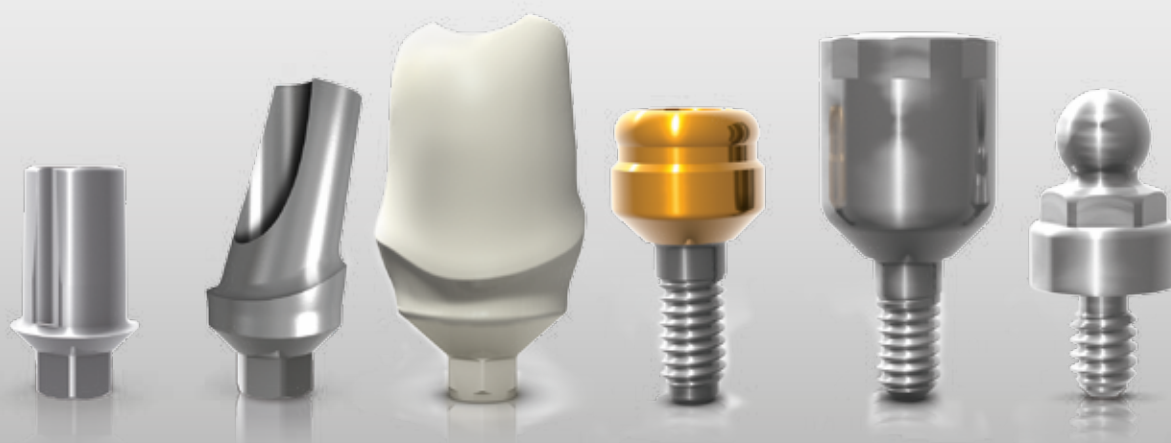




PROSTHODONTIC MANUAL

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The present Prosthetic Manual shall supersede all previous versions.
The manufacturer can accept no liability for any damage or injury resulting from failure to observe these instructions.

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¹ DALBO® is a registered trademark of Cendres & Métaux SA, Biel/Bienne, Switzerland

²Locator® is a registered trademark of Zest Anchors Inc., CA, USA

1. BEGO SEMADOS® IMPLANTS

A high-performance implant system
for all standard indications

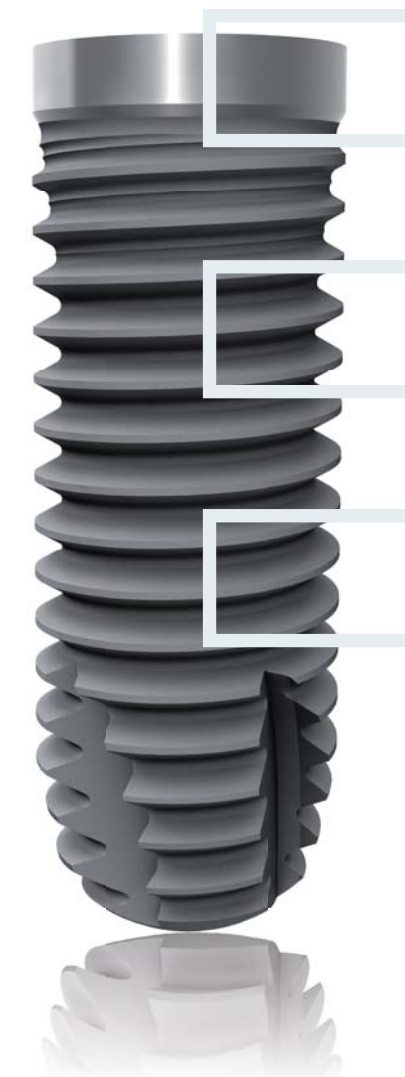
**BEGO Semados® implants: the last word in modern
and cost-effective dental implantology!**

- Cost-effective
- Simple to use
- Practical
- Quality product manufactured entirely in Germany
- Clinically tested
- Versatile

1.1 BEGO Semados® S implants – “The All-Rounders”

Since 1993 the preferred system for long-term success!

- Made of Grade 4 commercially pure titanium (ASTM F-67)
- Diameters: 3.25 · 3.75 · 4.1 · 4.5 · 5.5 mm
- Lengths: 7 · 8.5 · 10 · 11.5 · 13 · 15 mm
- Excellent osseointegration
- High-purity blasted and etched TiPure^{Plus} surface
- Rounded apex to protect anatomical structures



Machined shoulder

- Minimisation of marginal bone resorption
- Irritation-free mucosal apposition

Surface

- TiPure^{Plus}

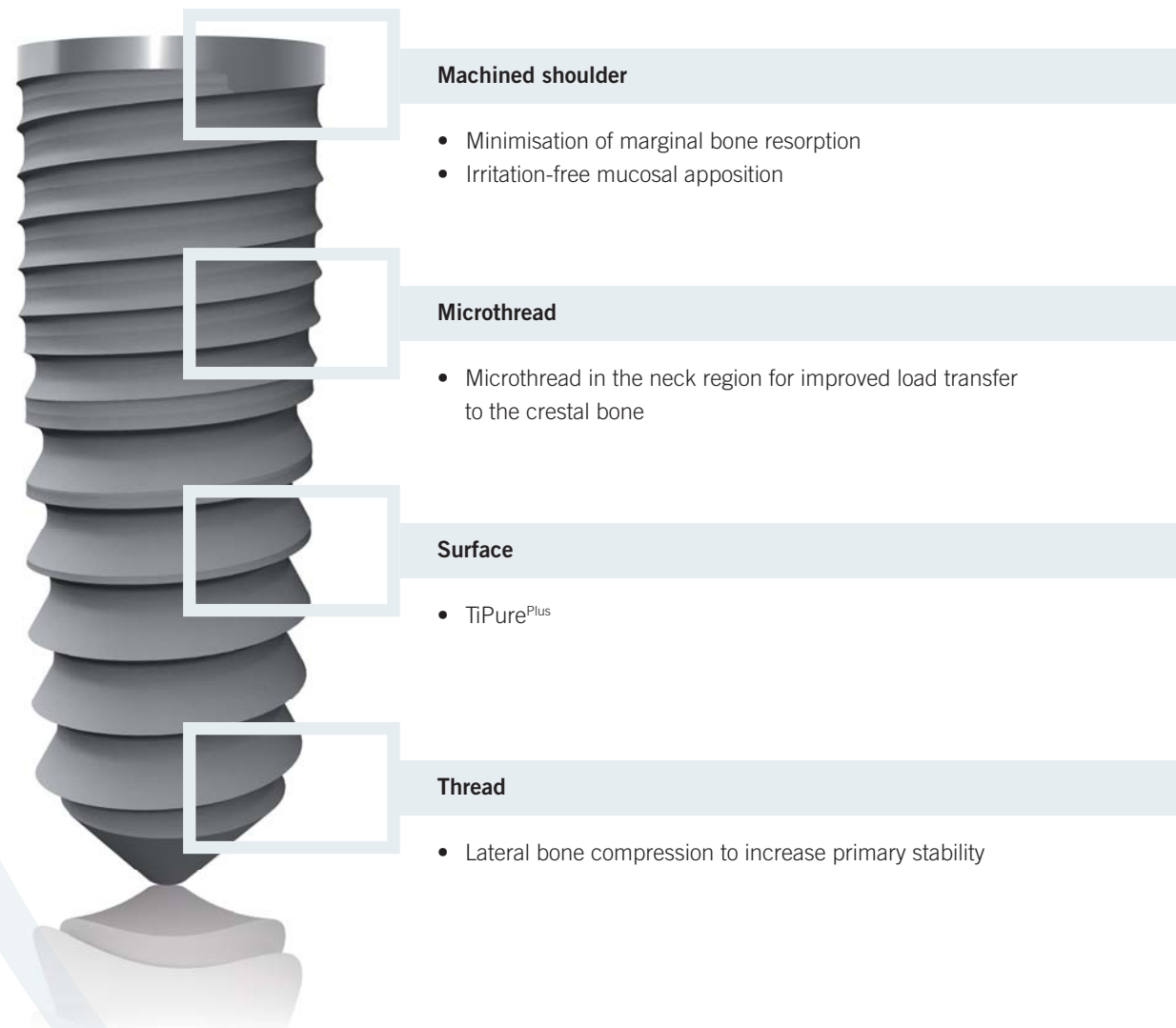
Thread

- Self-tapping thread

1.2 BEGO Semados® RI implants – “The Specialists”

**BEGO Semados® RI Implants – The preferred system
for poor bone condition and other cases
when primary stability is particularly important!**

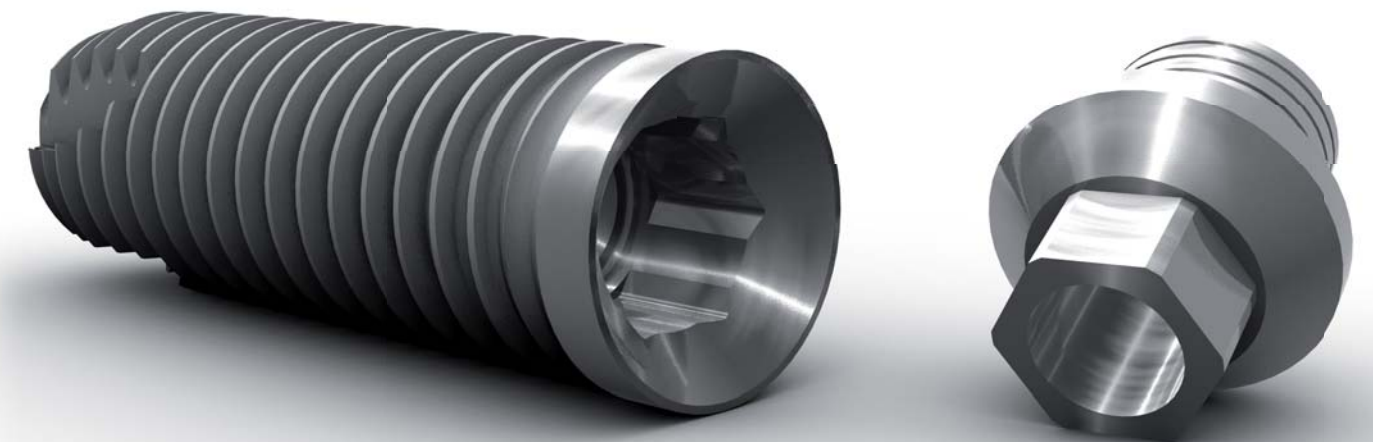
- Made of Grade 4 commercially pure titanium (ASTM F-67)
- Root shape diameters: 3.75 · 4.1 · 4.5 · 5.5 mm
- Lengths: 8.5 · 10 · 11.5 · 13 · 15 mm
- Excellent osseointegration
- High-purity, blasted and etched TiPure^{Plus} surface
- Bone-condensing



1.3 Implant-prosthesis interface

The high-performance implant-prosthesis interface

- Threaded connection for limited removal of the prosthesis
- Abutment elements protected from rotation by internal Hex
- Stable connection without micromovements
- Internal taper for gap-free seating of the abutment elements for excellent bacterial resistance



1.4 BEGO Semados® Mini implants – “The Narrow Ridge Experts”

The economical implant system

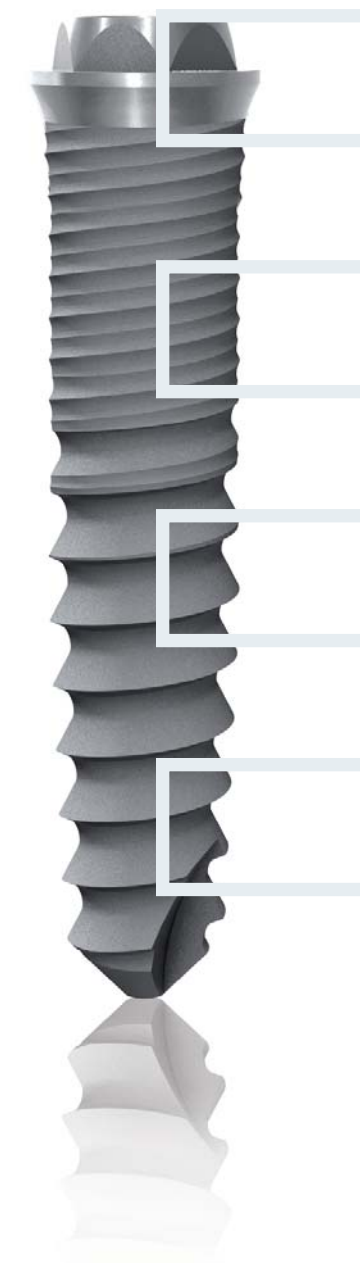
- Permanent restoration of edentulous, atrophied alveolar ridges with prefabricated bar system
- Shorter treatment time thanks to avoidance of time-consuming augmentation
- Low-cost form of treatment
- Strong, prosthetic solutions using Wirobond® MI abutments
- Single tooth and ball attachment restorations possible with implant diameters of 2.9 and 3.1 mm

BEGO Semados® Mini implants: the last word in modern and cost-effective dental implantology!

- Cost-effective
- Simple to use
- Practical
- Quality product manufactured entirely in Germany
- Clinically tested
- Versatile

The system of choice for narrow alveolar ridges and when primary stability is particularly important!

- Made of Grade 4 commercially pure titanium (ASTM F-67)
- Root shape diameters: 2.7 · 2.9 · 3.1 mm
- Lengths: 11.5 · 13 · 15 mm
- Excellent osseointegration
- High-purity blasted and etched TiPure^{Plus} surface
- Bone-condensing



Strong implant-abutment connection

- External taper with Hex connection for correction of implant angulations

Microthread

- Microthread in the neck region for improved load transfer to the crestal bone

Surface

- TiPure^{Plus}

Thread

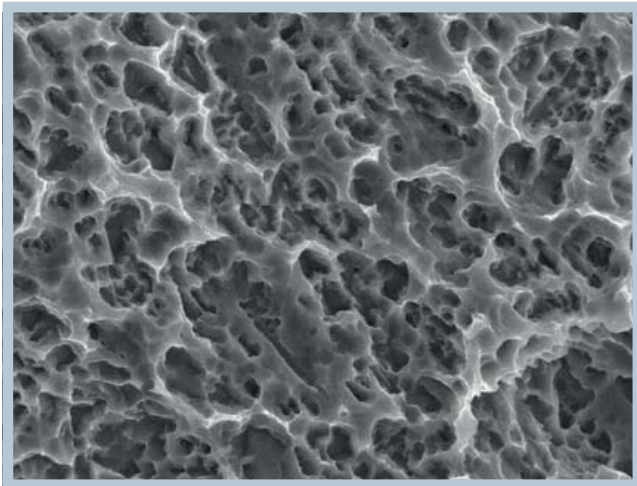
- Lateral bone compression to increase primary stability

2. PROSTHODONTIC BEGO SEMADOS® S/RI-LINE (SUB SYSTEM)

1.5 TiPure^{Plus} – The high-purity BEGO implant surface

The key feature of the TiPure^{Plus} surface is its outstanding purity. The level of surface purity exceeds 98%. The necessary tests were successfully performed at the University of Athens in 2007.

This means that when it comes to purity, the surface of BEGO implants is one of the top systems in the world. The surface configuration was designed to promote very rapid bone healing, a significant increase in surface area and a particularly high level of protein binding. Studies at the University of Düsseldorf showed an impressive bone coverage rate on animal models of over 80% after just 12 weeks.



- Ultra-homogeneous surface structure
- High-purity surface (> 98%)
- High protein-binding capacity for rapid bone healing
- High bone coverage rate for reliable osseointegration
- No etched grain boundaries, so the risk of material failure is minimised
- Rapid adhesion of osteogenic cells
- Optimised surface morphology for a strong bond between implant and bone

2.1 Examples of restoration with BEGO Semados® S or RI-Line (Sub system)

2.1.1 Single tooth replacement		
		BeCe Sub-Tec ceramic abutment
		Sub-Tec titanium abutment, conical
		Sub-Tec ^{Plus} abutment, Wirobond® MI or titanium
		Sub-Tec ^{Plus} angulated abutment 15° or 20° Wirobond® MI or titanium
		Sub-Tec Universal
		Sub-Tec gold cast-on
		Sub-Tec CAD/CAM titanium adhesive abutment

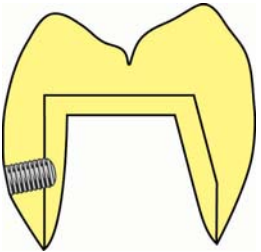
2.1.2 Bridges		
		BeCe Sub-Tec ceramic abutment
		Sub-Tec titanium abutment, conical
		Sub-Tec ^{Plus} abutment, Wirobond® MI or titanium
		Sub-Tec ^{Plus} angulated abutment 15° or 20° Wirobond® MI or titanium
		Sub-Tec Universal
		Sub-Tec gold cast-on
		Sub-Tec Universal no Hex
		Sub-Tec gold cast-on no Hex
		Sub-Tec CAD/CAM titanium adhesive abutment
		Sub-Tec Wirobond® MI laser base

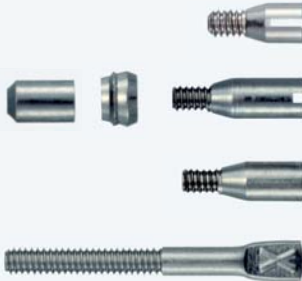
3. PROSTHODONTIC BEGO SEMADOS® S/RI-LINE (SUPRA SYSTEM)

2.1 Examples of restoration with BEGO Semados® S or RI-Line (Sub system)

2.1.3

Secondary connection

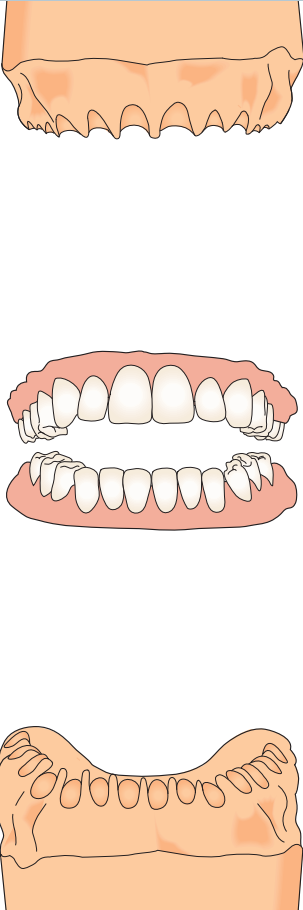




Secondary connection 1.2 mm (set)

2.1.4

Removable prostheses



Sub-Tec titanium abutment, conical

Sub-Tec^{Plus} abutment, Wirobond® MI or titanium

Sub-Tec^{Plus} angulated abutment 15° or 20° Wirobond® MI or titanium

Sub-Tec Universal

Sub-Tec Universal no Hex

Sub-Tec gold cast-on

Sub-Tec gold cast-on no Hex

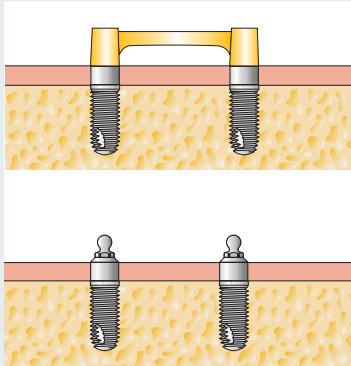
Sub-Tec ball attachment

Sub-Tec magnetic abutment

Sub-Tec bar abutment, Wirobond® MI or titanium

Sub-Tec ²Locator® abutment

3.1 Examples of restoration with BEGO Semados® S- or RI-Line (Supra system)



Transmucosal connecting part

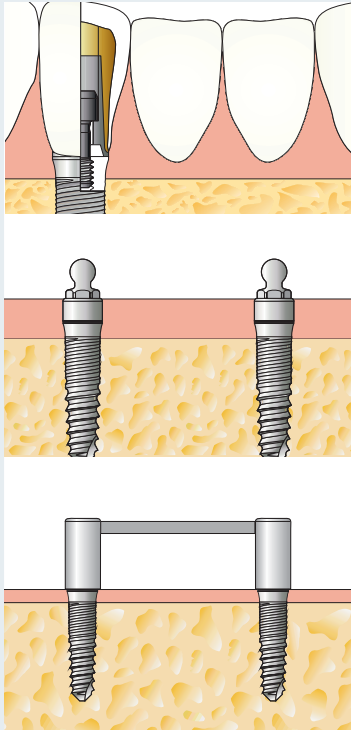
Supra-Tec Universal

Supra-Tec gold cast-on

Supra-Tec ball attachment

4. PROSTHODONTIC BEGO SEMADOS® MINI-LINE

4.1 Examples of restoration with BEGO Semados® Mini-Line



Wirobond® MI Mini abutment, conical – for restoration of narrow anterior gaps following loss of incisors 12, 22, 32, 31, 41 and 42 (only on Mini 2.9 and/or 3.1 mm)

Mini ball attachment 1.5/4.0 mm (only on Mini 2.9 and/or 3.1 mm)

Wirobond® MI Mini bar abutment

Mini gold bar abutment

5. BEGO SEMADOS® MATERIALS

5.1 General information

To avoid damage to the components, always use original BEGO Implant system tools and products. In particular, it is necessary to use the torque ratchet with the specified pretensioning of the connecting screws (specified in Ncm).

- Ensure that the prosthesis screws have not been used and damaged previously by the dental technician in the laboratory.
- After final securing of the implant abutments, all connecting screws should be tightened again to the specified torque after approx. 5 to 10 minutes and checked.
- The implant-prosthesis interfaces must be regularly checked to ensure they are tight and that there are no gaps.
- Extreme loads exerted on the components could cause the connecting screw(s) to loosen. If so, it is essential to identify and rectify the cause of loosening.
- In the case of abutments secured with a separate prosthesis screw, we recommend using a new screw after the original screw has been undone, e.g. for cleaning the prosthesis/implant abutments.

If you have any queries, please get in touch with the contacts listed below.

Advice for dental technicians
info@bego-implantology.com

Advice for dentists:
info@bego-implantology.com

All the information given has been determined to the best of our knowledge on the basis of years of practical application. It applies to restorations carried out in accordance with our own, and generally applicable, scientific findings.

5.2 Torques

Description	Torque
Implant cover screw	hand-tight/≤10
Healing post	hand-tight/ 10
Healing post, individual	15
Impression post	hand-tight/ 10
Sub-Tec provisional abutment	15
Sub-Tec CAD Positioner	hand-tight
Sub system • Sub-Tec provisional titanium abutment • BeCe Sub-Tec ceramic abutment • Sub-Tec titanium abutment • Sub-Tec Wirobond® MI abutment • Sub-Tec angulated abutment • Sub-Tec^{Plus} titanium/Wirobond® MI abutments • Sub-Tec Universal • Sub-Tec gold cast-on • Sub-Tec Wirobond® MI laser base • Sub-Tec ball attachment • Sub-Tec titanium/Wirobond® MI bar abutment • Sub-Tec magnetic abutment • Sub-Tec ²Locator® • Sub-Tec CAD/CAM titanium adhesive abutment	30
Transmucosal connecting part	30
Transmucosal connecting part cover screw	hand-tight/ 10
Supra system • Supra-Tec Universal • Supra-Tec gold cast-on • Supra-Tec ball attachment	25
Mini system • Wirobond® MI Mini abutment conical • Mini gold cast-on • Mini ball attachment 1.5/4.0 mm • Wirobond® MI Mini bar abutment • Mini gold bar abutment	25
Secondary screw 1.2 mm	hand-tight/ 10

5.3 Titanium

Titanium is a biopassive and bioinert material that is virtually tasteless, radiotransparent, resistant to corrosion and is a poor conductor of heat (thermal conductivity coefficient 0.168 in comparison with 3.118 for gold).

Commercially pure titanium and titanium alloys are used for implantology although this type of titanium also contains impurities. We distinguish between 4 grades of commercially pure titanium, depending on the level of impurities.

All 4 groups may only contain a maximum of 0.05% N, 0.08% C and 0.015 H. The presence of these substances is unavoidable as they occur during the extraction process or they are added intentionally to control its physical properties.

Elements	Grade 2	Grade 3	Grade 4	Grade 5
Nitrogen, max. [%]	0.03	0.05	0.05	0.05
Carbon, max. [%]	0.08	0.08	0.08	0.08
Hydrogen, max. [%]	0.015	0.015	0.015	0.015
Iron, max. [%]	0.30	0.30	0.50	0.40
Oxygen, max. [%]	0.25	0.35	0.40	0.20
Aluminium [%]	-	-	-	5.5 – 6.75
Vanadium [%]	-	-	-	3.5 – 4.5
Titanium [%]	Residual	Residual	Residual	Residual

Commercially pure titanium (grades 1 – 4) and titanium alloys (from grade 5) can be used for all types of dental work. It is possible to veneer titanium with special ceramic, which is fired at below 800°C because titanium undergoes a microstructural change at 882°C (volume change), with a specific CTE also being necessary (titanium: CTE of approx. 9.6). During

finishing and polishing the poor thermal conductivity of titanium must be borne in mind. Localised heat build-up can occur during processing. Increased deposition of O₂ then takes place at these points, so causing the material to become brittle.

As titanium smears when machined, special drills have to be used. Freshly polished surfaces will only retain their mirror finish if they do not come into contact with H₂O for at least 10 minutes.

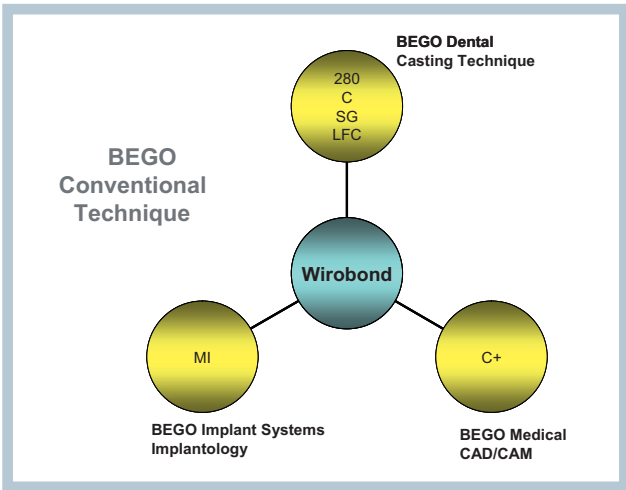
During this period the surface oxidises to form a protective layer. When modelling frames, bear in mind that when titanium is cast, a strong, thick layer of oxide containing elements of the investment is produced – the so-called α case layer. All traces of this layer need to be removed. Thicker wax-up margins are required here and are adjusted during finishing. Titanium and titanium alloys can only be joined by welding (laser, plasma, arc, resistance).

5.4 Wirobond® MI

BEGO Implant Systems is the only manufacturer to offer implant-prosthetic abutments made of a cobalt-chrome alloy (Wirobond® MI).

This is just one example of how BEGO is continuing to consolidate its pioneering role in the field of non-precious alloys, giving customers engaged in implantology the chance to benefit from BEGO's many years of experience in this field.

Wirobond® alloys have a long-standing reputation with laboratories for being a reliable material for use on patients.



Improved material properties mean processing has become simpler; today, acceptance of the alloys, which offer a competitive alternative to other alloys, is excellent at both national and international level.

Compared to titanium abutments, Wirobond® MI (Medical Implantology) abutments are silvery metallic in appearance, thus conforming to patient expectations regarding improved aesthetics and high-quality workmanship. The alloy is subject to a unique processing method which conditions the material to meet the high demands of implant prosthetics. Wirobond® MI has been optimised to suit laser-welding in particular – making it easier to laser than titanium.

This is primarily due to the negligible carbon content (max. 0.02%), which guarantees no build-up of carbide deposits. The result is a permanently secure welded seam, something which is especially important in the case of bar constructions.

The very fine microstructure of Wirobond® sets new standards. An exceptionally dense, high-gloss surface is achieved by polishing: a crucial prerequisite when seeking to prevent plaque deposits. Additional material properties include a high degree of heat resistance and low thermal conductivity. Wirobond® MI is non-corrosive, free of nickel and beryllium, has no cytotoxic potential and does not cause any skin irritation or allergic sensitisation. A bio-certificate is available on request.

Recent studies have also shown that when combined with titanium implants, Wirobond® MI abutments produce lower corrosion currents than titanium abutments or high-gold alloys.

5.5 Composition of materials

Material	Article
Commercially pure titanium grade 2 acc. to ASTM F67	Implant cover screws S/RI-Line
Commercially pure titanium grade 4 acc. to ASTM F67	BEGO Semados® implants S/RI/Mini-Line
	Drill sleeves 1,6/2,5
	³ Dolder® bar joint attachment 3.0 – titanium
	Mini implant cover screws/ designed by Prof. Engelke
	Osseo ^{Plus} transfer screws
	Female part ¹ DALBO®-Plus, female part
	Parallel post S/RI/Mini-Line
	Denture magnet (Sm ₂ Co ₁₇ , laser-welded in titanium, gas-tight)
	Sub-Dent magnetic impression
	Sub-Tec magnetic abutment (Sm ₂ Co ₁₇ , laser-welded in titanium, gas-tight)
	Sub-Tec titanium abutment, conical
	Sub-Tec titanium bar abutment
	Sub-/Supra-Tec gold cast-on/no Hex, Sub/Supra gold cast-on abutment/no Hex
	Gold bar abutment Mini/Gold cast-on Mini, Mini bar abutment
Titanium alloy Ti-6Al-4V as per ASTM F136	Healing post S/RI/Mini-Line
	Assortment set Sub-Tec ^{Plus} 0°/15°/20°
	Transmucosal connecting parts/Transmucosal connecting part cover screw
	Drill stops
	Insertion tools for implants
	Threadformer/Screw tapper RI-Line
	Ball attachment Mini-Line
	² Locator® laboratory set, retention cap
	Implant analogs S/RI/Mini-Line
	Mini open tray impression, Mini impression post
	Prosthesis screws/Technician screws
	Secondary screw 1.2 mm/1.2 Hex 0.9
	Sub-/Supra-Tec ball attachment
	Sub-/Supra-Tec ball attachment, spacer
	Sub-Dent closed/open tray impression, Sub impression post
	Sub-Tec ² Locator® abutment (coated with titanium/nitrate)
	Sub-Tec Universal/no Hex, Universal base Hex/no Hex
	Sub-Tec titanium adhesive abutment
	Sub-Tec ^{Plus} titanium abutment/Titanium angulated abutment
	Supra-Dent open tray impression, Supra impression post
Wirobond® MI, CoCr alloy 61.5Co – 26Cr – 6Mo – 5W – < 2Si – < 2Fe.	³ Dolder® bar joint attachment 3.0 – Wirobond® MI
	Sub-Tec Wirobond® MI laser base no Hex
	Sub-Tec Wirobond® MI bar abutment
	Sub-Tec ^{Plus} Wirobond® MI abutment/Angulated abutment
	Wirobond® MI Mini abutment, conical
	Wirobond® MI Mini bar abutment/Round bar 40 mm
Stainless steel 1.4305, 1.4034	Transmucosal insert analog
	Temperature-resistant implant analog
	Round drill, Pilot drill, Depth drill 2.5(S/RI/Mini-Line) Countersink S/RI-Line, Threadformer Mini-Line, Screw tapper S-Line, Form drill RI/Mini-Line, Gap-Cutter disc, Trepan drill Ø 4.2/5/6 (external), Osseo ^{Plus} Transfer instruments

Material	Article
Polyether-ether-ketone (PEEK)	Individual healing post Ø 7
	Sub-Tec CAD Positioner
	Sub-Tec provisional abutment Ø 5.5/7
	Sub-Tec CAD/CAM scanning abutment
	Scanning screw
	Wax-up cap
Zirconium oxide	BeCe Sub-Tec ceramic abutment
Silicone	Denture magnet, position sleeve/ ² Locator® block-out spacer (white)
Gold alloy	³ Dolder® attachment/female part with retention for plastic
60Au – 19Pt – 20Pd – 1Ir	Secondary connection 1.2 mm (set), thread
	Secondary connection 1.2 mm (set), cuff (cast-on)
	Sub/Supra-Tec gold cast-on/no Hex, Sub/Supra cast-on abutment/no Hex
	Gold bar abutment Mini/Gold cast-on Mini, Mini bar abutment
69Au – 12Ag – 11Cu – 4Pd – 3Pt	Female part ¹ DALBO®-Plus, retention insert ¹ DALBO®-Plus
60Au – 10.5Pt – 6.5Pd – 7Ag – 14Cu – 2Zn	Secondary connection 1.2 mm (set), wax-up screw long
Polyoxymethylene (POM)	Impression set ball attachment ¹ DALBO®-Plus, impression cap
	Female part ¹ DALBO®-Plus, space holder
	Female part PRECI-CLIX, white, yellow, red
	Sub-Dent closed tray impression, impression post cap
	Sub-Tec Universal/no Hex, Sub-burnout acrylic sleeve Universal
Brass	³ Dolder® attachment/female part, resilience rail
Ti-Al-V	Housing PRECI-CLIX
Polycarbonate (PC)	Assortment set angulated abutments
	Sub-Tec gold cast-on/no Hex, Sub-burnout acrylic sleeve gold cast-on
	Supra-Tec gold cast-on, Supra-burnout acrylic sleeve gold cast-on
	Supra-Tec Universal, Supra-burnout acrylic sleeve Universal
Polyethylene (PE)	² Locator® impression coping/parallel post
Aluminium	² Locator® analog
Nylon	² Locator® retention insert blue/pink/transparent/red/green
Steel	Initial drill
	Secondary connection 1.2 mm (set), fixation pin
	Secondary connection 1.2 mm (set), wax-up screw long
Rubber	Space holder PRECI-CLIX
67Fe – 17Cr – 10Ni – 2Mn – 1.6Cu – 1Si – 1.4C – 1.4S	Round bar system “PRECI-HORIX®”, rider housing (coated with titanium nitrate)
	Model analog PRECI-CLIX
Resin	Duplication auxiliary PRECI-CLIX
	Round bar system “PRECI-HORIX®”, insertion tool
	Round bar system “PRECI-HORIX®”, yellow female part
	Round bar system “PRECI-HORIX®”, space holder
Polyether	² Locator® production insert (black)

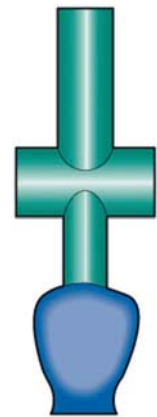
¹DALBO® is a registered trademark of Cendres & Métaux SA, Biel/Bienne, Switzerland

²Locator® is a registered trademark of Zest Anchors Inc., CA, USA

³Dolder® is a registered trademark of Prof. Eugen Dolder, formerly Director of the School of Dentistry at the University of Zurich, Switzerland.

