# IMPLANTOLOGY



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Sweden & Martina develops and manufactures implant systems that offer both excellent clinical functionality and perfect aesthetic results. The surfaces have been designed to obtain the best relationships between the surface roughness of the titanium and speed of bone healing. The surgical instruments are functional, easy to use and ergonomic. Training courses, continuous refresher courses and extensive assistance distinguish the service and reliability that have made Sweden & Martina a leader in the Italian implant market.





#### **Multifunctional mounter:**

The particular conformation of the Outlink<sup>2</sup> mounter allows it not only to act as a carrier for the transport and positioning of the implant in its site, but also as a transfer for taking the impression and as post.

#### The Outlink<sup>2</sup> implant system is suitable for:

- standard operating procedures involving the double or single surgical phase;
- immediate loading;
- post-extraction situations;
- guided regeneration protocols;
- Switching Platform.

#### **Outlink<sup>2</sup> Shorty:**

The Outlink<sup>2</sup> implant range also includes a line of short fixtures, ideal in the case of small vertical bone dimension.



The Outlink<sup>2</sup> implant system has a complete range of fixtures for diameters and heights, thus offering extremely versatile implant-prosthetic solutions. The Outlink<sup>2</sup> implants are available in diameters 3.30, 3.75, 4.10 (with the two different connections, standard and SP) and 5.00, and in all heights from h 5 mm to h 18 mm.

#### **Cylindrical shape:**

The implant body is cylindrical with a conical apical conformation for greater ease of insertion, and its external hexagon connection allows it to be used in different clinical situations.

#### Switching Platform:

The geometrical characteristics of Outlink<sup>2</sup> connections enable them to be applied in Switching Platform protocols.

Completeness of prosthetic solution: Ideal for both cemented and screwed prostheses, the external hexagon connection makes it particularly suitable in situation of severe disparallelism.





#### **Scientific support:**

The use of the Outlink<sup>2</sup> system is backed up by numerous publications which document its extreme versatility with over 10 years of clinical success.

### Outlink<sup>2</sup> ø 3.30 implant

The Outlink<sup>2</sup> ø 3.30 implant has a platform with 2.40 mm external hexagon, 1.0 mm high and threading M 1.8, allowing any type of prosthetic restoration to be produced satisfactorily.

Due to their small diameter, ø 3.30 implants are ideal for implant-prosthetic rehabilitation when there is limited space between adjacent teeth, as in the case of single crowns in upper lateral incisor positions and in lower intraforaminal situations.\*



Stability with respect to disto-mesial and antero-posterior stress guaranteed by the external hexagon height of 1.00 mm. Resistant and particularly sturdy section despite its small diameter, thanks to the external hexagon connection.



The thread of the implants has a pitch of 0.6 mm which facilitates screwing progress and limits bone trauma after application of the load.



Tapered apex with large discharge notches that give the implant excellent self-tapping properties; the fully threaded apex section considerably simplifies its insertion.





\* They can also be used for the rehabilitation of single crowns at premolar level. In distal sectors they must be used exclusively for the rehabilitation of multiple fixed structures. They are also very useful in the case of total edentulism on thin mandibular crests where it is preferred not to carry out regeneration. In this case it is recommended to use at least 4 fixed implants with a bar.



# Outlink<sup>2</sup> ø 3.75 and ø 4.10 implants

The Outlink<sup>2</sup> implant with prosthetic platform ø 4.10, with 2.70 mm standard hexagon 0.70 mm high and threading of M 2.0, is available both with a 4.10 mm neck and 3.75 mm spire and with a 4.10 mm neck and 4.10 mm spire.

Using the same platform (4.10 mm) it is possible to choose between two different spire diameters, 3.75 mm and 4.10 mm, depending on the available bone thickness.





The connection platform of Outlink<sup>2</sup> implants has an external hexagon that today is generally recognised as standard at world level.

The external connection makes them particularly suitable for operations in the case of multiple edentulism with severe disparallelism, as it considerably facilitates the phase of taking the impression and the subsequent insertion and removal of prostheses.



# Outlink<sup>2</sup> ø 4.10 SP implant (Switching Platform)

The Outlink<sup>2</sup>  $\emptyset$  4.10 SP implant has a 4.10 mm prosthetic platform, a 2.40 mm hexagon 1.0 mm high with a threading of M 1.8, the same as those of the  $\emptyset$  3.30 implant. This characteristic allows the use of prosthetic components with diameter 3.30 mm, optimally performing the Switching Platform technique which takes advantage of the horizontal component of the biological width, thus minimising the loss of crestal bone.



The Switching Platform is a prosthetic rehabilitation technique that requires the use of posts with a smaller diameter than the implant platform in order to improve the biomechanical distribution of the prosthetic load, but especially to distance the prosthetic connection from the cervical bone.

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



FEM analysis of Outlink<sup>2</sup>  $\emptyset$  4.10 mm implants with a  $\emptyset$  3.30 mm post according to the Switching Platform protocol.







# Outlink<sup>2</sup> ø 5.00 implant

The Outlink<sup>2</sup>  $\emptyset$  5.00 presents a prosthetic platform with diameter 5.00 mm with 2.70 mm external hexagon, 0.70 mm high and threading M.20, the same as those of the standard 4.10 mm platform, which guarantees high precision and versatility.

Outlink<sup>2</sup> ø 5.00 implants allow the application of the Switching Platform technique using ø 4.10 mm prosthetic components.



The 5.00 mm diameter of this implant makes it ideal for implant-prosthetic rehabilitation on thick bone crests.

The external connection and the wide diameter of the spires give this implant extraordinary sturdiness and stability.

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FEM analysis of Outlink<sup>2</sup>  $\emptyset$  5.00 mm implants with a  $\emptyset$  4.10 mm post according to the Switching Platform protocol.

#### Multifunctional mounter

The Outlink<sup>2</sup> implant has the mounter already assembled in the PMMA vial. As well as the traditional carrier function for the transport and positioning of the implant, the particular conformation of the Outlink<sup>2</sup> mounter, made in Gr.5 titanium, also allows it to be used as a transfer when taking the impression and as a post during prosthetic rehabilitation.



# Outlink<sup>2</sup>





# Outlink<sup>2</sup> Shorty implants

Shorty Outlink<sup>2</sup> fixtures with height 5.0, 7.0 and 8.5 mm are available in the program; they can be used, according to the most recent clinical protocols, in all cases where there is small vertical bone dimension.



WARNING: Never use these implants for rehabilitating single crowns, but only as support posts combined with longer fixtures for multiple rehabilitations. It is also recommended to always use, whenever possible, implants with the largest diameter possible depending on the thickness of the crest.

# Outlink<sup>2</sup>



In case of very short implants (5 mm and 7 mm), the apical tapering was redesigned to improve primary stability even further. Installing a prosthesis with the Switching Platform technique is recommended for these implants in order to preserve the already reduced vertical dimension of the crest as much as possible. This choice is necessary in Outlink<sup>2</sup> Shorty implants with a diameter of 4.10 mm because they have a 2.4 mm hexagon instead of the 2.7 mm standard hexagon (4.10SP platform).



#### Key to the implant codes

The implant codes are so-called "talking" codes, i.e. they allow easy identification of the piece. Below is a table showing how the talking codes work using Code E2-ZT-410-SP-115 as an example:

Type of implant E2- E2-	Surface ZT- ZT-	Diameter 410 410	Connection SP SP	Length 115 115
E2: Outlink <sup>2</sup> implant	3S: Trisurface Surface ZT: ZirTi surface	330: 3.30 mm 375: 4.10 mm 410 - 410SP: 4.10 mm 500: 5.00 mm	SP: Switching Platform(e.g. 2.40 mm)	050: 5 mm 070: 7 mm 085: 8.5 mm 100: 10 mm 115: 11.5 mm 130: 13 mm 150: 15 mm
		is the size of the diameter of the implant connection		refers to the length of the implant

#### Table of colour codes

A colour code system has been defined in the Outlink<sup>2</sup> implant system for identifying the endosseous diameter of the implant (see table on page 44-45). The colour code identifies:

- the transfers for taking an impression and the laboratory analogs;

- the final drills;

- the sequence on the surgical tray.

	ø 3.30	ø 3.75	ø 4.10	ø 4.10SP	ø 5.00
Colour code on the pack					

#### **IMPLANT SYSTEM**

## Surfaces

These studies have shown that the closer the roughness is to the size of the osteoblasts, the more influence it has on cell behaviour, causing the platelet activity to increase with respect to a smooth surface, thus accelerating the repair and osseointegration processes. The roughness is able to orient the cell layout, to influence their metabolism and proliferation, to differentiate osteoblasts and to modulate the production of extra-cellular matrix. These studies have led to the current development of the Outlink<sup>2</sup> implant surfaces: ZirTi (Zirconium Sand Blasted Acid Etched Titanium) and TriSurface.



# Outlink<sup>2</sup>





In both types of surface the collar is machined for 0.75 mm of the height.



#### **TriSurface Surface**



The implant with a TriSurface surface has a sandblasted coronal portion, in order to obtain an intermediate level of roughness that allows better control of any bacterial infections before they can degenerate into peri-implantitis.



The middle apical portion of the body of the implant is coated with HRPS (High Roughness Plasma Spray) and has the maximum level of roughness that can be obtained, thus guaranteeing excellent primary stability even when the bone is only slightly mineralised, and significantly increasing the bone-implant contact surface.



