

PROSTHETIC PROCEDURES FOR THE NARROW NECK CrossFit® IMPLANT



Straumann® Narrow Neck CrossFit® Implant Line

COMMITTED TO SIMPLY DOING MORE FOR DENTAL PROFESSIONALS



The ITI (International Team for Implantology) is academic partner of Institut Straumann in the areas of research and education.

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1. GENERAL INFORMATION

Purpose of this guide

This guide describes the essential steps required for the fabrication and insertion of prosthetic restorations for the Straumann® Narrow Neck CrossFit® (NNC) implant.

For detailed information regarding implantation and soft tissue management, please refer to "Basic information on the surgical procedures: Straumann® Narrow Neck CrossFit® implant" (Art. No. 152.809).

Note

Different procedures apply for dental clinicians and dental technicians. Such procedures are indicated by the use of different models to explain the procedures:

Procedure for dental clinician:



Procedure for dental technician:



Not all products shown are available in all markets. All products shown in this guide are for single use only if not indicated otherwise. Some of the products shown in this guide are trademarked:

LOCATOR® is a registered trademark of Zest Anchors, Inc., USA.

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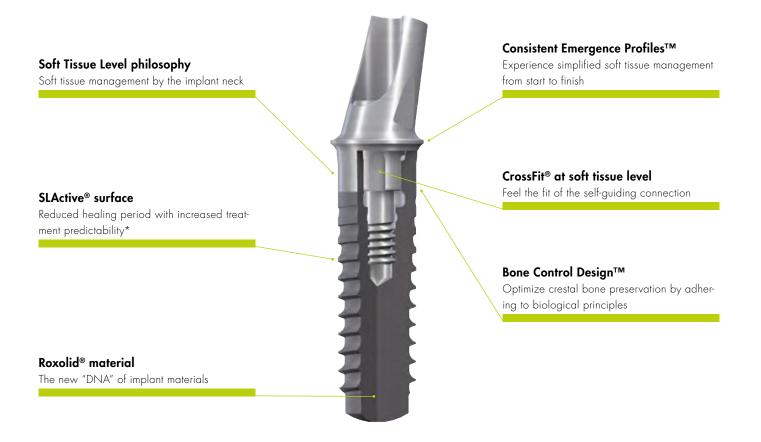
Manufacturer Zest Anchors, Inc. Escondido, CA 92029 USA

 ${\sf Ceramicor}^{\circledast}$ is a registered trademark of Cendres & Métaux SA, Biel-Bienne (Switzerland).

2. STRAUMANN® NARROW NECK CrossFit® IMPLANT

A new Soft Tissue Level implant design incorporating state-of-the-art technology

The Straumann[®] Narrow Neck CrossFit[®] implant provides you with a solution for narrow interdental spaces with expanded prosthetic flexibility through an internal connection. Based on innovative implant material and surface technology, this new Soft Tissue Level implant design combines many features and benefits of existing Straumann[®] products and technology, giving you a choice of a simple, versatile and effective solution.



* Compared to SLA®

Soft Tissue Level philosophy

Straumann® Soft Tissue Level solutions are designed to save time and increase efficiency:

- Soft Tissue Level implants aim at reducing chair time and minimizing treatment complexity
- Designed to provide integrated soft tissue management through built-in machined collar design
- High treatment success and patient satisfaction supported by strong scientific evidence¹

SLActive[®] surface

The hydrophilic SLActive® surface is designed to deliver:

- Higher security and faster osseointegration for every indication^{2,3}
- Reduced healing times from 6–8 weeks down to 3–4 weeks⁴
- Increased treatment predictability in clinical protocols²

Roxolid[®] material

Implants made of this titanium and zirconium alloy offer:

- Confidence when placing small diameter implants^{5,6,7}
- Flexibility of having more treatment options⁸
- Increased patients' acceptance of implant treatment⁹

Consistent Emergence Profiles™

The prosthetic components of the Straumann® Narrow Neck CrossFit® implant line are designed to facilitate highly esthetic restorations that perfectly mimic natural teeth. These implant line components, designed to match the abutment profiles, allow you to easily attain esthetic results through soft tissue management.

CrossFit® connection at soft tissue level

This prosthetic connection is intuitive; self-guiding and easy to grasp. The Cross-Fit® connection:

- Provides a clear-cut insertion through the guidance by 4 grooves and the deep, conical connection
- Provides precision against rotation through the orthogonal fit between implant and abutment
- Gives prosthetic flexibility and is designed for long-term mechanical stability through its conical connection

Bone Control Design[™]

The unique Bone Control Design[™] is based on key biological principles and thorough scientific research to support crestal bone preservation and stable soft tissue margins. It features the following strengths:

- Fast osseointegration with the SLActive® surface technology
- Optimal transmission of forces into the bone through the biomechanical implant design
- Consideration of the biological distance with a vertical distance of micro gap to bone
- Reduction of micromovements while controlling the micro gap through a conical connection

References

- ¹ Refers to an improved quality of life with a dental implant in comparison to no treatment. Awad M.A. et al. Measuring the effect of intra-oral implant rehabilitation on health-related quality of life in a randomized controlled clinical trial. J. Dent. Res. 2000 Sep;79(9):1659–63.
- ² Ganeles et al. Clin. Oral Impl. Res. 2008;19:1119–1128.
- ³ Bornstein et al. J Periodontol. 2010 Jun;81(6):809-819.
- ⁴ Oates et al. The International Journal of Oral & Maxillofacial Implants. 2007;22(5):755-760.
- ⁵ Norm ASTM F67 (states min. tensile strength of annealed titanium).
- ⁶ Data on file, used for all Straumann[®] titanium and Roxolid[®] implants.
- ⁷ Gottlow J et al. Preclinical data presented at the 23rd Annual Meeting of the Academy of Osseointegration (AO), Boston, and at the 17th Annual Scientific Meeting of the European Association for Osseointegration (EAO), Warsaw.
- ⁸ Non-interventional study, status 21st July 2009, data on file.
- ⁹ Data from 2200 Riegl surveys conducted in Germany, 2008.





The Straumann[®] Narrow Neck CrossFit[®] implant features this proven and intuitive implant-abutment connection that is self-guiding and enables simple positioning. It provides stability, allows clear-cut insertion with all components and protects against rotation.



Internal connection viewed from above, showing the 4 internal grooves.



Precision and simplicity: 4 grooves

The CrossFit[®] connection features 4 grooves to facilitate repositioning of prosthetic components. This configuration is characterized by its:

- Simple implant alignment
- Clear-cut and guided component insertion
- Flexibility in the placement of angled prosthetic components
- Optimal against rotation provided by orthogonal implant-abutment fit

Abutment insertion

Step 1

The abutment is placed on the 4 grooves in the implant.



INN⁴

Step 3

Step 2

grooves.

The abutment then falls into the final position.