6. GENERAL PROCESSING INSTRUCTIONS FOR BEGO SEMADOS® IMPLANT SUPERSTRUCTURE

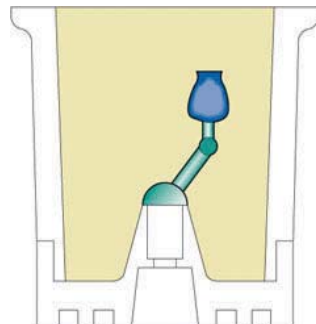
6.1 Investing/Casting/Deflasking



Spruing the wax-up

Sprue the wax-up according to the recommendations of the alloy/ceramic manufacturer. Bear in mind that with implant superstructures considerable volumes may result, which need to be cast free of cavities. Weigh the wax-up and calculate the alloy requirement (wax weight x specific weight of alloy).

With BEGO Semados® gold cast-on abutments, subtract 0.5 g per abutment from the final result when using Sub/Supra-Tec gold cast-on abutments, and 0.2 g when using Mini gold cast-on abutments.



Position of object in mould

Invest the wax-up according to the manufacturer's instructions. The objects to be cast must be located outside the heat centre of the mould. We recommend using the sprue system with the indirect technique (cross bar/T bar or support bar) as very bulky casting objects may have a considerably larger alloy requirement than conventional crowns or bridges. Using the direct technique with no casting reservoir may increase shrinkage porosity.



Investing

A controllable, fine-grain, phosphate-bonded precision investment material should be used. The investment material must be sufficiently hard to withstand physical stress during casting. Follow the manufacturer's instructions.



Curing the investment material under increased atmospheric pressure

We recommend curing the investment material under pressure (follow manufacturer's instructions) as tiny air bubbles remaining on the cast object will be compressed by the increased atmospheric pressure and detached from the object. The result will be an improvement in the surface finish.



Casting

Please follow the instructions of the alloy manufacturer.

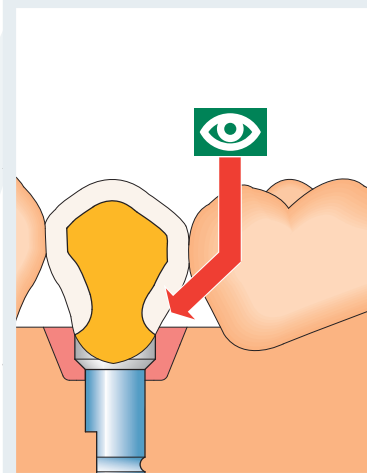


Deflasking

The investment material is removed with the help of a deinvesting drill and a precision sandblaster.

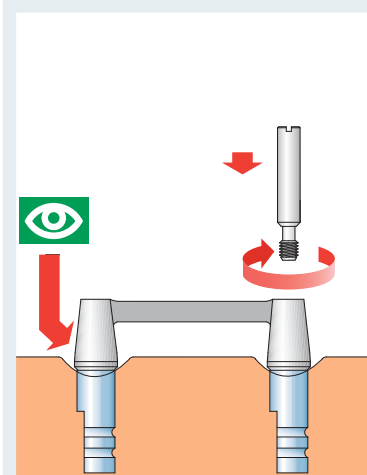
Caution: The connecting interfaces with the implant/transmucosal connecting part must not be sandblasted or finished. The fit is predetermined according to industrial specifications.

6.1 Investing/Casting/Deflasking



Check

When fitting the frames onto the abutments/implants/transmucosal connecting parts, ensure that the marginal seal is gap-free.



Trial fitting of frame

When fitting frames, you/the dentist should check correct seating of the construction. Perform a Sheffield test in the patient's mouth if required. The Sheffield test is the only way of checking stress-free seating of a superstructure. If correct seating of the construction cannot be confirmed with certainty by probing, a radiographic check should be carried out. The restoration can only be completed once the fit has been checked.

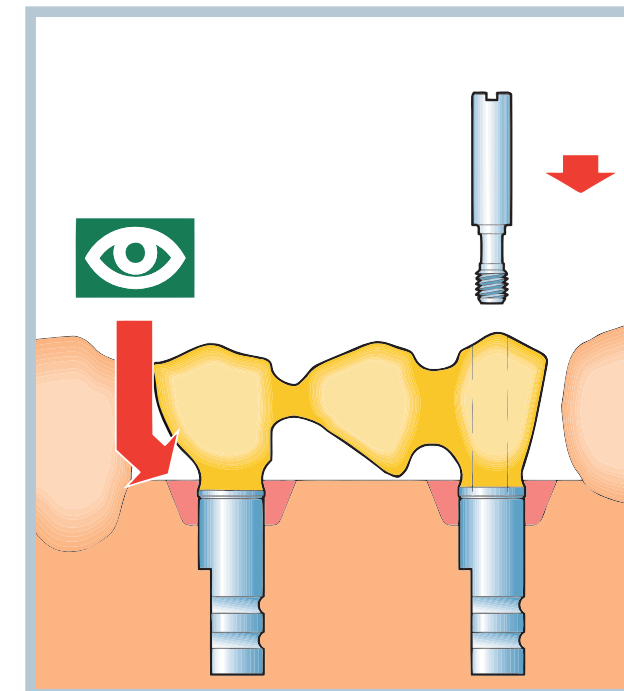
Completion and integration

While continuing work, please follow the processing instructions given by the manufacturers of the materials used. The prosthesis screw (internal Hex) is always used for the final insertion of implant abutments which are screwed in place with a separate screw (tool: hexagon screwdriver 1.25 mm).

6.2 Sheffield test

The work must be tested against precisely reproducible specifications if a reliable assessment is to be made about the stress-free seating of a construction at the laboratory. Pressing or manipulating the superstructure on the implant analogs will have no result. The insertion of all prosthesis screws will lead the technician to think that seating of the construction is stress-free. No gaps can be seen between the prosthetic components and the implants. This method is, however, useless in terms of testing as the elasticity of the metal permits form-fitting without the construction being stress-free.

The Sheffield test is the only meaningful technique in this regard. The test basically consists of tightening the screws alternately.



Procedure:

1. Screw the prosthesis to the most distal implant.
2. Check the fit on all other implant/prosthesis interfaces. If there is any distortion (gap formation), the relevant frame must be detached.
3. Repeat the procedure on all implants and detach again if necessary.
4. Join detached frame segments by laser (or soldering in the case of high-gold alloys).
Warnings: The connecting interfaces with the implant/transmucosal connecting part must not be sandblasted or finished. The fit is predetermined according to industrial specifications.
5. Retest.

Further reading on this topic:
Graham E. White, Implantat-Zahntechnik

7. GENERAL SAFETY INSTRUCTIONS

Rubber dam

It is advisable to use a rubber dam during trial fittings and final insertion in order to protect the patient from possible aspiration of the parts.

Personal expertise

To guarantee personal expertise when producing an implant restoration, we recommend taking part in a further training course offered by BEGO and/or studying current specialist literature on this subject.

Processing BEGO Semados® implant components

When using BEGO Semados® implant components, please follow the methods described in order to preserve the high quality of the parts supplied. Failure to do so may result in damage, for which BEGO Implant Systems can accept no liability.

Compatibility

BEGO Semados® implants are not compatible with other implant systems.

Precautions

Abutments angled more than 30° from the vertical axis of the implant should not be used. Especially important is proper load distribution. Please take note of the following: relining of the overdenture after implant placement to avoid premature loading, passive fit of the bridge on the implant abutments, correct adjustment of occlusion with the opposing jaw, and avoiding excessive transverse loading forces. Implant treatment has normal contraindications and risks. These are extensively documented in dental literature.

Follow the instructions for use supplied with each BEGO Semados® product.

8. FABRICATION OF A CUSTOM IMPRESSION TRAY FOR THE BEGO SEMADOS® SYSTEM

Use a conventional or a light-curing autopolymer as the tray material.



Blocking out the model

Block out the planning model with wax (1 wax sheet, approx. 1.5 mm thick).



Making the tray

Apply resin to the model and allow to cure according to the manufacturer's instructions. The tray size is based on conventional combination prostheses. The area of the implant is blocked out in a cylindrical shape (10 mm x 14 mm) to ensure sufficient space for the impression post.



Open tray

Use Mini open tray impressions for Sub/Supra-Dent/applications. Drill through the base of the tray in the implant block-out area to create a channel for the impression post screw, which is used to attach the impression post to the implant. Avoid sharp edges at the margins.



Closed tray

Use closed tray impressions for Sub/Supra-Dent/applications. Avoid sharp edges at the margins.

9. FABRICATION OF A DRILL TEMPLATE FOR THE BEGO SEMADOS® SYSTEM

9.1 Light-curing autopolymer basis

Only use drill sleeves from the BEGO Semados® system as they have been specially designed for BEGO Semados® drills (**CAUTION:** Drills for single use are not suitable here). Drill sleeves from other implant systems have different dimensions and would damage the drills or lead to inaccurate drilling. This would result in inferior preparation of the implant bed, possibly jeopardising the success of the restoration.



Producing the model segments

Saw the model segments through at the marked implant positions.



Wax-up

Make a wax-up or set-up with prosthetic teeth to replace the missing tooth units. Take an impression of the situation using silicone indexes.



Shape of the jawbone

Mark the shape of the jawbone on the model segments. The thickness of the gingiva is documented beforehand by the dentist by probing (e.g. needles with depth stop).



Implant axis

Determine the theoretical implant axis with the help of silicone indexes. In the best-case scenario the implant axis points to the central fossa of the respective adjacent tooth.



Drilling axis

Align the model with a model table in the milling unit.



Positioning hole

Drill the positioning hole with a diameter of 1.2 or 1.5 mm.



Positioning aid

Insert straight wires with the diameter selected (see above) to aid positioning for the drill sleeves.



Alignment of drill sleeves

Position the 1.6 mm and 2.5 mm drill sleeves. The basal surface of the sleeves is waxed with the model to prevent any ingress of resin during polymerisation.



Completion

Make a rail out of light-curing tray material and polymerise the drill sleeves 2.5 (follow manufacturer's instructions).

9.2 Thermoplastic technique

Only use drill sleeves from the BEGO Semados® system as they have been specially designed for BEGO Semados® drills (**Caution:** Drills for single use are not suitable here). Drill sleeves from other implant systems have different dimensions and would damage the drills or lead to inaccurate drilling. This would result in inferior preparation of the implant bed, possibly jeopardising the success of the restoration. We recommend using a hard film min. 1 mm thick.



Wax-up

Produce a wax-up or set-up with prosthetic teeth on the saw-cut model to replace the missing tooth units. Take an impression of the situation using silicone indexes.



Duplicate model

Duplicate the model (with wax-up or set-up) using an addition-cured silicone (e.g. BEGO/Wirosil®) and make a plaster model (follow manufacturer's instructions).



Blocking out

Block out the undercuts of the duplicate model.



Deep-drawing the template

Create a thermoplastic template (follow manufacturer's instructions). We recommend using a hard film at least 1 mm thick.



Finishing the deep-drawn film

Finish the deep-drawn film (follow manufacturer's instructions). The remaining dentition must be completely enclosed by the film to ensure secure fixation.



Producing the model segments

Saw the model segments through at the marked implant positions of the saw-cut model.



Shape of the jawbone

Mark the shape of the jawbone on the model segments. The thickness of the gingiva is documented beforehand by the dentist by probing (e.g. needles with depth stop).



Implant axis

Determine the theoretical implant axis with the help of the thermoplastic deep-drawn film. In the best-case scenario the implant axis points to the central fossa of the respective adjacent tooth.



Drilling axis

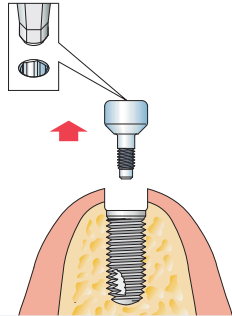
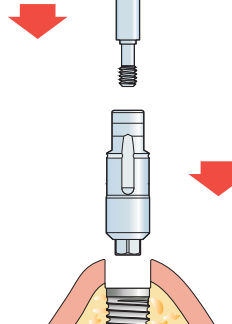
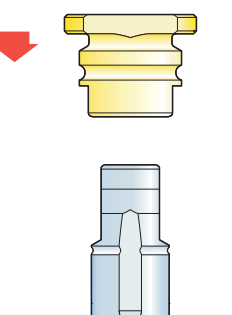
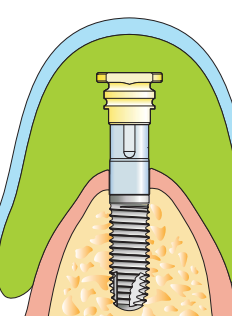
Align the model with a model table in the milling unit.

9.2 Thermoplastic technique

	Positioning hole Drill the positioning hole with a diameter of 1.2 or 1.5 mm.
	Positioning aid Insert straight wires with the diameter selected (see above) to aid positioning for the drill sleeves.
	Alignment of drill sleeves Position the 1.6 mm and 2.5 mm drill sleeves. The basal surface of the sleeves are waxed with the model to prevent any ingress of resin during polymerisation.
	Completion Fenestrate the thermoplastic template and polymerise the drill sleeves 2.5 with a self-curing resin (autopolymer).
	Double sleeve template Drill template with 1.6 mm and 2.5 mm drill sleeves for pilot and initial drilling in the BEGO Semados® Implant System.

10. BEGO SEMADOS® S/RI SUB-DENT CLOSED TRAY IMPRESSIONS

10.1 Impression-taking for implants with Sub-Dent closed tray impressions

	Removing the healing post Unscrew the healing post anticlockwise (tool: hexagon screwdriver 1.25 mm). Clean the implant interface to remove blood and tissue remnants before fitting the Sub impression post.
	Fitting the impression post Position the Sub impression post on the implant so that the anti-rotation protection (Hex) engages. Secure by turning the L11 titanium screw clockwise (hand-tight/10 Ncm) (tool: hexagon screwdriver 1.25 mm/slot screwdriver). Check for gap-free seating (radiographic check if necessary).
	Fitting the impression post cap Fit the impression post cap onto the Sub impression post so that the anti-rotation protection for the post audibly engages. Check for proper seating. Caution: The wings of the cap must be aligned parallel to the straight surfaces of the impression post.
	Taking the impression We recommend taking the impression with a special tray. Block out pronounced undercuts in the dental arch (e.g. bridge pontics). To take the impression use a silicone or polyether impression material with high elastic recovery (hydrocolloids are not suitable for this purpose!).

10.1 Impression-taking for implants with Sub-Dent closed tray impressions

Removing the impression

The impression post cap remains in the impression material and is directly removed from the mouth with the impression tray.

Removing the impression post

Release the L11 titanium screw anticlockwise (tool: hexagon screwdriver 1.25 mm/slot screwdriver) and remove the Sub impression post. Forward to the dental technician together with the implant analog from the impression set.

Inserting the healing post

Screw in the healing post clockwise (hand-tight/10 Ncm) (tool: hexagon screwdriver 1.25 mm).

10.2 Model-making with Sub-Dent closed tray impressions

Fitting the implant analog

Position the Sub impression post on the implant analog so that the anti-rotation protection (Hex) engages. Insert the L11 titanium screw clockwise (hand-tight/10 Ncm) (tool: hexagon screwdriver 1.25 mm/slot screwdriver).

Re-inserting the impression post

Re-insert the Sub impression post/implant analog in the impression. Use the groove of the Sub impression post as a visual guide to ensure precise re-insertion of the Sub impression post in the impression post cap. Check the correct seating (no gap) and the elastic recovery behaviour of the impression material (follow manufacturer's instructions). A recovery phase of up to 2 hours may have to be observed depending on the elastic recovery behaviour of the material. Failure to do so may result in an inaccurate master model.

Making an artificial gingival mask

Make an artificial gingival mask according to the manufacturer's instructions. We recommend using addition-cured silicone to permit long-term documentation (storage) of models.

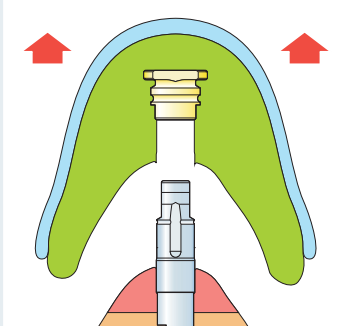
With the BEGO Semados® Sub system it is essential to use an artificial gingival mask.

Making the model

Make the model applying standard techniques and only using Type 4 dental plaster (DIN 6873) or a precision resin. Follow the manufacturer's instructions carefully, as any failure to do so may result in unserviceable master models.

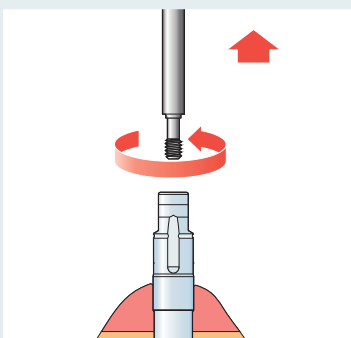
11. BEGO SEMADOS® S/RI SUB-DENT OPEN TRAY IMPRESSIONS

10.2 Model-making with Sub-Dent closed tray impressions



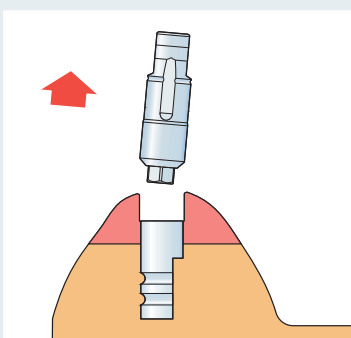
Removing the model

Do not remove from the impression until the modelling material has cured (follow manufacturer's instructions). Pay attention to the axis of the impression post as well as any remaining dentition. Impression post cap remains in the impression.



Removing the impression post retaining screw

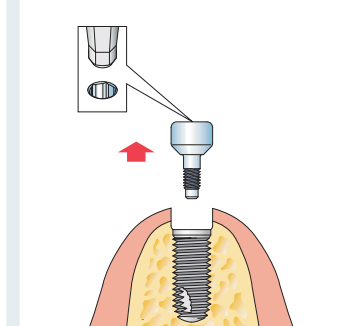
Release the L11 titanium screw anticlockwise and remove from the Sub impression post (tool: hexagon screwdriver 1.25 mm/slot screwdriver).



Removing Sub impression post

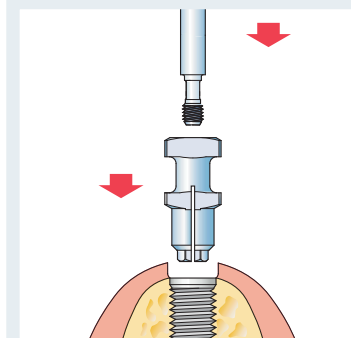
Remove the Sub impression post from the implant analog.

11.1 Impression-taking for implants with Sub-Dent open tray impressions



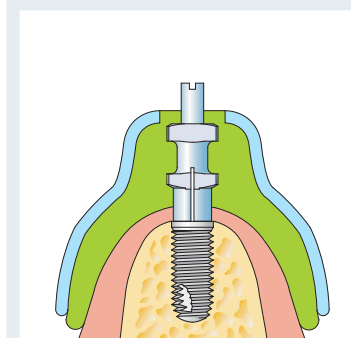
Removing the healing post

Unscrew the healing post anticlockwise (tool: hexagon screwdriver 1.25 mm). Clean the implant interface to remove blood and tissue remnants before fitting the Sub impression post.



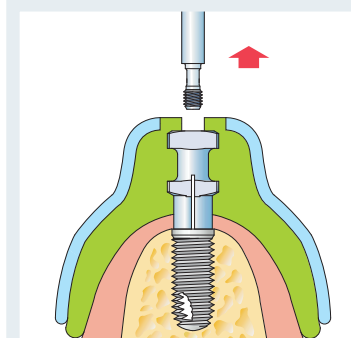
Fitting the impression post

Position the Sub impression post on the implant so that the anti-rotation protection (Hex) engages. Secure by turning the L16 or L21 titanium screw clockwise (hand-tight/10 Ncm) (tool: hexagon screwdriver 1.25 mm/slot screwdriver). Check for gap-free seating (radiographic check if necessary).



Taking the impression

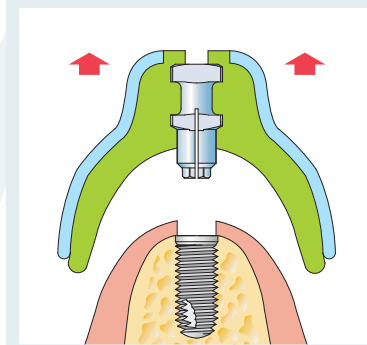
Use a special tray for trial fitting and modify the holes for the L16 or L21 titanium screws if necessary. The perforations in the tray must be blocked off with a wax sheet to prevent the impression material from oozing out. Block out pronounced undercuts in the dental arch (e.g. bridge pontics). To take the impression use a silicone or polyether impression material with high elastic recovery (hydrocolloids are not suitable for this purpose!).



Removing the L16/L21 titanium screw

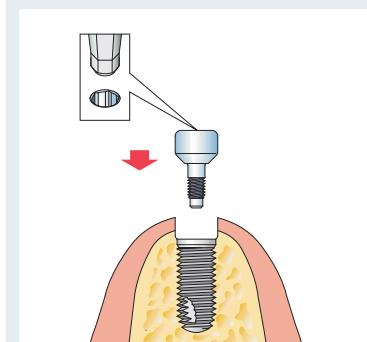
Caution: After the impression material has cured (follow manufacturer's instructions), the L16 or L21 titanium screw must first be removed by releasing anticlockwise before removing the impression from the mouth (tool: hexagon screwdriver 1.25 mm/slot screwdriver).

11.1 Impression-taking for implants with Sub-Dent open tray impressions



Removing the impression

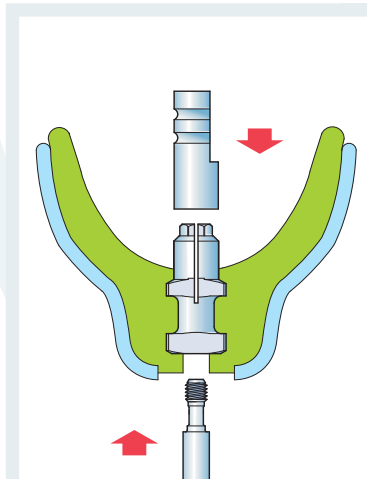
The Sub impression post remains in the impression material, is directly removed from the mouth with the impression tray and forwarded to the dental technician together with the implant analog from the impression set.



Inserting the healing post

Screw in the healing post clockwise (hand-tight/10 Ncm) (tool: hexagon screwdriver 1.25 mm).

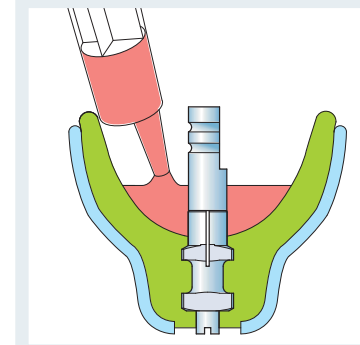
11.2 Model-making with Sub-Dent open tray impressions



Fitting the implant analog

Position the Sub impression post on the implant analog so that the anti-rotation protection (Hex) engages. Insert the L16 or L21 titanium screw clockwise (hand-tight/10 Ncm) (tool: hexagon screwdriver 1.25 mm/slot screwdriver).
Check the correct seating (no gap) and the elastic recovery behaviour of the impression material (follow manufacturer's instructions).
A recovery phase of up to 2 hours may have to be observed depending on the elastic recovery behaviour of the material.
Failure to do so may result in an inaccurate master model.

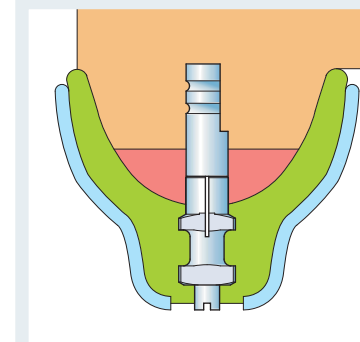
Grip the implant analog with forceps when screwing together so that the impression post does not rotate in the impression.



Making an artificial gingival mask

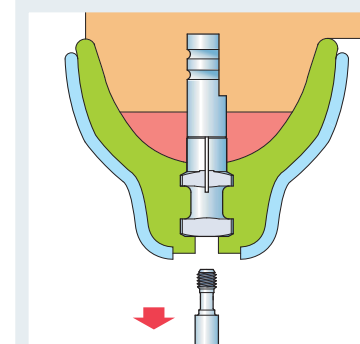
Make an artificial gingival mask according to the manufacturer's instructions. We recommend using addition-cured silicone to permit long-term documentation (storage) of models.

With the BEGO Semados® Sub system it is essential to use an artificial gingival mask.



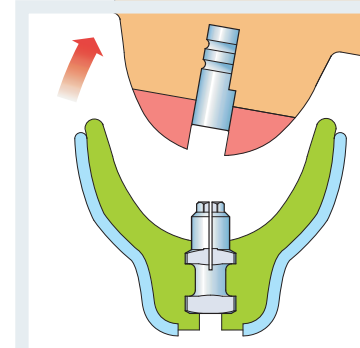
Making the model

Make the model applying standard techniques and only using Type 4 dental plaster (DIN 6873) or a precision resin. Follow the manufacturer's instructions carefully, as any failure to do so may result in unserviceable master models.



Releasing the L16/L21 titanium screw

Do not remove from the impression until the modelling material has cured (follow manufacturer's instructions). Release the L16 or L21 titanium screw anticlockwise (tool: hexagon screwdriver 1.25 mm/slot screwdriver) and remove from the impression tray.

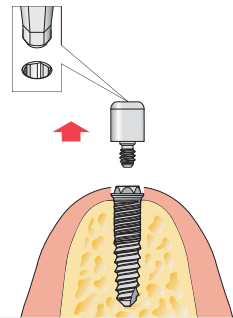


Removing the model

Detach the impression tray from the model. The Sub impression post remains in the impression tray.

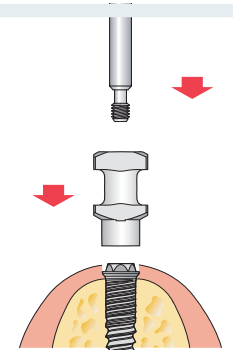
12. BEGO SEMADOS® MINI OPEN TRAY IMPRESSION

12.1 Impression-taking for implants with Mini open tray impressions



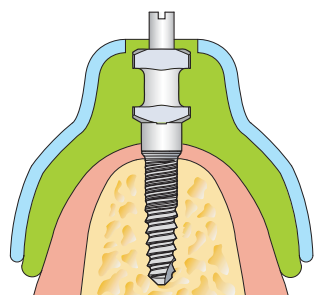
Removing the Mini healing post

Unscrew the Mini healing post anticlockwise (tool: hexagon screwdriver 1.25 mm). Clean the implant interface to remove blood and tissue remnants before fitting the Mini impression post.



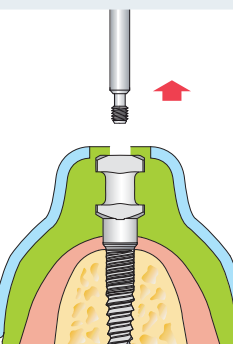
Fitting the Mini impression post

Position the Mini impression post on the implant so that the anti-rotation protection (Hex) engages. Secure by turning the L11.5 or L19 titanium screw clockwise (hand-tight/10 Ncm) (tool: hexagon screwdriver 1.25 mm/slot screwdriver). Check for gap-free seating (radiographic check if necessary).



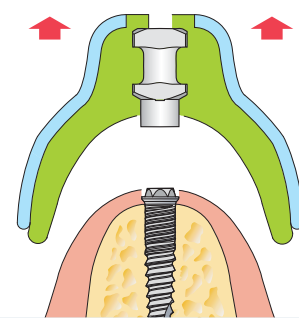
Taking the impression

Use a special tray for trial fitting and modify the holes for the L11.5 or L19 titanium screws if necessary. The perforations in the tray must be blocked off with a wax sheet to prevent the impression material from oozing out. Block out pronounced undercuts in the dental arch (e.g. bridge pontics). To take the impression use a silicone or polyether impression material with high elastic recovery (hydrocolloids are not suitable for this purpose!).



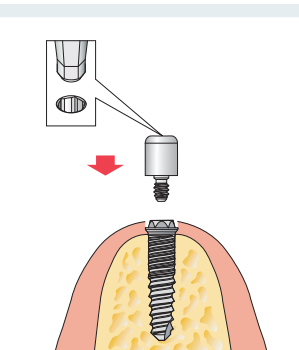
Removing the L11.5/L19 titanium screw

Caution: After the impression material has cured (follow manufacturer's instructions), the titanium screws must first be removed by releasing anticlockwise before removing the impression from the mouth (tool: hexagon screwdriver 1.25 mm/slot screwdriver).



Removing the impression

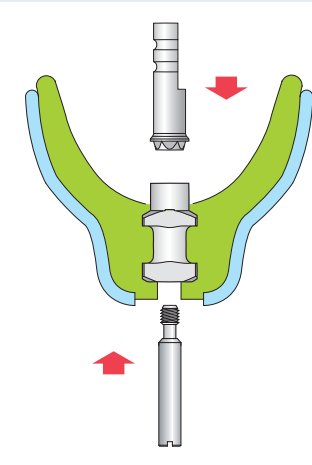
The Mini impression post remains in the impression material, is directly removed from the mouth with the impression tray and forwarded to the dental technician together with the Mini implant analog from the impression set.



Inserting the Mini healing post

Screw in the Mini healing post clockwise (hand-tight) (tool: hexagon screwdriver 1.25 mm).

12.2 Model-making with Mini open tray impressions



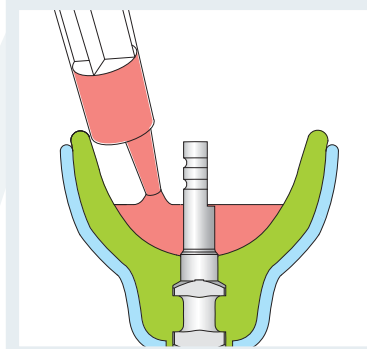
Fitting the implant analog

Position the Mini impression post on the Mini implant analog so that the anti-rotation protection (Hex) engages. Secure by turning the L11.5 or L19 titanium screw clockwise (hand-tight/10 Ncm) (tool: hexagon screwdriver 1.25 mm/slot screwdriver). Check the correct seating (no gap) and the elastic recovery behaviour of the impression material (follow manufacturer's instructions).

A recovery phase of up to 2 hours may have to be observed depending on the elastic recovery behaviour of the material. Failure to do so may result in an inaccurate master model.

Grip the implant analog with forceps when screwing together so that the impression post does not rotate in the impression.