Histological image of the bone growth around an  ${\sf Outlink}^2$  implant with TriSurface surface.

ll Circolo Rivista Periodica di Odontostomatologia, 1: 13-20, 2004

For clinical findings concerning Sweden & Martina surfaces refer to the paragraph in the bibliography (see page 90-91) with the list of numerous in-vitro and in-vivo studies.

#### Cold plasma surface decontamination

The better the processes of passivation, cleaning and decontamination of an implant surface, the greater the presence of pure titanium able to come in contact with the bone. This proportionally increases the possibilities of osseointegration.

At the end of the surface treatments, the implants are subjected to a careful cleaning and decontamination process by means of cold plasma triggered in Argon after first being cleaned of the main processing residue with numerous washing cycles in specific solvents.

What is decontamination? It is the total removal of dirt, particle residue and Bioburden from the surface of the implants, carried out before sterilisation. During the Argon treatment, the gas atoms are partially ionised, they acquire energy and "bombard" the surface of the fixture violently. This kind of "atomic sand-blasting" removes organic contaminants without leaving any traces or additional residuals.



Implant before the decontamination treatment.



Working plasma reactor during surface decontamination of the implants.





Implant after the decontamination treatment.

As known, Argon is an inert gas that does not react with the titanium surfaces. The condition of surface decontamination is controlled regularly with randomised analyses 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 packaging

The implants are packaged in PMMA vials in which they are held/housed in special titanium baskets that protect the surface of the fixture against possible recontaminations due to contact. All the materials comprising the packaging have been suitably tested to verify their suitability to sterilisation, preservation and medical use.



#### **Sterilisation**

Sterilisation is the total elimination of the residual microbial load present on the implant after the decontamination and packing process, it is carried out with the use of beta rays. The sterilisation procedures 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 a variety of different advantages:

- the process occurs in a completely automatic way with computerised control of all the phases;
- the process is quick, reliable and extremely easy to repeat with safety and precision;
- the process is extremely 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 with regards to packaging due to the speed of the treatment. This guarantees preservation of the product's sterility over time (certified duration of 5 years).

# Outlink<sup>2</sup> implants



\* The mounters are sold preassembled with the implants. Both the mounters and the connecting screws (VM-180 and VM-200) are available on sale as individual spare parts. If the mounter is used as a post, the torque for tightening the screws is 20-25 Ncm.

\*\* Each implant is sold with its own surgical cover screw. The surgical screws are also available on sale individually in a sterile pack and must be tightened to 10 Ncm.



#### Shorty implants

18 All measurements are given in mm, unless indicated otherwise.

Outlink<sup>2</sup>

**Standard implants** 



#### SURGICAL INSTRUMENTS

# Surgical kit

The Outlink<sup>2</sup> surgical kit has been designed and made to offer ease of use and immediate placing in the sequence of instruments<sup>\*</sup>. The instruments, all made of stainless steel, have their codes screen-printed on the tray to allow the user to identify each instrument more easily and to put it back after the cleansing and cleaning phases, with the aid of a colour code system that traces the suitable surgical procedures for the various implant diameters. The Outlink<sup>2</sup> surgical kit is also supplied with the templates for the graphic representation of the implant measurements to allow choosing the most suitable implant diameters and lengths by means of radiographic or tomographic analyses

The kit consists of a practical box in Radel with a surgical tray inside that is set-up to hold the instruments according to a guided procedure. The sequences of use of the instruments are indicated by coloured marks.



A practical ratchet is also included that acts as a dynamometric key for checking the closing torque of the prosthetic screws and as a surgical key for inserting the implants. The ratchet has a very small head, making it easy to use even in distal sectors.







\* The abbreviations ZOUTLINK2\* and OUT-KIT\* are followed by a letter and number that indicate the revision of the kit. The contents of the Surgical Kit can be updated and varied according to the most effective and innovative surgical techniques.

#### SURGICAL INSTRUMENTS

### OneBox<sup>2</sup>

The OneBox<sup>2</sup> surgical kit was created to meet the needs of surgeons who carry out a large number of implant operations and who therefore want to have a compact kit equipped essentially with all that is needed only for the surgical phase.

The OneBox<sup>2</sup> is a compact kit that is easy to carry, containing the surgical instruments strictly necessary for inserting Outlink2 implants.







code	description
ZEONEBOX*	OneBox <sup>2</sup> surgical kit
EONEBOX-KIT*	Instrument tray for OneBox <sup>2</sup>
GROMMET-CA-1	Kit with 5 spare silicon supports for surgical trays, for drills or instruments with right-angle shanks
GROMMET-CA-2	Kit with 5 spare silicon supports for surgical trays, for instruments fitted with connection hexagon

\* The words ZEONEBOX\* and EONEBOX-KIT\* are followed by a letter and a number that indicate the revision of the kit. The contents of the kit can be updated and varied according to the most effective and innovative surgical techniques

WARNING: OneBox<sup>2</sup> does not contain drill depth stops or prosthetic drivers, but it contains all the drivers in the one-piece digital version and the right-angle version, which are much more practical during surgical procedures.

#### SURGICAL INSTRUMENTS

### Screw Kit

The Sweden & Martina Screw Kit is a handy set containing the necessary drivers\* for the prosthetic phases after removal of the Outlink<sup>2</sup> transgingival healing screws.

It includes digital and right-angle drivers, as well as a dynamometric ratchet.

phase, with notable optimisation of the time spent at the

chair.

Small and easy to carry, it allows simple and immediate management of the prosthetic rehabilitation phase after surgery.

As well as digital and right-angle drivers, the Screw Kit includes a carrier for offset P.A.D. abutments, thus also favouring rapid full-arch prosthetic rehabilitations.



\*Please note: to guarantee maximum duration of the surgical and prosthetic instruments, it is advisable to follow the recommended cleansing and sterilisation procedures.







\* The abbreviations ZSCREW\* and SCREW-TRAY\* are followed by a letter and a number that indicate the revision of the kit. The contents of the kit can be updated and varied according to the most effective and innovative surgical techniques.

### Initial, intermediate and countersink drills

All Sweden & Martina drills are made of stainless steel with high resistance to corrosion and wear. The extreme accuracy of design and production allows use completely free from vibrations and oscillations.



**Countersink drill:** ideal for preparing the coronal part of the site in the case of implants with a prosthetic platform wider than the diameter of the spires.



#### initial drill, intermediate drills and countersink drill

kit





\* The word STOP is followed by a number indicating the revision of the accessory. The stops are included only in the ZOUTLINK2\* surgical kit.



**Please note:** The letters FPT are followed by a number (2, 3) indicating the length of the drill shank: 2 indicates a length of 12.5 mm, 3 indicates a length of 14 mm. All the STOP2 and STOP3\* are functional to any of these batches.

**Please note:** The initial drills (FPT\*) and the final drills (FFT\*, shown on the following page) always make a hole longer than the implant that is to be inserted. The oversizing (Lp) is equal to the height of the tip of the drill that is being used.

# Final drills and stops

Also made of stainless steel with high resistance to corrosion and wear, Outlink<sup>2</sup> final drills present a number of cutting edges proportional to the hole diameter, so as to allow a continuous and homogeneous cutting movement and greater instrument stability during operation. All this enables high-precision implant preparations to be obtained, with consequent ease in inserting the implant.









\*Please note: The letters FFT are followed by a number (2, 3) indicating the length of the drill shank: 2 indicates a length of 12.5 mm, 3 indicates a length of 14 mm. All the STOP2 and STOP3\* are functional to any of these batches.

**\*\*Please note:** The drills always make a hole that is longer than the implant to be inserted. The oversizing (Lp) is equal to the height of the tip of the drill that is being used. See image on page 27.

#### SURGICAL INSTRUMENTS

#### Bone taps

Outlink<sup>2</sup> implants are self-tapping implants with excellent cutting and insertion capabilities. However, the use of a bone tap is recommended in all cases where the type of bone requires it. The absence of tapping in cases where this is recommended may lead to problems later when inserting the implant. They are available both with right-angle shank and with a connector for dynamometric ratchet.



inserting axis and more uniform preparation.

# Outlink<sup>2</sup>





\* Please note: short bone taps are not included in any surgical kit.

### Osteotomes

A set of steel osteotomes is available, useful for maxillary sinus floor elevation via the crestal bone and bone expansion protocols. The laser-etched codes on the handles show the diameter and height of the corresponding implant, so as to facilitate recognition of the correct surgical sequence.









### Drills for distal sectors

As an option, shorter drills are available that are very practical in distal sectors with limited oral opening. They come in a wide range of diameters and are also useful for preparations in extremely compact bone where, in the most coronal portion, you want to widen the preparation diameter by 0.10 mm with respect to the size of the standard drills to facilitate the insertion of the implants. On the other hand, in low-density bone they can be used to under-prepare the implant site so as to obtain optimum primary stability.







#### Cylindrical drills





\* The drills for distal sectors are without irrigation and are not included in any surgical kit. They cannot be used with depth stops



**Please note:** The drills always make a hole that is longer than the implant to be inserted. The oversizing (Lp) is equal to the height of the tip of the drill that is being used.