The abutment is turned until it is aligned with the 4 implant



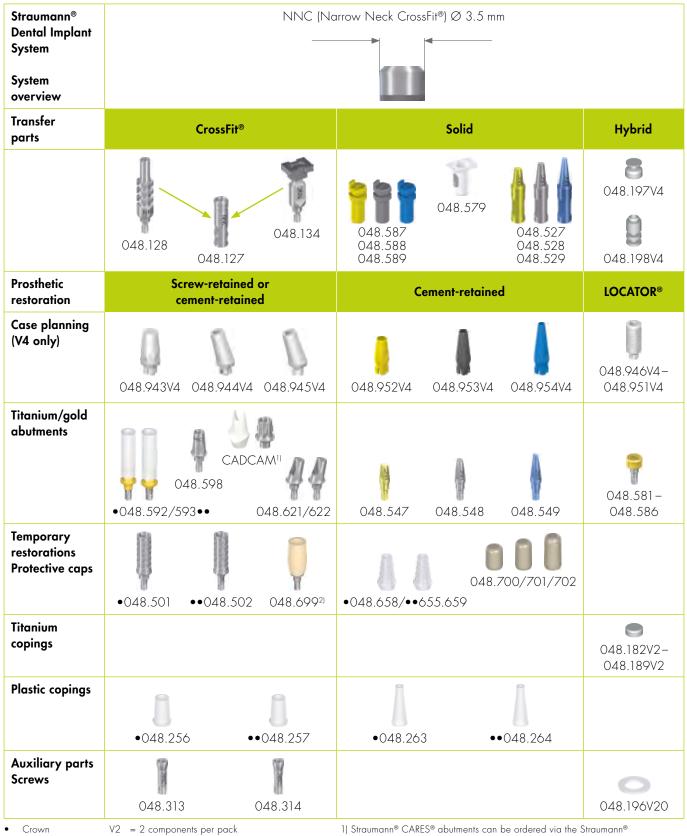
The abutment, when in place, shows the precise orthogonal fit between implant and abutment.

Reliability and flexibility: Conical connection

The CrossFit® connection features a cone with excellent mechanical properties, providing additional flexibility for prosthetic treatments. The conical prosthetic connection is designed to provide:

- Reduced micromovements and minimized micro-gap
- Outstanding mechanical stability and optimized stress distribution
- Precise implant-abutment fit
- Simplified impression taking even with divergently positioned implants

2.2 System overview



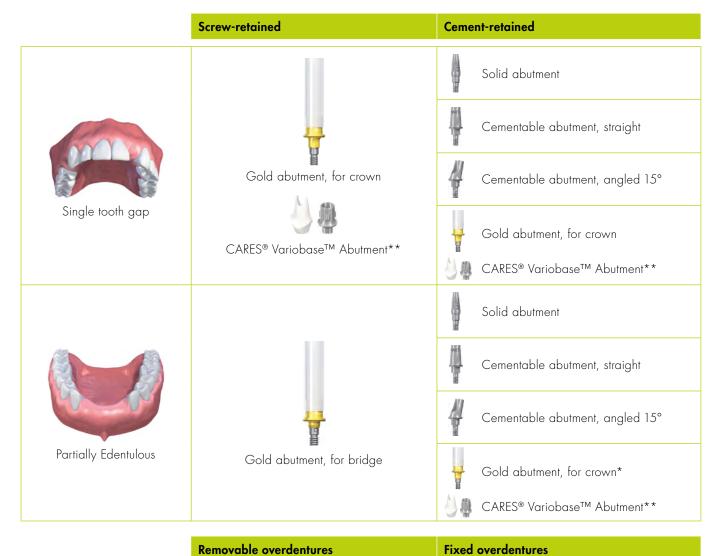
•• Bridge V4 = 4 components per pack

V20 = 20 components per pack

CARES® Visual software 8.0 and newer.

2) Straumann® Temporary Abutment, VITA CAD-Temp®

10



2.3 Restorative options for the NNC Implant

LOCATOR® Abutment

Gold abutment, for bridge (for customized bar) Gold abutment, for bridge (for screw-retained overdenture)

* For cement-retained bridge framework

Edentulous

** See brochure 152.822 for detailed information.

3. SOFT TISSUE MANAGEMENT

Successful soft tissue management plays a crucial role in determining the final esthetic result. The Straumann® Narrow Neck CrossFit® implant adopts the Soft Tissue Level philosophy, allowing the design of the implant neck to help manage the soft tissue and maintain a consistent emergence profile.

After implantation of the Straumann[®] Narrow Neck CrossFit[®] implant, the implant is closed and protected with an NNC Closure screw or healing abutment. This is done by hand-tightening with the SCS screwdriver. The surgeon can choose between submucosal and transmucosal healing.

3.1 Closure screws

The use of a closure screw or shorter healing abutment is recommended for submucosal healing (healing under a closed mucoperiosteal flap). Submucosal healing is suggested in esthetic indications and for implantations with simultaneous guided bone restoration (GBR) or membrane technique. A second surgical procedure is required to uncover the implant and insert the desired secondary component.

Step 1 - Insertion during the first surgical stage

Ensure that the internal configuration of the implant is clean and bloodless.

Pick up the closure screw with the SCS screwdriver. The friction fit will secure the closure screw to the instrument during insertion and will allow safe handling. Hand-tighten the closure screw. The design will provide a tight connection between the two components.

Subsequent loosening is made easier by applying a sterile gel to the closure screw before it is screwed into the implant.





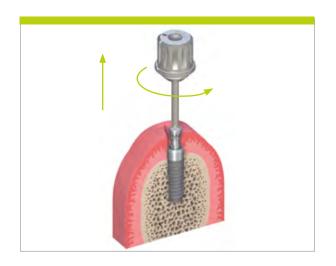
Step 2 – Wound closure

Adapt the mucoperiosteal flaps carefully and suture together with interrupted sutures. Make sure a tight seal is formed over the implant.



Step 3 – Re-opening and removal during the second surgical stage

Locate the implant. Make a small crestal incision down to the closure screw.



Retract the flap slightly and remove the closure screw with the SCS screwdriver.



Step 4 – Insertion and wound closure

Rinse the exposed internal connection of the implant thoroughly with sterile saline solution.

Insert a suitable secondary component, such as a healing abutment or temporary abutment.

Adapt the soft tissue and suture it back tightly without tension around the secondary component.

3.2 Prefabricated healing abutment

Healing abutments are available for Straumann[®] Narrow Neck CrossFit[®] implants to enable the closure of the implant connection for submucosal healing, and to allow sculpturing of the soft tissue during transmucosal healing. After the soft-tissue healing phase, they are replaced with the appropriate temporary or final restoration.

Step 1 – Insertion

Ensure that the internal configuration of the implant is clean and bloodless.

Insert the healing abutment with the SCS screwdriver. The friction fit secures the components to the instrument during insertion and provides safe handling.

Hand-tighten the healing abutment. It is designed to provide a tight connection between the two components.



D Note

Healing abutments are delivered non-sterile in blisters and must be sterilized prior to use.

Subsequent loosening is made easier by applying a sterile gel to the healing cap or healing abutment before they are screwed into the implant.



Step 2 – Wound closure

Adapt the soft tissue and suture it back tightly around the abutment.

Article number	Article	Description	Applications	
048.324 048.324V4	- 2	NNC Closure screw, H 0	Closure of the implant connection for submucosal and transmucosal healing.	
048.325 048.325V4	No.	NNC Closure screw, H 1.5		
048.071	and transmucosal healing. Transmucosal healing can be obtain		Closure of the implant connection for submucosal	
048.074	No.	Healing abutment Ti, regular height, H 4.5	the implant shoulder is in a subgingival position by using a taller healing abutment. The labial bevel facilitates exact approximation of the soft tissue over the healing abutment. Ensure that there is no tension on the vestibular wound margin,	
048.082		Healing abutment Ti, regular height, labial	otherwise mucosal necrosis can occur.	