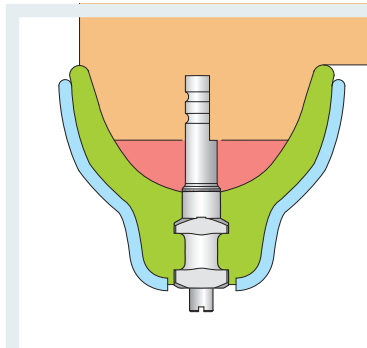
12.2 Model-making with Mini open tray impressions



Making an artificial gingival mask

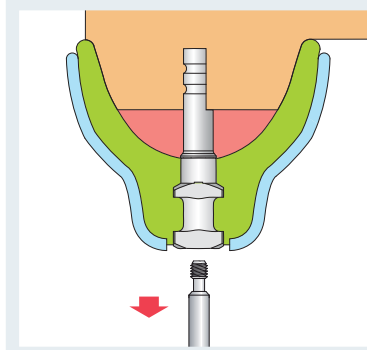
Make an artificial gingival mask according to the manufacturer's instructions. We recommend using addition-cured silicone to permit long-term documentation (storage) of models.

With the BEGO Semados® Mini system it is essential to use an artificial gingival mask.



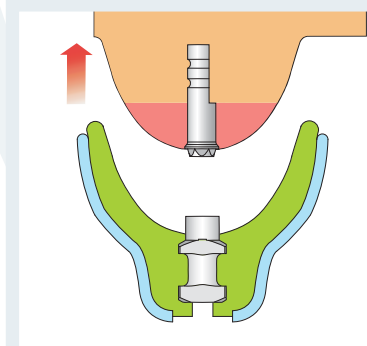
Making the model

Make the model applying standard techniques and only using Type 4 dental plaster (DIN 6873) or a precision resin. Follow the manufacturer's instructions carefully, as any failure to do so may result in unserviceable master models.



Releasing the L11.5/L19 titanium screw

Do not remove from the impression until the modelling material has cured (follow manufacturer's instructions). Release the L11.5 or L19 titanium screw anticlockwise (tool: hexagon screwdriver 1.25 mm/slot screwdriver) and remove from the impression tray.

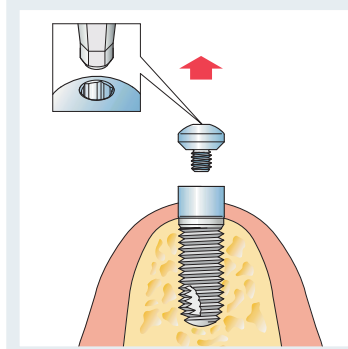


Removing the model

Detach the impression tray from the model. The Mini impression post remains in the tray.

13. BEGO SEMADOS® S/RI SUPRA-DENT CLOSED TRAY IMPRESSIONS

13.1 Impression-taking for implants with Supra-Dent closed tray impressions

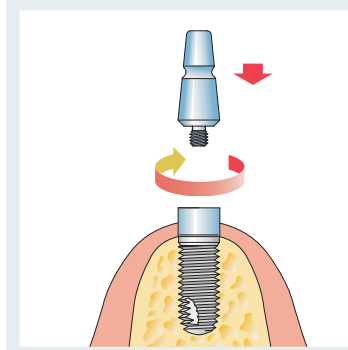


Removing the transmucosal connecting part cover screw

Unscrew the transmucosal connecting part cover screw anticlockwise (tool: hexagon screwdriver 1.25 mm). Clean the transmucosal connecting part to remove blood and tissue remnants before fitting the Supra impression post.

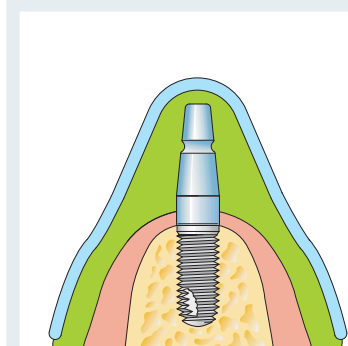
Check

Check that the transmucosal connecting part is seated on the implant without any gap (radiographic check if necessary). Check the tightening torque with the BEGO Semados® torque spanner (setting: 30 Ncm) (tool: cross-tip screwdriver).



Fitting the Supra impression post

Insert the Supra impression post by screwing clockwise onto the transmucosal connecting part screws (hand-tight/10 Ncm) (tool: impression post driver).



Taking the impression

We recommend taking the impression with a special tray. Block out pronounced undercuts in the dental arch (e.g. bridge pontics). To take the impression use a silicone or polyether impression material with high elastic recovery (hydrocolloids are not suitable for this purpose!).

13.1 Impression-taking for implants with Supra-Dent closed tray impressions

Removing the impression

Remove the impression tray. The Supra impression post initially remains in the patient's mouth.

Removing the impression post

Unscrew the Supra impression post anticlockwise (tool: impression post driver) out of the transmucosal connecting part and forward to the dental technician together with the transmucosal insert analog from the impression set. The transmucosal connecting part remains in the patient's mouth.

Inserting the transmucosal connecting part cover screw

Insert the transmucosal connecting part cover screw clockwise (hand-tight/10 Ncm) (tool: hexagon screwdriver 1.25 mm).

13.2 Model-making with Supra-Dent closed tray impressions

Fitting the transmucosal insert analog

Screw the Supra impression post into the transmucosal insert analog clockwise (hand-tight/10 Ncm) (tool: impression post driver).

Re-inserting the Supra impression post

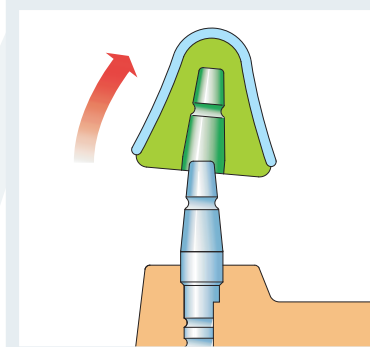
Re-insert the Supra impression post/transmucosal insert analog in the impression. Check the correct seating (no gap) and the elastic recovery behaviour of the impression material (follow manufacturer's instructions). A recovery phase of up to 2 hours may have to be observed depending on the elastic recovery behaviour of the material. Failure to do so may result in an inaccurate master model.

With the BEGO Semados® Supra system it is not essential to use an artificial gingival mask.

Making the model

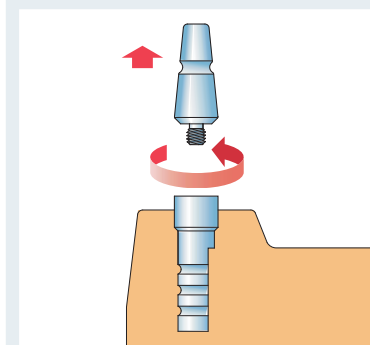
Make the model applying standard techniques and only using Type 4 dental plaster (DIN 6873) or a precision resin. Follow the manufacturer's instructions carefully, as any failure to do so may result in unserviceable master models.

13.2 Model-making with Supra-Dent closed tray impressions



Removing the model

Do not remove from the impression until the modelling material has cured (follow manufacturer's instructions). Pay attention to the axis of the impression post as well as any remaining dentition.

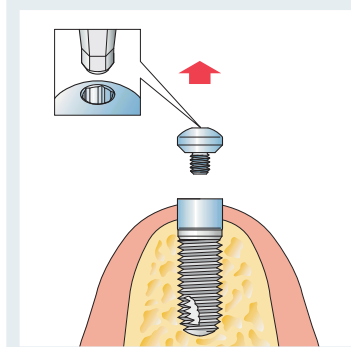


Removing Supra impression post

When the special tray is removed, the impression posts remain on the model and are then detached from the implant analog by turning anticlockwise (tool: impression post driver).

14. BEGO SEMADOS® S/RI SUPRA-DENT OPEN TRAY IMPRESSIONS

14.1 Impression-taking for implants with Supra-Dent open tray impressions

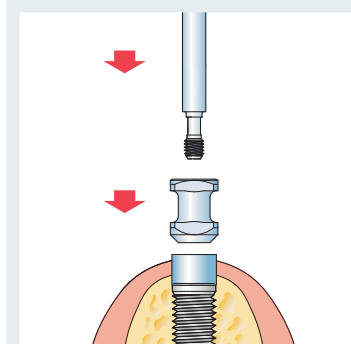


Removing the transmucosal connecting part cover screw

Unscrew the transmucosal connecting part cover screw anticlockwise (tool: hexagon screwdriver 1.25 mm). Clean the transmucosal connecting part to remove blood and tissue remnants before fitting the Supra impression post.

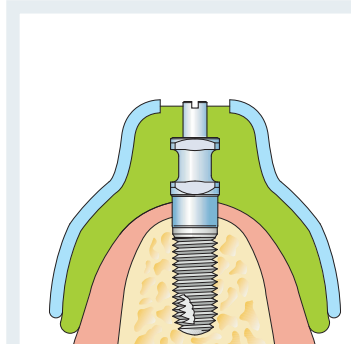
Check

Check that the transmucosal connecting part is seated on the implant without any gap (radiographic check if necessary). Check the tightening torque with the BEGO Semados® torque spanner (setting: 30 Ncm) (tool: cross-tip screwdriver).



Fitting the Supra impression post

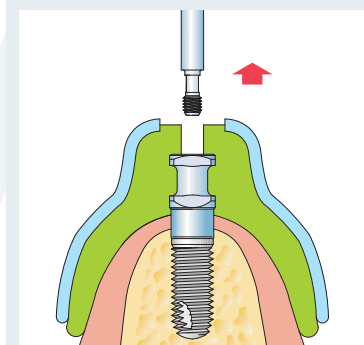
Position the Supra impression post on the transmucosal connecting part and secure by turning the L11 or L16 titanium screw clockwise (hand-tight/10 Ncm) (tool: hexagon screwdriver 1.25 mm/slot screwdriver). Check for gap-free seating (radiographic check if necessary).



Taking the impression

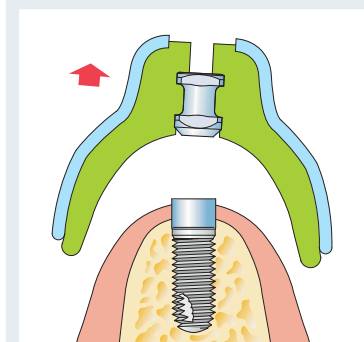
Use a special tray for trial fitting and modify the holes for the L11 or L21 titanium screw if necessary. The perforations in the tray must be blocked off with a wax sheet to prevent the impression material from oozing out. Block out pronounced undercuts in the dental arch (e.g. bridge pontics). To take the impression use a silicone or polyether impression material with high elastic recovery (hydrocolloids are not suitable for this purpose!).

14.1 Impression-taking for implants with Supra-Dent open tray impressions



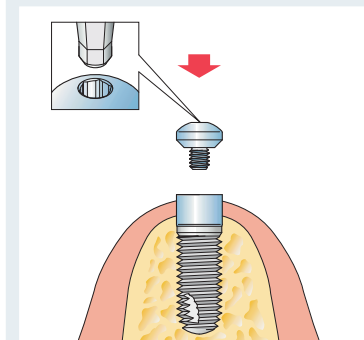
Removing the L11/L16 titanium screw

Caution: After the impression material has cured (follow manufacturer's instructions), the L11 or L16 titanium screw must be first removed by releasing anticlockwise before removing the impression from the mouth (tool: hexagon screwdriver 1.25 mm/slot screwdriver).



Removing the impression

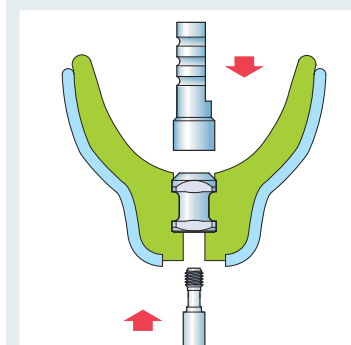
The Supra impression post remains in the impression material, is directly removed from the mouth with the impression tray, and forwarded to the dental technician together with the transmucosal insert analog. The transmucosal connecting part remains in the patient's mouth.



Inserting the transmucosal connecting part cover screw

Screw in the transmucosal connecting part cover screw clockwise (hand-tight/10 Ncm) (tool: hexagon screwdriver 1.25 mm).

14.2 Model-making with Supra-Dent open tray impressions

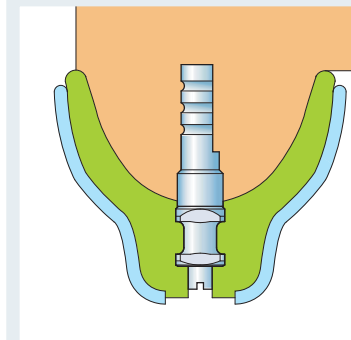


Fitting the transmucosal insert analog

Screw together the transmucosal insert analog and impression post clockwise with an L11 or L16 titanium screw (hand-tight/10 Ncm) (tool: hexagon screwdriver 1.25 mm/slot screwdriver). Check the correct seating (no gap) and the elastic recovery behaviour of the impression material (follow manufacturer's instructions). A recovery phase of up to 2 hours may have to be observed depending on the elastic recovery behaviour of the material. Failure to do so may result in an inaccurate master model.

Grip the transmucosal insert analog with forceps when screwing together so that the impression post does not rotate in the impression.

With the BEGO Semados® Supra system it is not essential to use an artificial gingival mask.



Making the model

Make the model applying standard techniques and only using Type 4 dental plaster (DIN 6873) or a precision resin. Follow the manufacturer's instructions carefully as any failure to do so may result in unserviceable master models.

14.2 Model-making with Supra-Dent open tray impressions

Releasing the L11/L16 titanium screw

Do not remove from the impression until the modelling material has cured (follow manufacturer's instructions). Release the L11 or L16 titanium screw anticlockwise (tool: hexagon screwdriver 1.25 mm/slot screwdriver) and remove from impression tray.

Removing the model

Detach the impression tray from the model. The Supra impression post remains in the impression tray.

15. BEGO SEMADOS® S/RI/MINI IMPRESSION SET BALL ATTACHMENT ¹DALBO®-PLUS

15.1 Impression-taking with impression set ball attachment ¹DALBO®-Plus*

**Removing the healing post/
transmucosal connecting part cover screw**

Unscrew the healing post/transmucosal connecting part cover screw anticlockwise (tool: hexagon screwdriver 1.25 mm). Clean the implant/transmucosal connecting part to remove blood and tissue remnants before fitting the Sub/Supra-Tec ball attachment.

Fitting the Sub/Supra-Tec ball attachment

Screw the ball attachment with a spacer into the implant (Sub-Tec ball attachment) or on the transmucosal connecting part (Supra-Tec ball attachment) (tool: insertion tool for ball attachment). The spacer creates the necessary resilience to allow the prosthesis to undergo vertical translation in terms of mucosal resilience when subject to occlusal pressure. Check for gap-free seating (radiographic check if necessary).

Fitting the impression cap

Fit the impression cap onto the Sub/Supra-Tec ball attachment. Check for proper seating.

Taking the impression

A special tray or existing denture should be used for taking the impression; try in and adjust any cavities if necessary. To take the impression use a silicone or polyether impression material with high elastic recovery (hydrocolloids are not suitable for this purpose).

15.1 Impression-taking with impression set ball attachment ¹DALBO®-Plus*

Removing the impression

Due to the low profile of the impression cap, the impression tray is removed as for a conventional functional impression for a full denture. Carefully remove the impression cap from the Sub/Supra-Tec ball attachment. Here it is essential to avoid any damage to the impression cap. Sharp tools should therefore not be used.

Removing the Sub/Supra-Tec ball attachment

Unscrew the Sub-/Supra-Tec ball attachment anticlockwise and store in a safe place (tool: insertion tool for ball attachment).

Inserting the healing post

Screw in the healing post clockwise (hand-tight/ 10 Ncm) (tool: hexagon screwdriver 1.25 mm).

15.2 Model-making with impression set ball attachment ¹DALBO®-Plus*

Fitting the ball attachment implant analog

Fit the impression cap onto the ball attachment implant analog without any gap. When doing so, ensure a complete form-fit between the two components.

Re-inserting the impression cap

Re-insert the impression cap in the impression. Check the correct seating (no gap) and the elastic recovery behaviour of the impression material (follow manufacturer's instructions). A recovery phase of up to 2 hours may have to be observed depending on the elastic recovery behaviour of the material.

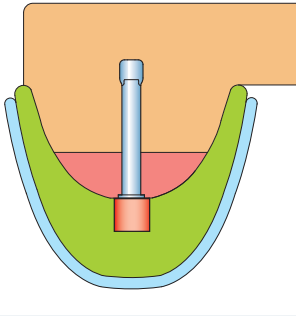
Failure to do so may result in an inaccurate master model. If the impression has been taken using the Sub/Supra-Dent impression set, the Sub/Supra-Tec ball attachment is screwed to the implant analog/transmucosal insert analog with the spacer to ensure the necessary resilience of the mucosa (tool: insertion tool for ball attachment). The spacer is not required when making the model if it has already been used with the impression set ball attachment ¹DALBO®-Plus to take an impression.

Making an artificial gingival mask (optional)

Make an artificial gingival mask according to the manufacturer's instructions. We recommend using addition-cured silicone to permit long-term documentation (storage) of models.

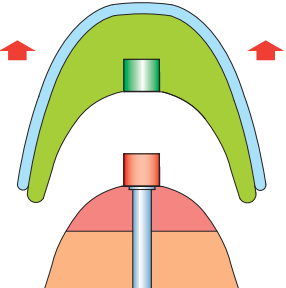
16. BEGO SEMADOS® S/RI SUB-DENT MAGNETIC IMPRESSIONS

15.2 Model-making with impression set ball attachment ¹DALBO®-Plus



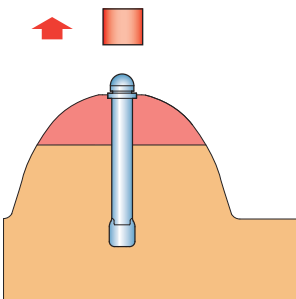
Making the model

When selecting the modelling material, follow the instructions provided by the manufacturer of the denture material. If no exact information is available, we recommend using a high-quality plaster, at least Class 3. Follow the manufacturer's instructions carefully, as any failure to do so may result in unserviceable master models.



Removing the model

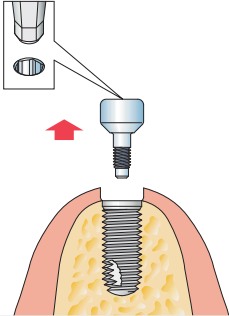
Do not remove from the impression until the modelling material has cured (follow manufacturer's instructions).



Removing the impression cap

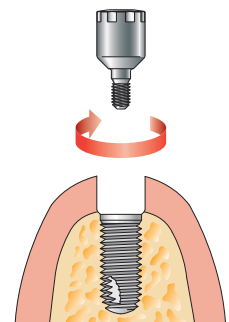
Remove the impression cap from the ball attachment anchor analog.

16.1 Impression-taking with Sub-Dent magnetic impressions



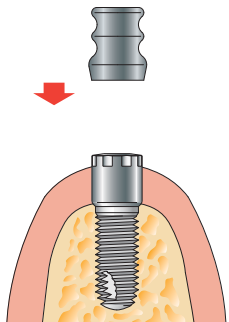
Removing the healing post

Unscrew the healing post anticlockwise (tool: hexagon screwdriver 1.25 mm). Clean the implant interface to remove blood and tissue remnants before fitting the Sub impression post.



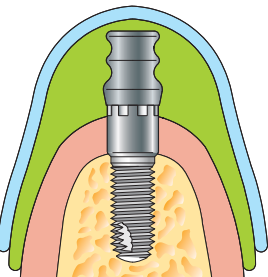
Fitting the Sub-Tec magnetic abutment

Secure the Sub-Tec magnetic abutment by turning clockwise (torque: 30 Ncm) (tool: insertion tool for magnetic abutment). Check for gap-free seating of abutment (radiographic check if necessary).



Fitting the magnetic impression post

Fit the magnetic impression post onto the Sub-Tec magnetic abutment so that the collar of the magnetic impression post overlaps the Sub-Tec magnetic abutment. Check for proper seating.



Taking the impression

We recommend taking the impression with a special tray. To take the impression use a silicone or polyether impression material with high elastic recovery (hydrocolloids are not suitable for this purpose).

16.1 Impression-taking with Sub-Dent magnetic impressions

Removing the impression

Remove the impression tray. Magnetic impression post remains in the impression material. The Sub-Tec magnetic abutment remains in the patient's mouth. In this case, the healing post is not reused.

Removing the Sub-Tec magnetic abutment (optional)

Unscrew the Sub-Tec magnetic abutment anticlockwise and store in a safe place (tool: insertion tool for magnetic abutment).

Inserting the healing post (optional)

Screw in the healing post clockwise (hand-tight/ 10 Ncm) (tool: hexagon screwdriver 1.25 mm).

16.2 Model-making with Sub-Dent magnetic impressions

Fitting the magnetic model analog

Insert the magnetic model analog into the magnetic impression post. Check the correct seating (no gap) and the elastic recovery behaviour of the impression material. A recovery phase of up to 2 hours may have to be observed depending on the elastic recovery behaviour of the material. Failure to do so may result in an inaccurate master model.

When using the BEGO Semados[®] 4steco[®] magnetic system, an artificial gingival mask is not essential.

Making the model

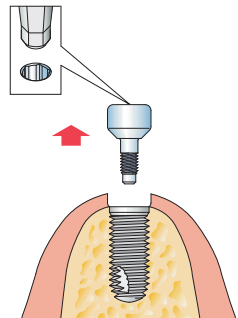
Make the model applying standard techniques and only using Type 4 dental plaster (DIN 6873) or a precision resin. Follow the manufacturer's instructions carefully, as any failure to do so may result in unserviceable master models.

Removing the model

Do not remove from the impression until the modelling material has cured (follow manufacturer's instructions). Detach the impression tray from the model. Impression post remains in the impression.

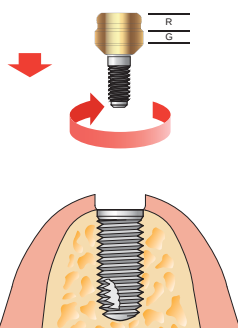
17. BEGO SEMADOS® S/RI ²Locator® IMPRESSIONS

17.1 Impression-taking with ²Locator® impression coping



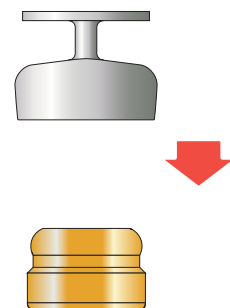
Removing the healing post

Unscrew the healing post anticlockwise (tool: hexagon screwdriver 1.25 mm). Clean the implant interface to remove blood and tissue remnants before fitting the Sub-Tec ²Locator®.



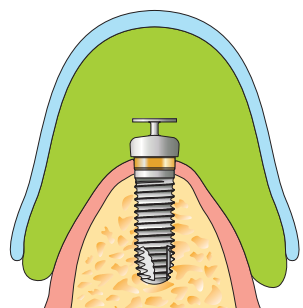
Fitting the Sub-Tec ²Locator®

First determine the gingival height in order to select the appropriate Sub-Tec ²Locator® abutment. The retention section (R) must never be below the gingiva. Secure the ²Locator® by turning clockwise (torque: 30 Ncm) (tool: ²Locator® insertion tool). Check for gap-free seating of abutment (radiographic check if necessary).



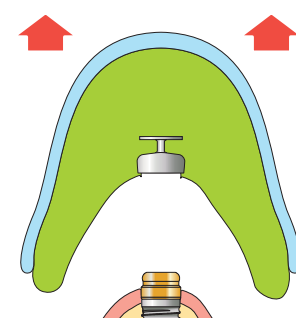
Fitting the ²Locator® impression coping

Fit the ²Locator® impression coping onto the Sub-Tec ²Locator® abutment. Check for proper seating.



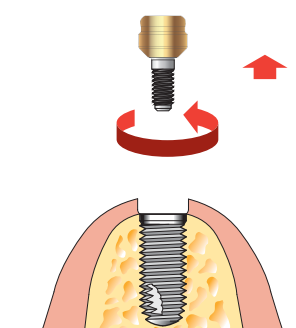
Taking the impression

A special tray or existing denture should be used for taking the impression; try in and modify if necessary. For a small denture base, the retention caps from the ²Locator® laboratory set can also be used in conjunction with the ²Locator® production insert (**Caution:** retention in the impression material is reduced). To take the impression use a silicone or polyether impression material with high elastic recovery (hydrocolloids are not suitable for this purpose).



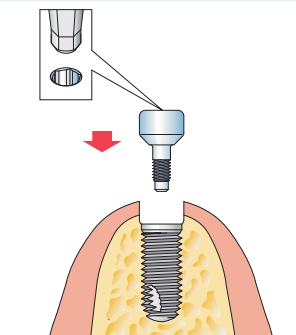
Removing the impression

Remove the impression tray. ²Locator® impression coping remains in the impression material.



Removing the Sub-Tec ²Locator® abutment

Unscrew the Sub-Tec ²Locator® abutment anticlockwise and store in a safe place (tool: insertion tool for ²Locator®).

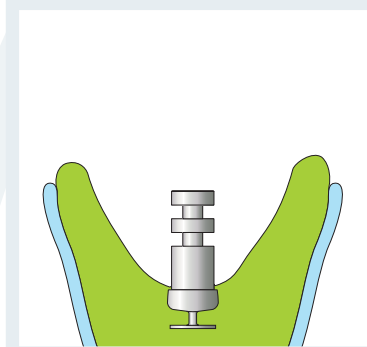


Inserting the healing post

Screw in the healing post clockwise (hand-tight/10 Ncm) (tool: hexagon screwdriver 1.25 mm).

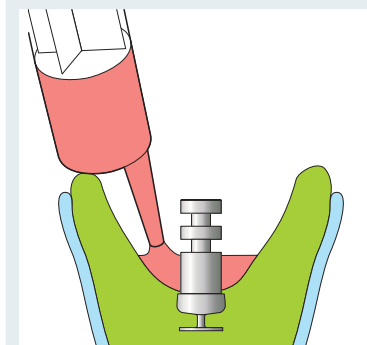
18. TEMPORARY RESTORATIONS ON BEGO SEMADOS® S/RI IMPLANTS

17.2 Model-making with ²Locator® impression coping



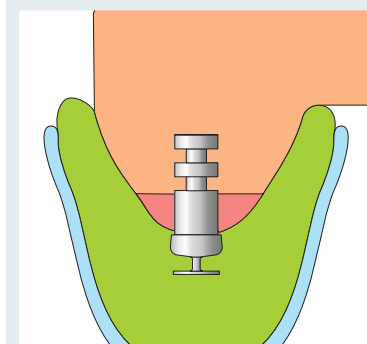
Fitting the ²Locator® analog

Insert the ²Locator® analog into the ²Locator® impression coping / ²Locator® retention cap (from ²Locator® laboratory set). Check the correct seating (no gap) and the elastic recovery behaviour of the impression material (follow manufacturer's instructions). A recovery phase of up to 2 hours may have to be observed depending on the elastic recovery behaviour of the material. Failure to do so may result in an inaccurate master model.



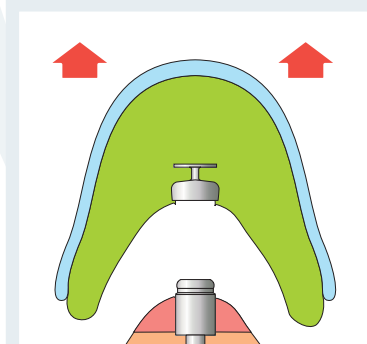
Making an artificial gingival mask (optional)

Make an artificial gingival mask according to the manufacturer's instructions. We recommend using addition-cured silicone to permit long-term documentation (storage) of models.



Making the model

Make the model applying standard techniques and only using Type 4 dental plaster (DIN 6873) or a precision resin. Follow the manufacturer's instructions as any failure to do so may result in unserviceable master models.



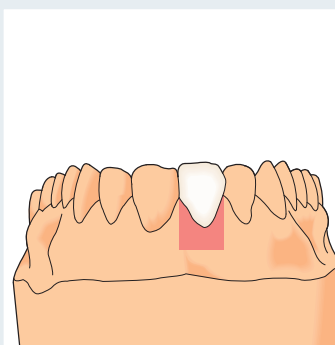
Removing the model

Do not remove from the impression until the modelling material has cured (follow manufacturer's instructions). Detach the impression tray from the model. ²Locator® impression coping remains in the impression. When using ²Locator® retention caps from the laboratory set, they are removed from the impression, cleaned and stored in a safe place for further use.

18.1 Sub-Tec provisional abutment Ø 5.5/7 – long-term temporary restoration

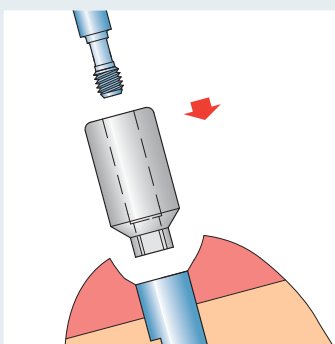
Product details

Sub-Tec provisional abutments Ø 5.5/7 are screwed directly into the implant and used to make long-term temporary restorations and/or immediate temporary restorations. A model with an artificial gingival mask is required when using the abutment. Sub-Tec provisional abutments Ø 5.5/7 are not suitable for the direct application of resins or for casting. We recommend disinfecting Sub-Tec provisional abutments Ø 5.5/7 before use on patients. Suitable surface disinfection should be used. The temporary abutment can only be worn for a limited period of ≤ 6 months.



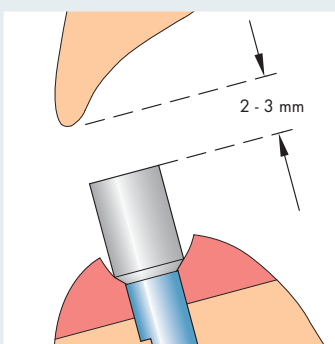
Set-up

Make the model applying standard techniques and only using Type 4 dental plaster (DIN 6873) or a precision resin. Follow the manufacturer's instructions carefully, as any failure to do so may result in unserviceable master models.



Inserting the Sub-Tec provisional abutment Ø 5.5/7

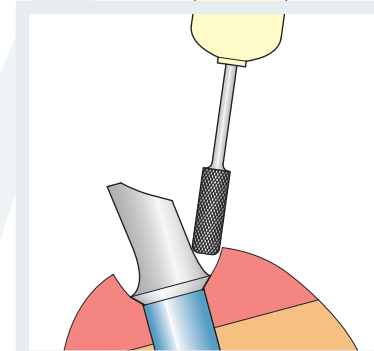
Screw the Sub-Tec provisional abutment Ø 5.5/7 onto the implant analog with the L9 technician screw (slotted screw) (hand-tight) (tool: slot screwdriver).



Shortening the Sub-Tec provisional abutment Ø 5.5/7

Use the silicone indexes prepared in the set-up for shortening the abutment (approx. 2–3 mm below the occlusal level). The L9 technician screw can also be shortened as far as the neck if required. In this case please customise the head of the screw for the slot screwdriver before use.

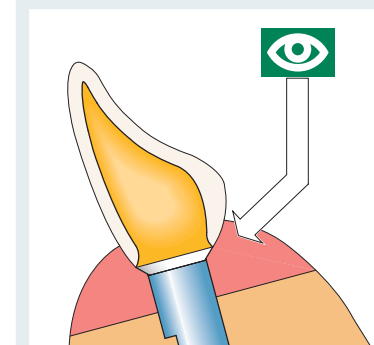
18.1 Sub-Tec provisional abutment Ø 5.5/7 – long-term temporary restoration



Individual grinding of the Sub-Tec provisional abutment Ø 5.5/7

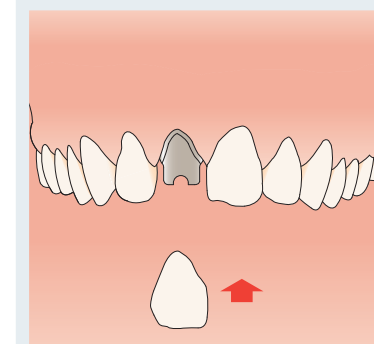
Prepare the abutment to suit individual requirements.

Caution: The connecting interfaces with the implant must not be sandblasted or finished. The fit is predetermined according to industrial specifications.



Making the long-term temporary restoration

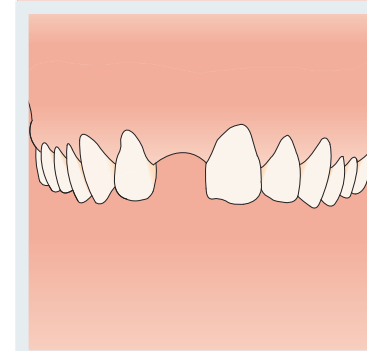
Make the frame out of metal, ceramic or plastic. Veneer with plastic or ceramic (follow manufacturer's instructions).



Integration

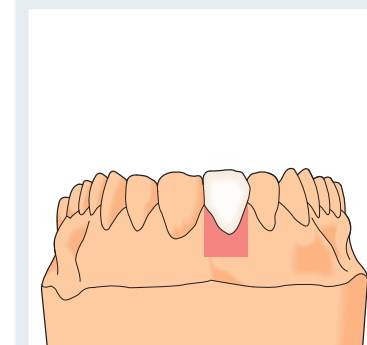
The prosthesis screw Hex 1.25 mm is used for final placement of the restoration in the patient's mouth (torque: 15 Ncm) (tool: hexagon screwdriver 1.25 mm). The prosthesis is secured with temporary cement (follow manufacturer's instructions).

