium base of the abutment is used to create a provisional, the impression is transferred to the laboratory with the use of special transfers and the castable sleeve is sent to the laboratory with the relative connecting screw. A titanium sleeve is normally used to create the provisional, which is supplied complete with the relative connecting screw.





GLOBAL



### **PROSTHETIC COMPONENTS**

# P.A.D. Disparallel Screwed Prosthesis

The P.A.D. system has been designed to facilitate the production of multiple screwed prostheses, even in the presence of very divergent implants and disparallel prosthetic emergences.

The P.A.D. angled abutments are the simplest and most predictable solutions for implants positioned in distal saddles with high angles. The P.A.D. prosthetic system is very versatile, and consists of a wide range of straight abutments (available in transgingival heights of 1.5, 3 and 4 mm) and angled abutments (with angles of 30° and 17° and transgingival heights of 3 and 5 mm), as well as a complete range of components necessary for producing the over-structures (transfers, analogues, sleeves, etc.).

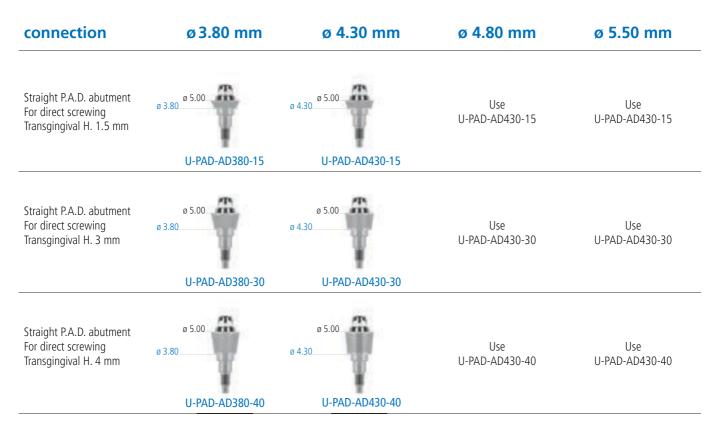








# Straight P.A.D.



To carry the abutments into the oral cavity, each package contains a practical carrier in plastic (code AVV-ABUT-DG, not sold separately). For securing the abutments to the implants, however, use the special driver, code AVV2-ABUT. The tightening torque recommended for the direct screwing of the abutments is 25-30 Ncm.

ATTENTION: The connection is the same for all platforms, therefore P.A.D. abutments with diameters of 3.80 mm and 4.30 mm can be used on implants with diameters of 4.80 mm and 5.50 mm.





# Angled P.A.D.

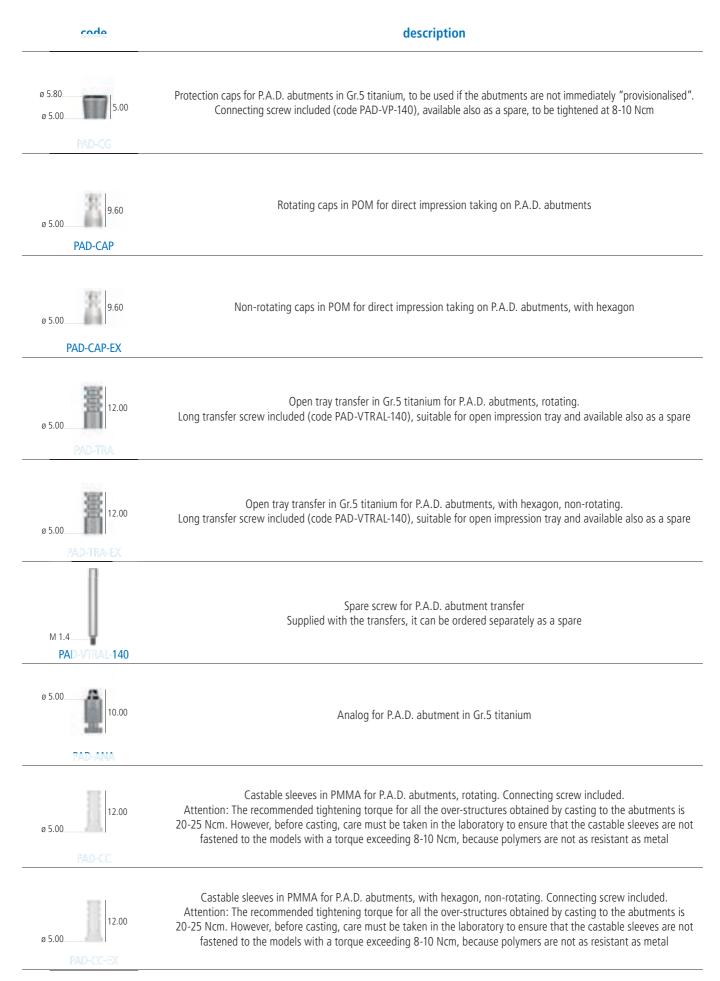




PAD-VM-180 connecting screw included Recommended tightening torque: 20-25 Ncm. Also available as a spare part, in single packages or in packages of 10 pieces (PAD-VM-180-10).