4. FABRICATION OF A TEMPORARY RESTORATION

4.1 Temporary abutment – Titanium alloy (TAN)

Characteristics

- Precise fit and high stability due to the titanium alloy (TAN) material
- CrossFit[®] connection for engaging abutments

Provides solutions for narrow interdental spaces

- Crowns and bridges
- Screw-retained and cement-retained
- Anterior and posterior region (up to premolar area)
- Chair-side or laboratory application

Intended use

048.501 Engaging temporary abutment:

- Screw-retained or cement-retained temporary crowns
- Cement-retained temporary bridges

048.502 Non-engaging temporary abutment:

Screw-retained temporary bridges

D Note

- Do not use for longer than 180 days.
- Place temporary restorations out of occlusion.
- The temporary abutment can be shortened vertically with standard tools and technique, but a minimal height of 4 mm above the mucosal margin must be maintained.
- The devices are provided non-sterile and are for single use only.
- The abutment must be secured against aspiration.
- Refer to the veneer material manufacturer for information regarding the disinfectants that can be used.
- The abutments can be processed with cleaning/disinfecting agents such as Ethanol, Tego Cid 2%, Micro 10+ 4%, Cidex OPA pure and Grotanat 2%.
- The abutment can be steam-sterilized (134 °C for 5 min).











Procedure for fabricating a screw-retained temporary bridge restoration

Step 1 – Preparation

Mount the disinfected temporary abutment in the patient's mouth.

Mark the appropriate heights according to the individual situation, taking note that the temporary restoration should be kept out of occlusion.

Remove the abutment from the patient's mouth.

This procedure may also be carried out on the master model after an impression is taken.

A gingival mask should always be used to ensure that the emergence profile of the restoration is optimally contoured.

The appropriate height of the abutment is marked.

Shorten the abutment as necessary using standard tools and technique.

The upper section of the abutment should be sandblasted before applying the opaquer.



Coat the temporary abutment with opaquer to prevent the titanium alloy (TAN) from showing through.

Screw the copings onto the implant in the patient's mouth and temporarily seal the screw channels (e.g. with cotton).



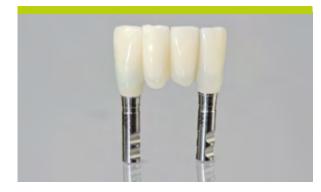
Step 2 – Creating the provisional

Use a standard technique to fabricate the temporary restoration (e.g. prefabricated crown or bridge form or vacuum-formed sheet technique as shown here on the master model).

The retention elements provide proper mechanical bonding of the veneering material to the temporary abutment.



Remove excess acrylic, re-open the screw channel and finish the temporary restoration.



Step 3 – Inserting the provisional

Clean and disinfect the polished temporary restoration.



Place it on the implants and tighten the screw between 15 Ncm and 35 Ncm (depending on implant stability) using the SCS screwdriver along with the ratchet and the torque control device.





Cover the screw head with absorbent cotton or gutta-percha.

Seal the screw channel with temporary veneering material (e.g. composite).

Note

- Proceed with a similar procedure for screw-retained or cement-retained temporary crown restorations by using the engaging temporary abutments (048.501).
- **2.** Use standard SCS screwdrivers.
- **3.** The temporary abutment is hand-tightened on the master cast.
- **4.** Final tightening torques can be between 15 Ncm and 35 Ncm, depending on implant stability in the patient's mouth.
- **5.** The implants should not have more than 16° divergence for a screw-retained bridge.
- **6.** For divergence greater than 16°, manufacture a meso structure with a cement-retained restoration in order to compensate for the divergence.



4.2 Temporary restoration – NNC Solid abutment with temporary copings

If the NNC Solid abutment is chosen for a restoration, it must be temporized while the superstructure is being fabricated. Keeping them covered will also be more comfortable for the patient, and also keep the abutments clean.

The use of temporary plastic copings (048.658/048.659) is recommended for the fabrication of crowns and small temporary bridges to create a good emergence profile.

In this example, a NNC Solid abutment was inserted into the implant and torqued to 35 Ncm (see chapter 7.5). The impression is taken next, after which the abutment can be temporarily restored.

Procedure for fabricating a cement-retained temporary crown restoration



Step 1 – Modifying the height of the coping

Snap the temporary coping onto the corresponding analog and mark the appropriate height according to the individual clinical situation and the abutment used.

The coping can then be shortened as necessary, using the vertical retention rings of the coping as a guide.

D Note

Do not use vaseline (aliphatic isolation agent) for insulation of the abutment.

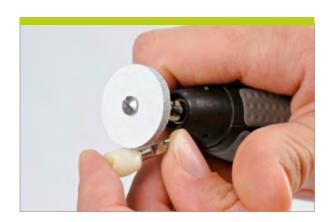


Step 2 – Fabricating the provisional restoration

If necessary, you can modify the margin of the coping. Then snap the temporary coping onto the implant shoulder and create the provisional restoration on the temporary coping according to standard techniques (e.g. prefabricated polycarbonate crowns or vacuum stents).

The retention rings provide proper mechanical bonding of the veneering material to the coping.

The plateau of the coping helps to prevent the veneering material from flowing under the implant shoulder.



Step 3 – Finalizing the fabrication of the provisional restoration

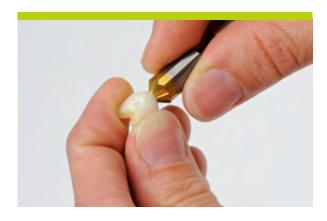
Remove the provisional restoration/temporary coping and place it back onto the analog.

Grind down and polish the emergence profile of the coping and the restoration to achieve an even profile.

To avoid tissue irritation, it is important to finish the interface until it is smooth and the coping is flush with the restoration.



The restoration must always be out of occlusion.



Step 4 – Removing the snap-on mechanism

Remove the lip of the snap-on mechanism from the temporary coping by using the NNC Reamer instrument.

It is mandatory to remove the lip of the snap-on mechanism to allow proper extrusion of excess cement.

For further information on the NNC Reamer, see chapter 7.2.



Step 5 – Cementing the provisional restoration onto the abutment

Apply temporary cement to the inner part of the coping, and cement it onto the abutment and the implant shoulder. Remove the excess cement.

D Note

- 1. Temporary copings must be attached with temporary cement. Adequate and secure attachment is only provided by the use of temporary cement.
- **2.** Temporary copings must not be kept in the mouth longer than 30 days.
- **3.** When it is time to remove the temporary coping with the attached provisional restoration, use conventional techniques.
- **4.** To prevent abutment shifting, provisional restorations must not be removed with rotational movements.

4.3 Temporary restoration – NNC Solid abutment with protective caps

If the temporary restoration is intended only as a protective measure, protective caps (048.700/701/702) are ideal as an interim solution.

Procedure for temporizing a Solid abutment with a protective cap

Step 1 – Cementing the protective cap

Only temporary cement should be used to secure the protective caps. Remove any excess cement.



- 1. Do not use for longer than 30 days.
- **2.** Protective caps are removed the same way as a temporarily cement-retained crown.
- **3.** In order to prevent any displacement of the abutment, the protective cap must not be removed using a rotary movement.



5. IMPRESSION TAKING

5.1 Options for impression taking

Implant-level impressions for the Straumann[®] Narrow Neck CrossFit[®] implant can be taken by either of the two following procedures:

Closed tray technique



Closed tray impression



Open tray impression



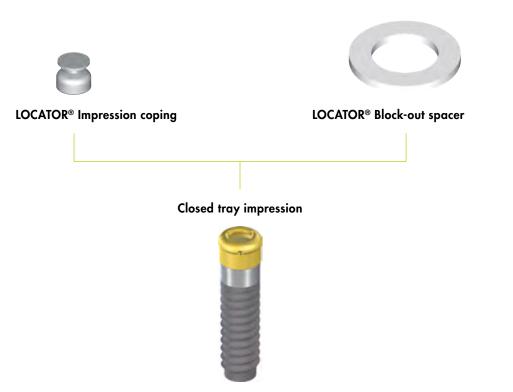
Straumann® Narrow Neck CrossFit® implant

D Note

The technique used depends on the user's preference and the clinical situation. All techniques are described in the following chapters. **Abutment-level impressions** are available for the Straumann[®] Narrow Neck CrossFit[®] Solid abutments and the LOCATOR[®] Abutment:



Straumann® Narrow Neck CrossFit® implant with Solid abutment



Straumann® Narrow Neck CrossFit® implant with LOCATOR® Abutment

Note

The technique used depends on the user's preference and the clinical situation. All techniques are described in the following chapters.