18.2 Sub-Tec provisional abutment Ø 5.5/7 – immediate temporary restoration



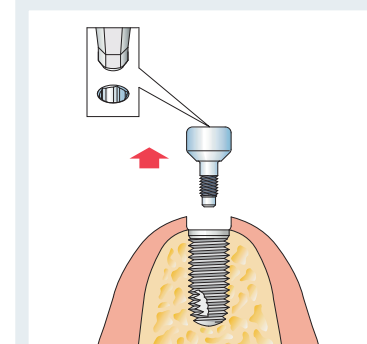
Taking the impression

Take an impression of the situation before exposing the implants and making a plaster model (follow manufacturer's instructions). The use of an existing study model may be possible here.



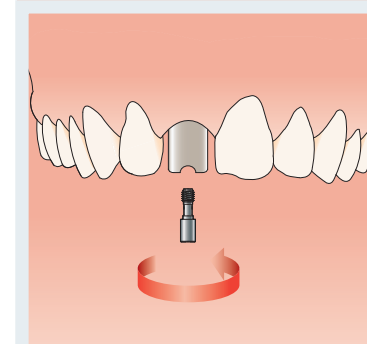
Set-up and production of a template

Make a set-up according to functional, phonetic and aesthetic aspects. Take an impression of the situation.



Exposure of implants

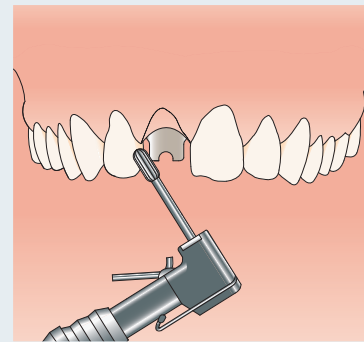
Expose the implants or remove the healing post, as required (tool: hexagon screwdriver 1.25 mm/slot screwdriver).



Inserting the Sub-Tec provisional abutment Ø 5.5/7

Screw the Sub-Tec provisional abutment Ø 5.5/7 onto the implant with the L9 technician screw (slotted screw) (hand-tight) (tool: slot screwdriver).

18.2 Sub-Tec provisional abutment Ø 5.5/7 – immediate temporary restoration

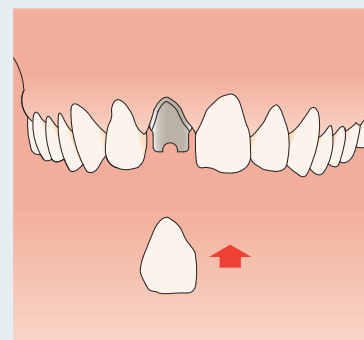


Individual grinding of the Sub-Tec provisional abutment Ø 5.5/7

Equigingival preparation of the abutment should be performed to suit individual requirements. The L9 technician screw can also be shortened as far as the neck if required. In this case please customise the head of the screw for the slot screwdriver before use.

Making the immediate temporary restoration

Make the immediate temporary restoration by taking an impression of the set-up using suitable temporary acrylic material (follow manufacturer's instructions).



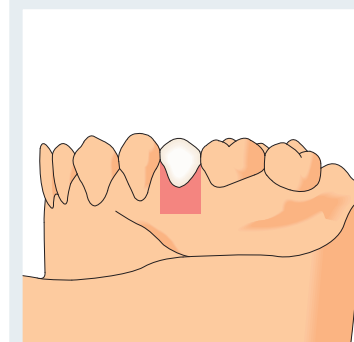
Integration

The prosthesis screw Hex 1.25 mm is used for final placement of the restoration in the patient's mouth (torque: 15 Ncm) (tool: hexagon screwdriver 1.25 mm). The prosthesis is secured with temporary cement (follow manufacturer's instructions).

18.3 Sub-Tec provisional titanium abutment

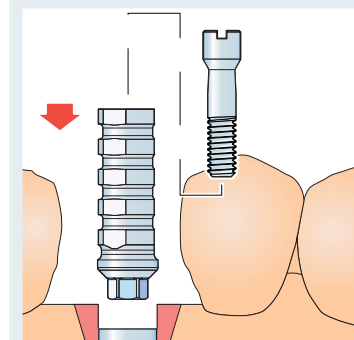
Product details

Sub-Tec provisional titanium abutments are screwed directly into the implant and used to make temporary single tooth restorations. A model with an artificial gingival mask is recommended for processing. Sub-Tec provisional titanium abutments are not suitable for making temporary directly screw-retained crown blocks, bridges, bar constructions or permanent restorations (> 6 months), nor for direct bonding of ceramics or for casting/soldering. We recommend disinfecting Sub-Tec provisional titanium abutments before use on patients. Suitable surface disinfection should be used. The temporary abutment can only be worn for a limited period of ≤ 6 months.



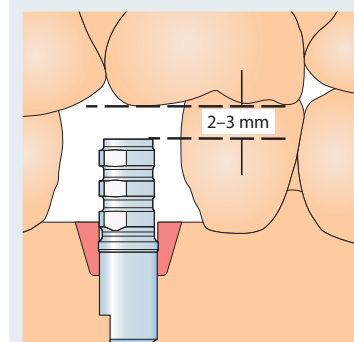
Set-up

Make a set-up according to functional, phonetic and aesthetic aspects. Take an impression of the situation using silicone indexes.



Inserting the Sub-Tec provisional titanium abutment

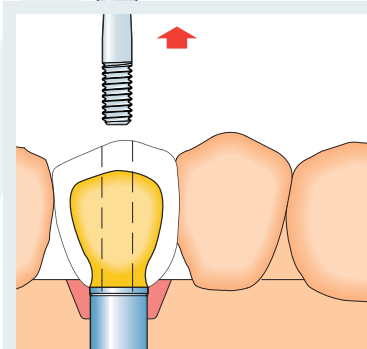
Screw the Sub-Tec provisional titanium abutment onto the implant analog with the Sub-Tec^{Plus} technician screw (slotted screw) (tool: slot screwdriver).



Shortening the Sub-Tec provisional titanium abutment

Use the silicone indices prepared in the set-up for shortening the abutment (approx. 2–3 mm below the occlusal level). If necessary, block out any undercuts in adjacent teeth. Fill the screw access channel with wadding, then seal with suitable material.

18.3 Sub-Tec provisional titanium abutment



Making the temporary restoration

Make the temporary restoration on the Sub-Tec provisional titanium abutment using a prefabricated mould and suitable temporary crown material (follow manufacturer's instructions). Drill an access hole through the mould. Then release and remove the Sub-Tec^{Plus} technician screw (tool: slot screwdriver). Finish and polish the temporary restoration.

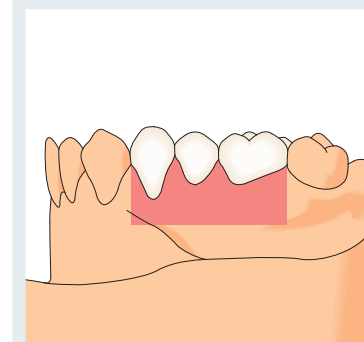
Integration

The Sub-Tec^{Plus} prosthesis screw is used for final placement of the restoration in the patient's mouth (torque: 30 Ncm) (tool: hexagon screwdriver 1.25 mm). The prosthesis is secured with temporary cement (follow manufacturer's instructions).

18.4 Sub-Tec provisional titanium abutment no Hex

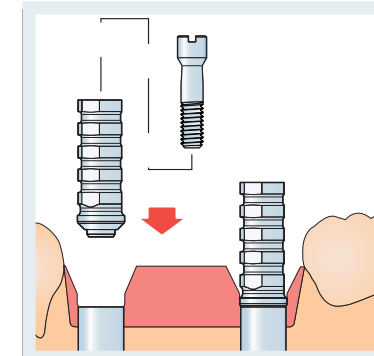
Product details

Sub-Tec provisional titanium abutments no Hex are screwed directly into the implant and used to make temporary splinted crowns and bridges. A model with an artificial gingival mask is recommended. Sub-Tec provisional titanium abutments no Hex are not suitable for making temporary single tooth restorations or permanent restorations (> 6 months), nor for direct bonding of ceramics or casting/soldering. We recommend disinfecting Sub-Tec provisional titanium abutments no Hex before use on patients. Suitable surface disinfection should be used. The temporary abutment can only be worn for a limited period of ≤ 6 months.



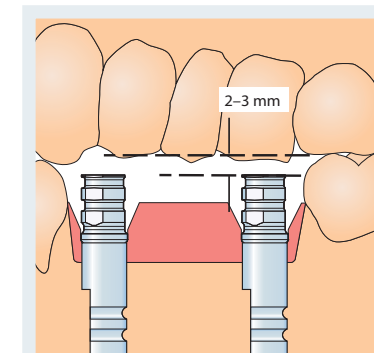
Set-up

Make a set-up according to functional, phonetic and aesthetic aspects. Take an impression of the situation using silicone indexes.



Inserting the Sub-Tec provisional titanium abutment no Hex

Screw the Sub-Tec provisional titanium abutment no Hex onto the implant analog with the Sub-Tec^{Plus} technician screw (slotted screw) (tool: slot screwdriver).

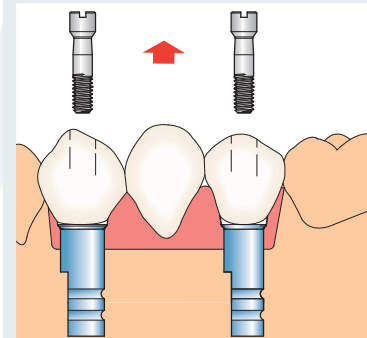


Shortening the Sub-Tec provisional titanium abutment no Hex

Use the silicone indices prepared in the set-up for shortening the abutment (approx. 2–3 mm below the occlusal level). If necessary, block out any undercuts in adjacent teeth. Fill the screw access channel with wadding, then seal with suitable material.

19. SUPERSTRUCTURES ON BEGO SEMADOS® S/RI IMPLANTS (SUPRA SYSTEM)

18.4 Sub-Tec provisional titanium abutment no Hex



Making the temporary restoration

Make the temporary restoration on the Sub-Tec provisional titanium abutment no Hex using a prefabricated mould and suitable temporary crown material (follow manufacturer's instructions). Drill an access hole through the mould. Then release and remove the Sub-Tec^{Plus} technician screw (tool: slot screwdriver). Finish and polish the temporary restoration.

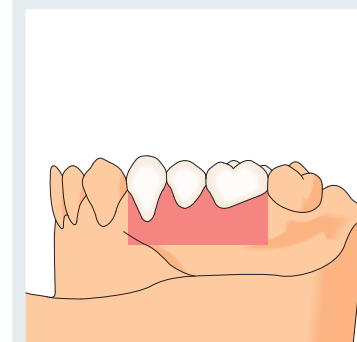
Integration

The Sub-Tec^{Plus} prosthesis screw is used for final placement of the restoration in the patient's mouth (torque: 30 Ncm) (tool: hexagon screwdriver 1.25 mm).

19.1 Supra-Tec Universal

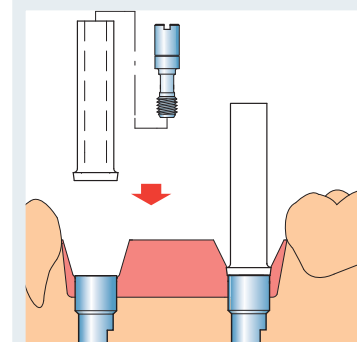
Product details

Supra-Tec Universal abutments are screwed directly onto the transmucosal connecting part and are used exclusively to make crowns with splinting or primary screw fixation, bridges and bar constructions due to the lack of anti-rotation protection. It is not essential to use an artificial gingival mask with the Supra-Tec Universal abutment when making the model. Supra-Tec Universal abutments are not suitable for making single tooth restorations. Avoid applying excessive torque when screwing the Supra-Burnout acrylic sleeve Universal in place prior to casting to prevent deformation of the material.



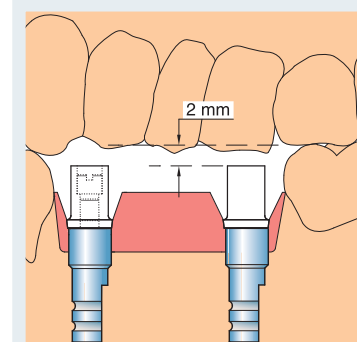
Set-up

Make a set-up according to functional, phonetic and aesthetic aspects. Take an impression of the situation using silicone indexes.



Inserting the Supra-Tec Universal abutments

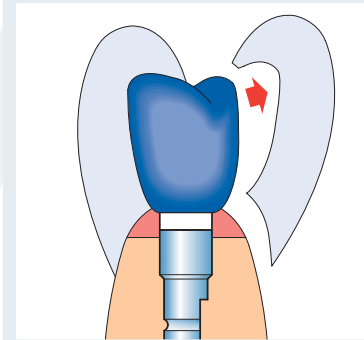
Screw the Supra-Burnout acrylic sleeve to the transmucosal insert analog with the L9 technician screw (slotted screw) (tool: slot screwdriver). Artificial gingival mask optional here.



Shortening the Supra-Burnout acrylic sleeve Universal

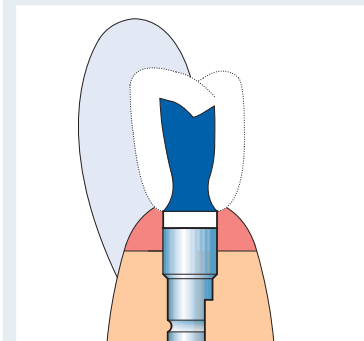
Use the silicone indexes prepared in the set-up for shortening the sleeve (approx. 2 mm below the occlusal level). The components can be secured to each other with cyanoacrylate adhesive. The L9 technician screw can also be shortened as far as the neck if required. In this case please customise the head of the screw for the slot screwdriver before use.

19.1 Supra-Tec Universal



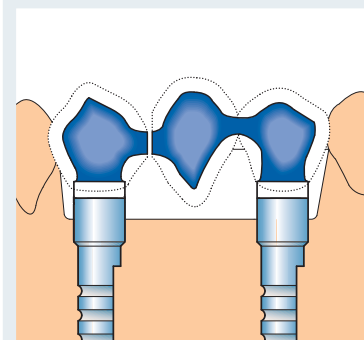
Wax-up

Make a complete wax-up, which allows you to check all the functional and aesthetic aspects of the restoration in advance. Take an impression of the situation with silicone indexes.



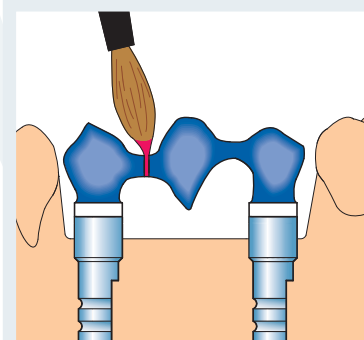
Reducing the wax-up

Follow the recommendations of the veneering material manufacturer for the layer thickness to be removed.



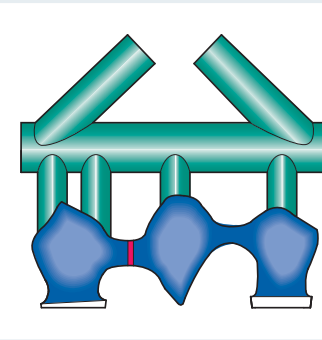
Separating the wax-up

Separate the wax-up to avoid stresses in the frame.



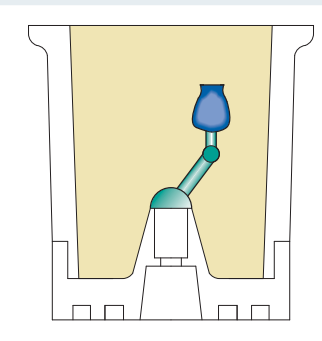
Splinting the wax-up

Splint with a self-curing resin (autopolymer, e.g. Pattern Resin, GC) to minimise stresses in the frame resulting from contraction of the modelling wax.



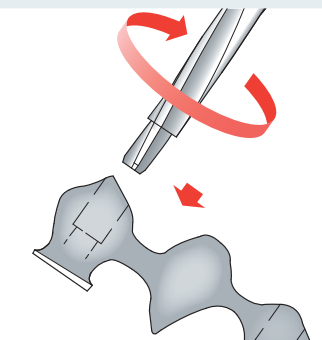
Spruing the wax-up

Sprue the wax-up according to the alloy manufacturer's recommendations.



Investing/Casting/Deflasking

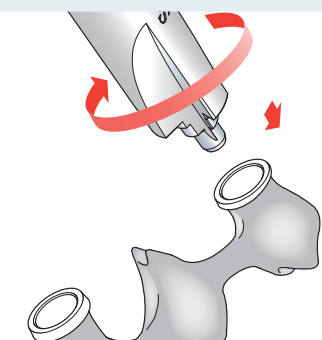
Make sure you follow the instructions supplied by the manufacturers of the products used and the General instructions for use of the BEGO Semados® implant superstructure given in Section 6.1.



Precision-finishing the inner frame structure/screw support

Use the internal reamer for Sub/Supra-Tec gold cast-on (Art. no. 53735) to precision-finish the screw channel and screw support. Introduce the tool into the frame from the occlusal direction. Use and then remove again in a clockwise direction without applying pressure. It may be necessary to repeat this step after final completion (e.g. if any ceramic material is left in the screw channel on completion).

Caution: Never rotate the reamer anticlockwise.

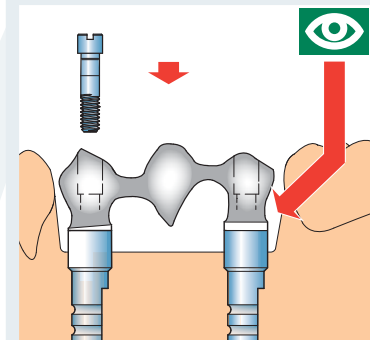


Precision-finishing the outer frame structure/screw support

The basal surface of the cast frame in contact with the transmucosal insert analog/transmucosal connecting part is precision-finished with the external reamer for Supra-Tec gold cast-on (Art. no. 53736). Make sure that the external reamer for Supra-Tec gold cast-on is used and removed again perpendicularly in a clockwise direction without applying pressure. It may be necessary to repeat this step after final completion (e.g. if any ceramic material is left in the basal contact surface on completion).

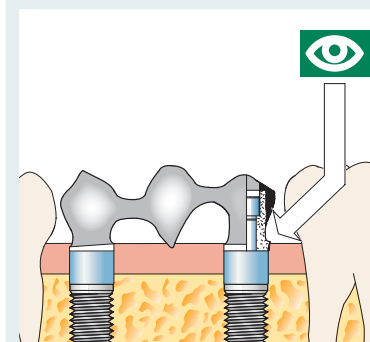
Caution: Never rotate the reamer anticlockwise.

19.1 Supra-Tec Universal



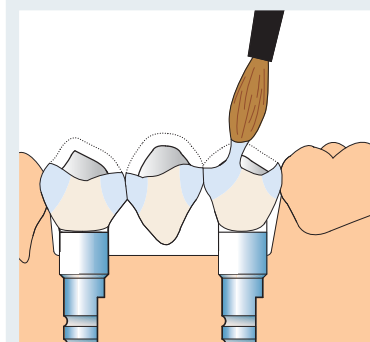
Check

Check that the construction is seated without any gaps or stress (Sheffield test).



Trial fitting of frame

Trial fitting of the frame on the model and in situ using plastic occlusal stops is recommended. The restoration can only be completed once the fit has been checked (radiographic check if necessary).



Completion/Integration

The dental technician completes the work as usual. The prosthesis screw Hex 1.25 mm is used for final placement of the restoration in the patient's mouth (torque: 25 Ncm) (tool: hexagon screwdriver 1.25 mm).

19.2 Supra-Tec gold cast-on

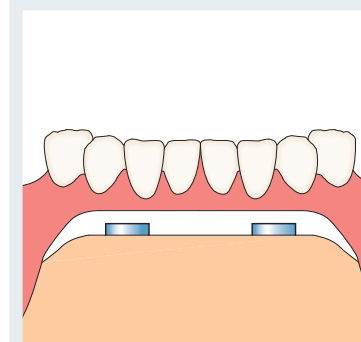
Product details

Supra-Tec gold cast-on abutments are screwed directly onto the transmucosal connecting part and are used exclusively to make crowns with splinting or primary screw fixation, bridges and bar constructions due to the lack of anti-rotation protection. It is not essential to use an artificial gingival mask with the Supra-Tec gold cast-on abutment when making the model. Supra-Tec gold cast-on abutments are not suitable for making single tooth restorations.

The Supra-Tec gold cast-on abutment is made of a gold-platinum alloy with a melting range of 1400–1460°C. For this reason a high-gold (at least 75% Au) alloy of the following classes must be used. Metal-to-ceramic alloy: DIN EN ISO 9693 standard; cast alloy: ISO 1562 standard, type 4. The cast alloy used should meet the following minimum requirements: modulus of elasticity > 90,000 MPa; ductile yield > 7%; elongation limit > 500 MPa; casting temperature < 1280°C; Vickers hardness > 220 HV 5; preheating temperature ≥ 850°C. We recommend using Bio PontoStar® XL or Bio PontoStar® (BEGO).

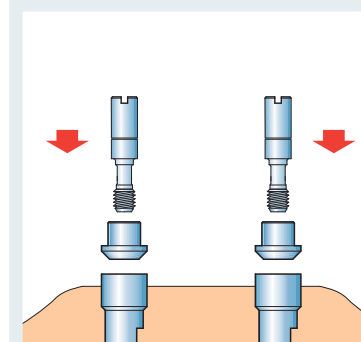
It is not possible to use alloys with reduced gold content or non-precious alloys.

For these alloys, the Supra-Tec Universal is suitable.



Set-up

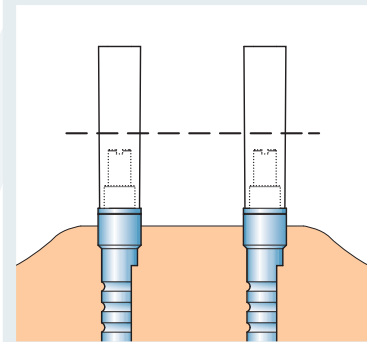
Set up the denture according to functional, aesthetic and phonetic aspects. Recess the implant region when shaping the base. Take an impression of the situation using silicone indexes. We recommend making a denture base using a self-curing resin (autopolymer) in order to give the set-up a high degree of stability.



Inserting the Supra-Tec gold cast-on abutment

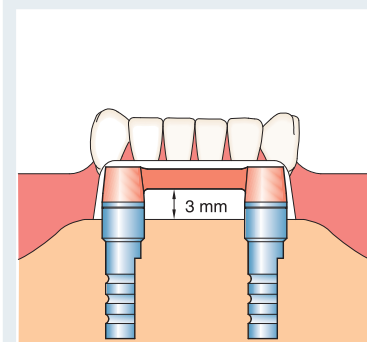
Screw the cast-on abutment to the transmucosal insert analog with the L9 technician screw (slotted screw) (tool: slot screwdriver).

19.2 Supra-Tec gold cast-on



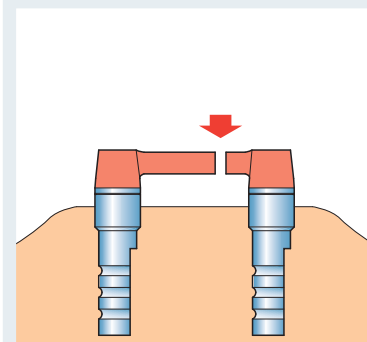
Shortening the acrylic sleeve

Fit the wider end of the acrylic sleeve onto the cast-on abutment. Close the gap between the cast-on abutment and the acrylic sleeve with wax. It has proven useful to secure the components to each other with some cyanoacrylate adhesive. Use the silicone indexes prepared in the set-up for shortening the acrylic sleeve and, if required, the L9 technician screw as far as the neck.



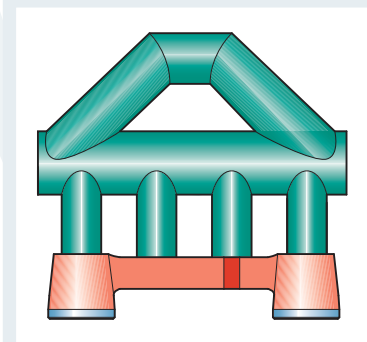
Dimensional check

When waxing up the bar, remember that the bar matrix must be integrated in the denture. Should the tongue be severely constricted by the type of construction, partial denture reinforcement is an adequate alternative in this case.



Wax-up of bar construction

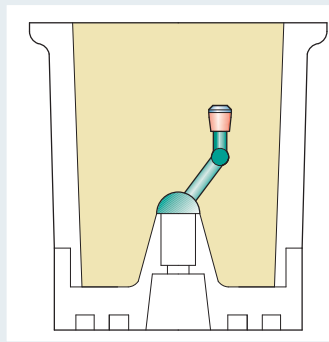
Separate the wax-up to avoid stresses in the frame. Splint with a self-curing resin (autopolymer) (e.g. Pattern Resin, GC) to minimise stresses in the frame resulting from contraction of the modelling wax.



Spruing the wax-up

Sprue the wax-up according to the ceramic/alloy manufacturer's recommendations. Weigh the wax-up carefully and calculate the alloy requirement (minus 0.5 g for each cast-on abutment).

Follow the General instructions for the use of BEGO Semados® implant superstructures given in Section 6.1.



Investing

Before investing, remove wax shavings etc. from the cast-on abutments. Do not use wetting agents, as they may form a film on the cast-on abutments, possibly resulting in defective casting. The use of a phosphate-bonded investment material is recommended here.

During preheating, castable alloys (cast-on abutments) put considerable stress on the investment material due to their coefficient of thermal expansion. If, during casting, constituents of the cast alloy shoot over the implant abutments ("skin formation"), this points to the investment material not being sufficiently stable. In this case an investment material of higher quality should be used.



Casting

When processing Semados® cast-on abutments, the preheating temperature of 850°C must be attained to ensure cast-on abutments which are flawless in metallurgical terms. Lower preheating temperatures cause insufficient diffusion of the alloy constituents.

The connection is then highly susceptible to corrosion and has little resistance to mechanical loads (casting temperature < 1280°C).

Make sure you follow the instructions supplied by the manufacturers of the products used and the General instructions for the use of BEGO Semados® implant superstructures given in Section 6.1.

19.2 Supra-Tec gold cast-on



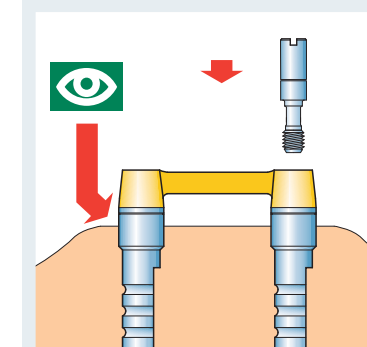
Deflasking

The investment material is removed with the help of a deinvesting drill – so as not to destroy the internal fit (screw support) – and a precision sandblaster. Optionally the investment material can be removed with a suitable fluid (e.g. hydrofluoric acid) in combination with ultrasound treatment. As high-melting alloys do not bond with investment material, the cast-on abutments emerge from the material with a high-gloss finish.

To ensure optimum fit of the prosthesis screw, use the internal reamer for Sub/Supra-Tec gold cast-on (Art. no.: 53735) (never rotate reamer anticlockwise).

Caution: The connecting interfaces with the implant must not be sandblasted or finished. The fit is predetermined according to industrial specifications.

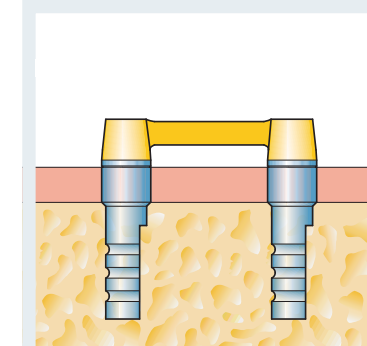
To help remove all traces of investment material from the casting by sandblasting with aluminium oxide, the exposed cast-on abutments can be coated with cold-cured polymer to protect them. The construction can then be carefully sandblasted once the resin material has cured.



Sheffield test according to White

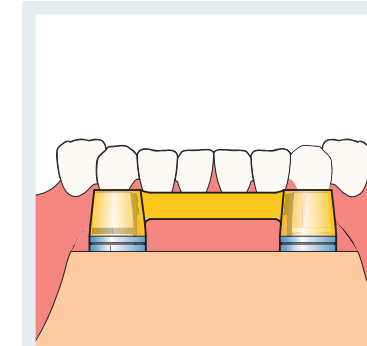
Follow the “General instructions for use – Sheffield-Test” given in Section 6.2.

The Sheffield test is the only way of checking stress-free seating of a superstructure.



Trial fitting in situ

Trial fitting of the frame on the model and intraorally using plastic occlusal stops is recommended. The restoration can only be completed once the fit has been checked. Check that the construction is seated without any gaps (Sheffield test).



Completion/Integration

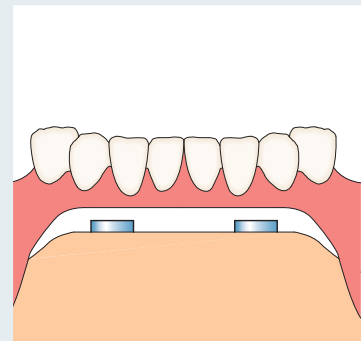
Complete the work according to the manufacturer's instructions. For final placement of the restoration in the patient's mouth start by positioning the transmucosal connecting part (torque: 30 Ncm) (tool: cross-tip screwdriver). The prosthesis screw Hex 1.25 mm is used for final placement of the restoration in the patient's mouth (torque: 25 Ncm) (tool: hexagon screwdriver 1.25 mm).

20. SUPERSTRUCTURES ON BEGO SEMADOS® S/RI IMPLANTS (SUB/SUPRA SYSTEM)

20.1 Sub/Supra-Tec ball attachment*

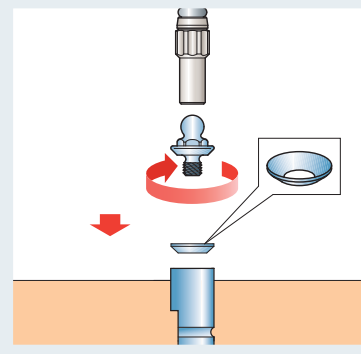
Product details

Sub-Tec ball attachment abutments are screwed directly into the implant, while Supra-Tec ball attachment abutments are screwed directly onto the transmucosal connecting part. They are both used for ball attachment restorations. With the Sub/Supra-Tec ball attachment abutment it is not essential to use an artificial gingival mask. The Sub/Supra-Tec ball attachment serves the purpose of prosthodontic retention and is not designed to absorb masticatory forces. Do not sandblast or otherwise finish any part of the Sub-/Supra-Tec ball attachment. We recommend using a base made of light-curing resin for bite taking and set-up in order to have a stable base and the option of temporarily fixing the female parts firmly with a self-curing resin (autopolymer) for trial fitting.



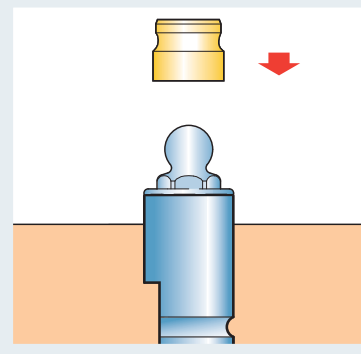
Set-up

Set up the denture taking into consideration functional, aesthetic and phonetic aspects. Recess the implant region when shaping the base. Take an impression of the situation using silicone indexes. It is recommended making a denture base using a self-curing resin (autopolymer) in order to give the set-up a high degree of stability and to temporarily fix the female parts firmly with a self-curing resin (autopolymer) for trial fitting if required.



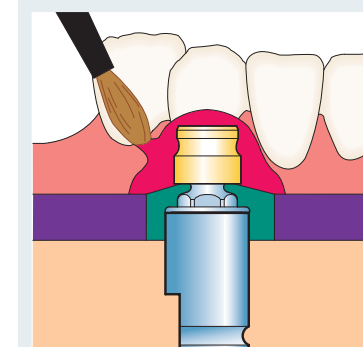
Inserting the Sub/Supra-Tec ball attachment

If impression has been taken using the Sub/Supra-Dent impression set, the ball attachment is screwed to the implant analog/transmucosal insert analog with the spacer to ensure the necessary resilience of the mucosa (tool: insertion tool for ball attachment). The spacer is not required when making the model if it has already been used with the impression set ball attachment ¹DALBO®-Plus to take the impression.