ATTENTION: since the connection is the same for all the platforms, P.A.D. abutments with diameters of 3.80 mm and 4.30 mm can be used on implants with diameters of 4.80 mm and 5.50 mm.

#### **PROSTHETIC COMPONENTS**







code	description
ø 5.00	PEEK sleeves for P.A.D. abutments, rotating. They are specifically for creating a temporary prosthesis or in cases wher it is necessary to reline an old prosthesis for using as a temporary one. Connecting screw included, to be tightened at 20-25 Ncm
ø 5.00	PEEK sleeves for P.A.D. abutments, with hexagon, non-rotating. They are specifically for creating a temporary prosthesis or in cases when it is necessary to reline an old prosthesis for using as a temporary one. Connecting screw included, available also as a spare, to be tightened at 20-25 Ncm
Ø 3.80 Ø 5.00 10.50 3.20 PAD-UC	Castable posts in PMMA with a pre-made base in gold alloy type "1", rotating, not repositionable, for overcasting on P.A.D. abutments. Connecting screw included, to be tightened at 20-25 Ncm. The head of the screw never rests on the PMMA, but always on the alloy base. The castable sleeve is also available as a spare (code A-CCUCR-330)
M 1.4	Spare screw for P.A.D. abutment prosthetic components. Supplied with all the components for making the over-structure and also available as a spare.
PAD-VP-140	May also be bought in packs of 10 pieces (code PAD-VP-140-10)
	May also be bought in packs of 10 pieces (code PAD-VP-140-10) ponents for relining and gluing technique
A.D. com	ponents for relining and gluing technique
A.D. com code	ponents for relining and gluing technique description Sleeves in Gr.5 titanium for P.A.D. abutments, rotating. They are specifically for an immediate and final prosthetisation process or for relining an old prosthesis to be used as a temporary post. Connecting screw included (code PAD-VP-140
A.D. com code	Description Sleeves in Gr.5 titanium for P.A.D. abutments, rotating. They are specifically for an immediate and final prosthetisation process or for relining an old prosthesis to be used as a temporary post. Connecting screw included (code PAD-VP-140 available also as a spare, to be tightened at 20-25 Ncm

PAD-VP-140

For the technical specifications of the gold alloy "1" and of PMMA, refer to pages 75 and 74.

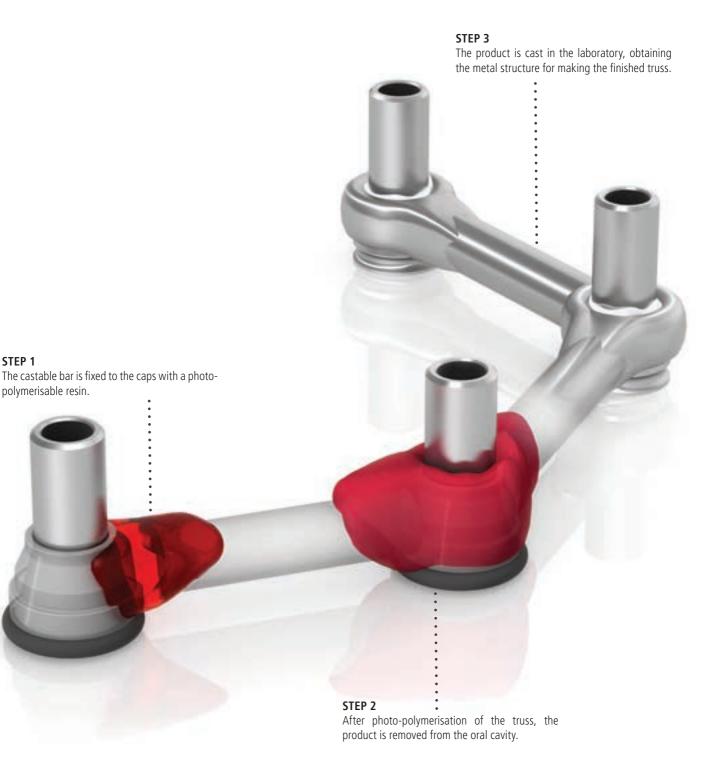
Recommended tightening torque for securing the prosthetic screws: 20-25 Ncm.