5.2 Implant level impression technique

5.2.1 Open tray impression

The open tray impression post has the following characteristics for simplicity and reliability:

- Slender emergence profile accommodates space limitations.
- Guide screw can be tightened either by hand or with the SCS screwdriver.
- High-precision impression components give a precise replica of the intraoral situation.
- Clear-cut tactile response from the prosthetic connection verifies proper seating of components.

D Note

- **1.** This open tray impression procedure requires a custom-made tray with perforations.
- **2.** Impression posts are intended for single use only to provide optimal fit and precise impression taking for each patient.





Open tray impression – Clinical procedure

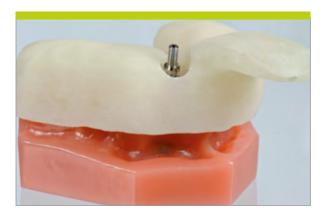
Step 1 – Positioning the impression post

Ensure sufficient access to the implant site in order to avoid pinching in the gingival tissue. Be aware that the sulcus may collapse rapidly once the healing components have been removed.

Clean the internal configuration of the implant thoroughly from blood, tissue, etc. prior to the impression procedure.

Place the impression post accurately into the implant and hand-tighten the guide screw.

In case of occlusal space limitation, the length of the impression post can be reduced by one retention ring after the guide screw has been removed.



Step 2 – Impression taking

Make perforations in the custom-made impression tray (light-cured resin) according to the individual situation so that the positioning screw of the impression post sticks out.



Take the impression using an elastomeric impression material (polyvinyl siloxane or polyether rubber). Uncover the screws before the material is cured.

Note

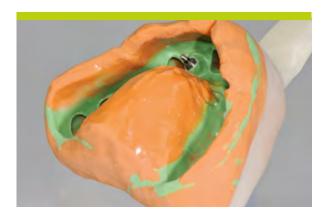
Due to its low tensile strength, hydrocolloid is not suitable for this application.



Once the material is cured, loosen the guide screws before removing the tray from the patient's mouth.



After removal from patient's mouth the impression is checked for sufficient detail.



Open tray impression – Laboratory procedure

Step 1 – Analog positioning

Position and attach the analog to the post in the impression using the guide screw.

To avoid inaccuracies when connecting, the analog must be positioned precisely in line with the grooves of the impression post before screwing in.



Note

When tightening the screw, grasp the retentive section of the analog securely to prevent the impression post from rotating.

This is especially important if the post has been shortened before the impression.





Step 2 – Fabricating the master cast

Fabricate the master cast using standard methods and type 4 dental stone (DIN 6873).

A gingival mask should always be used to ensure that the emergence profile of the final restoration is optimally contoured.

5.2.2 Closed tray impression

The closed tray impression post and cap have the following characteristics for simplicity and reliability:

- No additional preparation (i.e. perforation) of the impression tray is required.
- Slender emergence profile accommodates space limitations.
- Guide screw can be hand-tightened with the SCS screwdriver.
- High-precision impression components give a precise replica of the intraoral situation.
- Clear-cut tactile response from the prosthetic connection verifies proper seating of components.

D Note

- 1. Impression posts are intended for single use only to provide optimal fit and precise impression taking for each patient.
- **2.** For your convenience, a spare cap is included with each packaging in case you need to repeat the impression immediately.





Closed tray impression – Clinical procedure

Step 1 – Positioning the impression post

Ensure sufficient access to the implant site in order to avoid pinching in the gingival tissue. Be aware that the sulcus may collapse rapidly once the healing components have been removed.

Clean the internal configuration of the implant thoroughly from blood, tissue, etc. prior to the impression procedure.

Place the impression post accurately into the implant and hand-tighten the guide screw (using the SCS screwdriver).



Ensure that the lateral planar areas (flat side with NNC laser marking) of the post are facing mesial or distal.



Place the polymer impression cap on top of the fixed impression post. Ensure that the arrows are aligned with the oral-vestibular direction. Push the impression cap in apical direction until it clicks. The impression cap is now firmly seated on the impression post.



Step 2 – Impression taking

Take the impression using an elastomeric impression material (polyvinyl siloxane or polyether rubber).

D Note

Due to its low tensile strength, hydrocolloid is not suitable for this application.



Once the material is cured, carefully remove the tray. The impression cap remains in the impression material and therefore is automatically pulled off from the impression post during the removal of the tray.



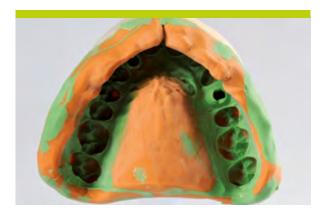
Unscrew and remove the impression post from the patient's mouth, disinfect appropriately, and send it together with the impression tray to the dental laboratory



Closed tray impression - Laboratory procedure

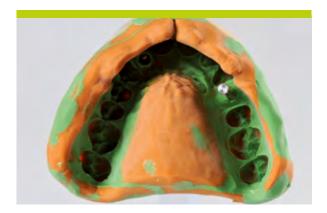
Step 1 – Analog fixing and impression post repositioning

Mount the impression post on the analog using the guide screw. To avoid inaccuracies when connecting, the analog must be positioned precisely in line with the grooves of the impression post before screwing in.



Note

Ensure that the color code of the analog corresponds to the gray color code of the polymer cap in the impression material.



Reposition the impression post in the tray. Smoothly push the impression post until you feel the tactile response of engagement. It is now firmly seated on the impression cap in the impression tray.



Step 2 – Fabricating the master cast

Fabricate the master cast using standard methods and a type 4 dental stone (DIN 6873).

A gingival mask should always be used to ensure that the emergence profile of the final restoration is optimally contoured.

5.3 Abutment level impression technique

5.3.1 Solid abutment (non-modified) impression

After successful osseointegration, the Straumann[®] Narrow Neck CrossFit[®] implant may be restored with a **non-modified** Solid abutment. Remove any debris from the head of the healing abutment and use any length SCS screwdriver to loosen, lift, and remove the healing abutment. The internal aspect of the implant must then be thoroughly cleaned and dried. The 45° implant shoulder makes it possible to carry out an abutment level impression for the Solid abutment by using a closed tray impression snap-on cap and positioning cylinder.

Color coding for NNC Transfer system

Accessories for NNC Solid abutment, height 4.0 mm = yellow Accessories for NNC Solid abutment, height 5.5 mm = gray Accessories for NNC Solid abutment, height 7.0 mm = blue

	Article number	Article
NNC Solid abutments	048.547 048.548 048.549	
NNC Impression cap	048.579	T
NNC Positioning cylinders	048.587 048.588 048.589	
NNC Implant analogs for Solid abutments	048.527 048.528 048.529	





D Note

All parts of the Solid abutment transfer system are supplied non-sterile. The parts can be disinfected as required using standard commercial disinfection agents (refer to the manufacturer's instructions) for plastic products.

Do not modify the Solid abutment prior to the abutment-level impression procedure.

\triangle Caution

The plastic components are for single use only. They must not be sterilized. In order to prevent any damage to the plastic components (loss of elasticity or embrittlement) they must be protected from strong light or heat irradiation.



Closed tray abutment level impression for the nonmodified Solid abutment – Clinical procedure

Step 1 – Placing the abutment

Sterilize and assemble the parts outside the mouth over a sterile field.