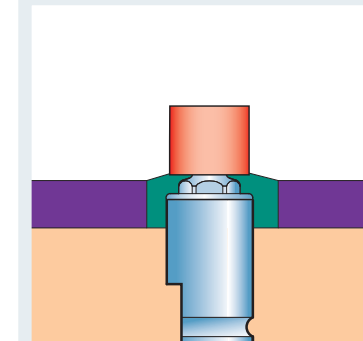
Fitting the female part ¹Dalbo®-Plus

After fitting the female part on the ball attachment, block out any undercuts all round the female part.



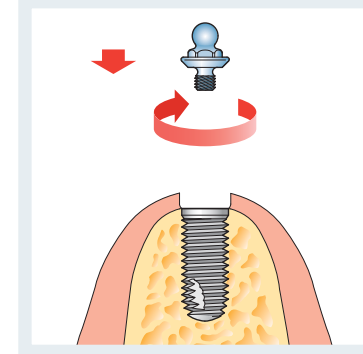
Fixing and completion of the female part

Temporary fixing of the female part with a self-curing resin (autopolymer) is followed by trial fitting on the patient. The denture is completed on the model (follow manufacturer's instructions) after blocking out any undercuts around the female part.



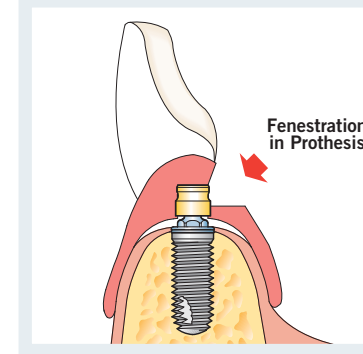
Optional partial denture reinforcement

If the female part is to be integrated into a partial denture plate, the space holder is used during duplication of the model (follow manufacturer's instructions) in order to generate a defined adhesive gap.



Integration

For final placement of the restoration the Sub-Tec ball attachment is screwed in place at a torque of 30 Ncm and the Supra-Tec ball attachment at 25 Ncm (tool: insertion tool for ball attachment). The level of retention strength for the denture can be adjusted using the ¹DALBO®-Plus Activator/Deactivator.



Optional intraoral completion

The denture is completed without female parts, fenestrated in the implant area, and the female parts are polymerised on the patient (follow manufacturer's instructions).

Caution: Completion takes place after blocking out undercuts around the female part.

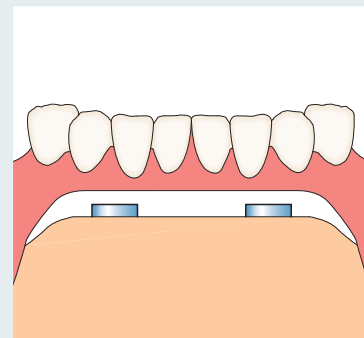
21. SUPERSTRUCTURES ON BEGO SEMADOS® S/RI IMPLANTS (SUB SYSTEM)

21.1 Sub-Tec magnetic abutment

Product details

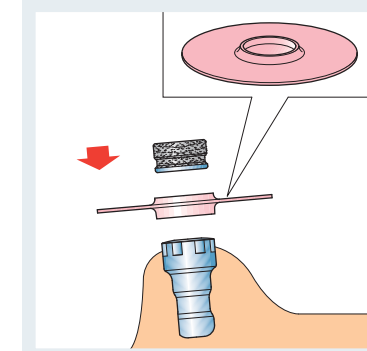
Sub-Tec magnetic abutments are screwed directly into the implant and used to make magnetic restorations. It is not essential to use an artificial gingival mask with the Sub-Tec magnetic abutment when making the model. A magnetic restoration is an implant-retained construction, which only compensates for withdrawal forces and is not able to withstand shear force or leverage.

The Sub-Tec magnetic abutment and the denture magnet (manufacturer: steco-system-technik GmbH & Co. KG, Hamburg, Germany) consist of a 0.25 mm thick titanium sheath and the cobalt samarium magnet. The magnet loses its magnetic force when exposed to temperatures exceeding 250°C, high mechanical loads (impact) or magnetic fields (MRI = magnetic resonance imaging). Components must not be subjected to mechanical loads (leverage) to avoid damage. The titanium sheath, sometimes only 0.2 mm thick, must never be ground down as this might expose the magnetic alloy ($\text{Sm}_2\text{Co}_{17}$), which is not resistant to the oral environment. The resulting corrosion will cause a loss of magnetic force, and further damage to the titanium sheath. Damaged magnets must be replaced at once. The denture magnet must not be soldered or lasered in. The high level of heat applied during soldering will cause an irreversible loss of magnetic force while lasering may perforate the titanium sheath. The functional sides of the magnets are dome-shaped to allow the denture to freely rotate on the inserts.



Set-up

Set up the denture taking into consideration functional, aesthetic and phonetic aspects. Recess the implant region when shaping the base. Take an impression of the situation using silicone indexes. We recommend making a denture base using a self-curing resin (autopolymer) in order to give the set-up a high degree of stability and to temporarily fix the denture magnets firmly with the resin for trial fitting if required.

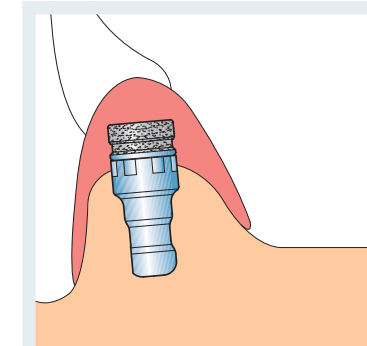


Denture magnet

Place position sleeve (approx. 0.3 mm) on magnetic model analog and position denture magnet on top.

Trial fitting

Fix the denture magnets to the set-up base with light-curing tray material. Trial fitting on patient for aesthetics/function. Trial fitting does not involve the position sleeves.



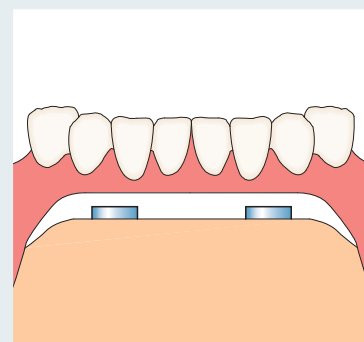
Completion

Resilience sleeves must be used to complete the denture to ensure the necessary degree of freedom in the patient's mouth.

21.2 Sub-Tec ²Locator® abutment

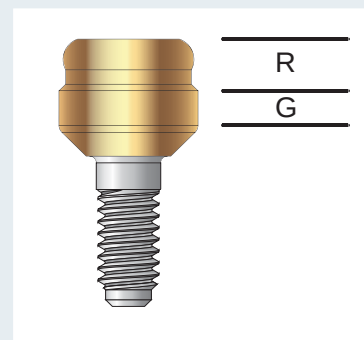
Product details:

Sub-Tec ²Locator® abutments are screwed directly into the implant and used to make resiliently supported full dentures on 2 to 4 implants. With the Sub-Tec ²Locator® abutment it is not essential to use an artificial gingival mask when making the model. Do not sandblast or otherwise finish any part of the Sub-Tec ²Locator® abutment. We recommend using a base made of light-curing resin for bite taking and set-up in order to have a stable base and the option of temporarily fixing the female parts firmly with a self-curing resin (autopolymer) for trial fitting.



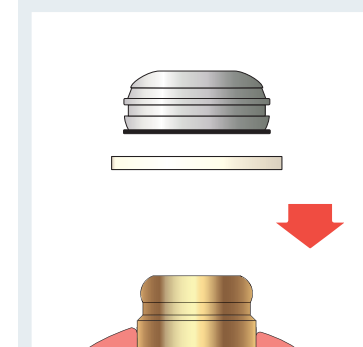
Set-up

Set up the denture taking into consideration functional, aesthetic and phonetic aspects. Recess the implant region when shaping the base. Take an impression of the situation using silicone indexes. We recommend making a denture base using a self-curing resin (autopolymer) in order to give the set-up a high degree of stability and to temporarily fix the retention cap from the ²Locator® laboratory set firmly with a self-curing resin (autopolymer) for trial fitting if required.



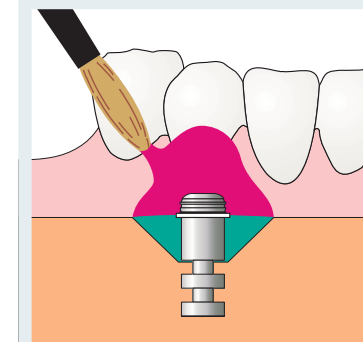
Inserting the Sub-Tec ²Locator® abutment

Caution: First determine the gingival height in order to select the appropriate Sub-Tec ²Locator® abutment. The retention section (R) must never be below the gingiva (G). If the impression has been taken using the Sub-Dent impression set, the Sub-Tec ²Locator® abutment is screwed to the implant analog (tool: ²Locator® insertion tool). It does not need to be screwed in when making the model if the ²Locator® impression coping or retention cap from the ²Locator® laboratory set has already been used to take an impression.



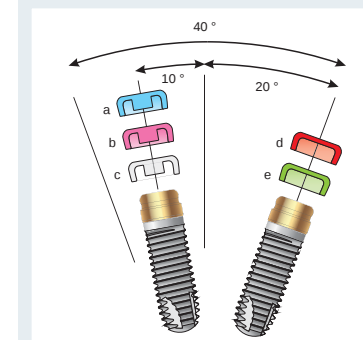
Fitting the retention cap

Before fitting the retention cap with the black production insert from the ²Locator® laboratory set, pull the white ²Locator® block-out ring over the retention section (R) of the ²Locator® abutments/analogs to prevent ingress of resin into the retention cap. Then block out any undercuts around the female part.



Fixing and completion of the retention cap

Temporary fixing of the female part with a self-curing resin (autopolymer) is followed by trial fitting on the patient. The denture is completed on the model (follow manufacturer's instructions) after blocking out any undercuts around the female part.

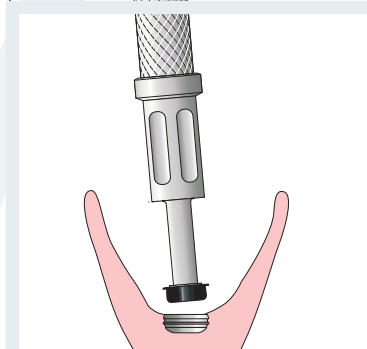


Determining the implant axes/ the correct ²Locator® retention inserts

Position the ²Locator® parallel posts on the seated Sub-Tec ²Locator® abutments/²Locator® analogs until a perceptible resistance is overcome. Use the ²Locator® angle measurement gauge to determine the divergences between the individual implant abutments.

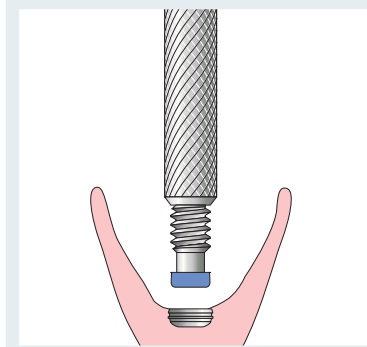
For divergences $\leq 10^\circ$ per implant ($\leq 20^\circ$ between two implants), use the blue (a), pink (b) or transparent (c) ²Locator® retention insert. For divergences between 10° and 20° per implant (up to 40° between two implants), use the red (d) or green (e) ²Locator® retention insert.

21.2 Sub-Tec ²Locator® abutment

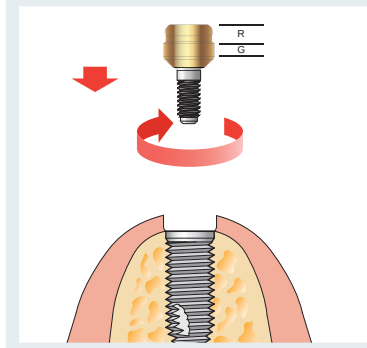


Placing the retention inserts

Remove the white ²Locator® block-out ring from the ²Locator® analogs or the Sub-Tec ²Locator® abutment. Replace the black ²Locator® production insert with a corresponding coloured ²Locator® retention insert. To do so, screw down the tip of the three-piece ²Locator® instrument (core tool) anticlockwise. Insert the retentive tip into the black production insert and then pull out the insert, keeping it straight all the time.



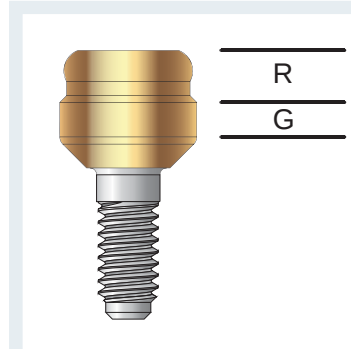
The retention inserts, selected according to the abutment divergence and desired retention strength, can be inserted into the retention cap using the middle section of the ²Locator® instrument (seating tool). Press the retention insert firmly into the free retention cap until it is flush with the edge of the cap.



Completion

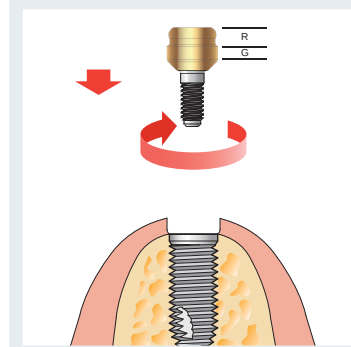
For final placement of the restoration in the patient's mouth, secure the Sub-Tec ²Locator® abutment by turning clockwise (torque: 30 Ncm) (tool: ²Locator® insertion tool). Check that the Sub-Tec ²Locator® abutment is seated without any gaps (radiographic check if necessary).

21.3 Sub-Tec ²Locator® abutment – Optional intraoral completion



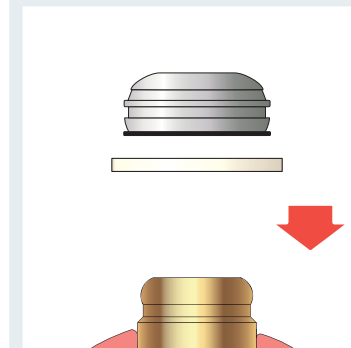
Caution:

First determine the gingival height in order to select the appropriate Sub-Tec ²Locator® abutment. The retention section (R) must never be below the gingiva (G).



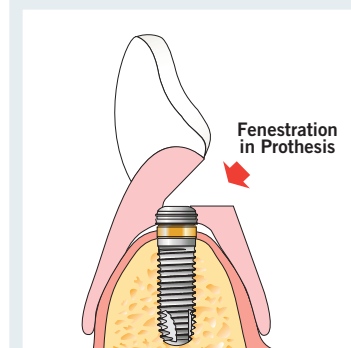
Inserting the Sub-Tec ²Locator® abutment

Secure the Sub-Tec ²Locator® abutment by turning clockwise (torque: 30 Ncm) (tool: insertion tool for Locator®). Check that the Sub-Tec ²Locator® abutments are seated without any gaps (radiographic check if necessary).



Fitting the retention cap

Before fitting the retention cap with the black production insert from the ²Locator® laboratory set, pull the white ²Locator® block-out ring over the retention section (R) of the ²Locator® abutments to prevent ingress of resin into the retention cap. Then block out any undercuts all round the female part.

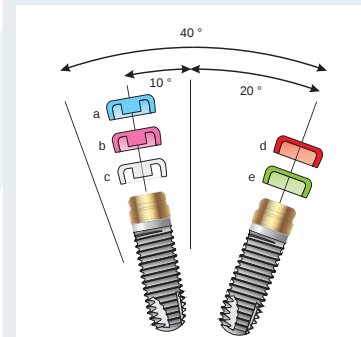


Making the prosthesis

The denture is completed without female parts, fenestrated in the implant area, and the female parts are polymerised on the patient (follow manufacturer's instructions).

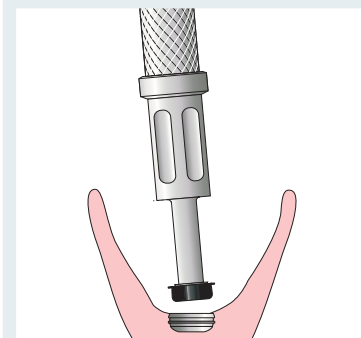
Caution: Completion takes place after blocking out undercuts around the female part.

21.3 Sub-Tec ²Locator® abutment – Optional intraoral completion



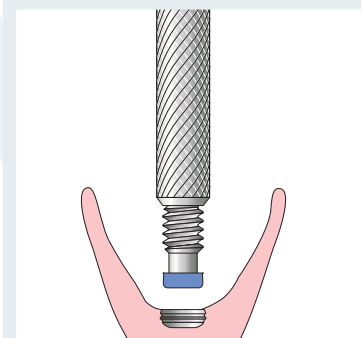
Determining the implant axes/ the correct Locator® retention inserts

Position the ²Locator® parallel posts on the seated Sub-Tec ²Locator® abutments until a perceptible resistance is overcome. Use the ²Locator® angle measurement gauge to determine the divergences between the individual implant abutments. For divergences $\leq 10^\circ$ per implant ($\leq 20^\circ$ between two implants), use the blue (a), pink (b) or transparent (c) ²Locator® retention insert. For divergences between 10° and 20° per implant (up to 40° between two implants), use the red (d) or green (e) ²Locator® retention insert.



Placing the retention inserts

Remove the white ²Locator® block-out ring from the ²Locator® analogs or the Sub-Tec ²Locator® abutment. Replace the black ²Locator® production insert with a corresponding coloured ²Locator® retention insert. To do so, screw down the tip of the three-piece ²Locator® instrument (core tool) anticlockwise. Insert the retentive tip into the black production insert and then pull out the insert, keeping it straight all the time.



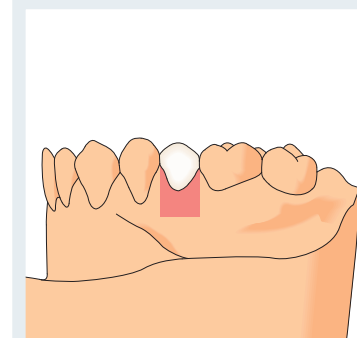
The retention inserts, selected according to the abutment divergence and desired retention strength, can be inserted into the retention cap using the middle section of the ²Locator® instrument (seating tool). Press the retention insert firmly into the free retention cap until it is flush with the edge of the cap.

21.4 BeCe Sub-Tec ceramic abutment

Product details

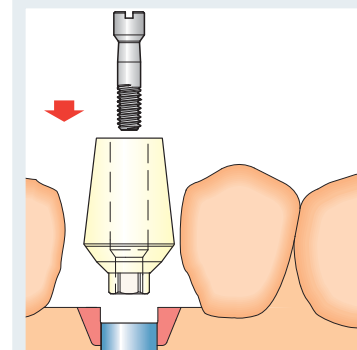
BeCe Sub-Tec ceramic abutment for making cement-retained restorations.

Caution: The direct bonding of ceramics is not possible. Never use ceramic abutments in the molar area or for terminal implants in the pre-molar area. A model with an artificial gingival mask is required when using the abutment. The ceramic abutment can be individually shortened/ground with a diamond ceramic shaper (e.g. BeCe Air Zirkon, BEGO) if continuous water cooling is used. A minimum material thickness of 0.4 mm must be preserved. BeCe Sub-Tec ceramic abutments must not be sterilised using an autoclave procedure (high-pressure steam sterilisation) or gamma/beta radiation. Avoid thermal shock conditions such as switching suddenly from hot to cold and steam cleaning.



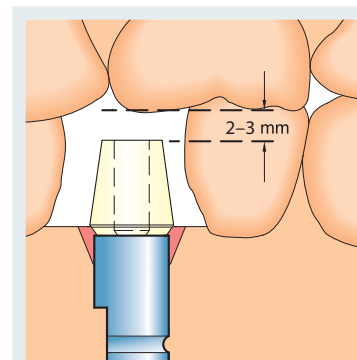
Set-up

Make a set-up with acrylic teeth according to functional, phonetic and aesthetic aspects. Take an impression of the situation using silicone indexes.



Inserting the ceramic abutment

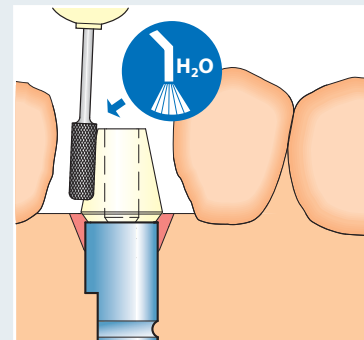
Screw the BeCe Sub-Tec ceramic abutment onto the implant analog with the Sub-Tec^{Plus} technician screw (slotted screw) (tool: slot screwdriver).



Shortening the ceramic abutment

Use the silicone indices prepared in the set-up for shortening the abutment (approx. 2–3 mm below the occlusal level).

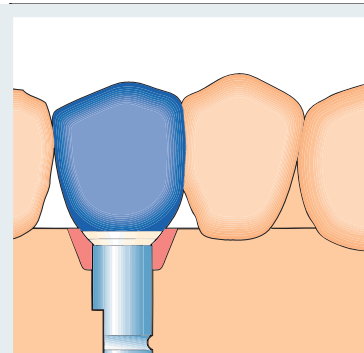
21.4 BeCe Sub-Tec ceramic abutment



Individual grinding of the ceramic abutment

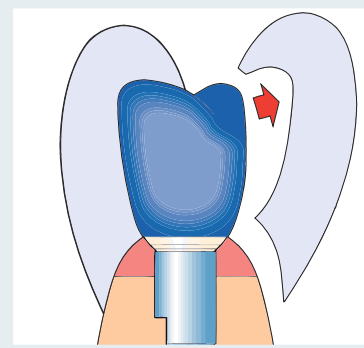
Prepare the abutment to suit individual requirements. We recommend making a circumferential chamfer. Ensure sufficient water cooling.

Caution: The connecting interfaces with the implant must not be sandblasted or finished. The fit is predetermined according to industrial specifications.



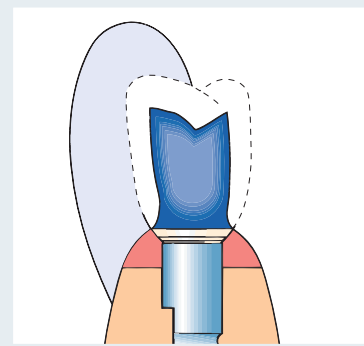
Wax-up

Make a complete wax-up, which allows you to check all the functional and aesthetic aspects of the restoration in advance (follow manufacturer's instructions).



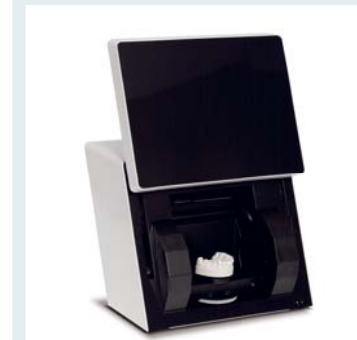
Taking the impression

Take an impression of the wax-up with separate silicone indexes for buccal/vestibular, occlusal and oral.



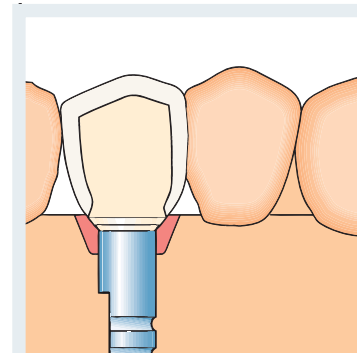
Reducing the wax-up

Reduce the wax-up in relation to the ceramic veneered frame. Follow the recommendations of the relevant ceramics manufacturer for the layer thickness to be removed. Aim to achieve the anatomical shape of the frame.



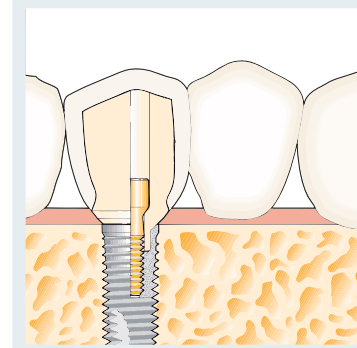
Making the prosthesis

In order to restore the BeCe Sub-Tec ceramic abutment optimally, make an all-ceramic frame according to the manufacturer's instructions using a method of your own choice. Restoration with a metal frame (porcelain-fused-to-metal crown (PFM)) tends to be less than ideal here.



Check

Ensure that there is a gap-free marginal seal between the frame and the BeCe Sub-Tec ceramic abutment.



Completion

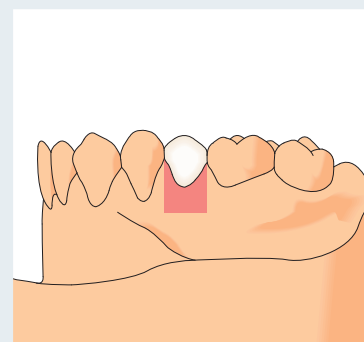
The prosthesis screw for ceramic abutment (gold colour) is used for final placement of the restoration in the patient's mouth (torque: 30 Ncm) (tool: hexagon screwdriver 1.25 mm).

21.5 Sub-Tec titanium abutment conical

Product details

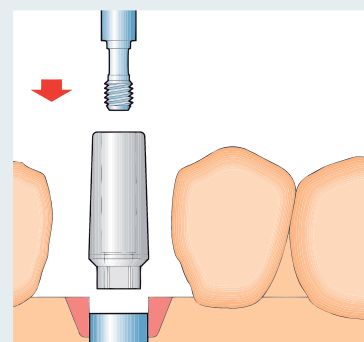
Sub-Tec conical titanium abutments are screwed directly into the implant and are used exclusively to make single tooth restorations/cement-retained restorations (crowns and bridges) due to their anti-rotation protection. A model with an artificial gingival mask is required when using the abutment. Sub-Tec conical titanium abutments are not suitable for making directly screw-retained constructions (e.g. bar constructions, bridges etc.). None of the abutments are suitable for direct bonding of ceramics or for casting/soldering.

Follow the “General instructions for use – BEGO Semados® materials, titanium” given in Section 5.3.



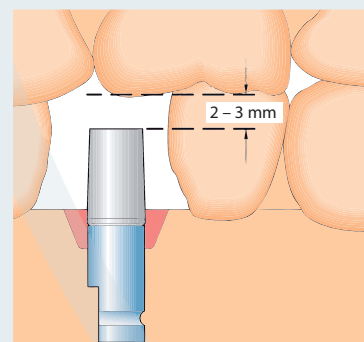
Set-up

Make a set-up with acrylic teeth according to functional, phonetic and aesthetic aspects. Take an impression of the situation using silicone indexes.



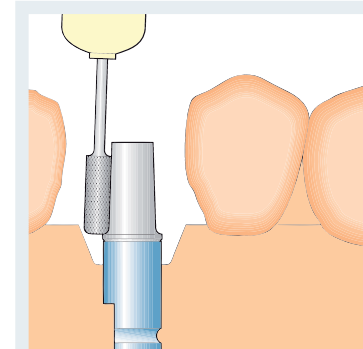
Inserting the Sub-Tec titanium abutment

Screw the Sub-Tec titanium abutment to the implant analog with the L9 technician screw (slotted screw) (tool: slot screwdriver).



Shortening the Sub-Tec titanium abutment

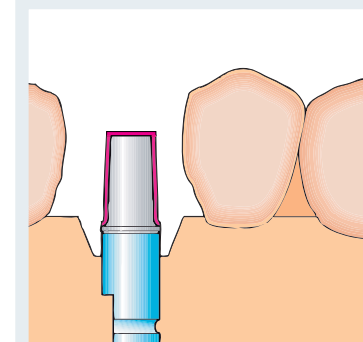
Use the silicone indices prepared in the set-up for shortening the abutment (approx. 2–3 mm below the occlusal level). The L9 technician screw can also be shortened as far as the neck if required. In this case please customise the head of the screw for the slot screwdriver before use.



Individual grinding of the Sub-Tec titanium abutment

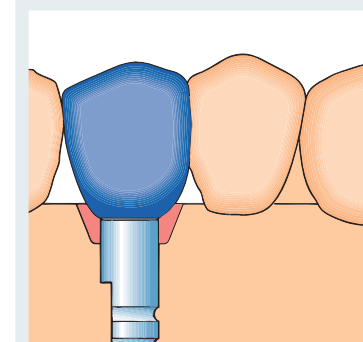
Prepare the abutment to suit individual anatomical requirements. It is advisable to make a circumferential chamfer.

Caution: The connecting interfaces with the implant must not be sandblasted or finished. The fit is predetermined according to industrial specifications.



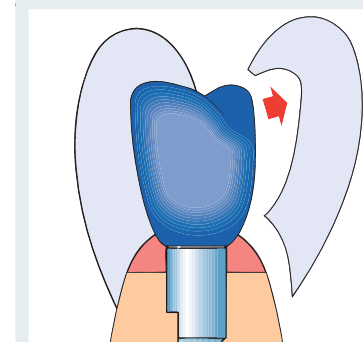
Secondary crown

The secondary crown can be made from self-curing resin (autopolymer) (follow manufacturer's instructions). Check the wax-up with the help of the silicone indexes prepared in the set-up.



Wax-up

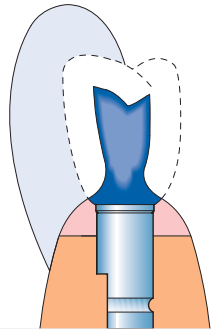
Make a complete wax-up, which allows you to check all the functional and aesthetic aspects of the restoration in advance (follow manufacturer's instructions).



Taking the impression

Take an impression of the wax-up with separate silicone indexes for buccal/vestibular, occlusal and oral.

21.5 Sub-Tec titanium abutment conical



Reducing the wax-up

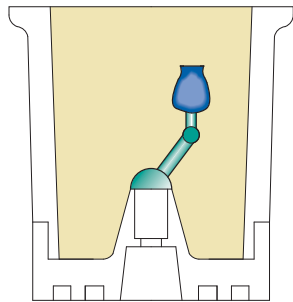
Reduce the wax-up in relation to the metal ceramic frame. Follow the recommendations of the relevant ceramics manufacturer for the layer thickness to be removed. Aim to achieve the reduced anatomical shape of the frame.



Spruing the wax-up

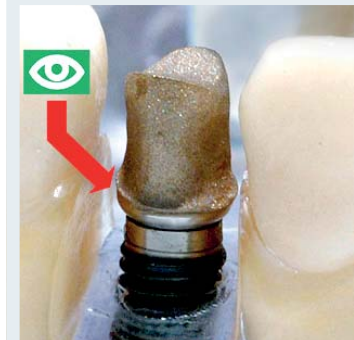
Sprue the wax-up according to the ceramic/alloy manufacturer's recommendations.

Follow the General instructions for the use of BEGO Semados® implant superstructures given in Section 6.1.



Investing/Casting/Deflasking

Make sure you follow the instructions provided by the manufacturers of the products used and the General instructions for the use of BEGO Semados® implant superstructures given in Section 6.1.



Check

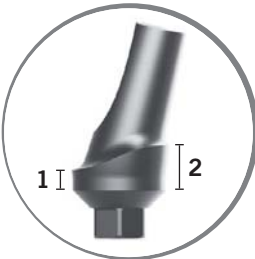
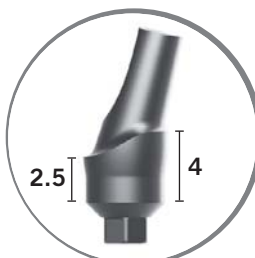
Ensure that there is a gap-free marginal seal between the frame and the Sub-Tec titanium abutments.



Completion

The prosthesis screw Hex 1.25 mm is used for final placement of the restoration in the patient's mouth (torque: 30 Ncm) (tool: hexagon screwdriver 1.25 mm).

21.6 Sub-Tec^{Plus} solid abutments – Assortment set 0°/15°/20°

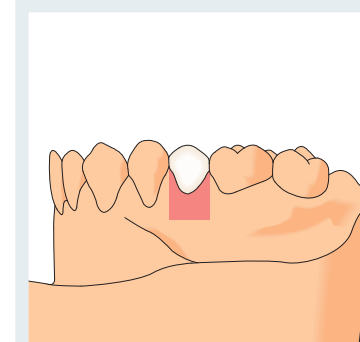
	GH 1 - 2 mm
	GH 2.5 - 4 mm
	Type E = Angle over Edge
	Type P = Angle over Plain

21.7 Sub-Tec^{Plus} solid abutments

Product details

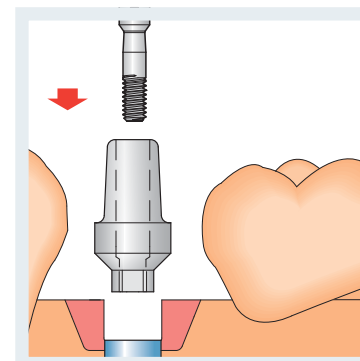
Sub-Tec^{Plus} solid abutments are screwed directly into the implant and are used exclusively to make single tooth restorations/cement-retained restorations (crowns and bridges) due to their anti-rotation protection. A model with an artificial gingival mask is required when using the abutment. Sub-Tec^{Plus} solid abutments are not suitable for making directly screw-retained constructions (e.g. bar constructions, bridges, etc.). None of the abutments are suitable for direct bonding of ceramics or for casting/soldering. Measure the mucosal thickness on the working model and select as appropriate the correct height, angle and alignment of the Hex of the required abutment.