### **PROSTHETIC COMPONENTS**

# P.A.D. prostheses for "D.P.F." Technique (Direct Prosthetic Framework)

P.A.D. abutments have proven to be a valid support for creating various simplified prosthetic protocols, including the creation of temporary posts for full-arch implant rehabilitations with immediate loading with a very simple and safe procedure. The D.P.F. components have been specially developed for creating a castable resin structure directly in the oral cavity that is absolutely passive, not restricted by connection geometries and with the additional advantage of being made without errors due to the taking of the impression and the development of the model. The intra-oral cementing of the metal truss obtained subsequently by casting allows the times for inserting the reinforced temporary post to be reduced to 8 hours after the end of surgery, while still maintaining the important properties of resistance and passivity during the first phase of implant loading.

The temporary post created in this way can also be used as a positioning stent for making the final prosthesis.



58





pack includes the titanium sleeve (PAD-CT-LV), the castable centring device (PAD-CC-LV), the anti-escape p	code	description
The pack does not include the connecting screw         PAD-CT-LV         #5.00       3.90         Spare castable centring device for the "D.P.F." technique         PAD-CC-LV       PAD-CC-LV         #5.00       4.00         Spare anti-escape plug for the "D.P.F." technique         PAD-TR-LV       Spare o-ring for the "D.P.F." technique.".         PAD-ORING-LV       Spare screw for P.A.D. abutment prosthetic components         Supplied with all the components for making the over-structure and also available as a spare. May also be bought in packs of 10 pieces (code PAD-VP-140-10)	PAD-LV	Complete pack of all the prosthetic components for the "D.P.F." technique on a single P.A.D. abutment. The pack includes the titanium sleeve (PAD-CT-LV), the castable centring device (PAD-CC-LV), the anti-escape plug (PAD-TR-LV), the protective o-ring (PAD-ORING-LV) and the connecting screw (PAD-VP-140) to be tightened at 20-25 Ncm, available also as a spare
• 5.00	ø 5.00	Spare titanium sleeve for the "D.P.F." technique. The pack does not include the connecting screw
# 5.00	ø 5.00	Spare castable centring device for the "D.P.F." technique
PAD-TR-LV  PAD-TR-LV  Spare o-ring for the "D.P.F." technique.".  PAD-ORING-LV  Spare screw for P.A.D. abutment prosthetic components Supplied with all the components for making the over-structure and also available as a spare. May also be bought in packs of 10 pieces (code PAD-VP-140-10)	FAD-CC-LV	
PAD-ORING-LV       Spare o-ring for the "D.P.F." technique.".         M 1.4       Spare screw for P.A.D. abutment prosthetic components         Supplied with all the components for making the over-structure and also available as a spare. May also be bought in packs of 10 pieces (code PAD-VP-140-10)		Spare anti-escape plug for the "D.P.F." technique
PAD-ORING-LV Spare screw for P.A.D. abutment prosthetic components Supplied with all the components for making the over-structure and also available as a spare. May also be bought in packs of 10 pieces (code PAD-VP-140-10)	PAD-TR-LV	
Spare screw for P.A.D. abutment prosthetic components M 1.4 Supplied with all the components for making the over-structure and also available as a spare. May also be bought in packs of 10 pieces (code PAD-VP-140-10)		Spare o-ring for the "D.P.F." technique.".
M 1.4 Supplied with all the components for making the over-structure and also available as a spare. May also be bought in packs of 10 pieces (code PAD-VP-140-10)	PAD-OKING-LV	
PAD-VP-140	M 1.4	Supplied with all the components for making the over-structure and also available as a spare.
	PAD-VP-140	
Castable bar, L. 5.00 cm, ø 2.20 mm		Castable bar, L. 5.00 cm, ø 2.20 mm
BARC	BARC	

See PMMA technical characteristics on page 74.

Recommended tightening torque for securing the prosthetic screws: 20-25 Ncm.

### Echo2 custom-made prostheses

In case of a custom-made prosthesis, maximum aesthetics and design flexibility is obtained with ECHO individual posts and ECHO Direct Bridges, produced using the CAD-CAM technique at the Sweden & Martina ECHO milling centre.