# **Drivers and Screwdrivers**

code	description	kit
U-AVV3-MOU-CA	Octagonal driver with right-angle attachment for Outlink <sup>2</sup> implant mounter	ZOUTLINK2*
U-AVV-MOUC	Short octagonal driver for Outlink <sup>2</sup> implant mounter	ZOUTLINK2*
AVV-CA-DG-EX	Hand knob for hand use of drivers, bone taps and drivers with right angle shank and with hexagonal connection for torque-control ratchet	ZEONEBOX*
HSM-20-EX	Driver for connecting screws, with connector for dynamometric ratchet or digital connector, short	ZOUTLINK2* ZSCREW*
HSML-20-EX	Driver for connecting screws, with connector for dynamometric ratchet or digital connector, long	ZOUTLINK2* ZSCREW*
HSMXL-20-EX	Driver for connecting screws, with connector for dynamometric ratchet or digital connector, extra long	ZSCREW*
HSMXS-20-DG	Driver for surgical connecting screws, digital, extra short	ZOUTLINK2* ZEONEBOX* ZSCREW*
HSM-20-DG	Driver for connecting screws, digital, short	ZOUTLINK2* ZEONEBOX* ZSCREW*
HSML-20-DG	Driver for connecting screws, digital, long	ZOUTLINK2* ZEONEBOX* ZSCREW*


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code	description	kit
HSMXS-09-DG	Driver for surgical cover screws, digital, extra short	ZOUTLINK2* ZEONEBOX*
HSM-09-DG	Driver for surgical cover screws, digital	ZOUTLINK2* ZEONEBOX*
HSM-20-CA	Driver for connecting screws, with right-angle shank	ZOUTLINK2* ZEONEBOX* ZSCREW*
HSM-09-CA	Driver for surgical cover screws, with right-angle shank	ZOUTLINK2* ZEONEBOX*
AVV2-ABUT	Driver for standard abutments and for straight P.A.D. abutments	ZSCREW*
BASCC-EX	Driver for ball attachments, with connector for dynamometric ratchet or digital connector	ZSCREW*
8926-SW	Short driver in Gr. 5 titanium for screwing the Locator Abutments. The driver is compatible with the Outlink <sup>2</sup> system's dynamometric ratchet	ZSCREW*
8927-SW	Long driver in Gr. 5 titanium for screwing the Locator Abutments. The driver is compatible with the Outlink <sup>2</sup> system's dynamometric ratchet	ZSCREW*
PAD-CAR	Carrier for transferring angled P.A.D. abutments into the oral cavity, sterilisable and reusable. It must be fixed to the abutments with the screw PAD-VTRAL-140	ZSCREW*

## Accessories

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code	description	kit
B-AVV-CA3	Mechanical adapter with right-angle shank for instruments with hexagonal connector	ZOUTLINK2* ZEONEBOX* ZSCREW*
вем-15 ВРМ-15	Extension for bone taps, mounters, drivers and manual drivers, with hexagonal connector for dynamometric key	ZOUTLINK2* ZEONEBOX*
AVV3-MAN-DG	Hand knob for bone taps, mounters, drivers and manual drivers	ZOUTLINK2* ZSCREW*
	Kit with 5 spare o-rings for all accessories with hexagonal connector for dynamometric key	-
CRIS-KIT	Kit composed of a ratchet, which can be used in dynamometric or fixed mode, and accessories for quick torque adjustment and periodic maintenance (Allen wrench and lubricant). The ratchet has torque limits from 10 to 70 Ncm, with adjustment lines at 10-20-25-30-35- 50-70 Ncm. (Supplied with the Outlink <sup>2</sup> surgical kit)	ZOUTLINK2* ZEONEBOX* ZSCREW*
PP-2/28	Parallelism pin Ø 2.00 and 2.80 mm	ZOUTLINK2* ZEONEBOX*
PROF3	Depth gauge	ZOUTLINK2*
sueden - martina CMD	Mounter stop key	ZOUTLINK2* ZEONEBOX*
E2-CM	Mounter stop key	ZOUTLINK2* ZEONEBOX*
PROF-	Extension for surgical drills	ZOUTLINK2* ZEONEBOX*





code	description	kit
E-MOU-330	Short mounter Ø 3.30	ZOUTLINK2*
<b>E-MOU-410</b>	Short mounter Ø 4.10	ZOUTLINK2*
E-MOUL-330	Long mounter Ø 3.30	ZOUTLINK2*
E-MOUL-410	Long mounter Ø 4.10	ZOUTLINK2*
E-PAD-PS410-L	Bone profiler for levelling irregular bone crest, with wide flaring	-
E-PAD-PS410-S	Bone profiler for levelling irregular bone crest, with narrow flaring	-
The second secon	X-ray template for Outlink <sup>2</sup> implants (real dimensions)	ZOUTLINK2* ZEONEBOX*
Provide restored and the second secon	X-ray template for Outlink <sup>2</sup> implants (dimensions increased by 20%)	ZOUTLINK2* ZEONEBOX*
E-L130	X-ray template for Outlink <sup>2</sup> implants (dimensions increased by 30%)	ZOUTLINK2* ZEONEBOX*

#### SURGICAL INSTRUMENTS

# Shorty drilling kit

The implant site of the specific Shorty implants with lengths of 5.0, 7.0 and 8.5 mm can be prepared with the drills contained in the standard surgical kits; however, the drills in these kits require an over-preparation connected to the measurement of the drill tip. On the other hand, the choice of a short implant is generally connected to the lack of available bone height in the implant site, so it would be preferable not to have to engage a working thickness with the tip of the drill, but instead to lodge a longer implant. For this reason, a drilling kit was created to enable preparing the sites for Shorty implants with a height of 5.7, and 8.5 mm and very short tip where a portion of over-preparation is not considered necessary. The Shorty drills allow dedicating the entire bone available to lodging the implant, without any waste. They also have the advantage of being shorter than the standard drills (24.85 mm instead of 35 mm). This important feature makes it possible to use these instruments even in case of difficult to reach distal sectors or small oral openings.



All the instruments in the Shorty Drilling Kit are also available individually as spare parts.





code	description
ZSHORTY*	Drilling kit for short implants
SHORTY-KIT*	Empty tray in Radel
GROMMET-CA-1	Kit with 5 spare silicon supports for surgical trays, for drills or instruments with right-angle shanks

\* The abbreviations ZSHORTY\* and SHORTY-KIT\* are followed by a letter and a number that indicate the revision of the kit. The contents of the kit can be updated and varied according to the most effective and innovative surgical techniques.

#### **SURGICAL INSTRUMENTS**

# Instruments contained in the Shorty Drilling Kit



All measurements are given in mm, unless indicated otherwise.







\* Drills and stops with diameter 5.40 mm for other Sweden & Martina implant systems are also available in the Drilling Kit.



**Please note:** remember that the drills in the Drilling Kit do not over-prepare the surgical site. The working lengths include the portion related to the conical tip of the drill.

#### **GUIDE TO THE CHOICE OF PROSTHETIC SOLUTIONS**







# Transgingival healing caps

The transgingival healing caps in Gr. 5 titanium can be identified via a laser-marking that reports the diameter, emergence profile and height. In case of transgingival healing screws with straight emergence profile, the marking only reports the platform diameter and height. The transgingival healing caps must be tightened at a maximum torque of 10 Ncm, using the HSM series of drivers, the full details and codes of which can be found on page 36-37.



size (in the example 60 = 6.00 mm) and the transgingival height (in the example 2 = 2.00 mm).

The transgingival caps for implants ø 3.30 and 4.10SP have a M1.8 thread (like the thread of the implant platform). The transgingival caps for implants 3.75, 4.10 and 5.00 have a M2.0 thread.





implant diameter	ø 3.30 mm and ø 4.10SP mm	ø 3.75 mm and ø 4.10 mm	ø 5.00 mm
Transgingival healing caps Anatomical emergence profile Transgingival H. 2 mm	o 3.75 2.00 2.00	ø 5.00 ø 4.10	ø 6.00 2.00 2.00
	E-1MG-330-372	E-1MG-410-502	E-IMG-500-602
Transgingival healing caps Anatomical emergence profile Transgingival H. 3 mm	ø 3.75	ø 5.00	ø 6.00
	E-TMG-330-373	E-TMG-410-503	E-TMG-500-603
Transgingival healing caps Anatomical emergence profile Transgingival H. 5 mm	ø 3.75 33/375 ø 3.30	ø 5.00. ø 4.10	ø 6.00. ø 5.00
	E-TMG-330-375	E-TMG-410-505	E-TMG-500-605
Transgingival healing caps Straight emergence profile Transgingival H. 2 mm	ø 3.30	-	-
	E-TMG-330-2		
Transgingival healing caps Straight emergence profile Transgingival H. 3 mm	ø 3.30	-	-
	E-TMG-330-3		
Transgingival healing caps Straight emergence profile Transgingival H. 5 mm	ø 3.30	-	-
	E-TMG-330-5		

## Impression and model phase

The components for the phase of taking the impression and creating the model are produced by the same maximum precision CNC machines that produce the respective implants; this ensures a real guarantee of precision from the point of view of tolerance and fidelity in the reproduction of the clinical situation. The open tray and closed tray transfers are made of Gr. 5 titanium, anodised according to the colour code of the reference implant platform.





#### Open tray transfer



WARNING: In case of prostheses on more than one post, it is recommended to glue the open tray transfers together with resin in order to guarantee stability and solidity of the impression.

#### Closed tray transfer



#### Analogues



Recommended tightening torque: 8-10 Ncm.

## SIMPLE temporary posts

The SIMPLE prosthetic protocol calls for practical and simple solutions to create the temporary posts. The temporary posts can be used in a conventional way after the bone healing period, or immediately after surgical insertion of the implants, if conditions exist for immediate loading. Instead of using transgingival healing screws, depending on the prosthetic protocols adopted, it is possible to condition the tissues with the temporary prosthesis made using these posts.

PEEK is an extremely resistant and highly biodegradable polymer, easy to drill even chair-side. The titanium base, with an anatomical emergence profile, guarantees maximum connection precision. These posts have a connection hexagon which allows them to be repositioned; they are therefore ideal as a support for cement-retained single crowns.