Follow the “General instructions for use – BEGO Semados® materials, titanium and Wirobond® MI” given in Sections 5.3 and 5.4.



Set-up

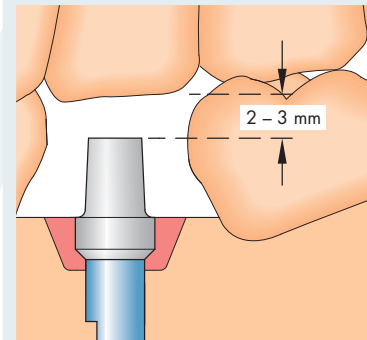
Make a set-up with acrylic teeth according to functional, phonetic and aesthetic aspects. Take an impression of the situation using silicone indexes.



Inserting the Sub-Tec^{Plus} abutment

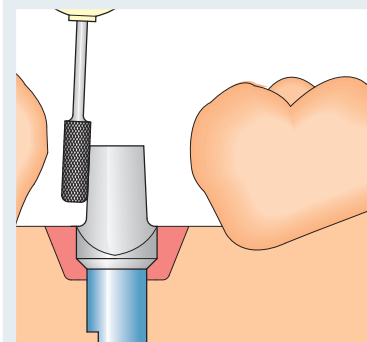
Screw the Sub-Tec^{Plus} abutment onto the implant analog with the Sub-Tec^{Plus} technician screw (slotted screw) (tool: slot screwdriver).

21.7 Sub-Tec^{Plus} solid abutments



Shortening the Sub-Tec^{Plus} abutment

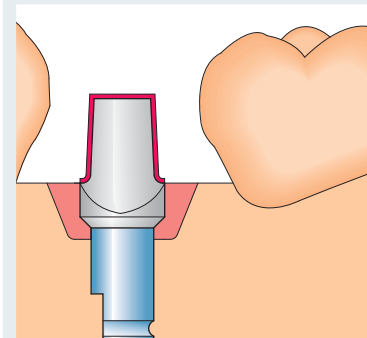
Use the silicone indices prepared in the set-up for shortening the abutment (approx. 2–3 mm below the occlusal level).



Individual grinding of the Sub-Tec^{Plus} abutment

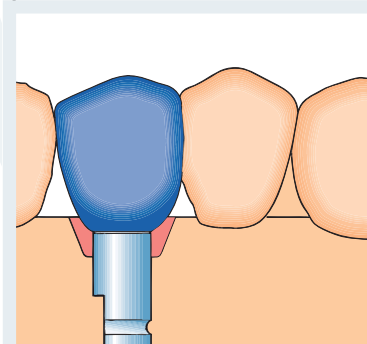
Prepare the abutment to suit individual requirements. It is advisable to make a circumferential chamfer.

Caution: The connecting interfaces with the implant must not be sandblasted or finished. The fit is predetermined according to industrial specifications.



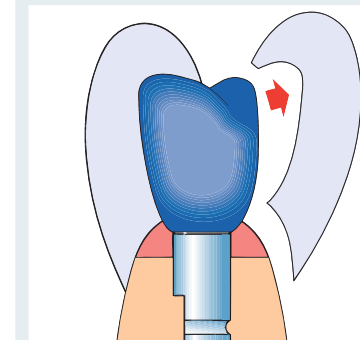
Secondary crown

The secondary crown can be made from self-curing resin (autopolymer) (follow manufacturer's instructions). Check the wax-up with the help of the silicone indices prepared in the set-up.



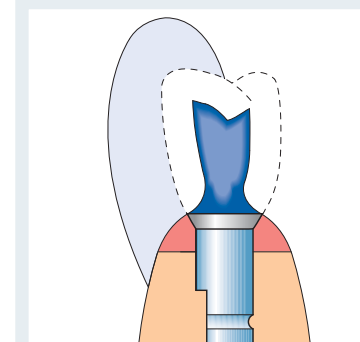
Wax-up

Make a complete wax-up, which allows you to check all the functional and aesthetic aspects of the restoration in advance (follow manufacturer's instructions).



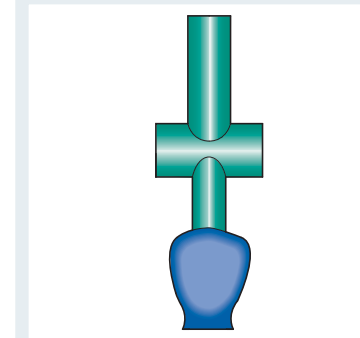
Taking the impression

Take an impression of the wax-up with separate silicone indexes for buccal/vestibular, occlusal and oral.



Reducing the wax-up

Reduce the wax-up in relation to the metal ceramic frame. Follow the recommendations of the relevant ceramics manufacturer for the layer thickness to be removed. Aim to achieve the reduced anatomical shape of the frame.

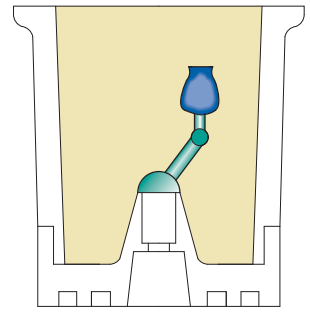


Spruing the wax-up

Sprue the wax-up according to the ceramic/alloy manufacturer's recommendations.

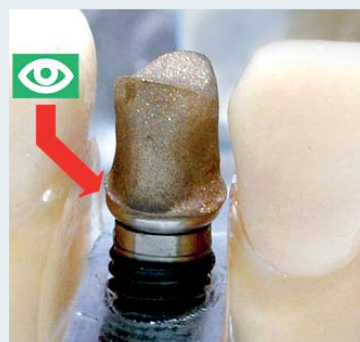
Follow the General instructions for the use of BEGO Semados[®] implant superstructures given in Section 6.1.

21.7 Sub-Tec^{Plus} solid abutments



Investing/Casting/Deflasking

Make sure you follow the instructions provided by the manufacturers of the products used and the General instructions for the use of BEGO Semados® implant superstructures given in Section 6.1.



Check

Ensure that there is a gap-free marginal seal between the frame and the Sub-Tec^{Plus} abutments.



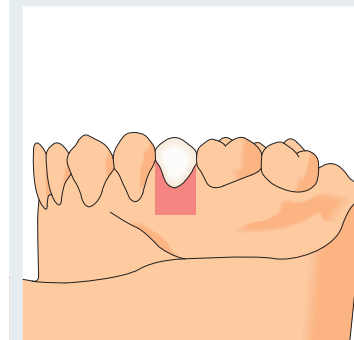
Completion

The Sub-Tec^{Plus} prosthesis screw is used for final placement of the restoration in the patient's mouth (torque: 30 Ncm) (tool: hexagon screwdriver 1.25 mm).

21.8 Sub-Tec Universal

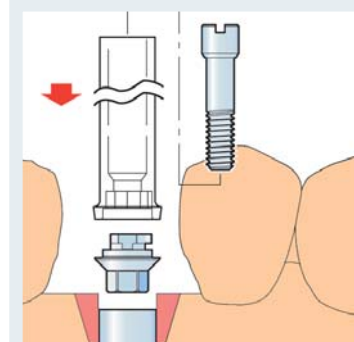
Product details

Sub-Tec Universal abutments are screwed directly into the implant and are used exclusively to make single-tooth restorations with primary screw fixation due to their anti-rotation protection. A model with an artificial gingival mask is required when using the abutment. Sub-Tec Universal abutments are not suitable for making directly screw-retained crown blocks, bridges or bar constructions. None of the abutments are suitable for direct casting-on. Avoid applying excessive torque when screwing the Sub-Burnout acrylic sleeve Universal in place prior to casting to prevent deformation of the material. An attachment adhesive is required to complete the work (see Section 21.10). Adhesive bonding merely serves to create a bacteria-proof seal for the connection between the Universal base Hex and Sub-Burnout acrylic sleeve or the cast frame. The seat of the screw is in the Sub-Burnout acrylic sleeve Universal or, later on, in the cast frame.



Set-up

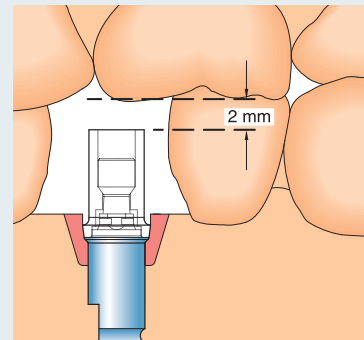
Make a set-up with acrylic teeth according to functional, phonetic and aesthetic aspects. Take an impression of the situation using silicone indexes.



Inserting the Universal base Hex

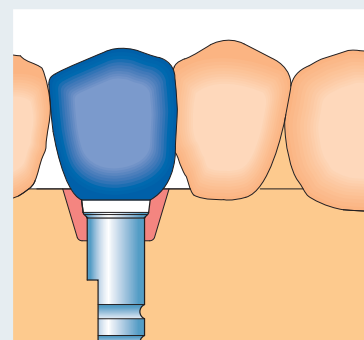
Screw the Sub-Burnout acrylic sleeve and the Universal base Hex onto the implant analog with the technician screw Universal (black) (tool: slot screwdriver).

21.8 Sub-Tec Universal



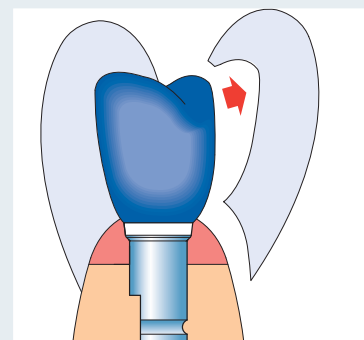
Shortening the Sub-Burnout acrylic sleeve Universal

Use the silicone indexes prepared in the set-up for shortening the sleeve (approx. 2 mm below the occlusal level).



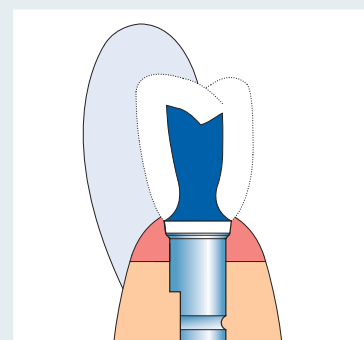
Wax-up

Make a complete wax-up, which allows you to check all the functional and aesthetic aspects of the restoration in advance (follow manufacturer's instructions).



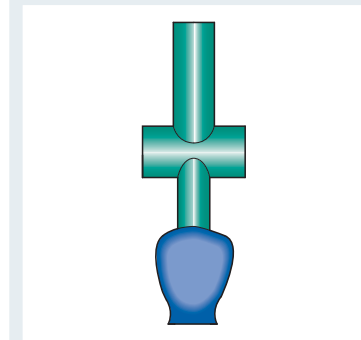
Taking the impression

Take an impression of the wax-up with separate silicone indexes for buccal/vestibular, occlusal and oral.



Reducing the wax-up

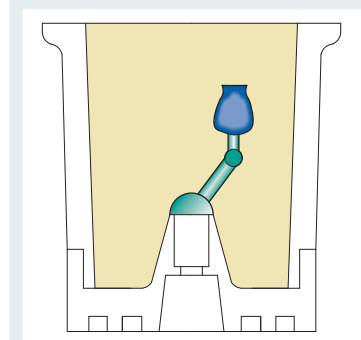
Reduce the wax-up in relation to the metal ceramic frame. Follow the recommendations of the relevant ceramics manufacturer for the layer thickness to be removed. Aim to achieve the reduced anatomical shape of the frame.



Spruing the wax-up

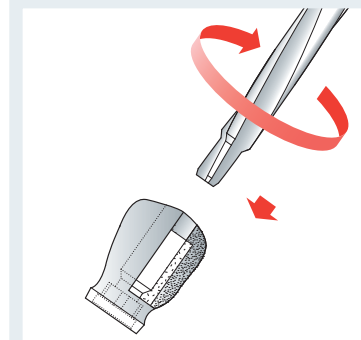
Sprue the wax-up according to the ceramic/alloy manufacturer's recommendations.

Follow the General instructions for the use of BEGO Semados® implant superstructures given in Section 6.1.



Investing/Casting/Deflasking

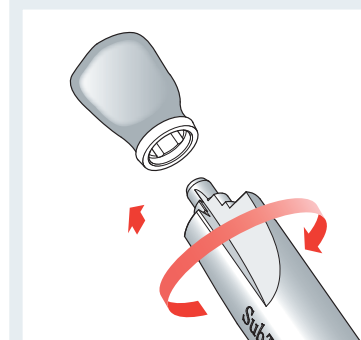
Caution: Before investing, the Universal base Hex must be removed from the wax-up. **Make sure you take follow the instructions provided by the manufacturers of the products used and the General instructions for the use of BEGO Semados® implant superstructures given in Section 6.1.** The investment material is removed with the help of a deinvesting drill, so as not to destroy the internal fit (screw support), and a precision sandblaster.



Precision-finishing the inner frame structures/screw support

The screw channel and screw support are precision-finished with the internal reamer for Sub-Tec Universal (Art. no.: 55536). Introduce the tool into the frame from the occlusal direction. Use and then remove again in a clockwise direction without applying pressure. It may be necessary to repeat this step before final cementing (e.g. if any ceramic material is left in the screw channel on completion).

Caution: Never rotate the reamer anticlockwise.

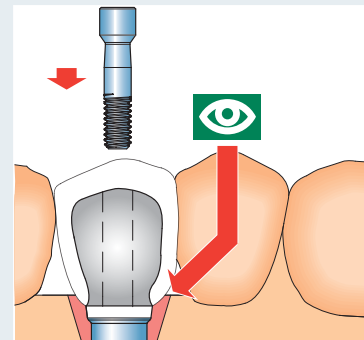


Precision-finishing the bonded joint level

The basal surface of the cast frame in contact with the titanium abutment is precision-finished with the external reamer for Sub-Tec Universal (Art. no. 55537 or 55538). Make sure that the reamer is used and removed again perpendicularly in a clockwise direction without applying pressure. It may be necessary to repeat this step before final cementing (e.g. if any ceramic material is left in the basal contact surface on completion).

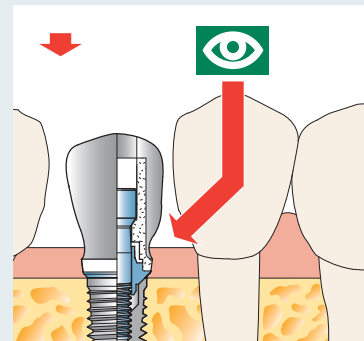
Caution: Never rotate the reamer anticlockwise.

21.8 Sub-Tec Universal



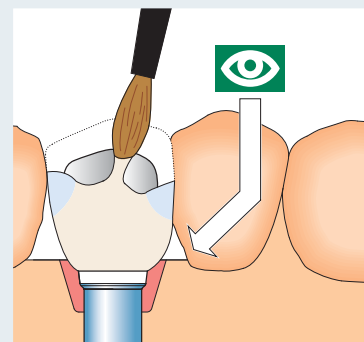
Trial fitting of the frame on the model

Screw the work to the model using the technician screw Universal (black). Check that it is seated without any gaps and free of stresses. The Universal base Hex and the frame can be temporarily secured with temporary cement for trial fitting. To do so, follow the step "Cementing the Universal base Hex to the frame" with a temporary cement.



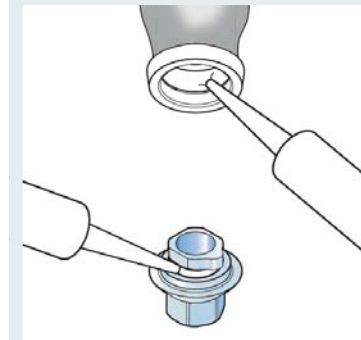
Trial fitting of the frame on the patient

When fitting frames, you/the dentist should check correct seating of the construction. If correct seating of the construction cannot be confirmed with certainty by probing, a radiographic check should be carried out. The restoration can only be completed once the fit has been checked.



Completion

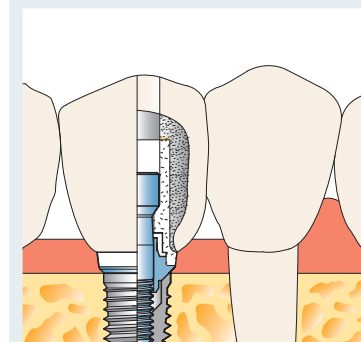
The titanium abutments must be removed before ceramic veneering. Amidosulphonic acid is very effective for removing any residual temporary cement without trace. The dental technician completes the work as usual. Even with the positioning aid it is still helpful to mark the position of the Universal base Hex in relation to the cast abutment using a permanent marker/graphite pencil. This allows the correct crown position to be found easily at any time when veneering.



Cementing the Universal base Hex to the veneered frame

The work must be polished before permanently cementing it to the titanium abutments. The use of a so-called attachment adhesive is recommended here. **Follow the relevant BEGO Semados® product information "Recommended adhesives for Sub-Tec Universal" (Section 21.10) and the information provided by the adhesive manufacturer.**

The adhesive creates a bacteria-proof seal inside the construction. Apply the adhesive as shown in the diagram and join the Universal base Hex and frame together. Screw the work to the master model using the technician screw Universal (black). After the adhesive has cured, remove any excess material from the frame/Universal base Hex. Check that the construction is seated without any gaps.



Completion

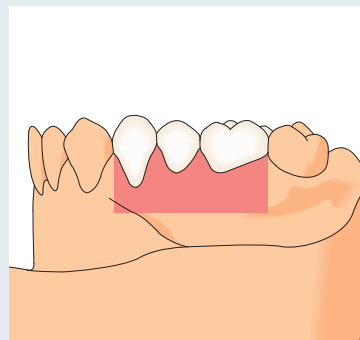
The prosthesis screw for Sub-Tec Universal is used for final placement of the restoration in the patient's mouth (torque: 30 Ncm) (tool: hexagon screwdriver 1.25 mm).

21.9 Sub-Tec Universal no Hex

Product details

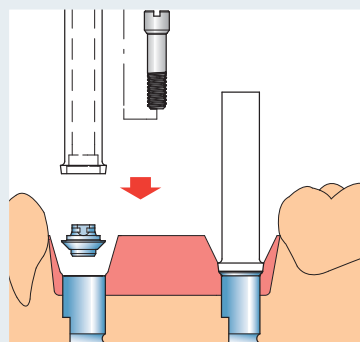
Sub-Tec Universal abutments no Hex are screwed directly into the implant and are used exclusively to make splinted crowns, bridges and bar constructions due to the lack of anti-rotation protection. A model with an artificial gingival mask is required when using the abutment. Sub-Tec Universal abutments no Hex are not suitable for making single tooth restorations. None of the abutments are suitable for direct casting-on. Avoid applying excessive torque when screwing the Sub-Burnout acrylic sleeve Universal in place prior to casting to prevent deformation of the material. The taper connection between the implant and superstructure means that no angulation-correction abutments are needed.

An attachment adhesive is required to complete the work (see Section 21.10). Adhesive bonding merely serves to create a bacteria-proof seal for the connection between the Universal base no Hex and Sub-Burnout acrylic sleeve or the cast frame. The seat of the screw is in the Sub-Burnout acrylic sleeve Universal or, later on, in the cast frame.



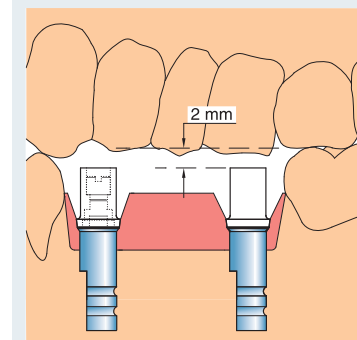
Set-up

Make a set-up with acrylic teeth according to functional, phonetic and aesthetic aspects. Take an impression of the situation using silicone indexes.



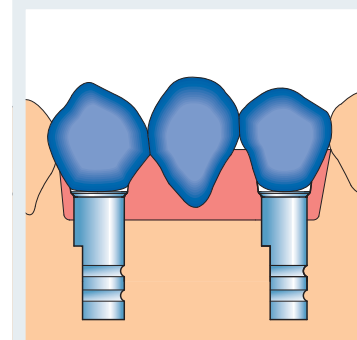
Inserting the Universal base no Hex

Screw the Sub-Burnout acrylic sleeve Universal and the Universal base no Hex onto the implant analog using the Universal technician screw (black) (tool: slot screwdriver).



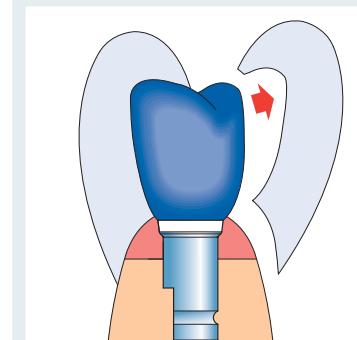
Shortening the Sub-Burnout acrylic sleeve Universal

Use the silicone indexes prepared in the set-up for shortening the sleeve (approx. 2 mm below the occlusal level).



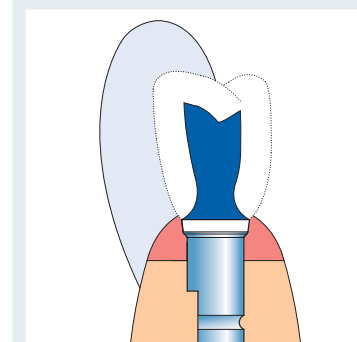
Wax-up

Make a complete wax-up, which allows you to check all the functional and aesthetic aspects of the restoration in advance (follow manufacturer's instructions).



Taking the impression

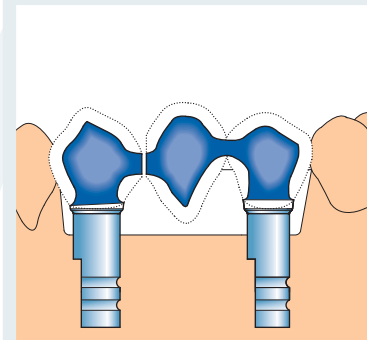
Take an impression of the wax-up with separate silicone indexes for buccal/vestibular, occlusal and oral.



Reducing the wax-up

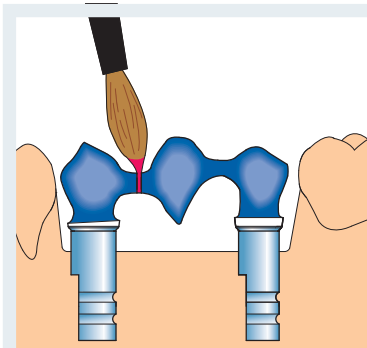
Reduce the wax-up in relation to the metal ceramic frame. Follow the recommendations of the relevant ceramics manufacturer for the layer thickness to be removed. Aim to achieve the reduced anatomical shape of the frame.

21.9 Sub-Tec Universal no Hex



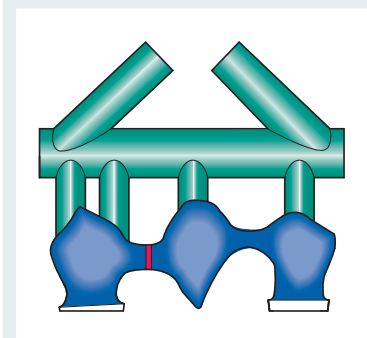
Separating the wax-up

Separate the wax-up to avoid stresses in the frame.



Splinting the wax-up

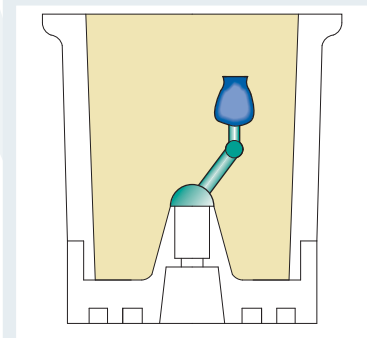
Splint with a self-curing resin (autopolymer) (e.g. Pattern Resin, GC) to minimise stresses in the frame resulting from contraction of the modelling wax.



Spruing the wax-up

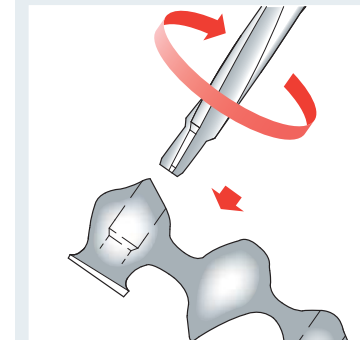
Sprue the wax-up according to the ceramic/alloy manufacturer's recommendations.

Follow the General instructions for the use of BEGO Semados® implant superstructures given in Section 6.1.



Investing/Casting/Deflasking

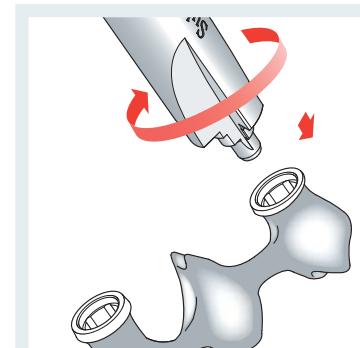
Caution: Before investing, the Universal base no Hex must be removed from the wax-up. **Make sure you follow the instructions provided by the manufacturers of the products used and the General instructions for the use of BEGO Semados® implant superstructures given in Section 6.1.** The investment material is removed with the help of a deinvesting drill, so as not to destroy the internal fit (screw support), and a precision sandblaster.



Precision-finishing the inner frame structures/screw support

The screw channel and screw support are precision-finished with the internal reamer for Sub-Tec Universal (Art. no. 55536). Introduce the tool into the frame from the occlusal direction. Use and then remove again in a clockwise direction without applying pressure. It may be necessary to repeat this step before final cementing (e.g. if any ceramic material is left in the screw channel on completion).

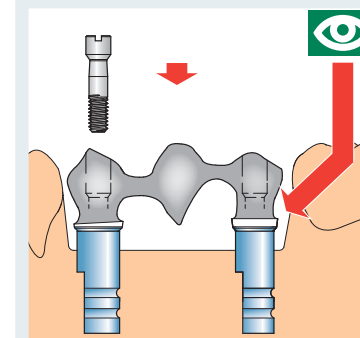
Caution: Never rotate the reamer anticlockwise.



Precision-finishing the bonded joint level

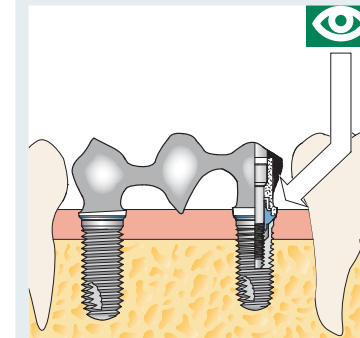
The basal surface of the cast frame in contact with the titanium abutment is precision-finished with the external reamer for Sub-Tec Universal (Art. no. 55537 or 55538). Make sure that the reamer is used perpendicularly in a clockwise direction without applying pressure. It may be necessary to repeat this step before final cementing (e.g. if any ceramic material is left in the screw channel on completion).

Caution: Never rotate the reamer anticlockwise.



Trial fitting of the frame on the model

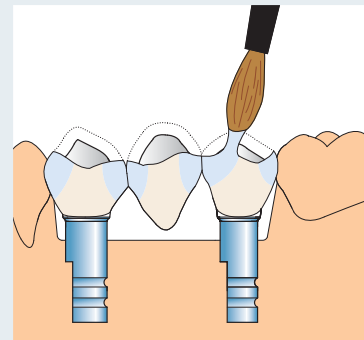
Screw the work to the model using the technician screw Universal (black). Check that the construction is seated without any gaps and free of stresses. The Universal base no Hex and the frame can be temporarily secured with temporary cement for trial fitting. To do so, follow the step "Cementing the Universal base no Hex to the frame" with a temporary cement.



Trial fitting of the frame on the patient

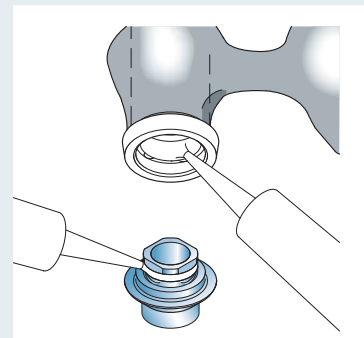
When fitting frames, you/the dentist should check correct seating of the construction. If correct seating of the construction cannot be confirmed with certainty by probing, a radiographic check should be carried out. The restoration can only be completed once the fit has been checked.

21.9 Sub-Tec Universal no Hex



Completion

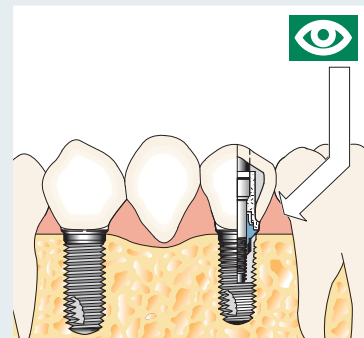
The titanium abutments must be removed before ceramic firing. Amidosulphonic acid is very effective for removing any residual temporary cement without trace. The dental technician completes the work as usual.



Cementing the Universal base no Hex to the veneered frame

The work must be polished before permanently cementing it to the titanium abutments. The use of a so-called attachment adhesive is recommended here.

Follow the relevant BEGO Semados® product information “Recommended adhesives for Sub-Tec Universal” given in Section 21.10. The adhesive creates a bacteria-proof seal inside the construction. Apply the adhesive as shown in the diagram and join the Universal base no Hex and frame together. Screw the work to the master model using the technician screw Universal (black). Once the adhesive has cured, remove any excess material from the frame/Universal base no Hex. Check that the construction is seated without any gaps.



Completion

For final placement of the restoration in the patient's mouth the prosthesis screw for Sub-Tec Universal should be used (torque: 30 Ncm) (tool: hexagon screwdriver 1.25 mm).

21.10 Recommended adhesives for Sub-Tec Universal abutments

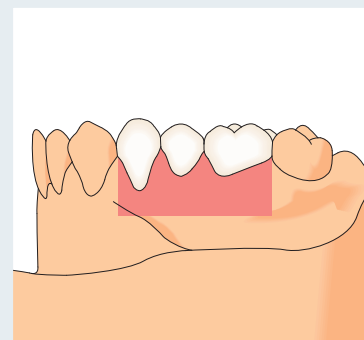
- **Nimetic-Cem** (3M ESPE AG)
- **Pro Bond two-component adhesive** (al dente dentalprodukte GmbH)
- **CEKA SITE** (ALPHADENT NV)
- **Attachment bond** (Heraeus Kulzer GmbH)
- **Panavia 21** (Kuraray Dental)
- **Panavia F** (Kuraray Dental)
- **Alphalink** (Schütz Dental GmbH)
- **Alphalink fast** (Schütz Dental GmbH)
- **SD-Masterbond** (Servo-Dental Rademacher)
- **AGC® CEM** (Wieland Dental + Technik GmbH)
- **Durobond** (ZL-Microdent-Attachment GmbH & Co. KG)



This list is not exhaustive and does not indicate an order of preference.

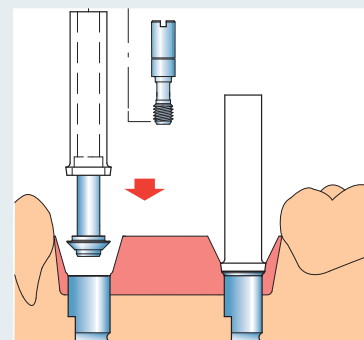
21.11 Sub-Tec Wirobond® MI laser base no Hex

Sub-Tec Wirobond® MI laser base abutments no Hex are screwed directly into the implant and are used exclusively to make crowns with splinting or primary screw fixation, bridges and bar constructions due to the lack of anti-rotation protection. A model with an artificial gingival mask is required when using the abutment. Sub-Tec Wirobond® MI laser base abutments are not suitable for making single tooth restorations. None of the abutments are suitable for direct bonding of ceramics or for casting/soldering. The taper connection between the implant and superstructure means that no angulation-correction abutments are needed. A laser (e.g. BEGO LaserStar T plus) is required for the work. Do not damage the connecting interfaces with the implant when joining.



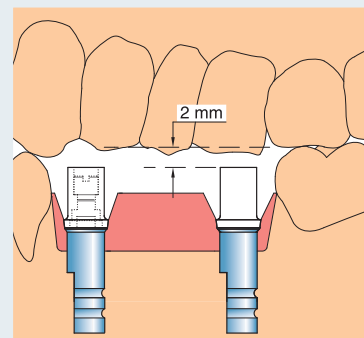
Set-up

Make a set-up according to functional, phonetic and aesthetic aspects. Take an impression of the situation using silicone indexes.