Align the groove of the NNC Solid abutment with the line on the driver shaft and insert the NNC Solid abutment into the NNC Solid abutment driver.

Bring the abutment to the mouth with the appropriate driver and insert it into the implant. Use finger pressure to tighten it down. Tighten with the ratchet and torque control device to **35 Ncm**.

For more details on how to assemble and use the ratchet and torque control device, please refer to chapters 7.3, 7.4 and 7.5.

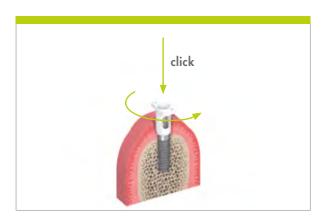


D Note

The Solid abutments are inserted into the implant without applying cement.

Important

Once the impression has been taken, any removal or repositioning of the abutment will require a new impression to capture the change in location of the flat side. Therefore, once an abutment is torqued in, it should not be removed after the impression is taken.



Step 2 – Placing the impression cap

Both the implant shoulder and the abutment must be cleaned of any blood or tissue prior to the impression procedure.

The NNC Impression cap (048.579) is pushed over the abutment and onto the implant shoulder, until the cap "clicks" into place.

The impression cap is turned gently in order to check that it securely snapped onto the implant shoulder. When the cap is seated correctly, it can be rotated smoothly on the implant.

Important

In order to carry out the impression procedure correctly, first, check that the shoulder and the margin of the impression cap are not damaged.

Step 3 - Insertion of the positioning cylinder

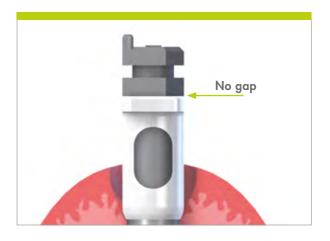
Positioning cylinders have a flat-side indicator (external knob) to identify where the internal flat side is. Care should always be taken to align the flat side of the positioning cylinder with the flat side of the abutment.

It is then pushed down over the abutment and through the impression cap.



Note

The positioning cylinder must be pushed down as far as possible, until it is flat and flush against the impression cap.





Step 4 – Taking the impression

The impression is taken using an elastomeric impression material (polyvinyl siloxane or polyether rubber).



Due to its low tensile strength, hydrocolloid is not suitable for this application.



The impression post and positioning cylinder will be inside the impression when removed from the patient's mouth.



Closed tray abutment level impression for the Solid abutment – Laboratory procedure

Step 1 – Positioning the analog

The color of the positioning cylinder in the impression identifies which analog must be used. The corresponding analog (048.527/528/529) is positioned in the impression.

Care should be taken to properly align the flat side of the analog with the flat side of the positioning cylinder. The analog is then pushed into the impression until it fits securely into place.



Step 2 – Casting the model

Fabricate the master cast using standard methods and a type 4 dental stone (DIN 6873).

A gingival mask should always be used to ensure that the emergence profile of the final restoration is optimally contoured. This is absolutely essential for restorations in the esthetic region and with subgingival crown margins.



5.3.2 LOCATOR® Abutment impression

For abutment level impression taking, special LOCATOR® Impression components are used.

As a consequence, the doctor can select abutment heights while working within the patient's mouth.

Step 1 - Selecting the abutment height

Make sure the top of the implant is not covered by hard or soft tissue.



It is imperative that all hard and soft tissue is removed from the implant shoulder to ensure correct seating of the LOCATOR® Abutment.

Select the height of the LOCATOR® Abutment by determining the height of the gingiva at its highest point in the patient's mouth. Choose the corresponding abutment tissue cuff height or the next closest higher size available.



Prosthesis insertion is easier for the patient if the LOCATOR® Abutments are on the same horizontal level.



Step 2 – Abutment insertion

Screw the abutment hand-tight into the implant, using the LOCATOR $\ensuremath{^{\ensuremath{\mathbb R}}}$ Driver.



Tighten the abutment to 35 Ncm using the ratchet along with the torque control device (see instructions in chapter 7.5) and the LOCATOR® Driver (see chapter 6.5).





Step 3 – Placing spacer and impression coping

Place a white block-out spacer ring on each abutment. The spacer ring is used to block out the area surrounding the abutment.



Place the LOCATOR® Impression copings on the LOCATOR® Abutments.



Step 4 – Impression taking

Take the impression utilizing the mucodynamic technique (vinyl polysiloxane or polyether rubber).

Send the impression to the dental laboratory.



Step 5 – Position the LOCATOR® Analog

The corresponding LOCATOR® Female analog (025.0120-04) is positioned in the impression.



Step 6 – Fabricating the master cast

Fabricate the master cast using standard methods and a type 4 dental stone (DIN 6873).

6. RESTORATIONS

6.1 Cementable straight and angled abutments

The NNC Cementable straight and angled abutments are intended for cementretained restorations.

- Consistent emergence profile of a natural tooth following the "tulip" design of the NNC Implant
- CrossFit[®] connection
- Modifiable (e.g. height adjustment)
- Easy handling of prefabricated copings

Two types of NNC Cementable angled abutments are available: Type A and Type B. This enables the axis to be corrected in 8 different alignments (in 45° graduations).







Art.No. 048.621 15° Type A



Art.No. 048.022 15° Type B



Note

- **1.** Not suitable for direct ceramic veneering.
- 2. The cement margin must not be more than 2 mm below the mucosa.
- **3.** A minimum height of 3 mm above the mucosa margin of the abutment must be maintained to provide proper stability and retention of the restoration.
- 4. Use a new basal screw for the final insertion of the abutment.



Fabrication of a cement-retained single crown with the NNC Cementable straight abutment – Laboratory procedure

The impression has been taken by the dental clinician (see chapter 5) and sent to the laboratory.

Step 1 – Fabricating the master cast and wax-up

Fabricate the master cast including a gingival mask with the corresponding implant analog (see chapter 5.2 or 5.3).



For optimal esthetic planning, model a full anatomical waxup. Use the corresponding burn-out coping (048.256) as a basis for this wax-up.



Make a silicone key over the full wax-up in order to define the optimal shape of the customized abutment.



Step 2 – Preparing the abutment

The abutment is made of titanium and may be modified as required.

Note

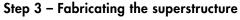
To maintain the emergence profile of the abutment, do not modify the margin of the abutment.

A minimum height of 3 mm of the abutment above the mucosa margin is required to allow adequate retention after cementation of the final restoration.

The abutment may be modified.





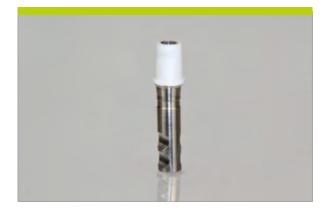


The superstructure can be fabricated on the modified abutment by using the standard modeling, casting and veneering methods.

Place the modified abutment on the analog and handtighten the screw using the SCS screwdriver.

Select the burn-out coping and place it on the abutment until it "clicks" into place.

Shorten the burn-out coping, if necessary.





Wax an individual resin cap onto the burn-out coping on the abutment.



Contour a wax model according to the anatomical circumstances of the individual cast.



Check the wax-up with the silicone key.



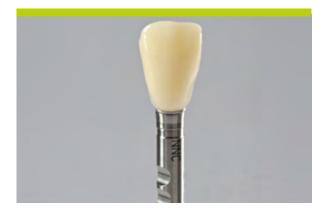
Step 4 – Casting and veneering

Cast the framework using the standard casting methods.









Check the framework with the silicone key before veneering.

Veneer the superstructure.