In Simple aesthetic posts, the wider flaring of the transgingival profile, adaptable to any anatomy by drilling, simplifies the immediate aesthetic conditioning of the mucosa.

These posts do not have the non-rotational and repositioning connection hexagon; they are therefore useful for making multiple temporary structures to be screwed directly onto the implants.





implant diameter	ø 3.30 mm and ø 4.10SP mm	ø 3.75 mm and ø 4.10 mm	ø 5.00 mm
SIMPLE temporary posts in PEEK With Gr. 5 titanium base Anatomical emergence profile Repositionable With hexagon Connecting screw included	ø 3.80 ø 3.30 E MDS CD 220	9.50 9.4.10	ø 6.00 ø 5.00
	E-MPSCR-330	E-MPSCR-410	E-MPSCR-500
SIMPLE temporary posts in titanium Anatomical emergence profile Repositionable With hexagon Connecting screw included	ø 3.30 ø 4.60 1.20	ø 4.10. ø 5.00.	ø 5.00.
	E-MPSA-330-EX	E-MPSA-410-EX	E-MPSA-500-EX
SIMPLE temporary posts in titanium Anatomical emergence profile Non-repositionable Without hexagon, rotating Connecting screw included	ø 3.30 ø 4.60 E-MPSA-330	ø 4.10	ø 5.00
SIMPLE aesthetic temporary posts in titanium Wide emergence profile Non-repositionable Without hexagon, rotating Connecting screw included	ø 3.30ø 5.00 ■ 9.00 1.20 E-MPS-330	φ 4.10φ 6.20 E-MPS-410	0.00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Connecting screw Supplied with the temporary posts, it can also be ordered separately as a spare Single pack	V/M 190		Use VM-200
Pack of 10 pieces	VM-180 VM-180-10	VM-200-10	

WARNING: it is recommended always to use test screws for the laboratory phases and to keep the new screw supplied for the final fastening in the mouth.

#### **PROSTHETIC COMPONENTS**

## Pre-made posts

Made of Gr. 5 titanium, these posts are subjected to a controlled passivation process that changes their surface colour: the result is a characteristic golden pale yellow colour. This colour is obtained through an anodising process and, therefore, there is no type of coating, which allows combining the advantages of a highly biocompatible surface with prosthetic reconstructions that are very aesthetically pleasing.



The golden colour makes them ideal for prosthetic rehabilitations of particular aesthetic importance.



implant diameter	ø 3.30 mm and ø 4.10SP mm	ø 3.75 mm and ø 4.10 mm	ø 5.00 mm
Pre-made straight posts Repositionable Anatomical emergence Transgingival H. 1 mm Connecting screw included	o 3.30. <i>o</i> 3.75 − 5.80 1.00 E-MD-330-371	≤ 4.10 0 5.00 5.80 E-MD-410-501	5.80 5.00, ø 6.00, for 6.
Pre-made straight posts Repositionable Anatomical emergence Transgingival H. 2 mm Connecting screw included	φ 3.30φ 3.75 E-MD-330-372	ø 4.10. E-MD-410-502	ø 6.00 <b>6.00</b> <b>6.00</b> <b>8.00</b> <b>2.00</b> <b>E-MD-500-602</b>
Pre-made straight posts Repositionable Anatomical emergence Transgingival H. 4 mm Connecting screw included	σ 3.75 = -MD-330-374	ø 5.00 ø 4.10. E-MD-410-504	ø 6.00 ø 5.00 E-MD-500-604
Pre-made straight posts Repositionable Straight emergence Transgingival H. 1 mm Connecting screw included	ø 3.30 ■ 8.00 1.00 E-MD-330-1	-	-
Pre-made straight posts Repositionable Straight emergence Transgingival H. 2 mm Connecting screw included	ø 3.30 E-MD-330-2	-	-
Pre-made straight posts Repositionable Straight emergence Transgingival H. 4 mm Connecting screw included	<ul> <li>Ø 3.30</li> <li>■ 4.00</li> <li>E-MD-330-4</li> </ul>	-	-
Pre-made posts angled at 15° Repositionable Anatomical emergence Connecting screw included	ο 3.30	¢ 4.10.	¢ 5.00
Pre-made posts angled at 15° Repositionable Straight emergence Connecting screw included	€-MAIT-5550 #.00 2.00 E-MAI5-330	L-IVIAILI J-410	
Connecting screw supplied with the pre-made posts, it can also be ordered separately as a spare Single pack Pack of 10 pieces	VM-180 VM-180-10	VM-200 VM-200-10	Use VM-200

Recommended tightening torque: 20-25 Ncm.

All measurements are given in mm, unless indicated otherwise.

SIMPLE millable posts have a very wide emergence profile which can be

# Standard and Simple millable posts

These posts are made of grade 5 titanium and are able to respond to complex anatomical requirements in terms of both narrow prosthetic spaces and disparallel implants. Alongside the traditional prosthetic protocols, Sweden & Martina has developed innovative solutions in collaboration with distinguished professionals and universities. Among these, the SIMPLE Technique allows perfect conditioning of the mucosa starting with temporary posts (see page 50) and uses a millable post with large dimensions for making a primarily custom-built final prosthesis

adapted to any anatomy obtained with SIMPLE temporary aesthetic posts in the immediate conditioning phase. Straight millable posts, with their characteristic profile in the shape of an inverted cone, are suitable for angles of up to 10° and for small profiles.

Pre-unloaded posts allow very pronounced angles to be reached, up to 25°, limiting the time needed to reduce them by milling.





implant diameter	ø 3.30 mm and ø 4.10SP mm	ø 3.75 mm and ø 4.10 mm	ø 5.00 mm
Straight millable posts Repositionable With hexagon Connecting screw included	ø 5.00 ø 3.30 ø 3.75 1.60	ø 6.00 ø 4.10 <sup>ø 5.00</sup> – 8.40 1.60	¢ 7.50 \$.40 \$.00 \$\$ 6.00
	E-MFD-330-50	E-MFD-410-60	E-MFD-500-75
Pre-unloaded millable posts Repositionable With hexagon Connecting screw included	<u>6.15</u> 0 3.30 0 3.75	<u>7.15</u> 0 4.10 0 5.00	<u>8.15</u> 0 5.00 0 6.00
	E-MFP-330-50	E-MFP-410-60	E-MFP-500-75
SIMPLE millable posts Repositionable With hexagon Connecting screw included	ø 3.30 ø 4.40	ø 4.10 ø 5.50	ø 5.00 ø 6.70
	E-MFS-330	E-MFS-410	E-MFS-500
Connecting screw Supplied with the millable posts, it can also be ordered separately as a spare	ľ	Ĩ	Use VM-200
Single pack Pack of 10 pieces	VM-180 VM-180-10	VM-200 VM-200-10	

WARNING: it is recommended always to use test screws for the laboratory phases and to keep the new screw supplied for the final fastening in the mouth.

# Castable posts with alloy base

This solutions combines the simplicity of castable solutions with a gold alloy base that is highly biocompatible and highly resistant to corrosion. The melting point of the alloy is such as to preserve the base against dimensional alterations at the time of overcasting the castable part.



The non repositionable version presents an internal coupling cylinder which guarantees the simple insertion of multiple structures.



implant diameter	ø 3.30 mm and ø 4.10SP mm	ø 3.75 mm and ø 4.10 mm	ø 5.00 mm
Castable posts With premade alloy base for overcasting Repositionable With hexagon Connecting screw included	ø 3.30 ø 3.75 9.50	9.50 9.50 -0.50	ø 5.00 ø 5.20
	E-UC-330-EX	E-UC-410-EX	E-UC-500-EX
Castable posts With premade alloy base for overcasting Non-repositionable Rotating Connecting screw included	o 3.30 <sup>Ø</sup> 3.75 ■ 9.50 1.50 E-UC-330-ROT	9.50 9.50 0.50 E-UC-410-ROT	ø 5.00 <sup>ø</sup> 5.20 ■ 9.50 ■ 0.50 ■ 0.50
Spare castable sleeves for castable posts with alloy bases	ø 3.75 €-UCC-330	ø 4.25 <u>ø 5.00</u> E-UCC-410	و 5.20 ∞ 6.00 E-UCC-500
Connecting screw Supplied with the millable posts, it can also be ordered separately as a spare	ľ		Use VM-200
Single pack Pack of 10 pieces	VM-180 VM-180-10	VM-200 VM-200-10	

WARNING: it is recommended always to use test screws for the laboratory phases and to keep the new screw supplied for the final fastening in the mouth.

For the technical specifications of the gold alloy "1" refer to page 89.

#### **PROSTHETIC COMPONENTS**

# Fully castable posts

Sweden & Martina fully castable posts are made of PMMA, a resin that does not leave any residue during the casting process; like all the prosthetic components, these posts are made by turning too, with consequent respect of micrometric tolerances.





implant diameter	ø 3.30 mm and ø 4.10SP mm	ø 3.75 mm and ø 4.10 mm	ø 5.00 mm
Fully castable posts Repositionable With hexagon Anatomical emergence Connecting screw included	ø 3.30 ø 3.75 E-CCR-330-EX	α 4.10	ø 6.00 ø 5.00 E-CCR-500-EX
Fully castable posts Repositionable With hexagon Straight emergence Connecting screw included	ø 3.30 E-CC-330-EX	-	-
Fully castable posts Non-repositionable Rotating Anatomical emergence Connecting screw included	۵ 3.30 م E-CCR-330-ROT	۵ 5.00 ه 4.10 E-CCR-410-ROT	ø 6.00 ø 5.00 E -CCR-500-ROT
Fully castable posts Non-repositionable Rotating Straight emergence Connecting screw included	ø 3.30 <b>E-CC-330-ROT</b>	-	-
Connecting screw Supplied with the millable posts, it can also be ordered separately as a spare		Ĩ	Use VM-200
Single pack Pack of 10 pieces	VM-180 VM-180-10	VM-200 VM-200-10	

WARNING: it is recommended always to use test screws for the laboratory phases and to keep the new screw supplied for the final fastening in the mouth.