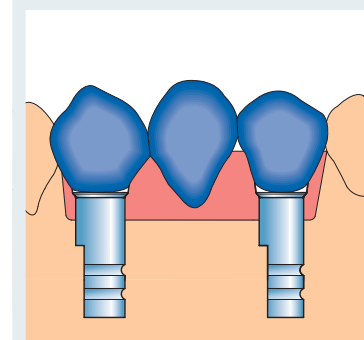
Inserting the Sub-Tec Wirobond® MI laser base

Screw the laser base to the implant analog with the L9 technician screw (slotted screw) and attach the acrylic sleeve (tool: slot screwdriver).



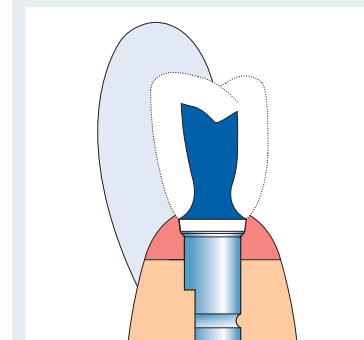
Shortening the laser base and acrylic sleeve

Use the silicone indexes prepared in the set-up for shortening the laser base and cut the acrylic sleeve to length so that the base and sleeve end approx. 2 mm below the occlusion level. The L9 technician screw can also be shortened as far as the neck if required. In this case please customise the head of the screw for the slot screwdriver before use.



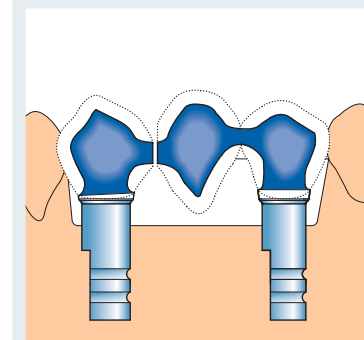
Wax-up

Make a complete wax-up, which allows you to check all the functional and aesthetic aspects of the restoration in advance. Take an impression of the situation with silicone indexes.



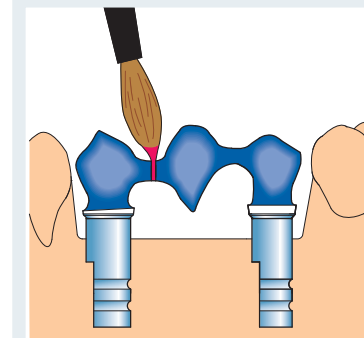
Reducing the wax-up

Follow the recommendations of the relevant veneering material manufacturer for the layer thickness to be removed. Leave a sufficiently wide metal margin to the parallel transition of the laser base for final lateral/circumferential laser welding.



Separating the wax-up

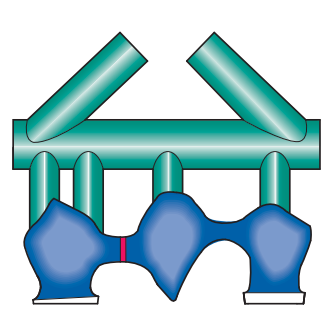
Separate the wax-up to avoid stresses in the frame.



Splinting the wax-up

Splint with a self-curing resin (autopolymer) (e.g. Pattern Resin, GC) to minimise stresses in the frame resulting from contraction of the modelling wax.

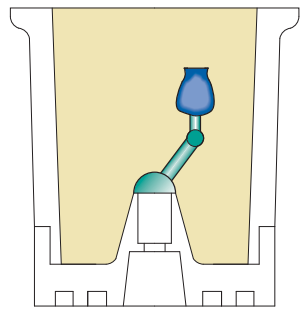
21.11 Sub-Tec Wirobond® MI laser base no Hex



Spruing the wax-up

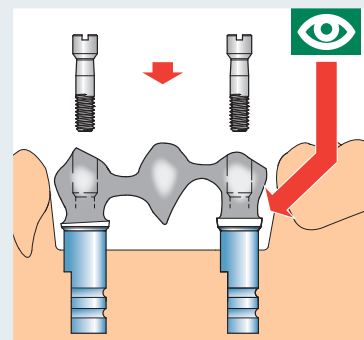
Sprue the wax-up according to the alloy manufacturer's recommendations.

Follow the General instructions for the use of of BEGO Semados® implant superstructures given in Section 6.1.



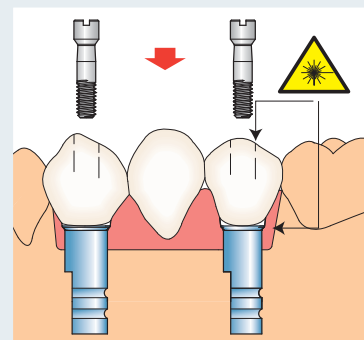
Investing/Casting/Deflasking

Make sure you follow the instructions supplied by the manufacturers of the products used and the General instructions for the use of of BEGO Semados® implant superstructures given in Section 6.1.



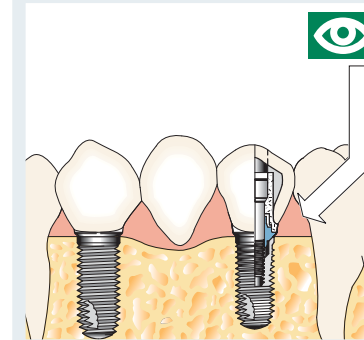
Trial fitting of frame

Check that the construction is seated stress-free.
If correct seating of the construction cannot be confirmed with certainty by probing, a radiographic check should be carried out.



Lasering the laser base to the frame and completion

The dental technician completes the work as usual.
Then the polished superstructure is lasered to the Sub-Tec Wirobond® MI laser base laterally/circumferentially at the base, and occlusally between the metal cylinder and casting. The joint surfaces may need to be matted for this purpose. Follow the laser manufacturer's instructions. Add filler material, e.g. BEGO Wiroweld (BEGO) as required. Check that the construction is seated without any gaps and free of stresses (Sheffield test).



Integration

The prosthesis screw Hex 1.25 mm is used for final placement of the restoration in the patient's mouth (torque: 30 Ncm) (tool: hexagon screwdriver 1.25 mm).

21.12 Sub-Tec gold cast-on

Product details:

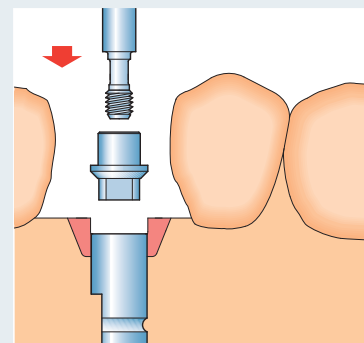
Sub-Tec gold cast-on abutments are screwed directly into the implant and are used exclusively to make single-tooth restorations with primary screw fixation due to their anti-rotation protection. A model with an artificial gingival mask is required when using the abutment. Sub-Tec gold cast-on abutments are not suitable for making directly screw-retained crown blocks, bridges or bar constructions.

The Sub-Tec gold cast-on abutment is made of a gold-platinum alloy with a melting range of 1400°C–1460°C. For this reason, a high-gold ($\geq 75\%$ Au) alloy of the following classes must be used. Metal-to-ceramic alloy: DIN EN ISO 9693 standard; cast alloy: ISO 1562 standard, type 4. The cast alloy used should meet the following minimum requirements: modulus of elasticity $> 90,000$ MPa; ductile yield $> 7\%$; elongation limit > 500 MPa; casting temperature $< 1280^\circ\text{C}$; Vickers hardness > 220 HV 5; preheating temperature $\geq 850^\circ\text{C}$. We recommend using Bio PontoStar® XL or Bio PontoStar® (BEGO).

It is not possible to use alloys with reduced gold content or non-precious alloys.

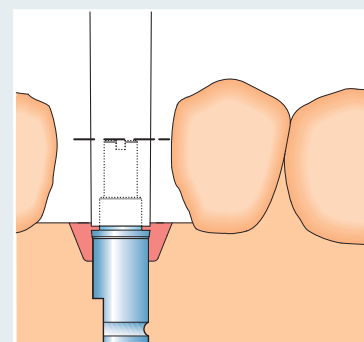
For these alloys, the Sub-Tec Universal is suitable.

21.12 Sub-Tec gold cast-on



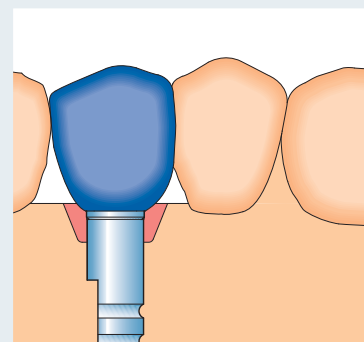
Inserting the Sub cast-on abutment

Screw the Sub-cast-on abutment to the implant analog with the L9 technician screw (tool: slot screwdriver).



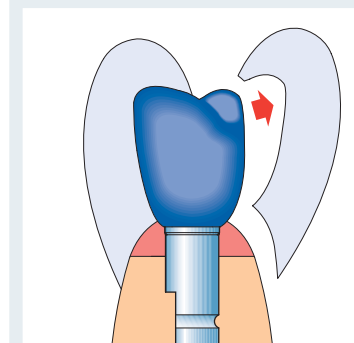
Shortening the Sub-Burnout acrylic sleeve gold cast-on

Place the acrylic sleeve on the cast-on abutment. Close the gap between the Sub cast-on abutment and the Sub-burnout acrylic sleeve gold cast-on with wax. It has proven useful to secure the components to each other with some cyanoacrylate adhesive. Use the the silicone indexes prepared in the set-up for shortening the sleeve (approx. 2 mm below the occlusal level). The L9 technician screw can also be shortened as far as the neck if required. In this case please customise the head of the screw for the slot screwdriver before use.



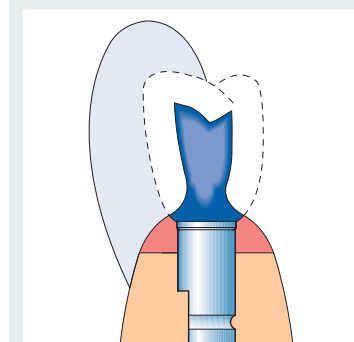
Wax-up

Make a complete wax-up, which allows you to check all the functional and aesthetic aspects of the restoration in advance (follow manufacturer's instructions).



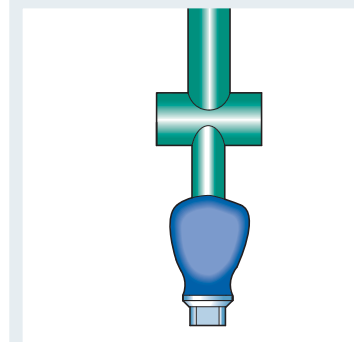
Taking the impression

Take an impression of the wax-up with separate silicone indexes for buccal/vestibular, occlusal and oral.



Reducing the wax-up

Reduce the wax-up in relation to the metal ceramic frame. Follow the recommendations of the relevant ceramics manufacturer for the layer thickness to be removed. Aim to achieve the reduced anatomical shape of the frame.

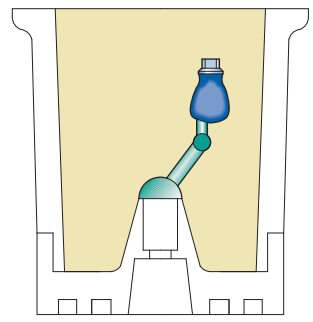


Spruing the wax-up

Sprue the wax-up according to the ceramic/alloy manufacturer's recommendations. Weigh the wax-up carefully and calculate the alloy requirement (minus 0.5 g for each cast-on abutment).

Follow the General instructions for the use of BEGO Semados® implant superstructures given in Section 6.1.

21.12 Sub-Tec gold cast-on



Investing

Before investing, remove wax shavings etc. from the cast-on abutments. Do not use wetting agents, as they may form a film on the cast-on abutments, possibly resulting in defective casting. The use of a phosphate-bonded investment material is recommended here. During preheating, castable alloys (cast-on abutments) put considerable stress on the investment material due to their coefficient of thermal expansion. If, during casting, constituents of the cast alloy shoot over the implant abutments ("skin formation"), this points to the investment material not being sufficiently stable. In this case an investment material of higher quality should be used.



Casting

When processing Semados® cast-on abutments, the preheating temperature of 850°C must be attained to ensure cast-on abutments which are flawless in metallurgical terms. Lower temperatures cause insufficient diffusion of the alloy constituents. The connection is then highly susceptible to corrosion and has little resistance to mechanical loads (casting temperature < 1280°C).

Make sure you follow the instructions provided by the manufacturers of the products used and the General instructions for the use of BEGO Semados® implant superstructures given in Section 6.1.



Deflasking

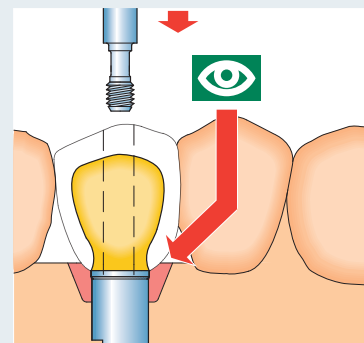
The investment material is removed with the help of a deinvesting drill, so as not to destroy the internal fit (screw support), and a precision sandblaster. Optionally the investment material can be removed with a suitable fluid (e.g. hydrofluoric acid) in combination with ultrasound treatment. As high-melting alloys do not bond with investment material, the cast-on abutments emerge from the material with a high-gloss finish.

To ensure optimum fit of the prosthesis screw, use the internal reamer for Sub/Supra-Tec gold cast-on (Art. no.: 53735) (never rotate reamer anticlockwise).

Caution: The connecting interfaces with the implant must not be sandblasted or finished. The fit is predetermined according to industrial specifications.

To help remove all traces of investment material from the casting by sandblasting with aluminium oxide, the exposed cast-on abutments can be coated with cold-cured polymer to protect them. The construction can then be carefully sandblasted once the resin material has cured.

21.12 Sub-Tec gold cast-on



Trial fitting of frame

Trial fitting of the frame on the model and intraorally using plastic occlusal stops is recommended. The restoration can only be completed once the fit has been checked.

Completion

The prosthesis screw Hex 1.25 mm is used for final placement of the restoration in the patient's mouth (torque: 30 Ncm) (tool: hexagon screwdriver 1.25 mm).

21.13 Sub-Tec gold cast-on no Hex

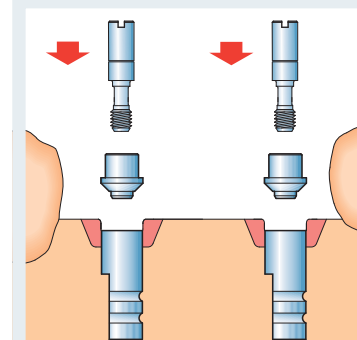
Product details:

Sub-Tec gold cast-on abutments no Hex are screwed directly into the implant and are used exclusively to make splinted crowns, bridges and bar constructions on two or more implants or in combination with natural teeth due to the lack of anti-rotation protection. A model with an artificial gingival mask is required when using the abutment. Sub-Tec gold cast-on abutments no Hex are not suitable for making single tooth restorations. The taper connection between the implant and superstructure means that no angulation-correction abutments are needed.

The Sub-Tec gold cast-on abutment no Hex is made of a gold-platinum alloy with a melting range of 1400–1460°C. For this reason, a high-gold (at least 75% Au) alloy of the following classes must be used. Metal-to-ceramic alloy: DIN EN ISO 9693 standard; cast alloy: ISO 1562 standard, type 4. The cast alloy used should meet the following minimum requirements: modulus of elasticity > 90,000 MPa; ductile yield > 7%; elongation limit > 500 MPa; casting temperature < 1280°C; Vickers hardness > 220 HV 5; preheating temperature ≥ 850°C. We recommend using Bio PontoStar® XL or Bio PontoStar® (BEGO).

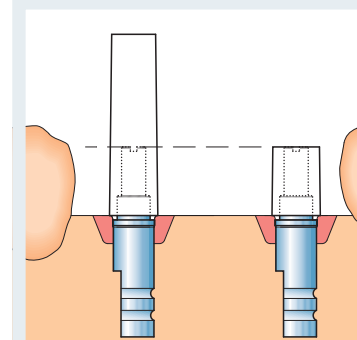
It is not possible to use alloys with reduced gold content or non-precious alloys.

For these alloys, the Sub-Tec Universal no Hex is suitable.



Inserting the Sub cast-on abutment no Hex

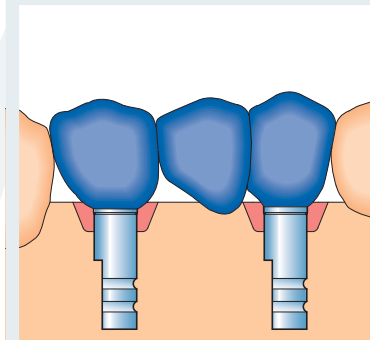
Screw the Sub cast-on abutment no Hex to the implant analog with the L9 technician screw (tool: slot screwdriver).



Shortening the Sub-Burnout acrylic sleeve gold cast-on

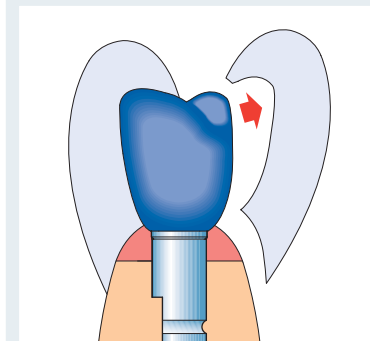
Place the acrylic sleeve on the cast-on abutment. Close the gap between the Sub cast-on abutment and the Sub-Burnout acrylic sleeve gold cast-on with wax. It has proven useful to secure the components to each other with some cyanoacrylate adhesive. Use the silicone indexes prepared in the set-up for shortening the sleeve (approx. 2 mm below the occlusal level). The L9 technician screw can also be shortened as far as the neck if required. In this case please customise the head of the screw for the slot screwdriver before use.

21.13 Sub-Tec gold cast-on no Hex



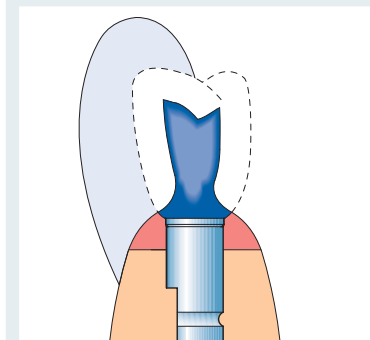
Wax-up

Make a complete wax-up, which allows you to check all the functional and aesthetic aspects of the restoration in advance (follow manufacturer's instructions).



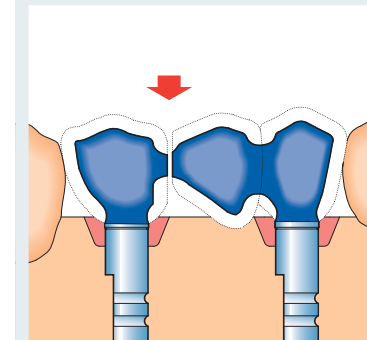
Taking the impression

Take an impression of the wax-up with separate silicone indexes for buccal/vestibular, occlusal and oral.



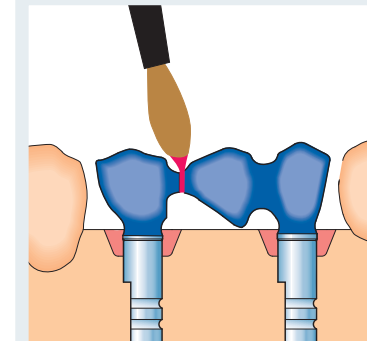
Reducing the wax-up

Follow the recommendations of the relevant ceramics manufacturer for the layer thickness to be removed.
Aim to achieve the reduced anatomical shape of the frame.



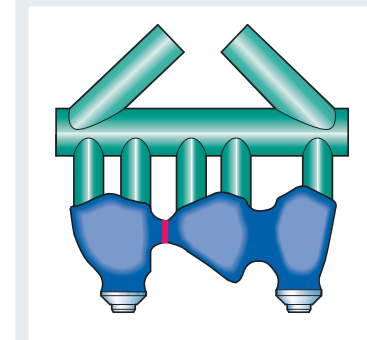
Separating the wax-up

Separate the wax-up to avoid stresses in the frame.



Splinting

Splint with a self-curing resin (autopolymer) (e.g. Pattern Resin, GC) to minimise stresses in the frame resulting from contraction of the modelling wax.

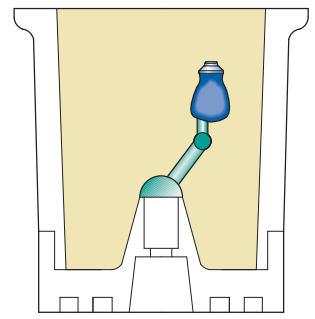


Spruing the wax-up

Sprue the wax-up according to the ceramic/alloy manufacturer's recommendations.
Weigh the wax-up carefully and calculate the alloy requirement (minus 0.5 g for each cast-on abutment).

Follow the General instructions for the use of BEGO Semados® implant superstructures given in Section 6.1.

21.13 Sub-Tec gold cast-on no Hex



Investing

Before investing, remove wax shavings etc. from the cast-on abutments. Do not use wetting agents, as they may form a film on the cast-on abutments, possibly resulting in defective casting. A phosphate-bonded investment material is recommended. During preheating, castable alloys (cast-on abutments) put considerable stress on the investment material due to their coefficient of thermal expansion. If, during casting, constituents of the cast alloy shoot over the implant abutments ("skin formation"), this points to the investment material not being sufficiently stable. In this case an investment material of higher quality should be used.



Casting

When processing Semados® cast-on abutments, the preheating temperature of 850°C must be attained to ensure cast-on abutments which are flawless in metallurgical terms. Lower temperatures cause insufficient diffusion of the alloy constituents. The connection is then highly susceptible to corrosion and has little resistance to mechanical loads (casting temperature < 1280°C).

Make sure you follow the instructions provided by the manufacturers of the products used and the General instructions for the use of BEGO Semados® implant superstructures given in Section 6.1.



Deflasking

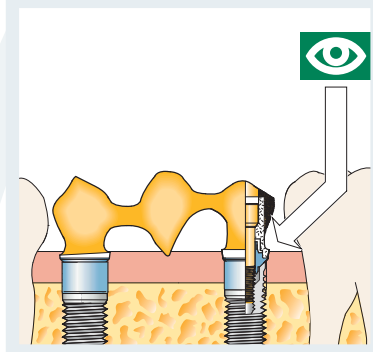
The investment material is removed with the help of a deinvesting drill, so as not to destroy the internal fit (screw support), and a precision sandblaster. Optionally the investment material can be removed with a suitable fluid (e.g. hydrofluoric acid) in combination with ultrasound treatment. As high-melting alloys do not bond with investment material, the cast-on abutments emerge from the material with a high-gloss finish.

To obtain optimum fit of the prosthesis screw, use the internal reamer for Sub/Supra-Tec gold cast-on (Art. no.: 53735) (never rotate reamer anticlockwise).

Caution: The connecting interfaces with the implant must not be sandblasted or finished. The fit is predetermined according to industrial specifications.

To help remove all traces of investment material from the casting by sandblasting with special corundum (aluminium oxide), the exposed cast-on abutments can be coated with cold-cured polymer to protect them. The construction can then be carefully sandblasted once the resin material has cured.

21.13 Sub-Tec gold cast-on no Hex



Trial fitting of frame

Trial fitting of the frame on the model and intraorally using plastic occlusal stops is recommended. The restoration can only be completed once the fit has been checked.



Completion

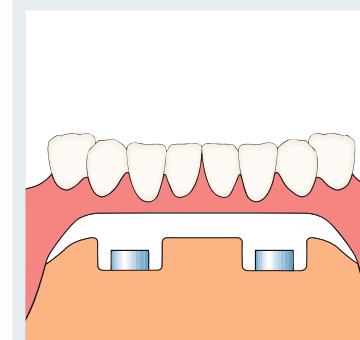
The prosthesis screw Hex 1.25 mm is used for final placement of the restoration in the patient's mouth (torque: 30 Ncm) (tool: hexagon screwdriver 1.25 mm).

21.14 Sub-Tec titanium/Wirobond® MI bar abutment

Product details

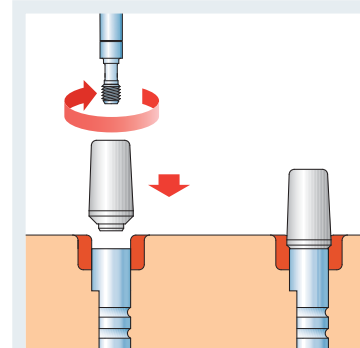
Sub-Tec titanium/Wirobond® MI bar abutments are screwed directly into the implant and are used exclusively to make bar constructions due to the lack of anti-rotation protection. A model with an artificial gingival mask is required when using the abutment. Wirobond® MI bar abutments/titanium bar abutments are not suitable for making single tooth restorations. None of the abutments are suitable for direct bonding of ceramics or for casting/soldering. We recommend using a ³Dolder® bar joint attachment to prevent mechanical overloading of the construction. A parallel retainer for bars (e.g. Art. no. 55927) and a laser (e.g. BEGO LaserStar T Plus) are required for the work. We recommend using a base made of light-curing resin for bite taking and set-up in order to have a stable base and the option of temporarily fixing the female parts firmly with a self-curing resin (autopolymer) for trial fitting.

Follow the “General instructions for use – BEGO Semados® materials, titanium and Wirobond® MI” given in Section 6.3 and 6.4.



Set-up

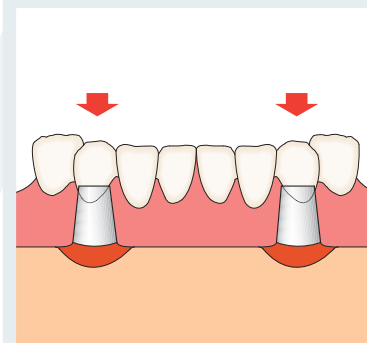
Set up the denture taking into consideration functional, aesthetic and phonetic aspects. Recess the lingual/palatal region of the implants when shaping the base. Take an impression of the situation using silicone indexes.



Inserting the titanium bar abutment

Screw the Sub-Tec titanium/Wirobond® MI bar abutment onto the implant analog with the L9 technician screw (tool: slot screwdriver).

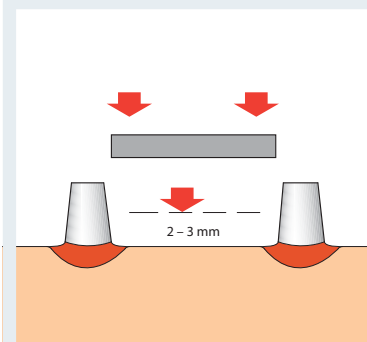
21.14 Sub-Tec titanium/Wirobond® MI bar abutment



Dimensional check

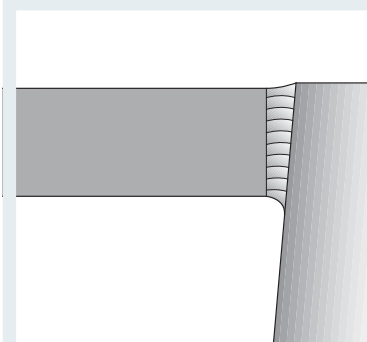
Carry out a dimensional check using the denture set-up. The bar abutments can be customised. The L9 technician screw can also be shortened as far as the neck if required. In this case please customise the head of the screw for the slot screwdriver before use.

Caution: The connecting interfaces with the implant must not be sandblasted or finished. The fit is predetermined according to industrial specifications.



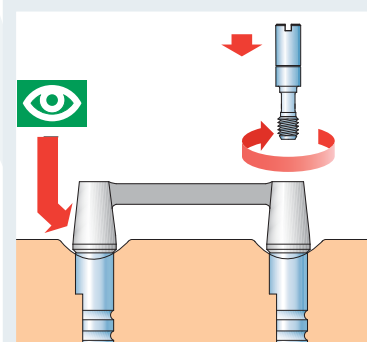
Bars

Use the parallel retainer to fit the bar straight and flush between the Sub-Tec titanium bar abutments. A minimum distance of approx. 2–3 mm from the gingiva must be maintained. Align the bar parallel to the occlusal plane in the physiologically most favourable position in accordance with the abutments and the contour of the alveolar ridge.



Welding the connections

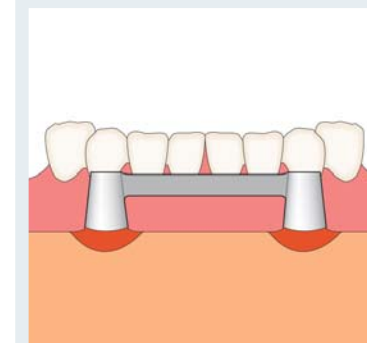
Follow the instructions provided by the manufacturer of the laser unit.



Sheffield test according to White

Follow the “General instructions for use – Sheffield test” given in Section 6.2.

Caution: The Sheffield test is the only way of checking stress-free seating of a superstructure.



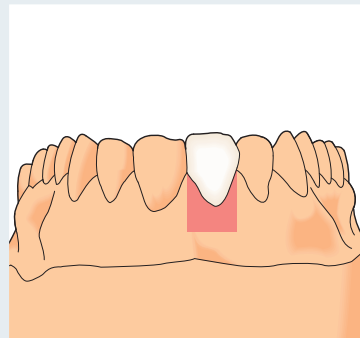
Completion

Trial fitting of frame on the model and in situ, recommended with set-up of denture for aesthetic and functional checking. The dentist performs the Sheffield test in the patient's mouth. For general trial fitting of the prosthesis, the bar matrix is temporarily integrated into the denture base, and the bar and denture are then tried. To complete the denture, the bar matrix is given a defined hollow contour by means of a resilience rail in order to integrate the gingival resilience into the prosthodontic system. The dental technician completes the work as usual (follow manufacturer's instructions). The resilience rail is removed in order to integrate the denture in the patient's mouth.

21.15 Sub-Tec CAD Positioner

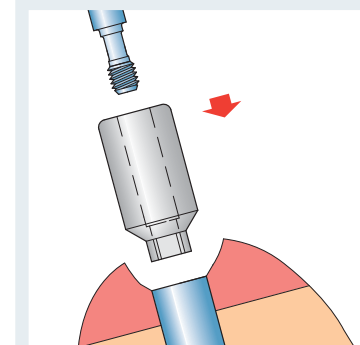
Product details

The Sub-Tec CAD Positioner is a prefabricated abutment with anti-rotation protection. It is used as a positioning aid purely to ensure correct positioning of the implants on the laboratory model for all optical 3D dental scanners that have data of the BEGO Semados® implants stored in their software, e.g. in BEGO Speedscan®/53shape™ (follow instructions of scanner manufacturer). The resulting three-dimensional CAD data is used for CAM fabrication of the prosthesis. Sub-Tec CAD Positioner abutments are used exclusively on patients with a BEGO Semados® S or RI implant. They are screwed directly into the implant or implant analog for making customised, implant-retained restorations, e.g., single-tooth restorations with primary screw fixation or cement-retained restorations (crowns and bridges) by the CAM technique. Select the diameter of the abutment to be fabricated according to the diameter of the implant and save in your scanning software. A model with an artificial gingival mask is required when using the abutment. Do not sandblast or otherwise finish any part of the Sub-Tec CAD Positioner. The fit is predetermined according to industrial specifications.



Set-up

Make a set-up according to functional, phonetic and aesthetic aspects. Take an impression of the situation using silicone indexes or include the set-up in the scan if required.



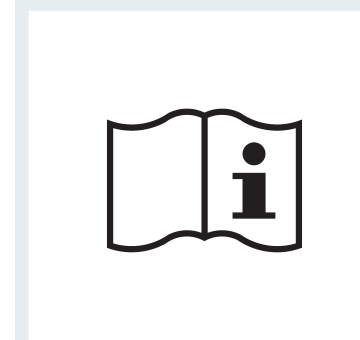
Inserting the Sub-Tec CAD Positioner

Attach the Sub-Tec CAD Positioner with the prosthesis screw Hex 1.25 mm (hand-tight) (tool: hexagon screwdriver 1.25 mm). To obtain a good scan result, ensure that a flat side of the Sub-Tec CAD Positioner is facing in a vestibular direction if possible.



Scanning

Scan the Sub-Tec CAD Positioner as usual. Follow the instructions supplied by the manufacturer of the dental scanner and, if possible and/or necessary, also include the opposing jaw or occlusal record in the scan.



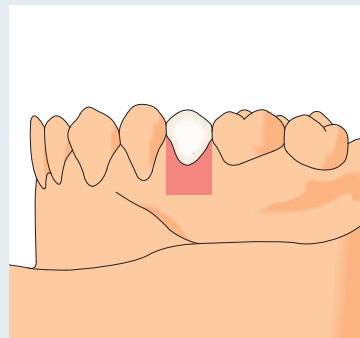
Design of the CAD data of the restoration

Proceed as instructed by your software manufacturer.