Insertion of the final restoration with the abutment – Clinical procedure

Step 1 – Preparation

The final restoration placed on the master cast is delivered to the doctor's office.

Remove the healing cap or temporary restoration. Remove the superstructure from the master cast and unscrew the abutment from the analog. Clean and dry the interior of the implant and the abutment thoroughly.

Step 2 – Final insertion

Position the cleaned abutment in the implant. Tighten the screw to 35 Ncm using the SCS screwdriver along with the ratchet and the torque control device (see instructions in chapter 7.5).

Close the SCS configuration of the screw with cotton and sealing compound (e.g. gutta-percha). This allows removal of the abutment in case a crown replacement is required later.

Cement the superstructure to the abutment. Remove excess cement and check the occlusion.

6.2 Gold abutment for crown

Characteristics

- Designed to achieve good esthetics due to individual contouring of the emergence profile and adaptation to the margin of the gingival contour
- Easy wax-up and protection of the screw channel due to modeling aid (burn-out polymer)
- Excess cement can be easily removed by raising the cement margin using an individually designed mesostructure
- CrossFit[®] connection

Intended use

- Screw-retained or cement-retained crowns
- Cement-retained bridges via mesostructure (custom abutment technique)
- Telescopic crowns and telescopic bridges

Note

- 1. Not suitable for direct splinting with other gold abutments.
- **2.** For screw-retained bridges, the gold abutment for bridge must be used (see instructions in chapter 6.3).
- 3. Use a new basal screw for the final insertion of the abutment.
- **4.** A minimum height of 3 mm above the mucosa margin of the abutment must be maintained to provide proper stability and retention of the cement-retained restoration.



Gold abutment for crown – Laboratory procedure

The following case describes the fabrication of a screw-retained single crown.

The impression has been taken by the dental clinician (see chapter 5) and sent to the laboratory.

Step 1 – Fabricating the master cast and wax-up

Fabricate the master cast including a gingival mask with the corresponding implant analog (see instructions in chapter 5).





For optimal esthetic planning, model a full anatomical wax-up.



Make a silicone key over the full anatomical wax-up in order to define the optimal shape of the final restoration.



Step 2 – Preparing the gold abutment

Place the gold abutment on the analog and hand-tighten the screw using the SCS screwdriver.



Shorten the modeling aid to the height of the occlusal plane according to the individual circumstances. Working with the modeling aid provides a clean and sharp-edged finish of the screw channel.



The occlusion may be checked with articulated models.



The gold abutment may be attached onto the implant analog for easier handling during manipulation outside of the model.



Step 3 – Wax modeling

Contour a wax-up shape according to the individual anatomical situation.

The silicone key shows the precise space for the screw-retained abutment and crown.



Make sure that the wax layer on the abutment is sufficiently thick (at least 0.7 mm).

Do not cover the delicate margin of the abutment with wax.





Check the wax-up of the crown framework with the silicone key.

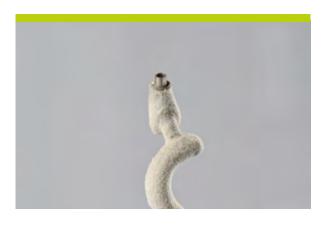


Step 4 – Investment

Invest the crown framework on the gold abutment according to standard methods without using wetting agents.

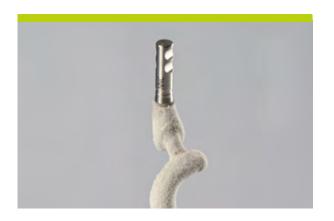
Note

- In order to avoid overflow of the cast-on alloy, thoroughly clean the abutment prior to investment (removal of wax particles, insulating agents with a cotton pellet or brush moistened with alcohol).
- Always do the cast with the modeling aid. Otherwise, the dental casting alloy will not flow out or only flow out too thinly at the upper coping rim.
- 3. Ensure that there is no wax on the delicate margin.
- **4.** The use of investment materials for rapid heating methods (speed investment materials) is not recommended.
- **5.** When processing the investment material, follow the manufacturers' instructions.
- **6.** Observe the recommended mixing ratio and preheating time precisely.



Step 5 – Casting and devestment

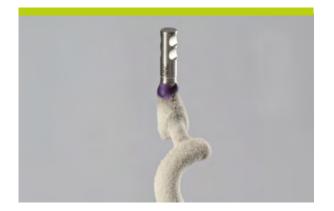
Cast the customized gold abutment. Gently devest the customized gold abutment with ultrasound, water jet, pickling acid or a glass fiber brush.



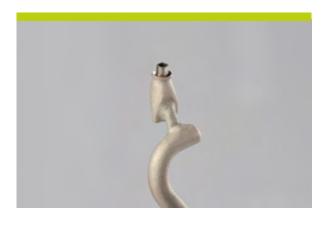
D Note

For guidelines on using alloys with castable Ceramicor® components, please see page 59.

For the devestment of the gold abutment with sandblasting (maximum pressure: 2 bars; maximum alumina particle size: 50μ m), the inner configuration has to be protected from infiltration with sand by affixing the analog to the abutment.



The wax-fixed analog allows better fixation and protects the pre-polished part of the gold abutment.



The crown framework on the gold abutment after sandblasting.



Do not sandblast the inner configuration of the gold abutment.



Failed casting

Casting errors and incorrect handling

The long-term success of the prosthetic work depends on the accurate fit of the restoration.

Examples of when the entire procedure has to be repeated:

 Trimming through the cast-on alloy prohibits the Ceramicor[®] surface from being covered with ceramic veneering material (Ceramicor[®] is a non-oxidizing alloy and does not allow ceramic bonding).

2. The cast-on gold did not flow out entirely.



3. Extruded casting metals and casting pearls cannot be removed from the connection part of the gold abutment.

Using alloys with castable Ceramicor® components

Ceramicor® is only suitable for cast-on procedures.

Ceramics cannot be bonded directly to cast-on Ceramicor® components as this alloy does not form bonding oxides.

When selecting the casting alloy, ensure that it is compatible with the highfusing alloy of the Ceramicor® components. The melting range of the casting alloy must not exceed a liquidus temperature of 1350 °C (2462 °F).

Ceramicor[®] must not be cast on with base metal casting alloys because gold in combination with nickel or cobalt destroys the components.

Suitable dental casting alloys

- High noble alloys
- Precious metal alloys with a minimum content of gold and platinum group metals of 25%
- Palladium-based alloys with a minimum content of palladium of 50%

ISO standard alloy types

Alloy types according to the following ISO standards are suitable for cast-on procedures to the prefabricated Ceramicor® component:

- ISO standard 9693
- ISO standard 22674

D Note

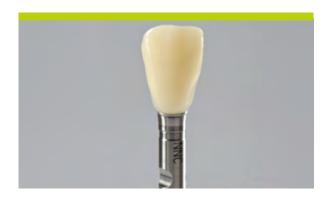
The manufacturer's recommendation for alloys must be followed. Due to diffusion at the alloy and the cast-on coping interface, components made from an unsuitable alloy may result in a part which has low-strength, reduced corrosion resistance or a lower melting range.

Ceramicor® is a registered trademark of Cendres & Métaux SA, Biel-Bienne (Switzerland).



Step 6 – Preparation before veneering

Remove the sprue and smooth the area. The silicone key shows the spatial relations for veneering.



Step 7 – Veneering Veneer the superstructure.





Gold abutment for crown - Clinical procedure

The final restoration placed on the master cast is delivered to the doctor's office.

Step 1 – Preparation

Remove the healing abutment or temporary restoration. Remove the superstructure from the master cast and unscrew the abutment from the analog in the model.

Clean and dry the interior of the implant and the abutment thoroughly.