## Prosthesis on intermediate abutments

These abutments are composed of a titanium base, which screws directly onto the implants, characterised by a small upper cone with a height of 0.70 mm, the same for all the connection diameters, which allows easy insertion and removal of the over-structures, even in case of slight disparallelism. Castable sleeves are supplied with the abutment, to be used for modelling and casting the over-structure, and the respective connecting screw. A small hexagon is found at the base of the cone which is used as a "key for screwing" the piece to the implant. To transfer the abutment into the oral cavity each package contains a practical plastic carrier (code AVV-ABUT-DG, not available separately). For the final fixing of the abutments to the implants, instead, use the special key, code AVV2-ABUT, not included in the surgical kits, but in the Screw-Kit of prosthetic drivers, and it can also be ordered separately (see table on page 37).

The torque recommended for fastening the direct screw-retained abutments is 25-30 Ncm.





implant diameter	ø 3.30 mm and ø 4.10SP mm	ø 3.75 mm and ø 4.10 mm	ø 5.00 mm
Standard Abutments Non-repositionable with straight screwing Complete with castable sleeve and respective connecting screw Emergence H. 2.5 mm	φ 4.10 φ 3.30 E-ABUT-330-2.5	ø 4.10 E-ABUT-410-2.5	Use E-ABUT-410-2.5
Standard Abutments Non-repositionable with straight screwing Complete with castable sleeve and respective connecting screw Emergence H. 3.5 mm	¢ 4.10 ¢ 3.30 E-ABUT-330-3.5	e 4.10 F-ABUT-410-3.5	Use E-ABUT-410-3.5
Protection cap for abutments	ø 4.10 4.10 E-ABUT-VT	Use E-ABUT-VT	Use E-ABUT-VT
Spare castable sleeve, for abutments	∞ 4.10 E-ABUT-CC	Use E-ABUT-CC	Use E-ABUT-CC
Universal spare prosthetic screws for fastening the prosthesis to the abutments	M1.4 P 4.20 VABUT	Use VABUT	Use VABUT
Open tray transfer without hexagon, for abutments Connecting screw included	ø 4.10 9.00 <b>E-TRABUT</b>	Use E-TRABUT	Use E-TRABUT
Spare screws for open tray transfer of the abutments	M1.4 VTRABUT	Use VTRABUT	Use VTRABUT
Abutment analogs	ø 4.10t 10.70 E-ANABUT	Use E-ANABUT	Use E-ANABUT

WARNING: it is recommended always to use test screws for the laboratory phases and to keep the new screw supplied for the final fastening in the mouth.

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

## P.A.D. Disparallel Screwed Prosthesis

The P.A.D. systematics (Disparallel Screwed Prosthesis) was 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, in particular, are the simplest and most reliable solution for implants positioned in distal saddles with high inclination. The P.A.D. prosthetic system is very versatile, starting from the wide range of straight abutments (available in various transgingival heights of 1.5, 3 and 4 mm), angled abutments (available with angles of 30° and 17° and transgingival heights of 3 and 5 mm), and a complete line of components necessary for producing the over-structures (transfers, analogues, sleeves, etc.).



The upper cone allows further repositioning of the prosthetic structure by 15° on each side, which in the case of angled P.A.D. abutments are added to the angle of 17° or 30°. This characteristic allows easy management of disparallelism of up to 45° on each side.



implant diameter	ø 3.30 mm and ø 4.10SP mm	ø 3.75 mm and ø 4.10 mm	ø 5.00 mm
Straight P.A.D. abutments Direct screw-retained Transgingival H. 1.5 mm	ی 3.30	ø 4.10. ø 5.00 E-PAD-AD410-15	Use E-PAD-AD410-15
Straight P.A.D. abutments Direct screw-retained Transgingival H. 3 mm	ø 5.00 ø 3.30	ø 5.00 ø 4.10 E-PAD- AD410-30	Use E-PAD-AD410-30
Straight P.A.D. abutments Direct screw-retained Transgingival H. 4 mm	-	ø 5.00 ø 4.10 E-PAD-AD410-40	Use E-PAD-AD410-40
P.A.D. abutment angled at 17° Transgingival H. 3 mm Connecting screw included	ø 5.00 ø 3.30 3.00 2.00 E-PAD-AA330-173	ø 5.00. ø 4.103.00 I I 1.10 E-PAD-AA410-173	Use E-PAD-AA410-173
P.A.D. abutment angled at 17° Transgingival H. 5 mm Connecting screw included	-	ø 5.00 5.00 3.50 E-PAD-AA410-175	Use E-PAD-AA410-175
P.A.D. abutment angled at 30° Transgingival H. 3 mm Connecting screw included	ø 5.00 ø 3.30 3.00 11.20 E-PAD-AA330-303	ø 5.00 ø 4.10	Use E-PAD-AA410-303
P.A.D. abutment angled at 30° Transgingival H. 5 mm Connecting screw included	-	ø 5.00 ø 4.10 5.00 2.50 E-PAD-AA410-305	Use E-PAD-AA410-305
Spare screws for fastening the P.A.D. angled abutments to the implants Supplied with the P.A.D., they can also be ordered separately	ĩ	Ĩ	Use PAD-VM-200
Single pack Pack of 10 pieces	PAD-VM-180 PAD-VM-180-10	PAD-VM-200 PAD-VM-200-10	

To transfer **straight** abutments into the oral cavity each package contains a practical plastic carrier (code AVV-ABUT-DG, not available separately). For fixing the abutments to the implants, instead, use the special driver, code AVV2-ABUT. The torque recommended for fastening the direct screw-retained abutments is 25-30 Ncm.

To transfer **angled** abutments into the oral cavity, a special instrument is available (code PAD-CAR-ABUA), present in the Screw Kit and which can be ordered separately (see page 37). To stabilise the abutment in the instrument a screw must be used (code PAD-VTRAL-140), to be ordered separately. The recommended tightening torque is 20-25 Ncm.

WARNING: it is recommended always to use test screws for the laboratory phases and to keep the new screw supplied for the final fastening in the mouth.

#### **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 when it is necessary to reline an old prosthesis for using as a temporary one. Connecting screw included (code PAD-VP-140), available also as a spare, to be tightened at 20-25 Ncm			
ø 5.00 PAD-CP-EX	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 (code PADVP- 140), available also as a spare, to be tightened at 20-25 Ncm			
ø 3.8010.50 ø 5.003.20 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 (code PAD-VP-140), available also as a spare, to be tightened at 20-25 Ncm regardless of the working phase, because 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)			
M1.4	Spare screw for P.A.D. abutment prosthetic components Also available in packs of 10 pieces (code PAD-VP-140-10)			
PAD-VP-140				

For the technical specifications of the gold alloy "1" and of PMMA, refer to pages 89 and 87 respectively.

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

## P.A.D. components for relining and gluing technique

code	description			
ø 5.00	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			
ø 5.00	Sleeves in Gr. 5 titanium for P.A.D. abutments, with hexagon, non-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 25-30 Ncm			
ø 5.00	Castable posts in PMMA for cementing on titanium sleeves Effective for prosthetisation without residual tensions.			

#### **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.







Image: 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-IV), the castable centring device (PAD-VC-IV) the anti-exception of the "D.P.F." technique.         PAD-IV       Image: PAD-IV         Image: PAD-IV       Spare titanium sleeve for the "D.P.F." technique.         Image: PAD-IV       Spare titanium sleeve for the "D.P.F." technique.         Image: PAD-IV       Spare titanium sleeve for the "D.P.F." technique.         Image: PAD-IV       Spare castable centring device for the "D.P.F." technique.         Image: PAD-IV       Spare castable centring device for the "D.P.F." technique.         PAD-IV       Spare castable centring device for the "D.P.F." technique.         PAD-IV       Spare castable centring device for the "D.P.F." technique.         PAD-IV       Spare castable centring device for the "D.P.F." technique.         PAD-IV       Spare castable centring device for the "D.P.F." technique.         PAD-IV       Spare anti-escape plug for the "D.P.F." technique.         PAD-IR-IV       Spare oring for the "D.P.F." technique.         PAD-ORIMG-IV       Spare screw for PA.D. abutment prosthetic components Also available in packs of 10 pieces (code PAD-VP-140-10)         PAD-VP-140       Castable bar, L. 5 cm, Ø 2.2 mm	code	description			
Image: space stable centring for the "D.P.F." technique.         PAD-CC-IV         Image: space castable centring device for the "D.P.F." technique.         PAD-CC-IV         Image: space castable centring device for the "D.P.F." technique.         PAD-CC-IV         Image: space castable centring device for the "D.P.F." technique.         PAD-TR-IV         Image: space castable centring for the "D.P.F." technique.         PAD-TR-IV         Spare or-ring for the "D.P.F." technique.         PAD-TR-IV         Image: space word provided the packs of 10 pieces (code PAD-VP-140-10)         PAD-VP-140	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 tighte- ned at 20-25 Ncm, available also as a spare.			
a 5.00 3:90   Spare castable centring device for the "D.P.F." technique.   PAD-CC-LV   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 Also available in packs of 10 pieces (code PAD-VP-140-10) PAD-VP-140 Castable bar, L. 5 cm, 0.2.2 mm	ø 5.00PAD-CT-LV	Spare titanium sleeve for the "D.P.F." technique. The pack does not include the connecting screw.			
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 Also available in packs of 10 pieces (code PAD-VP-140-10) PAD-VP-140 Castable bar, L. 5 cm, Ø 2.2 mm	ø 5.00 3.90 PAD-CC-LV	Spare castable centring device for the "D.P.F." technique.			
Spare o-ring for the "D.P.F." technique.         PAD-ORING-LV         M1.4         M1.4         PAD-VP-140         Spare screw for P.A.D. abutment prosthetic components Also available in packs of 10 pieces (code PAD-VP-140-10)         PAD-VP-140         Castable bar, L. 5 cm, Ø 2.2 mm	ø 5.00 4.00 PAD-TR-LV	Spare anti-escape plug for the "D.P.F." technique.			
Spare screw for P.A.D. abutment prosthetic components Also available in packs of 10 pieces (code PAD-VP-140-10) PAD-VP-140 Castable bar, L. 5 cm, Ø 2.2 mm	O PAD-ORING-LV	Spare o-ring for the "D.P.F." technique.			
Castable bar, L. 5 cm, Ø 2.2 mm	M1.4	Spare screw for P.A.D. abutment prosthetic components Also available in packs of 10 pieces (code PAD-VP-140-10)			
BARC	BARC	Castable bar, L. 5 cm, Ø 2.2 mm			