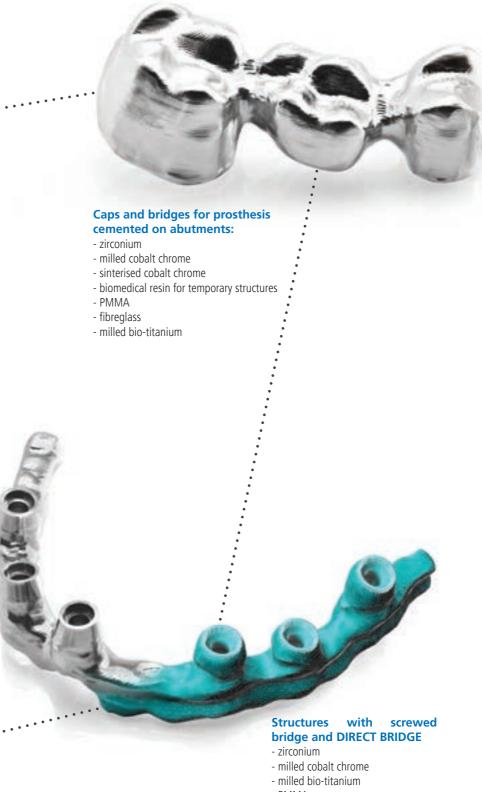
The individual posts in titanium are an evolution of the standard millable posts and allow the prosthesis to adapt perfectly to the patient's gingival anatomy, which is difficult to obtain using traditional laboratory techniques.

Posts in zirconium oxide are also available, currently the most advanced custom-made solution since they offer many advantages such as translucent restorations, extreme personalisation, biocompatibility, no corrosion into the oral cavity, maximum precision of the connection which is made of titanium using the same micrometric tolerances of the implants, excellent resistance to occlusal loads, low invasiveness by perfectly adapting to the tissues and less time in the chair-side. A Scan-transfer in aluminium is available for the scanning process (code U-CAMETRA-380, details on page 61).









- PMMA
- fibreglass

# **T-Connect**

The T-Connect supports can be used to make custom-made zirconium prostheses with open CAD CAM systems, such as the Sweden & Martina Echo2 system, while maintaining micrometric precision in the coupling between the platforms as with traditional components. Users of Echo2 can also opt to use the T-Connect supports: the zirconium posts obtained in this way have a small support base in titanium that prevents contact between the zirconium body and the platform of the implant.

For more information on the compatible CAD systems, contact Sweden & Martina's CAD CAM product specialist.



**T-Connect:** allows obtaining perfect coupling between the prosthesis and implant with zirconium structures milled and sinterised in the laboratory.





connection	ø3.80 mm	ø 4.30 mm	ø 4.80 mm	ø 5.50 mm
Bases in Grade 5 titanium for zirconium custom-made posts.				-
	U-BASTZR-S-380	U-BASTZR-S-430	U-BASTZR-S-480	U-BASTZR-S-550

code



Scan-transfer in aluminium with a profile that optimises 3D scanning with structured light; sold complete with the

description

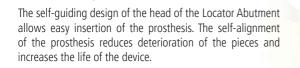
relative screws for fastening to the analogues.

U-VM-180 connecting screw included Recommended tightening torque: 20-25 Ncm. Also available as a spare part, in single packages or in packages of 10 pieces (U-VM-180-10).

# Locator Abutment

Locator Abutments are a patented and versatile prosthetic solution for attaching overdentures to dental implants easily and safely. The Locator system allows easily correcting misalignment of divergent implants by up to 40° (20° for each implant) in limited occlusal spaces and, given the limited amount of space occupied, is perfect for patients with removable prosthesis.

The abutments are made of Grade 5 titanium and come in different transgingival heights. When choosing the height of the device, take into account that the total height indicated in the table must be added to the length of the implant's transgingival neck. The Locators are tightened at a torque of 25-30 Ncm using the special driver, optional (code 8926-SW, short, and code 8927-SW, long). Refer to page 67.



The Locator system has a practical steel cap where the retainer lodges inside the prosthesis. When the retainer loses retentiveness, it can be easily replaced because there is no need to extract it from the resin by removing material from the prosthesis, but can be simply extracted from the steel cap that remains attached to the prosthesis.