Step 2 – Final insertion

Position the cleaned abutment in the implant. Tighten the screw to 35 Ncm using the SCS screwdriver along with the ratchet and the torque control device (see instructions in chapter 7.5).

Close the SCS configuration of the screw with cotton and sealing compound (e.g. gutta-percha or composite). This allows later removal of the customized abutment in case a crown replacement is required.



6.3 Gold abutment for bridge

Characteristics

- Easy wax-up and protection of the screw channel due to modeling aid (burn-out polymer)
- Designed to achieve good esthetics due to individual contouring of the emergence profile
- Profile and adaptation to the margin of the gingival contour

Intended use

- Screw-retained bridges
- Cement-retained bridges

D Note

- **1.** Not suitable for single crowns. For single crowns the gold abutment for crown must be used (see instructions in chapter 6.2).
- 2. Use a new basal screw for the final insertion of the abutment.
- **3.** A minimum height of 3 mm above the mucosa margin of the abutment must be maintained to provide proper stability and retention of the cement-retained restoration.



Gold abutment for bridge – Laboratory procedure

The following case describes the planning and fabrication of a screw-retained bridge.

The impression has been taken by the dental clinician (see chapter 5) and sent to the laboratory.

Step 1 – Fabricating the master cast and wax-up

Fabricate a master cast including a gingival mask with the corresponding analogs (see instructions in chapter 5).





For optimal esthetic planning, model a full anatomical wax-up.



Make a silicone key over the full wax-up in order to define the optimal shape of the screw-retained bridge.



Step 2 – Preparing the gold abutments

Place the gold abutments for bridge on the analogs and hand-tighten the screws using the SCS screwdriver.



Shorten the modeling aids to the height of the occlusal plane according to individual circumstances. Working with the modeling aid results in a clean and sharp-edged finish of the screw channel.



To avoid deformation of the conical design of the connection, it is highly recommended to always attach the gold abutment to an analog while working outside of the model.



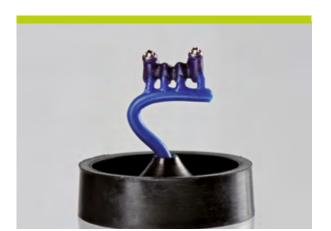
Step 3 – Wax modeling

Contour a wax-up shape according to the individual anatomical situation.

Make sure that the wax layer on the abutment is sufficiently thick (at least 0.7 mm).

Do not cover the delicate margin of the abutments with wax.





Check the spatial conditions before casting the bridge framework with the silicone key of the wax-up.

Step 4 – Investment

Check that the wax framework of the bridge is tensionfree before investing the framework. This is accomplished according to commonly known bridge techniques.

Invest the bridge framework according to standard methods without using wetting agents.

Note

- In order to avoid overflow of the cast-on alloy, thoroughly clean the abutments prior to investment (removal of wax particles, insulating agents with a cotton pellet or brush moistened with alcohol).
- 2. Ensure that there is no wax on the delicate margin.
- **3.** The use of investment materials for rapid heating methods (speed investment materials) is not recommended.
- **4.** When processing the investment material, follow the manufacturers' instructions.
- **5.** Observe the recommended mixing ratio and preheating time precisely.



Step 5 – Casting and devestment Cast the bridge framework.



Allow for enough cooling time of the casted bridge before the devestment.

Gently devest the bridge framework with ultrasound, water jet, pickling acid or a glass fiber brush.



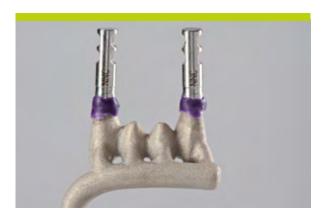
The wax-fixed analogs allow better fixation and protect the pre-polished part of the gold abutments.

Note

For guidelines on using alloys with castable Ceramicor® components, please see page 59.

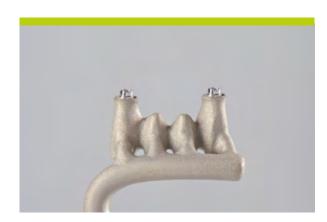
The long-term success of the prosthetic work depends on the accurate fit of the restoration. The entire procedure will have to be repeated, if casting errors occur. See the examples on page 58.

For the devestment of the gold abutment with sandblasting (maximum pressure: 2 bars; maximum alumina particle size: 50 μ m), the inner configuration has to be protected from infiltration with sand by affixing the analog to the abutment.



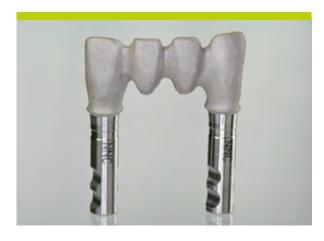
Note

- **1.** To help achieve success of the restoration, a precise prosthetic fit in the internal connection of the implant is mandatory.
- **2.** Take particular care not to let the bridge reconstruction fall down onto any surface.
- **3.** Due to the weight of the bridge construction, this might have a negative impact on the high-precision connection of the gold abutment.
- **4.** If the construction falls down at anytime, repeat the entire procedure.
- **5.** There are three notches on the connection which help to prevent rotation of the framework during the casting procedure.





Do not sandblast the inner configuration of the gold abutment.



Step 6 – Preparation before veneering

Remove the sprues and smooth the removal areas.

Check the spatial conditions with the silicone key.



Assess tension-free fitting on the master cast (Sheffield test).

If the bridge is not tension-free and therefore rocks during the Sheffield test, cut the bridge and re-splint it in a tensionfree manner.

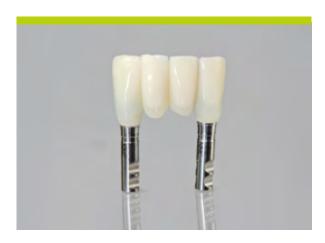




In order to take the bridge off the master cast, all basal screws need to be removed first.



Do an additional try-on of the tension-free fit of the framework in the mouth of the patient.



Step 7 – Veneering

Veneer the superstructure. Refer to your chosen veneering material manufacturer's instructions for use.



Gold abutment for bridge - Clinical procedure

The final restoration placed on the master cast is delivered to the doctor's office.

Step 1 – Preparation

Remove the healing abutment or temporary restoration. Remove the superstructure from the master cast and unscrew the bridge from the analogs.

Clean and dry the interior of the implants and the bridgework thoroughly.

Check the tension-free fit of the bridgework before tightening it in the mouth of the patient.



D Note

Do not insert the bridge if there are movements due to tensions in the bridgework.

Step 2 - Final insertion

Position the cleaned bridgework in the implants. Tighten the screws to 35 Ncm using the SCS screwdriver along with the ratchet and the torque control device (see instructions in chapter 7.5).

Close the SCS configuration of the screws with cotton and sealing compound (e.g. gutta-percha and composite). This allows later removal of the bridge work if needed.

6.4 Solid abutment

The Solid abutments are intended for cement-retained crowns and bridges.

- Consistent emergence profile of a natural tooth following the "tulip" of the NNC implant
- CrossFit[®] connection
- Available in 3 different heights (4 mm, 5.5 mm and 7 mm)
- Easy handling with prefabricated copings



D Note

- 1. Modification of the NNC Solid abutment is not advisable.
- 2. Not suitable for direct ceramic veneering.
- 3. The cement margin must not be more than 2 mm below the mucosa.



Constructing the superstructure with non-modified Solid abutments – Laboratory procedure

A Solid abutment was inserted into the NNC Implant by the dentist and torqued to 35 Ncm (see chapter 7.5). The abutment was not modified. The impression was taken (see chapter 5.4) and sent to the dental laboratory. In order not to change the position of the anti-rotational feature, the abutment was left in situ and temporized while the crown was constructed.