# Individualised prosthesis Echo2

In case of an individualised prosthesis, maximum aesthetics and design flexibility are obtained with ECHO individual posts and with ECHO Direct Bridges, designed using the CAD-CAM technique and produced 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 completely made of zirconium oxide are also available, which are the most advanced individualised solution today since they present many advantages in terms of translucence of restoration, extreme customisation of the product, biocompatibility and absence of corrosion in the oral cavity, maximum connection precision, excellent resistance to occlusal loads, less invasiveness thanks to the perfect adaptation to the tissues and reduced session times.

All the individual components (posts, Direct Bridges, etc.) are sold complete with the necessary connecting screws. For zirconium components a washer is also supplied, made of a special high-resistance polymer to be placed between the head of the screw and its stop, with the function of absorbing and distributing forces between the parts. Screws and Peek washers are also available as spares.

The aluminium Scan-transfer is available for scanning (code E-CAMETRA330 and E-CAMETRA410, details on page 70).







- milled cobalt chrome
- milled bio-titanium
- PMMA
- fibreglass

#### **PROSTHETIC COMPONENTS**

implant diameter	ø 3.30 mm and ø 4.10SP mm	ø 3.75 mm and ø 4.10 mm	ø 5.00 mm
ECHO Scan Transfer for implants (in aluminium ERGAL 7075) Connecting screw included	E-CAMETRA330	E-CAMETRA410	Utilizzare E-CAMETRA410
		L-CAIME INA410	
Spare screws for ECHO Scan Transfer for implants		Ĭ	Use VM-200
Single pack Pack of 10 pieces	VM-180 VM-180-10	VM-200 VM-200-10	
Spare screws for fastening ECHO individual posts and prosthetic over- structures in zirconium oxide directly on implants (in Gr. 5 titanium, complete with lock ring washer)	-	E-CAMTVABU200	-
Spare screws for fastening ECHO individual posts and prosthetic over- structures in titanium and cobalt chrome directly on implants	Use VM-180	Use VM-200	Use VM-200
Spare screws for fastening ECHO prosthetic over-structures in zirconium oxide directly on P.A.D. abutments (in Gr. 5 titanium, complete with lock ring washer)	M1.4 T	Use PAD-VCAM-140	Use PAD-VCAM-140
Spare screws for fastening ECHO prosthetic over-structures in titanium and cobalt chrome on P.A.D. abutments	M1.4 PAD-VP-140	Use PAD-VP-140	Use PAD-VP-140
Spare lock ring washers for the head of the spare connecting screw, for ECHO individual posts in zirconium (in Classic Peek ).	0	Use CAMPRON205-10	Use CAMPRON205-10
Pack of 10 pieces	CAMPRON205-10		

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

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





# **T-Connect**

T-Connect supports can be used for making individual prostheses in zirconium with open CAD-CAM systems, including Echo2 by Sweden & Martina, without sacrificing micrometric precision in the join between the platforms that can be obtained with traditional components. Users of Echo2 can also choose to use T-Connect supports: the zirconium posts obtained in this way require a small support base in titanium which avoids contact between the zirconium oxide body and the implant platform.

For further information on the compatible systems, contact the CAD-CAM product specialist at Sweden & Martina.



WARNING: it is recommended always to use test screws for the laboratory phases and to keep the new screw supplied for the final fastening in the mouth.

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

#### **PROSTHETIC COMPONENTS**

### 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; given the limited amount of space occupied, Locator abutments are perfect for patients with a removable prosthesis.

These abutments are made of Gr. 5 titanium and are available in different transgingival heights. The Locators are tightened at a torque of 25-30 Ncm using the special driver to be ordered separately (code 8926-SW, short, and code 8927-SW, long).








Retainers with different flexibilities are available for easily inserting into the steel cap with the use of a practical instrument for retainer insertion. The different retentive capacities are easily identified based on a colour code. The blue, pink and transparent retainers can be used on implants with angles of up to 10°; orange, red and green retainers are used on implants with an angle between 10° and 20°.

\* 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.

#### **PROSTHETIC COMPONENTS**

implant diameter	ø 3.30 mm and ø 4.10SP mm	ø 3.75 mm and ø 4.10 mm	ø 5.00 mm
Locator abutment* Transgingival H. 1 mm	1773	1741	Use 1741
Locator abutment* Transgingival H. 2 mm	1774	1742	Use 1742
Locator abutment* Transgingival H. 3 mm	1775	1743	Use 1743
Locator abutment* Transgingival H. 4 mm	_	1744	Use 1744

\* 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.

#### Impression taking







code	description
8505	Pack of 4 aluminium transfers for Locator abutments, one size for all platforms, and 4 black polyethylene retainers (LDPE 993I) with low retention included (code 8515). The retainers are also available as spares
8515	Pack of 4 black polyethylene retainers (LDPE 993I) with low retention capacity for impression taking
8517	Pack of 4 black nylon parallelism pins (LDPE 9931) for Locator abutments
•\\\ ///•	Steel plate AISI 316L for measuring angles
9530	

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

code	description
<ul> <li></li></ul>	Kit containing 2 Gr. 5 <b>titanium</b> caps, 2 spacer rings in silicon rubber, 2 black polyethylene retainers (LDPE 993I) with low retention capacity for impression taking and 2 nylon retainers for each of the 4 different retention capacities, designed for slight disparallelism (up to 10°)
8540-2	Kit containing 2 Gr. 5 <b>titanium</b> caps, 2 spacer rings in silicon rubber, 2 black polyethylene retainers (LDPE 993I) with low retention capacity for impression taking and 2 nylon retainers for each of the 4 different retention capacities, designed for severe disparallelism (between 10° and 20°)
<ul> <li></li></ul>	Kit containing 2 <b>stee</b> l caps, 2 spacer rings in silicon rubber, 2 black polyethylene retainers (LDPE 993I) with low retention capacity for impression taking and 2 nylon retainers for each of the 4 different retention capacities, designed for slight disparallelism (up to 10°))
<b>0</b> 8514	Pack of 20 spacer rings in silicon rubber, for the prosthesis relining phase
8515	Pack of 4 black polyethylene retainers (LDPE 993I) with low retention capacity for impression taking
<b>8524</b>	Pack of 4 transparent nylon retainers, retention 5 lb corresponding to 2268 g for slight disparallelism (up to 10°)
Ø 8527	Pack of 4 pink nylon retainers, retention 3 lb corresponding to 1361 g for slight disparallelism (up to 10°)
8529	Pack of 4 blue nylon retainers, retention 1.5 lb corresponding to 680 g for slight disparallelism (up to 10°)
8547	Pack of 4 green nylon retainers, retention 4 lb corresponding to 1814 g for severe disparallelism between 10° and 20°)
8548	Pack of 4 red nylon retainers, retention 1 lb corresponding to 450 g for severe disparallelism between 10° and 20°)
8915	Pack of 4 orange nylon retainers, retention 2 lb corresponding to 907 g for severe disparallelism between 10° and 20°)

\* 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
<b>€ € € € € € € € € € € € € € € € € € € </b>	Locator Core Tool. Steel instrument composed of: - handle - driver (8390) for screwing Locator abutments. - push-rod (8397) for inserting retainers into the caps - spare (8394) for Locator Core Tool retainer
8397	Steel push rod for inserting the retainers in the caps. Not necessary for those who already own or order the complete Locator Core Tool separately
8390	Steel driver for abutment screwing/unscrewing. Not necessary for those who already own or order the Locator Core Tool separately
8394	Retention jacket for the driver (8390) for transferring the Locator abutments into the oral cavity

### Overdentures anchored with ball attachments

These attachments have a small hexagon at the base of the ball for engaging the driver (N.B.: the driver code BASCC-EX is not included in the surgical kit, it is in the Screw Kit and may be ordered separately). This driver is compatible with the system's dynamometric ratchet.





implant diameter	ø 3.30 mm and ø 4.10SP mm	ø 3.75 mm and ø 4.10 mm	ø 5.00 mm
Ball attachment Transgingival H. 1 mm	ø 2.20 ø 3.30   1.00	ø 2.20 ø 4.10	Use E-AS-410-1
	E-AS-330-1	E-AS-410-1	
Ball attachment Transgingival H. 2 mm	ø 2.20 ø 3.30	ø 2.20 ø 4.10	Use E-AS-410-2
	E-AS-330-2	E-AS-410-2	
Ball attachment Transgingival H. 4 mm	ø 2.20 ø 3.30 4.00	© 2.20 © 4.10 ↓ 4.00	Use E-AS-410-4
Analog of the ball attachment	ANAS	Use ANAS	Use ANAS

code	description
	Steel driver for ball attachments, with connector for dynamometric ratchet or digital connector. (Not included in the surgical kit, included in the Screw Kit and can be ordered separately.)
BASCC-EX	

Recommended tightening torque: 25-30 Ncm.