Since the overdentures use the mucous support and do not subject the abutment to masticatory forces, the locator only acts as an anchorage for the prosthesis. Therefore, it only comes in a diameter of 3.80. Implants with larger diameters require application of the Platform Switching protocol, which offers greater preservation of the hard and soft tissues around the implant.



Retainers with different flexibilities are available for easy insertion in the steel cap with the use of a practical instrument.

The different retention capacities are easily identifiable based on a colour code. The blue, pink and transparent retainers can be used on implants with angles of up to  $10^{\circ}$ ; orange, red and green retainers are used on implants with an angle between  $10^{\circ}$  and  $20^{\circ}$ .

\* Locator Abutments are medical devices manufactured and patented by Zest Anchors, Inc., 2061 Wineridge Place, Escondido, CA 92029, USA. Locator is a registered trademark of Zest Anchors, Inc. The European Agent for the purposes of MDD 93/42/EEC is Ventura Implant and Attachment Systems, 69 The Avenue, Ealing, London W13 8JR, England.

### **OVERDENTURE**

### Locator abutment

connection	ø3.80 mm	ø 4.30 mm	ø 4.80 mm	ø 5.50 mm
Locator Abutment * transgingival height 1 mm, diameter 3.80 mm, the same for all platforms.	ø 3.80 I 1.00	Use 1779	Use 1779	Use 1779
Locator Abutment * transgingival height 2 mm, diameter 3.80 mm, the same for all platforms.	ø 3.80 2.00 1780	Use 1780	Use 1780	Use 1780
Locator Abutment * transgingival height 3 mm, diameter 3.80 mm, the same for all platforms.	ø 3.80	Use 1781	Use 1781	Use 1781

#### Impression taking

code	description
<b>8530</b>	Package of 4 aluminium analogues for Locator Abutments, one size for all platforms.

<sup>\*</sup> Locator Abutments are medical devices manufactured and patented by Zest Anchors, Inc., 2061 Wineridge Place, Escondido, CA 92029, USA. Locator is a registered trademark of Zest Anchors, Inc. The European Agent for the purposes of MDD 93/42/EEC is Ventura Implant and Attachment Systems, 69 The Avenue, Ealing, London W13 8JR, England.





code	description
8505	Package of 4 aluminium transfers for Locator Abutments, one size for all platforms, includes 4 retainers in black polyethylene (LDPE 993I) with low retention capacity (code 8515), also available as a spare part.
8515	Package of 4 retainers in black polyethylene (LDPE 993I) with low retention capacity for impression taking.
8517	Package of 4 parallelism pins in black polyethylene (LDPE 993I) for Locator Abutments.
•\ \   / /•	AISI 316L steel plate for measuring the angles.
9530	

### Plastic caps and retainers for Locator Abutments \*

code	description
O      O	Kit containing 2 Grade 5 titanium caps, 2 spacer rings in silicone rubber, 2 retainers in black polyethylene (LDPE 993I) with low retention capacity for impression taking and 2 retainers in nylon for each of the 4 different retention capacities.
8540-2	Kit containing 2 Grade 5 titanium caps, 2 spacer rings in silicone rubber, 2 retainers in black polyethylene (LDPE 993I) with low retention capacity for impression taking and 2 retainers in nylon for each of the 4 different retention capacities designed for severe disparallelism.
O O O O O O     S550-2	Kit containing 2 steel caps, 2 spacer rings in silicone rubber, 2 retainers in black polyethylene (LDPE 993I) with low retention capacity for impression taking and 2 retainers in nylon for each of the 4 different retention capacities.
<b>0</b> 8514	Package of 20 spacer rings in silicone rubber for relining of the prosthesis.
8515	Package of 4 retainers in black polyethylene (LDPE 993I) with low retention capacity for impression taking.
8524	Package of 4 retainers in transparent nylon, retention of 5 lb corresponding to 2268 g.
<b>8527</b>	Package of 4 retainers in pink nylon, retention of 3 lb or 1361 g.
8529	Package of 4 retainers in blue nylon, retention of 1.5 lb or 680 g.
8547	Package of 4 retainers in green nylon, retention of 4 lb or 1814 g.
8548	Package of 4 retainers in red nylon, retention of 1 lb or 450 g.
8915	Package of 4 retainers in orange nylon, retention of 2 lb or 907 g.