21.16 Sub-Tec CAD/CAM titanium adhesive abutment/scanning abutment

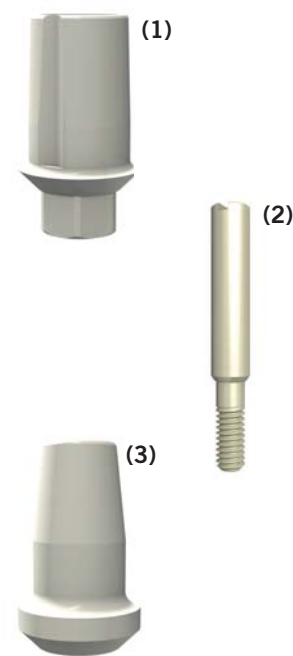
Product details

The Sub-Tec CAD/CAM scanning abutment is used exclusively to make customised prostheses with the aid of digital production technology or copy milling techniques. This scanning abutment is designed for all dental scanners currently available and is thus suitable whatever type of scanner is in use. The resulting three-dimensional CAD data is used for CAM fabrication of the prosthesis. The Sub-Tec adhesive abutment has anti-rotation protection for making single tooth restorations and/or primary elements for cemented bridges by means of CAM fabrication or copy milling. Individual abutments, without an all-ceramic implant interface, must finally be secured to the Sub-Tec adhesive abutment. A standard attachment adhesive is required to complete the work.



Set-up

If necessary, make a set-up according to functional, phonetic and aesthetic aspects. Take an impression of the situation using silicone indexes.



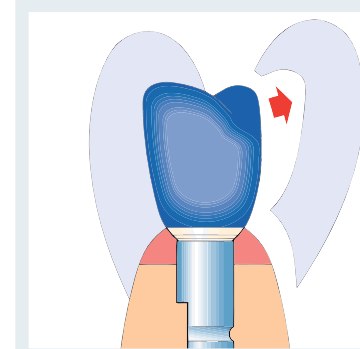
Placement of the Sub-Tec CAD/CAM scanning abutment

Screw the Sub-Tec CAD/CAM scanning abutment (1) onto the implant analog (hand-tight) using the scanning screw (2) (tool: slot screwdriver) and place the wax-up cap (3) on top. If you are not using the wax-up cap, continue with the item "Scanning".

Use the Sub-Tec CAD/CAM scanning abutment (1) for scanning if you wish to secure a crown directly on the Sub-Tec adhesive abutment.

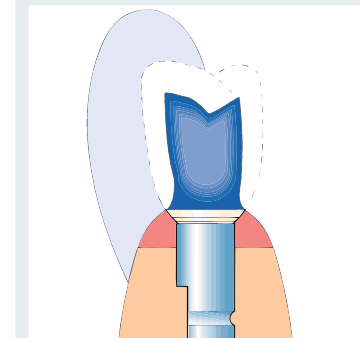
Use the Sub-Tec CAD/CAM scanning abutment (1) together with the wax-up cap (3) and the scanning screw (2) if you wish to create a customised abutment using a difference scan.

Use the wax-up cap (3) if you wish to create a customised abutment by means of copy milling.



Wax-up

Make a complete wax-up on the wax-up cap (3), which allows you to check all the functional and aesthetic aspects of the restoration in advance. Take an impression of the situation with silicone indexes.



Reducing the wax-up

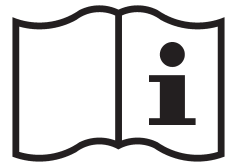
Follow the recommendations of the relevant veneering material manufacturer for the layer thickness to be removed.



Scanning

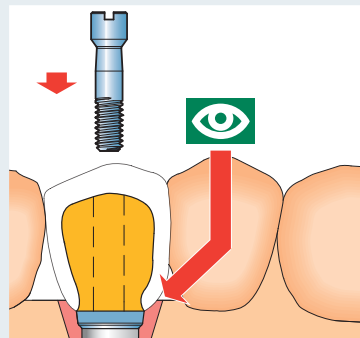
Start by scanning the customised wax-up cap (3), if you have used one. Then perform a difference scan. When copy milling, only scan the customised wax-up cap (3) (follow manufacturer's instructions). Now scan the Sub-Tec CAD/CAM scanning abutment (1) and scanning screw (2) regardless of whether you used a wax-up cap or not. If possible and/or necessary also include the opposing jaw or occlusal record in the scan.

21.16 Sub-Tec CAD/CAM titanium adhesive abutment/scanning abutment



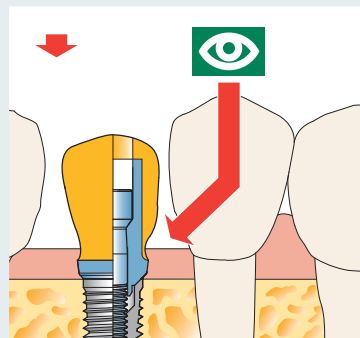
Precision-finishing the adhesive joint

To achieve an optimum adhesive gap select an appropriate cement gap on your scanner (follow manufacturer's instructions).



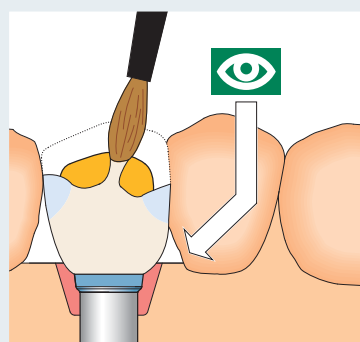
Check

Screw the work to the model using the Sub-Tec^{Plus} technician screw. Check that the construction is seated without any gaps and free of stresses (Sheffield test if required).



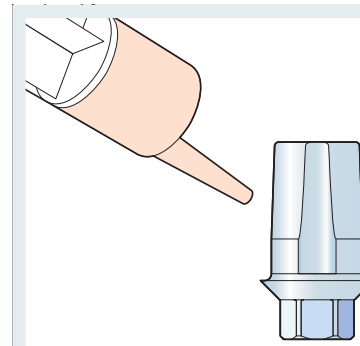
Trial fitting of frame

Check that the construction is seated without any gaps and free of stresses (Sheffield test if required). If correct seating of the construction cannot be confirmed with certainty by probing, a radiographic check should be carried out.



Completion

The dental technician completes the work as usual. The instructions given by the manufacturer of the materials used for making the frame/completion should be followed here



Securing the Sub-Tec CAD/CAM titanium adhesive abutment to the completed frame

The work must be polished before permanently cementing to the Sub-Tec adhesive abutment. The use of a so-called attachment adhesive is recommended here. Follow the adhesive manufacturer's instructions.

Only sandblast the adhesive surface of the Sub-Tec adhesive abutment prior to cementing. When doing so, protect the interface with the implant, e.g. using the appropriate implant analog. Apply adhesive to the entire adhesive area and join the Sub-Tec adhesive abutment and frame together.

Once the adhesive has cured, remove any excess material from the frame/Sub-Tec adhesive abutment.

Check that the construction is seated without any gaps.

Integration

The Sub-Tec^{Plus} prosthesis screw is used for final placement of the restoration in the patient's mouth (torque: 30 Ncm) (tool: hexagon screwdriver 1.25 mm).

22. SUPERSTRUCTURES ON BEGO SEMADOS® MINI IMPLANTS

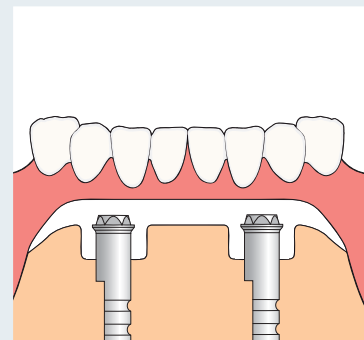
22.1 Wirobond® MI Mini bar system

Product details

Wirobond® MI Mini bar system abutments are screwed directly onto the implant and are used exclusively to make bar constructions due to the lack of anti-rotation protection. A model with an artificial gingival mask is required when using the abutment.

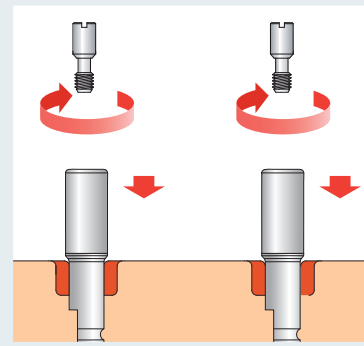
Wirobond® MI Mini bar abutments are not suitable for making single tooth restorations. None of the abutments are suitable for direct bonding of ceramics or for casting/soldering. We recommend using a Wirobond® MI round bar to prevent mechanical overloading of the construction. A laser (e.g. BEGO LaserStar T Plus) is required for the work. We recommend using a base made of light-curing resin for bite taking and set-up in order to have a stable base and the option of temporarily fixing the female parts firmly with a self-curing resin (autopolymer) for trial fitting.

Follow the “General instructions for use – BEGO Semados® materials, Wirobond® MI” given in Section 5.4.



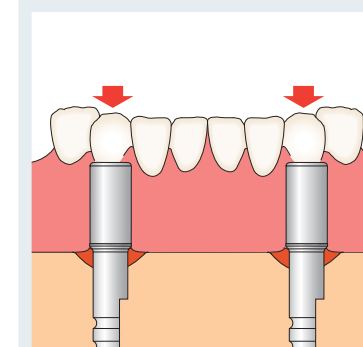
Set-up

Recess the implant regions and then set up the denture in wax. We recommend making a denture base using a self-curing resin (autopolymer) in order to give the set-up a high degree of stability.



Inserting the Wirobond® MI Mini bar abutments

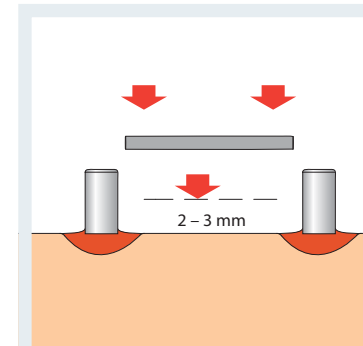
Screw the Wirobond® MI Mini bar abutments to the implant analog with the Mini technician screw (slotted screw) (tool: slot screwdriver).



Dimensional check

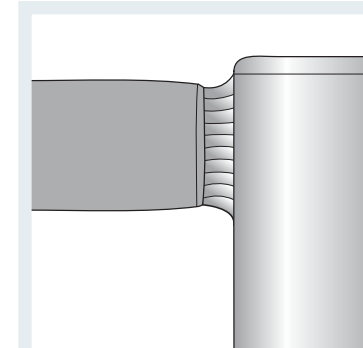
Carry out a dimensional check using the denture set-up. The Wirobond® MI Mini bar abutments can be customised.

Caution: The connecting interfaces with the implant must not be sandblasted or finished. The fit is predetermined according to industrial specifications.



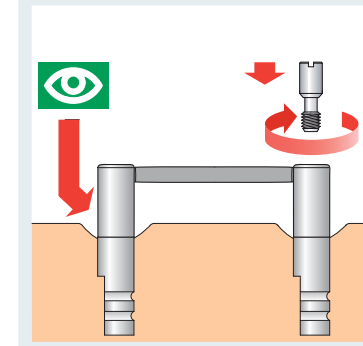
Round bar

Fit the round bar straight and flush between the Wirobond® MI Mini bar abutments. A minimum distance of approx. 2 – 3 mm from the gingiva must be maintained. Align the bar parallel to the occlusal plane in the physiologically most favourable position in accordance with the abutments and the contour of the alveolar ridge.



Welding the connection

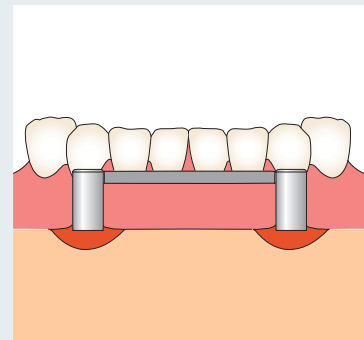
Follow the instructions provided by the manufacturer of the laser unit. Incorrect welding can lead to mechanical failure, which may pose a health risk to the patient.



Sheffield test

Check that the construction is seated without any gaps.

22.1 Wirobond® MI Mini bar system



Completion/Integration

Follow the manufacturer's general instructions. Trial fitting of the frame with set-up denture is recommended. For trial fitting of the prosthesis, cut out the bar in the denture base. When using the round bar system PRECI-HORIX: place the green space maintainer on the bar, and place the metal housing on top. Block out underneath the bar. Polymerise the metal housing into the plastic for accurate seating of the space maintainer. Then insert the yellow PRECI-HORIX plastic rider into the metal housing.

For further information, go to: www.ceka-preciline.com

The Mini prosthesis screw is used for final placement of the restoration in the patient's mouth (torque: 25 Ncm) (tool: hexagon screwdriver 1.25 mm).

22.2 Mini gold bar abutment

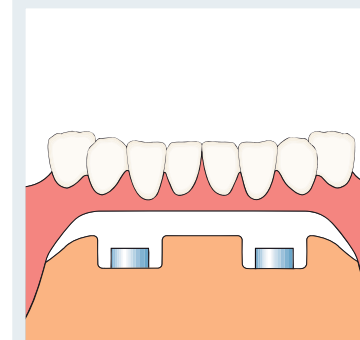
Product details

Mini gold bar abutments are screwed directly onto the implant and are used exclusively to make bar constructions due to the lack of anti-rotation protection. A model with an artificial gingival mask is required when using the abutment. Mini gold bar abutments are not suitable for making single tooth restorations or for direct bonding of ceramics. We recommend using a ³Dolder® bar joint attachment Micro/Macro-Gold. A laser (e.g. BEGO LaserStar T Plus) is required for the work. We recommend using a base made of light-curing resin for bite taking and set-up in order to have a stable base and the option of temporarily fixing the female parts firmly with a self-curing resin (autopolymer) for trial fitting.

The Mini gold bar abutment is made of a gold-platinum alloy with a melting range of 1400–1460°C. For this reason, a high-gold (at least 75% Au) alloy of the following classes must be used if casting directly onto the Mini gold bar abutment. Metal-to-ceramic alloy: DIN EN ISO 9693 standard; cast alloy: ISO 1562 standard, type 4.

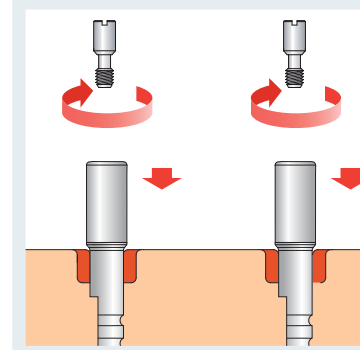
The cast alloy used should meet the following minimum requirements: modulus of elasticity > 90,000 MPa; ductile yield > 7%; elongation limit > 500 MPa; casting temperature < 1280°C; Vickers hardness > 220 HV 5; preheating temperature ≥ 850°C. We recommend using Bio PontoStar® XL or Bio PontoStar® (BEGO).

It is not possible to use alloys with reduced gold content or non-precious alloys.



Set-up

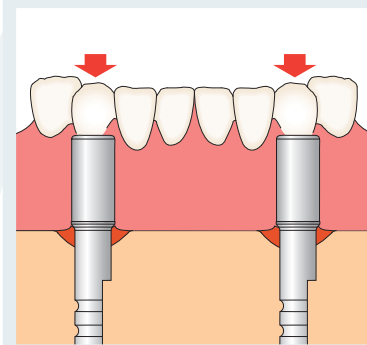
Make a set-up according to functional, phonetic and aesthetic aspects. Recess the implant region when shaping the base.



Inserting the Mini gold bar abutment

Screw the Mini gold bar abutment to the implant analog with the Mini technician screw (slotted screw) (tool: slot screwdriver).

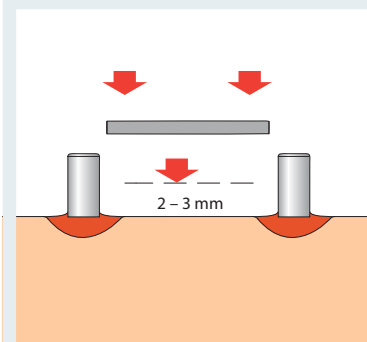
22.2 Mini gold bar abutment



Individual grinding of the Mini gold bar abutment

The abutment is customised using the denture set-up.

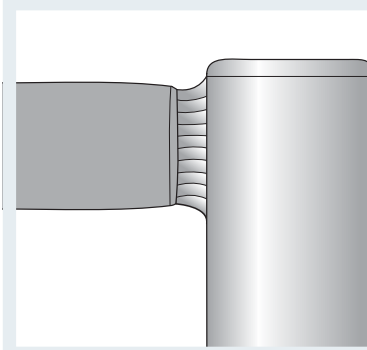
Caution: The connecting interfaces with the implant must not be sandblasted or finished. The fit is predetermined according to industrial specifications.



Bars

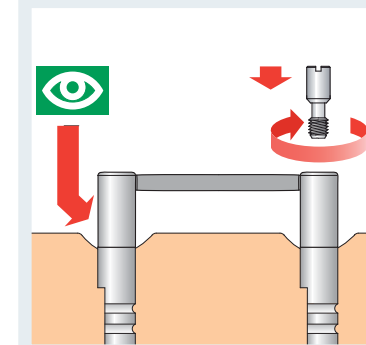
Fit the bar straight and flush between the Mini gold bar abutments using a parallel retainer if necessary.

A minimum distance of approx. 2–3 mm from the gingiva must be maintained. Align the bar parallel to the occlusal plane in the physiologically most favourable position in accordance with the abutments and the contour of the alveolar ridge.



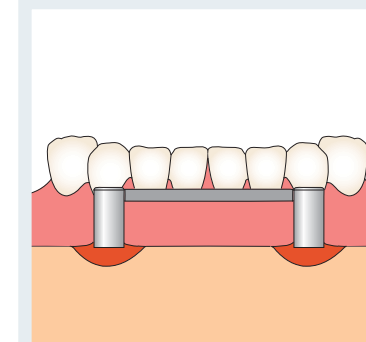
Welding/soldering the connection

Follow the instructions of the laser supplier and the solder manufacturer. Laser welding is the option which should be preferred here. Incorrect welding/soldering can lead to mechanical failure, which may pose a health risk to the patient.



Check

Check that the construction is seated without any gaps and free of stresses (Sheffield test).



Trial fitting of frame

Trial fitting of the frame on the model and in situ with the set-up denture is recommended. For trial fitting of the prosthesis cut out the bar in the denture base.

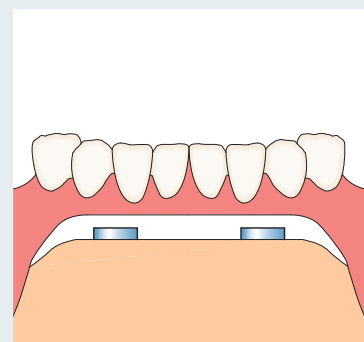
Completion/Integration

The denture is completed on the model after blocking out any undercuts around the female/male part. The dental technician completes the work as usual. The Mini prosthesis screw is used for final placement of the restoration in the patient's mouth (torque: 25 Ncm) (tool: hexagon screwdriver 1.25 mm).

22.3 Mini ball attachment (PRECI-CLIX)

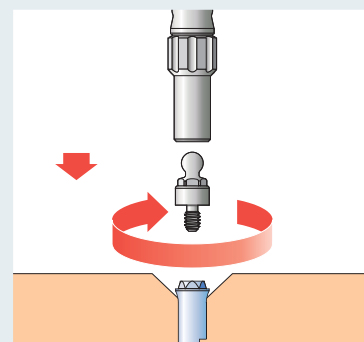
Product details

Mini ball attachment abutments are screwed directly onto the implant and are used for ball attachment restorations on implant diameters of 2.9 and/or 3.1 mm. It is not essential to use an artificial gingival mask with the Mini ball attachment abutment when making the model. The Mini ball attachment serves the purpose of prosthodontic retention and is not designed to absorb masticatory forces. Do not sandblast or otherwise finish any part of the Mini ball attachment. We recommend using a base made of light-curing resin for bite taking and set-up in order to have a stable base and the option of temporarily fixing the female parts firmly with a self-curing resin (autopolymer) for trial fitting.



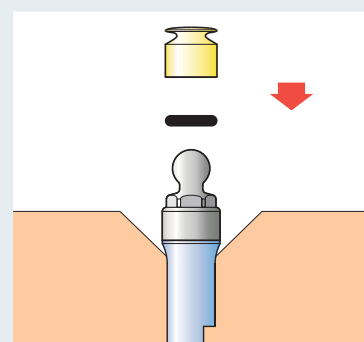
Setting up the denture

Set up the denture taking into consideration functional, aesthetic and phonetic aspects. Recess the implant region when shaping the base.



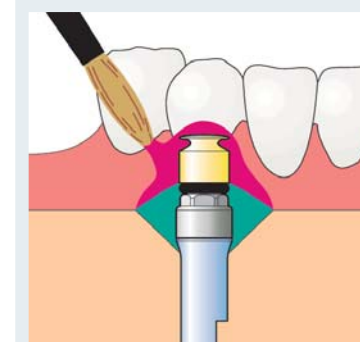
Inserting the ball attachment

Screw the Mini ball attachment into the Mini implant analog (tool: insertion tool for ball attachment).



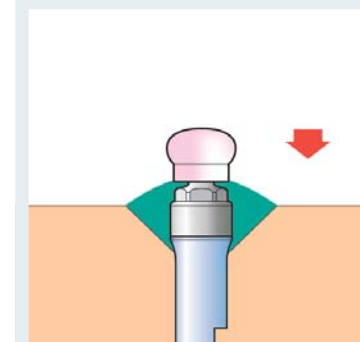
Fitting the female part

Pull the PRECI-CLIX space holder over the Mini ball attachment. Press the PRECI-CLIX female part selected firmly into the PRECI-CLIX female part housing and fit onto the Mini ball attachment (tool: PRECI-CLIX insertion tool). Block out any undercuts around the female part.



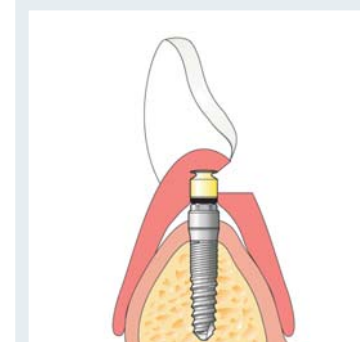
Fixing and completion of the denture

Temporarily secure the PRECI-CLIX female part with a self-curing resin (autopolymer) and adjust on the patient. Complete the denture on the model using standard techniques.



Optional partial denture reinforcement

If the female part is to be integrated into a partial denture plate (without female part housing), use the PRECI-CLIX duplication auxiliary when duplicating the model. Block out any undercuts around the duplication auxiliary. The investment material must reproduce the exact shape of the duplication auxiliary. After completing the partial denture (using standard techniques), press the PRECI-CLIX female part selected into the space created in the partial denture (tool: PRECI-CLIX insertion tool).



Optional intraoral completion (chairside)

Complete the denture without a female part/female part housing. Fenestrate the denture in the region of the implants and polymerise on the patient.

Caution: Completion takes place after pulling the PRECI-CLIX space holder over the Mini ball attachment, fitting the female part with the female part housing and blocking out any undercuts around the female part.

Integration

For final placement of the restoration, the Mini ball attachment is screwed in place at a torque of 25 Ncm (tool: insertion tool for ball attachment).

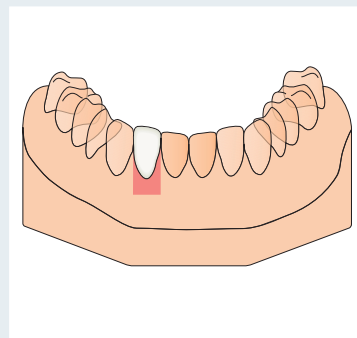
Caution: If retention of the female parts does not/no longer fulfils the requirements, they can be replaced. To do so, bend the lips of the female part inwards using a pointed instrument. Use an end-cutting carbide drill to carefully drill a hole in the middle of the female part (up to the housing). Remove the female part with a pointed instrument.

22.4 Wirobond® MI Mini abutment conical

Product details

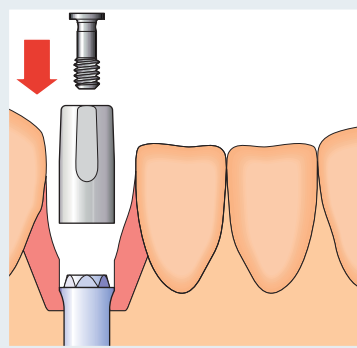
Wirobond® MI Mini abutments conical are screwed directly onto the implant and are used exclusively for making single tooth restorations/cement-retained restorations (single crowns) for narrow anterior gaps between incisors 12, 22, 32, 31, 41 and 42 on implant diameters of 2.9 and/or 3.1 mm. A model with an artificial gingival mask is required when using the abutment. Wirobond® MI Mini abutments are not suitable for telescopic restorations or bridges. None of the abutments are suitable for direct bonding of ceramics or for casting/soldering.

Follow the “General instructions for use – BEGO Semados® materials, Wirobond® MI” given in Section 5.4.



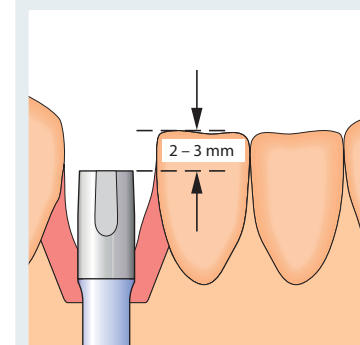
Set-up

Make a set-up with acrylic teeth according to functional, phonetic and aesthetic aspects. Take an impression of the situation using a silicone index.



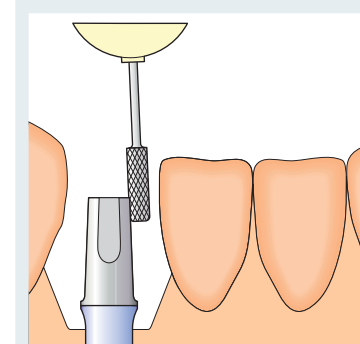
Inserting Wirobond® MI Mini abutments conical

Screw the abutment onto the implant analog using the Mini technician screw (slotted screw) (tool: slot screwdriver).



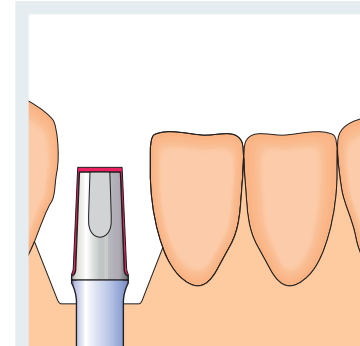
Shortening Wirobond® MI Mini abutments conical

Use the silicone indexes prepared in the set-up for shortening the abutment (approx. 2–3 mm below the occlusal level).



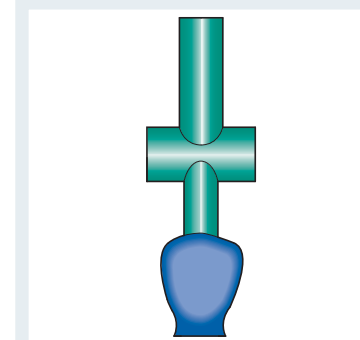
Individual grinding of the Wirobond® MI Mini abutment conical

Prepare the abutment to suit individual anatomical requirements. **Caution:** The connecting interfaces with the implant must not be sandblasted or finished. The fit is predetermined according to industrial specifications.



Fabrication of a coping/wax-up

The coping can be made from self-curing resin (autopolymer). Follow the manufacturer's instructions. Check the wax-up with the set-up.



Spruing the wax-up

Sprue the wax-up according to the alloy manufacturer's recommendations.

22.4 Wirobond® MI Mini abutment conical

Investing/Casting/Deflasking

Make sure you follow the instructions supplied by the manufacturers of the products used and the General instructions for use of the BEGO Semados® implant superstructure in Section 6.1.

Check

Ensure that there is a gap-free marginal seal between the Wirobond® MI Mini abutment and the frames.

Completion/Integration

The dental technician completes the work as usual. The Mini prosthesis screw is used for final placement of the restoration in the patient's mouth (torque: 25 Ncm) (tool: hexagon screwdriver 1.25 mm).

23.1 Secondary connection 1.2 mm (set)

Product details

The secondary connection 1.2 mm (set) is used for vertical screw retention of crowns and bridges in implantology and conventional techniques, e.g. sectional partial dentures or partially detachable prostheses. The short conical slotted screw or secondary screw 1.2 Hex 0.9 fits into the cuff perfectly, so ensuring ideal force distribution as well as a hygienic seal in the occlusal region.

The set can also be used for transverse screw retention if there is sufficient space. In this case, however, we recommend using a pin screw (e.g. Cendres+Métaux SA, Biel/Bienne, Switzerland) as well as customised fabrication of a cut thread.

Integration and use

Thread: Can be cemented, cast, lasered or soldered in place

Cuff: Preferably cast on. Lasering and soldering also possible.

Long slotted screw: Facilitates wax-up.

Fixation pin: Used to fix the sleeve in place during casting and soldering, protects the thread from ingress of the alloy. Temperatures over 1400°C and major overheating of the cast alloy may destroy the fixation pin.

Short slotted screw: Used to fix primary elements and abutments in the mouth.

Secondary screw 1.2 Hex 0.9: Used to fix primary and secondary elements in the mouth.

Alloy constituents

Thread and cuff: Non-oxidising, cast-on precious metal alloy
60Au – 19Pt – 20Pd – 1Ir (Ts – TI – 1400 – 1490°C)

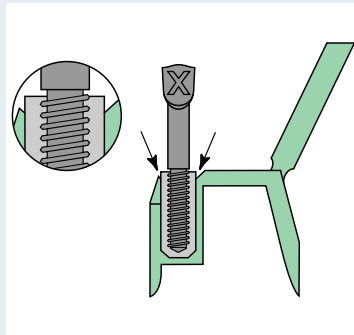
Long slotted screw and fixation pin: Steel

Short slotted screw: Precious metal alloy with high strength
60Au – 10.5Pt – 6.5Pd – 7Ag – 14Cu – 2.0Zn

Secondary screw 1.2 Hex 0.9: Grade 5 titanium in accordance with ASTM F136

Cast-on alloys: Non-precious metal alloys must not be used for casting .
Precious metal alloys for low-fusing ceramics are not always suitable here due to their high coefficient of thermal expansion (risk of cracking with ceramic veneering).

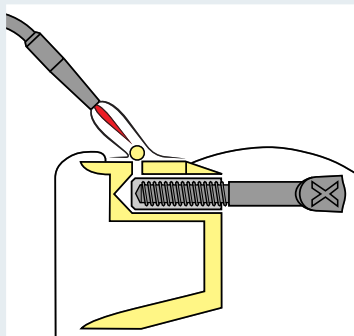
23.1 Secondary connection 1.2 mm (set)



Primary element: Inserting the sleeve

Wax-up of the primary crown or bridge element is followed by placement of the threaded sleeve taking account of anatomical, functional and aesthetic principles. The threaded sleeve must be completely surrounded by wax. A fine notch can be made at the junction between the wax and the sleeve to prevent the ingress of alloy during casting-on.

Important: Check the occlusion with the cuff and the inserted screw (short slotted screw or secondary screw 1.2 Hex 0.9). The head of the screw must not be in contact with the opposing tooth. If necessary, the head of the screw can be individually shortened provided that it can still be gripped by the spanner.



Casting and soldering

Casting: For investment, insert the fixation pin in the investment material to hold the threaded sleeve in place and to protect the thread. First oxidise the fixation pin before use (400°C/10 minutes). Next, coat the thread with colloidal graphite (e.g. Cendres+Métaux SA, Biel/Bienne, Switzerland). Then insert into the threaded sleeve, invest and cast. After casting, carefully remove the fixation pin from the threaded sleeve, keeping it straight. Should the fixation pin break after casting despite taking every care, it will dissolve in a heated 30% solution of hydrochloric acid (HCL) after about an hour.

Soldering: The fixation pin is also used to produce the soldering block. We recommend venting the blind hole to ensure complete soldering around the threaded sleeve and to protect the thread from the ingress of solder. To do so, drill a small hole or slot.

Cementing and lasering

When waxing up the primary crown or bridge element make sure that sufficient material is available for drilling at the screw support. After making a pilot hole with a centring bur (e.g. Cendres+Métaux SA, Biel/Bienne, Switzerland) the end dimension drill hole can be made directly with the twist drill selected according to the diameter of the screw (oil well and lift at intervals). Once the bonding surfaces have been sandblasted and cleaned, cement the threaded sleeve with a suitable adhesive (follow manufacturer's instructions).

Instead of cementing the threaded sleeve, it can also be lasered in place. Filler material from the crown alloy should be used to ensure a secure connection. There should be absolutely no leakage at the laser-welded seam to prevent localised pitting corrosion.

Secondary element: Integration of cuff by casting-on

Once the primary element has been milled and polished, work on the secondary construction can then start. This involves inserting the cuff with the screw, which has already been shortened as required. The cuff is integrated in the wax-up. A fine notch should be made at the junction between the wax and the cuff to prevent the ingress of molten alloy as far as possible during subsequent casting-on. Then invest, cast and polish.

Note: The investment material will give the cuff sufficient retention if investment has been carried out properly without voids.

www.bego.com



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