## Accessories for overdentures on ball attachments

#### Polyamide caps for ball attachments

code	description
	Polyamide cap for ball attachments Ø 2.20 mm
CAP-TFL-1	
	Steel container for polyamide cap with outer Ø 4.80 mm. The total height is 3.20 mm
CONT-CAP-TFL-1	

#### Titanium caps for ball attachments

code	description
rife and the second sec	Gr. 5 titanium cap complete with cap in two parts, titanium retention spring, and plastic mounting ring for ball attachments Ø 2.20 mm. The total height is 3.20 mm
AN-CAP-TIT-1	Spare plastic ring for titanium cap height 2.20 mm
MOL1-CAP-TIT-1	Spare retention spring for titanium caps, average hardness, steel, Ø 3.20 mm
MOL2-CAP-TIT-1	Spare retention spring for titanium cap, soft, for progressive adaptation of the prosthesis, steel, Ø 3.20 mm
AVV-CAP-TIT-1	Instrument for assembling and maintaining the titanium CAP-TIT-1

#### Caps in gold alloy for ball attachments

code



Cap in gold alloy, complete with plastic positioning ring for ball attachments Ø 2.20 mm. The total height is 3.00 mm, and the outside diameter is 3.50 mm

description



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

code	description
99-440044*	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
0	Red ring in silicon for laboratory use, outside Ø 4.50 mm, height 1.50 mm. Pack of 12 pieces
99-443034*	
0	White ring in natural rubber, soft, outside Ø 4.50 mm, height 1.50 mm. Pack of 12 pieces
99-443035*	
0	Black ring in natural rubber, hard, outside Ø 4.50 mm, height 1.50 mm. Pack of 12 pieces
99-443036*	

\* The retention O-ring 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.l., via Passanti 332, 84018 Scafati (SA) Italy.

### Overdentures on bars



#### **PROSTHETIC COMPONENTS**

### SFI-Bar

The total removable prosthesis supported by implants is acquiring more and more importance in prosthetic restorations. To enable patients to enjoy a substantially better quality of life on a long-term basis thanks to optimum retention, the principle of treatment with bars on implants has been radically reviewed, creating the SFI-Bar. The result is an exclusive solution that offers numerous clinical and economic advantages for patients, dentists and dental technicians in comparison with conventional bars.

The abutment driver for the SFI-Bar can be ordered separately, with code 07000046-SW. This driver is compatible with the system's dynamometric ratchet.

See pages 84-85 for the list of accessories available.

**Chair-side and lab-side processing:** Thanks to the extremely reduced production times, the SFI-Bar can be processed either chair-side or in the laboratory. In both cases the exclusive bar system with prefabricated elements is convincing for its almost universal possibilities of use, with costs reduced to a minimum in comparison with the traditional bar solution.

The bar prostheses made with the SFI-Bar can be supported by 3, 4, 5 or 6 implants, they take up less space in the mouth and present characteristics of biocompatibility. In case of repair it is possible to replace the individual elements without any problems.



**Immediate loading:** SFI-Bar offers the ideal basis for carrying out the immediate loading treatment, which exploits the complete absence of stress that can be obtained with this prosthetic protocol. This improves acceptance of the prosthesis by the patient and creates the conditions for optimum osseointegration.

**Passive Fit:** The stress-free position of a bar treatment is a fundamental requirement for the long-term clinical success of a prosthesis supported by implants. SFI-Bar offers the ideal basis for carrying out the immediate loading treatment, which exploits the complete absence of stress that can be obtained with this prosthetic protocol.





implant diameter	ø 3.30 mm and ø 4.10SP mm	ø 3.75 mm and ø 4.10 mm	Ø 5.00 mm
Abutment for SFI-Bar Transgingival H. 4 mm	-	05001182	-
Abutment for SFI-Bar Transgingival H. 5 mm	-	05001183	-
Abutment for SFI-Bar Transgingival H. 6 mm	-	05001184	-

Recommended tightening torque: 25-30 Ncm.

The components for SFI-Bar prostheses are medical devices manufactured by Cendres+Métaux, Rue de Boujean 122 CH-2501 Biel/Bienne.

#### **OVERDENTURES**

code	description	material	pack
05000337	Prosthetization kit on 2 implants, including: 2 large ball connectors, 2 connecting screws, 1 tubular bar	Gr. 5 titanium	
05000338	Prosthetization kit on 4 implants, including: 2 large ball connectors, 2 small ball connectors, 2 hemispherical shells, 4 connecting screws, 3 tubular bars	Gr. 5 titanium	
05000668	Additional prosthetization kit, including: 1 large ball connector, 1 connecting screw, 2 tubular bars	Gr. 5 titanium	
05000382	Tubular bar L. 20 mm	Gr. 5 titanium	
05000383	Large ball connector	Gr. 5 titanium	
05000384	Small ball connector	Gr. 5 titanium	
05000385	Hemispherical shell	Gr. 5 titanium	
05000386	Connecting screw	Gr. 5 titanium	
05000344	Asymmetrical female L. 50 mm	gold alloy "2"	1 piece
05000358	Female complete with sheaths L. 47.5 mm	grade 5 titanium and plastic material	1 bar with 12 segments, 6 yellow sheaths 6 red sheaths
05000387	Female L. 47.5 mm	Gr. 5 titanium	1 bar with 12 seg- ments
05000388	Yellow retentive sheath – low retention	plastic material	6 pieces
05000389	Red retentive sheath — medium retention	plastic material	6 pieces
05000390	Green retentive sheath – high retention	plastic material	6 pieces

#### Instruments

code	description
0700118	Instruments kit
052082	Brass wire for resilience To be inserted between the bar and the female during polymerisation to ensure a vertical translation of the prosthesis
07000107	Transfer axis L. 26 mm
07000106	Tube guide

	translation of the prosthesis	
07000107	Transfer axis L. 26 mm	
07000106	Tube guide	
07000100	Guide for cutting tubular bars	
07000114	Flathead screwdriver for screwing the abutments onto the implants	
07000115	Allen screwdriver for screwing the connecting screws onto the abutments	
070221	Thomas key	
07000036	Positioning pin for sheaths	
070198	Set of activators for Elitor females	
070201	Macro deactivator for Elitor females	
070347	Forceps	
07000111	Implant planner	
08000101	Discs for cutting tubular bars	

#### Sweden & Martina auxiliary instruments



#### **MATERIAL COMPOSITION**

GRADE 4 TITANIUM (cold worked)*	Element	Maximum allowed values (%)	Tolerance
Chemical composition:	Nitrogen	0.05	+/- 0.02
	Carbon	0.08	+/- 0.02
	Hydrogen	0.015	+/- 0.002
	Iron	0.50	+/- 0.01 (%<0.25)
			+/- 0.15 (%>0.25)
	Oxygen	0.40	+/- 0.02 (%<0.20)
			+/- 0.03 (%>0.20)
	Titanium	remainder	-

Mechanical properties*	Minimum allowed values	
Tensile stress:	680 MPa (N/mm²)	
Yield strength (0.2%):	520 MPa (N/mm <sup>2</sup> )	
Elongation at yield:	15 %	
Section reduction:	25 %	

\* This technical information complies with the express specifications of the regulations in force for the use of grade 4 titanium in implantology:

• ASTM F67-06: Standard Specification for unalloyed titanium, for surgical implant applications.

• ISO 5832-2:1999: Implant for surgery – Metallic materials – Part 2: Unalloyed titanium.

**Please note:** the use of bars obtained from cold processing, for the production of Sweden & Martina Spa implants, allows the exploitation of the mechanical characteristics of tensile strength and yield strength about 15% higher than those that can be obtained with a hot process (respectively 550 MPa and 483 MPa).

GRADE 5 TITANIUM	Element	Maximum allowed values (%)	Tolerance
Chemical composition:	Nitrogen	0.05	+/- 0.02
	Carbon	0.08	+/- 0.02
	Hydrogen	0.012	+/- 0.002
	Iron	0.25	+/- 0.10
	Oxygen	0.13	+/- 0.02
	Aluminium	0.50÷6.50	+/- 0.40
	Vanadium	3.50÷4.50	+/- 0.15
	Titanium	remainder	-

Mechanical properties*	Minimum allowed values
Tensile stress (for bar diameters up to 44.45 mm):	860 MPa (N/mm <sup>2</sup> )
Yield strength (0.2%):	795 MPa (N/mm²)
Elongation at yield:	10 %
Section reduction:	25 %

\* This technical information complies with the express specifications of the regulations in force for the use of grade 5 titanium in implantology:

• ASTM F136-11: Standard Specification for wrought Titanium-6Aluminum-4Vanadium ELI (Extra low Interstitial) Alloy for surgical implant applications;;

• ISO 5832-3:1996: Implants for surgery – Metallic materials – Part 3: Wrought titanium 6-aluminium 4-vanadium alloy.