\* Locator Abutments are medical devices manufactured and patented by Zest Anchors, Inc., 2061 Wineridge Place, Escondido, CA 92029, USA. Locator is a registered trademark of Zest Anchors, Inc. The European Agent for the purposes of MDD 93/42/EEC is Ventura Implant and Attachment Systems, 69 The Avenue, Ealing, London W13 8JR, England.





code	description
8393	Locator Core Tool. Instrument in steel consisting of a handle, driver (8390) for screwing Locator Abutments, and a tip (8397) for inserting the retainers into the caps.
8397	Steel tip for inserting the retainers into the caps. Not necessary for those who already own or purchase the complete Locator Core Tool separately.
8390	Steel driver for abutment screwing/unscrewing. Not necessary for those who already own or purchase the complete Locator Core Tool separately.
8394	Retention jacket for the driver (8390) for transferring the Locator abutments into the oral cavity.
8926-SW	Grade 5 Titanium short driver for screwing the Locator Abutments. The driver is compatible with the Global system's torque control ratchet.
8927-SW	Grade 5 titanium Long driver for screwing Locator Abutments. The driver is compatible with the Global system's torque control ratchet.

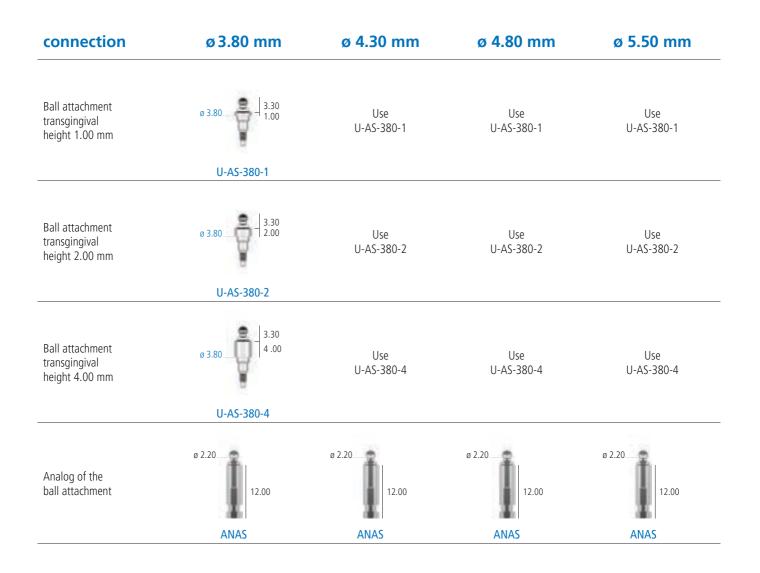
# Overdentures anchored with ball attachments

These attachments have a small hexagon at the base of the ball which is used to engage the screwing driver (N.B.: the driver is not contained in the surgical kit and must be purchased separately, code BASCC-EX). This driver is compatible with the system's torque control ratchet. The ball attachments must be tightened at a torque of 25-30 Ncm.





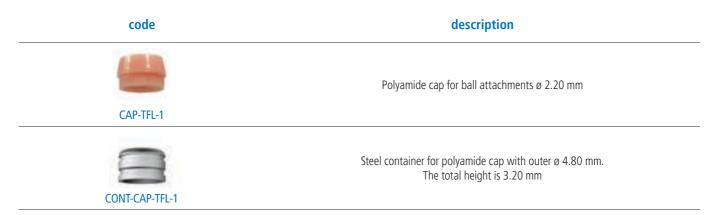




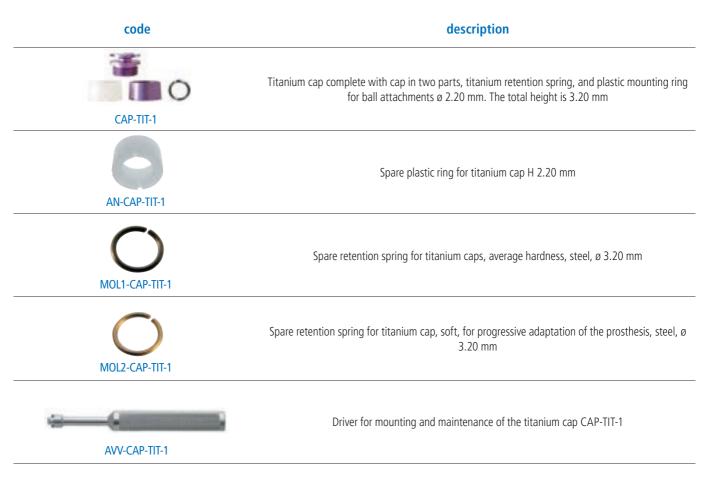
code	description
	Steel screwdriver for ball attachments, to be used with torque control ratchet. (Not included in the surgical kit, to be purchased separately).
BASCC-EX	

# Accessories for overdentures on ball attachments

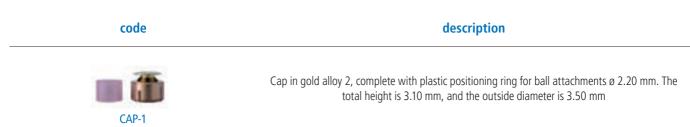
#### Polyamide caps for ball attachments



#### Titanium caps for ball attachments



#### Caps in gold alloy for ball attachments



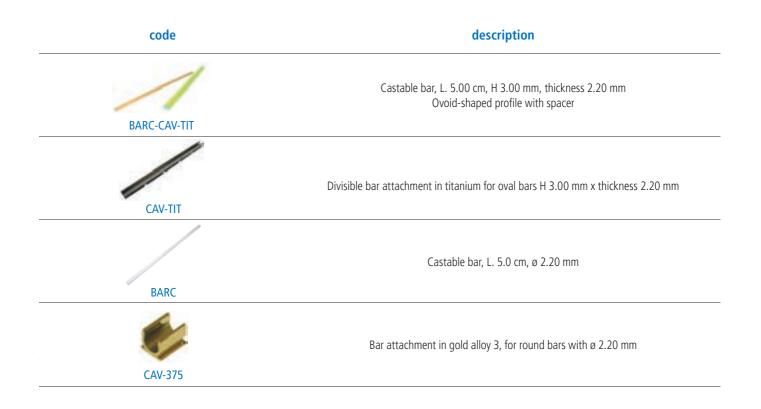




#### O-ring retention devices for ball attachments

code	description
0	Metal container in the shape of a ring for rubber o-rings. For ball attachments ø 2.20 mm. The total height is 1.50 mm, and the outside diameter is 4.50 mm. Pack of 6 pieces
99-440044*	
0	Red ring in silicon for laboratory use, outside ø 4.50 mm, H 1.50 mm. Pack of 12 pieces
99-443034*	
0	White ring in natural rubber, soft, outside ø 4.50 mm, H 1.50 mm. Pack of 12 pieces
99-443035*	
0	Black ring in natural rubber, hard, outside ø 4.50 mm, H 1.50 mm. Pack of 12 pieces
99-443036*	

\* The retention o-rings for ball attachments are manufactured by Implant Direct Sybron International, 27030 Malibù Hills Road, Calabasas Hills, 91301 U.S.A. The European Agent for the purposes of MDD 93/42/EEC is Kerr Italia S.r.I., via Passanti 332, 84018 Scafati (SA) Italy.



### **MATERIAL COMPOSITION**

#### PMMA

Chemical designation:	Polymethylmethacrylate
Colour:	Transparent
Physical and mechanical properties	
Density (DIN 53479)	1.18 g/cm <sup>3</sup>
Yield strength (DIN 53454)	110 N/mm <sup>2</sup>
Elongation at yield (DIN 53455)	5.5 %
Modulus of elasticity (DIN 53457)	115 N/mm <sup>2</sup>
Tangential elastic modulus at 10 Hz (DIN 53445)	3300 N/mm <sup>2</sup>
BRINELL hardness ball falling h961/30 (DIN 53456)	1700 N/mm <sup>2</sup>
BRINELL hardness if the ball falls (DIN 53456)	200 N/mm <sup>2</sup>
Thermal properties	
Coefficient of linear extension for 050C (DIN VDE 0304/01)	70-10 <sup>-6</sup> · 1/°C
Thermal conductivity (DIN 52612)	0.19 W/m °C
Oven temperature	≈ 160 °C
Regaining temperature	>80 °C
Maximum service temperature long term	78 °C
VICAT temperature, proceeding B (DIN 53460)	115 °C
ISO 75 flection resistance 1.80N/mm2 (DIN 53461)	105 °C
Heat resistance according martens (DIN 53458)	95 °C
Chemical properties	
Water absorption in weight increase after 1 day immersion (DIN 53495)	0.3 %