DIVIVIV	

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	>° 08<
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

Colour         Natural opaque           Physical and mechanical properties         1.41 g/cm³           Density (DIN S3 479):         1.41 g/cm³           Tensile strength (DIN EN ISO 527-2)         67 Mpa           Elongation at yield (DIN EN ISO 527-2):         9%           Elongation at yield (DIN EN ISO 527-2):         32 %           Modulus of elasticity (flexural test) (DIN EN ISO 527-2):         32 %           Modulus of elasticity (tensural test) (DIN EN ISO 527-2):         2800 Mpa           Modulus of elasticity (tensural test) (DIN EN ISO 527-2):         2800 Mpa           Modulus of elasticity (tensural test) (DIN EN ISO 527-2):         2800 Mpa           Modulus of elasticity (tensural test) (DIN EN ISO 527-2):         2800 Mpa           Modulus of elasticity (tensural test) (DIN EN ISO 527-2):         2800 Mpa           Impact strength (Charyo) (DIN EN ISO 752-2):         2800 Mpa           Modulus of elasticity (tensural test) (DIN EN ISO 752-2):         Not broken           Compression modulus (EN ISO 604):         2300 Mpa           Thermal properties         32 %           Meling temperature (DIN 53765):         166 °C           Glass transition temperature (DIN 53765):         -60 °C           Service temperature long term:         100 °C           Specific heat (ISO 22007-4):         1.40 v/G	Chemical designation	Polyoxymethylene (copolymer)
Physical and mechanical properties           Density (DIN 53479):         1.41 g/cm <sup>3</sup> Tensile strength (DIN EN ISO 527-2)         67 Mpa           Elongation at yield (DIN EN ISO 527-2):         9%           Elongation at yield (DIN EN ISO 527-2):         9%           Elongation at treak (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 (Chargy) (DIN EN ISO 179-1eU):         Not broken           Compression modulus (EN ISO 604):         2300 Mpa           Thermal properties         166 °C           Glass transition temperature (DIN 53765):         -60 °C           Service temperature (DIN 53765):         166 °C           Service temperature (IN 53765):         -60 °C           Service temperature (IN 53765):         -60 °C           Service temperature long term:         100 °C           Specific heat (ISO 22007-4):         1.4 J/(gK)           Thermal expansion (CLTE) 23-60°C (DIN EN ISO 11359-1;2):         3.30 W (mK)           Thermal expansion (CLTE) 23-100°C (DIN EN ISO 11359-1;2):         13-10°/K           Thermal expansion (CLTE) 23-100°C (DIN EN ISO 1135	Colour	Natural opaque
Density (DIN 53479):         1.41 g/cm <sup>3</sup> Tensile strength (DIN EN ISO 527-2)         67 Mpa           Elongation at yield (DIN EN ISO 527-2):         9%           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 527-2):         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 649):         2300 Mpa           Termal properties         3200 Mpa           Melting temperature (DIN 53765):         166 °C           Glass transition temperature (DIN 53765):         -60 °C           Service temperature Iong term:         100 °C           Service temperature long term:         0.39 W/(mK)           Thermal conductivity (ISO 22007-4):         1.4 J/(gK)           Thermal expansion (CLTE) 23-60°C (DIN EN ISO 11359-1;2):         13:10 <sup>3</sup> /K           Thermal expansion (CLTE) 23-100°C (DIN EN ISO 11359-1;2):         13:10 <sup>3</sup> /K           Thermal expansion (CLTE) 23-100°C (DIN EN ISO 11359-1;2):         13:10 <sup>3</sup> /K	Physical and mechanical properties	
Tensile strength (DIN EN ISO 527-2)       67 Mpa         Enoration at yield (DIN EN ISO 527-2):       9%         Elongation at yield (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         Inpact strength (Charpy) (DIN EN ISO 179-1eU):       Not broken         Compression modulus (EN ISO 604):       2300 Mpa         Thermal properties       166 °C         Glass transition temperature (DIN 53765):       166 °C         Service temperature (DIN 53765):       60 °C         Service temperature Iong term:       140 °C         Service temperature (DIN 53765):       1.41 //(gK)         Thermal conductivity (ISO 22007-4):       0.39 W/ (mK)         Thermal expansion (CLTE) 23-60°C (DIN EN ISO 11359-1;2):       13·10° /K         Thermal expansion (CLTE) 23-100°C (DIN EN ISO 11359-1;2):       13·10° /K         Thermal expansion (CLTE) 23-100°C (DIN EN ISO 11359-1;2):       13·10° /K         Thermal expansion (CLTE) 23-100°C (DIN EN ISO 11359-1;2):       13·10° /K         Thermal expansion (CLTE) 23-100°C (DIN EN ISO 11359-1;2):       13·10° /K	Density (DIN 53479):	1.41 g/cm <sup>3</sup>
Tensile strenght at yield (DIN EN ISO 527-2):         9%           Elongation at yield (DIN EN ISO 527-2):         32 %           Bodulus 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 (SO 2039-1):         165 MPa           Inpact strength (Charpy) (DIN EN ISO 179-1eU):         Not broken           Compression modulus (EN ISO 604):         2300 Mpa           Tennal properties         2300 Mpa           Melting temperature (DIN 53765):         166 °C           Glass transition temperature (DIN 53765):         600 °C           Service temperature ong term:         100 °C           Service temperature (DIN 53765):         1.4 J/(gK)           Thermal conductivity (ISO 22007-4):         0.39 W/ (mK)           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           Thermal expansion (CLTE) 23-100°C (DIN EN ISO 11359-1;2):         14-10 <sup>5</sup> /K	Tensile strength (DIN EN ISO 527-2)	67 Mpa
Elongation at yield (DIN EN ISO 527-2):         32 %           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         166 °C           Glass transition temperature (DIN 53765):         166 °C           Glass transition temperature (DIN 53765):         166 °C           Service temperature soft term:         100 °C           Service temperature long term:         100 °C           Specific heat (ISO 22007-4):         1.4 J/(gK)           Thermal expansion (CLTE) 23-60°C (DIN EN ISO 11359-1;2):         13-10 <sup>3</sup> /K           Thermal expansion (CLTE) 23-100°C (DIN EN ISO 11359-1;2):         13-10 <sup>3</sup> /K           Thermal expansion (CLTE) 23-100°C (DIN EN ISO 11359-1;2):         140''K           Chemical properties         0.50000''	Tensile strenght at yield (DIN EN ISO 527-2)	67 Mpa
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         32 %           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 expansion (CLTE) 23-60°C (DIN EN ISO 11359-1;2):         13-10 <sup>5</sup> /K           Thermal expansion (CLTE) 23-60°C (DIN EN ISO 11359-1;2):         13-10 <sup>5</sup> /K           Thermal expansion (CLTE) 23-60°C (DIN EN ISO 11359-1;2):         13-10 <sup>5</sup> /K	Elongation at yield (DIN EN ISO 527-2):	9%
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         2300 Mpa           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 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):         13·10 <sup>5</sup> /K	Elongation at break (DIN EN ISO 527-2):	32 %
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 <b>Thermal properties</b> 2800 °C           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 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	Modulus of elasticity (flexural test) (DIN EN ISO 178):	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 <b>Thermal properties</b> 166 °C           Glass transition temperature (DIN 53765):         -60 °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 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         0.39 W/ (mK)	Modulus of elasticity (tensile test) (DIN EN ISO 527-2):	2800 MPa
Impact strength (Charpy) (DIN EN ISO 179-1eU):         Not broken           Compression modulus (EN ISO 604):         2300 Mpa <b>Thermal properties</b> 166 °C           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 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           Thermal expansion (CLTE) 23-100°C (DIN EN ISO 11359-1;2):         14-10 <sup>5</sup> /K	Ball indentation hardness (ISO 2039-1):	165 MPa
Compression modulus (EN ISO 604):       2300 Mpa         Thermal properties       166 °C         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 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       0.2010 (0)	Impact strength (Charpy) (DIN EN ISO 179-1eU):	Not broken
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       0.50°10′(m)	Compression modulus (EN ISO 604):	2300 Mpa
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           Chemical properties         0.25//0.100	Thermal properties	
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         Chemical properties       14/10 <sup>-5</sup> /K	Melting temperature (DIN 53765):	166 °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         201/(021/(0205)/(DN EN ISO 1020))	Glass transition temperature (DIN 53765):	-60 °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	Service temperature short term:	140 °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	Service temperature long term:	100 °C
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         0.25/0.100 C (DIN EN ISO 0.000 C (DIN E	Specific heat (ISO 22007-4):	1.4 J/(gK)
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       0.05/(0.100)         White the still add (0.05) (0.000)       0.05/(0.100)	Thermal conductivity (ISO 22007-4):	0.39 W/ (mK)
Thermal expansion (CLTE) 23-100°C (DIN EN ISO 11359-1;2):         14·10 <sup>-5</sup> /K           Chemical properties         2011 (2012) (2014) (20	Thermal expansion (CLTE) 23-60°C (DIN EN ISO 11359-1;2):	13·10 <sup>-5</sup> /K
Chemical properties	Thermal expansion (CLTE) 23-100°C (DIN EN ISO 11359-1;2):	14·10 <sup>-5</sup> /K
	Chemical properties	
vvater absorption 24n / yon (23°C) (UIN EN ISO 62) 0.05/0.1%	Water absorption 24h / 96h (23°C) (DIN EN ISO 62)	0.05/0.1%

#### **COMPOSIZIONE DEI MATERIALI**

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 %	-
lr	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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