#### POM

Chemical designation	Polyoxymethylene (copolymer)
Colour	Natural opaque
Physical and mechanical properties	
Density (DIN 53479):	1.41 g/cm <sup>3</sup>
Tensile strength (DIN EN ISO 527-2)	67 Mpa
Tensile strenght at yield (DIN EN ISO 527-2)	67 Mpa
Elongation at yield (DIN EN ISO 527-2):	9%
Elongation at break (DIN EN ISO 527-2):	32 %
Modulus of elasticity (flexural test) (DIN EN ISO 178):	2800 Mpa
Modulus of elasticity (tensile test) (DIN EN ISO 527-2):	2800 MPa
Ball indentation hardness (ISO 2039-1):	165 MPa
Impact strength (Charpy) (DIN EN ISO 179-1eU):	Not broken
Compression modulus (EN ISO 604):	2300 Mpa
Thermal properties	
Melting temperature (DIN 53765):	166 °C
Glass transition temperature (DIN 53765):	-60 °C
Service temperature short term:	140 °C
Service temperature long term:	100 °C
Specific heat (ISO 22007-4):	1.4 J/(gK)
Thermal conductivity (ISO 22007-4):	0.39 W/ (mK)
Thermal expansion (CLTE) 23-60°C (DIN EN ISO 11359-1;2):	13·10 <sup>-5</sup> /K
Thermal expansion (CLTE) 23-100°C (DIN EN ISO 11359-1;2):	14·10 <sup>-5</sup> /K
Chemical properties	
Water absorption 24h / 96h (23°C) (DIN EN ISO 62)	0.05/0.1%





PEEK *(tested on the same quantity of material)	Radiopaque	Classic
Chemical designation	Polyetheretherketone	Polyetheretherketone
Colour	Cream white opaque	Cream white opaque
Physical and mechanical properties		
Density:	1.65 g/cm <sup>3</sup>	1,4 g/cm <sup>3</sup>
Modulus of elasticity (tensile test) (DIN EN ISO 527-2):	5200 MPa	4100 MPa
Tensile strength (DIN EN ISO 527-2):	77 MPa	97 MPa
Tensile strength at yield (DIN EN ISO 527-2):	77 MPa	97 MPa
Elongation at yield (DIN EN ISO 527-2):	2%	5%
Elongation at break (DIN EN ISO 527-2):	2%	13%
Flexural strength (DIN EN ISO 178):	178 MPa	174 MPa
Modulus of elasticity (flexural test) (DIN EN ISO 178):	5000 MPa	4000 MPa
Compression modulus (EN ISO 604):	4000 MPa	3500 MPa
Thermal properties		
Glass transition temperature (DIN 53765):	-	150 °C
Service temperature short term:	300 °C	300 °C
Service temperature long term:	260 °C	260 °C
Chemical properties		
Water absorption 24h / 96h (23°C) (DIN EN ISO 62):	-	0.02/0.03 %

GOLD ALLOY	Gold alloy 1	Gold alloy 2	Gold alloy 3
Chemical designation	Gold alloy 1	Gold alloy 2	Gold alloy 3
Colour	White	Yellow	Yellow
Composition			
Au	60 %	> 68.60 %	70 %
Pt	24 %	2.45 %	8.5 %
Pd	15 %	3.95 %	-
Ir	1 %	0.05 %	0.10 %
Ag	-	11.85 %	13.40 %
Cu	-	10.60 %	7.50 %
Zn	-	2.50 %	0.50 %
Au + Pt Group Metals	-	75.35 %	-
Ru	-	-	-
Physical and mechanical properties			
Density:	18.1 g/cm <sup>3</sup>	15.0 g/cm <sup>3</sup>	15.7 g/cm <sup>3</sup>
Melting range:	1400 ÷ 1460 °C	880 ÷ 940 °C	895 ÷ 1010 °C
Modulus of elasticity (tensile test):	115 GPa	97 GPa	100 GPa
Vickers Hardness HV1 (Gold alloy 1) HV5 (Gold alloy 2, Gold alloy 3)	160 (annealed) 250 (hardened) 220 (after deformation) 240 (after casting)	> 240	170 (annealed) 295 (hardened) 280 (selfhardening)
Proof stress Rp0.2	400 MPa (annealed) 700 (after deformation) 800 (after casting)	> 710 MPa (cold worked) 410 Mpa (soft) 680 Mpa (hardened)	380 MPa (annealed) 730 (after deformation)
Yield strenght Rm	600 Mpa (annealed) 850 (hardened) 850 (after deformation)	>790 MPa (cold worked) 535 MPa (soft) 780 MPa (hardened)	-
Elongation in %	20 % (annealed) 15 (hardened) 1 (after deformation)	> 4 % (cold worked) 35% (soft) 12% (hardened)	-

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