Step 1 – Casting the model

The appropriate analog was selected, matching the color of the positioning cylinder in the impression (see chapter 5.4). The flat side of the analog was properly aligned with the flat side of the positioning cylinder, and pushed into the impression until it snapped securely in place.



Standard techniques and type 4 extra hard stone plaster was used to cast the working model.

Note

A gingival mask should always be used to ensure that the crown is contoured correctly. This is absolutely essential for restorations in the esthetic region and with subgingival crown margins.



Step 2 – Placing the plastic coping

Once the working model has been fabricated, suitable plastic copings are selected. These are placed on the analogs and shortened if necessary.



With antirotation feature



Without antirotation feature

The plastic coping is selected in accordance with the planned superstructure:

048.263 NNC Plastic coping for Solid, crown 048.264 NNC Plastic coping for Solid, bridge

Note

The plastic components are for single use only. They must not be sterilized.

In order to prevent any damage to the plastic components (loss of elasticity or embrittlement) they must be protected from strong light or heat.



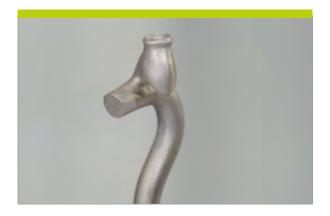
Step 3 – Waxing up and casting the framework

The framework is waxed up using the conventional technique and cast in a high-gold alloy.

Note

Cusps must not be over-contoured as this may lead to non-physiological loading.

The mold must be transferred to the casting machine in the shortest time possible.

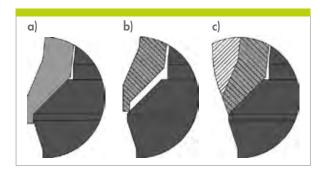


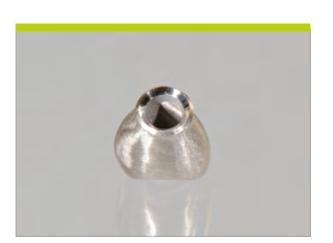
Once the mold has slowly cooled to room temperature, carefully remove the investment material from the cast object. The following are suitable for devesting: ultrasound, water jet, pickling or a glass fiber brush.

D Note

- Never use sand-blasting for devesting. This would destroy the fine margins and the internal configuration, which would lead to reduced accuracy of the fit (poor marginal fit and rotation of the copings).
- 2. Casting defects like insufficient discharge, casting beads or casting flashes considerably affect the precision of the prefabricated parts and jeopardize the long-term success of the restoration. The work then has to be repeated.







Step 4 – Removal of the snap-on mechanism

The plastic copings for Solid abutments are fitted with a "snap-on mechanism", which makes it easy to fit the plastic coping on the analog. This allows the plastic copings to be precisely positioned and fixed on the analog and, therefore, makes the modeling process easier as the coping is secured on the abutment.

However, once the coping has been cast, the "snap-on mechanism" no longer works, because unlike plastic, the casting alloy has no elasticity. Following the casting, this "snap-on mechanism" must be removed using the finishing instrument (reamer) or a rubber/silicone wheel polisher before the cast coping is placed on the analog; otherwise it will not be possible to position the construction on the analog or implant.

- a) Plastic coping with "snap-on mechanism".
- b) Coping following casting. The snap-on mechanism no longer works. The lip must be removed before the cast coping is placed on the analog.
- c) Finished work with lip removed.

D Note

Working under a stereo microscope is recommended.

It is also possible to remove up to 70% of the margin overhang using a rotary instrument like a silicone wheel. When you are close to the 45° implant shoulder, you should stop and finish the metal margin using the finishing instrument (reamer). Position the guide pin in the cast coping and remove the "snap-on mechanism" by rotating the finishing instrument slowly and evenly.

The finishing instrument (reamer) does not have an automatic stopping mechanism. Only remove as much as is necessary, until the protruding lip is flush with the implant shoulder. Then the crown can be placed on the analog.

For further information on the NNC Reamer, please refer to chapter 7.2.



Step 5 – Finish and veneer the framework

The final processing of the framework is then carried out and the facing is built up according to the anatomical guidelines.

The process from cast framework to ceramic application depends on the instructions from your ceramic material manufacturer.



The "freedom in centric" concept should be used for the occlusion as described below.

The concept of "Freedom in centric"

Natural teeth are suspended elastically in the alveolar bone by the periodontium. In comparison, implants are retained rigidly as they undergo ankylosis with the bone. Loads exerted on implant-borne crowns and bridges are transferred directly into the bone.

The "freedom in centric" concept is ideal for the occlusion for implant-borne bridgework. Wherever possible, these loads should be transferred during a physiological movement, i.e. by a correctly designed occlusion, as the integrated implants may be disturbed by inadequately designed occlusal surfaces. "Freedom in centric" involves the creation of an area of approximately 1 mm² which permits lateral freedom of approximately 1 mm in habitual intercuspidation. This surface permits the cusps to slide smoothly between the retruded contact position and maximum intercuspidation. The position of maximum intercuspidation is considered to be the centric occlusion.

As masticatory movements can be carried out with the described tolerance, certain guided movements of the restored dentition are possible. This, together with premolarization prevents overloading. Extreme cusp anatomy must be avoided as it may lead to severe intercuspidation and, consequently, to overloading.

Vertical masticatory forces must be exerted as physiologically as possible on the implant-antagonist axis. Crowns on single-tooth implants should not perform guidance functions. During treatment planning (diagnostic wax-up) one should decide the degree to which this can be achieved.

Important notes - Laboratory procedure

The success of work carried out with prefabricated plastic components depends on the attention paid to the following points:

Burn-out plastics are characterized by the fact that they swell up when they are burnt out. For that reason, it is important that the outside of the plastic coping is completely covered with wax. The wax burns off and, therefore, creates sufficient space in the mold for expansion when burned out in the oven. There must be a wax layer of at least 0.3 mm in the marginal region.

⚠́ Caution

Do not wax above the delicate margin.

- If there is insufficient waxing in the marginal region of the coping, there is a risk that the frustum will break in the interior of the invested coping, due to the effects of the expansion of the plastic in the mold. This can result in a casting error.
- To avoid casting errors due to wax particles, insulating agents, etc., careful cleaning of the interior and the inside and outside of the delicate edge of the coping prior to investment (e.g. with a cotton bud soaked in alcohol) is recommended.
- The sprues must encourage elimination of the wax and plastic and must not impede the direction of flow of the alloy (i.e. there should be no sharp angles or edges). Follow the manufacturer's recommendations for investment material on the selection and positioning of sprues.
- Do not use wax wetting agents, if possible. The plastic is so smooth that the investment material will fill all the fine contours of the coping's interior very well during investment (with the aid of a fine blunt instrument or a fine brush). However, if wetting agents are utilized, ensure that no aggressive wetting agents are used which could attack the surface of the plastic copings. Then blow-dry the copings carefully with compressed air. Wetting agent residues can lead to a reaction with the investing material and thus to casting errors.



Insertion of cement-retained crown on a non-modified Solid abutment – Clinical procedure

Step 1 – Final insertion

Remove the temporary restoration or protective cap in a conventional manner.

Clean the abutment thoroughly and remove all remaining temporary cement.

Cement the crown to the abutment. Remove excess cement.



- **1.** When it is time to remove the temporary coping or protective cap with the attached provisional restoration, use conventional techniques.
- **2.** In order to prevent any displacement of the abutment, the temporary restoration or protective cap must not be removed using a rotary movement.

6.5 LOCATOR® Abutment

Intended use Dentures retained by implants in the mandible and maxilla

Characteristics

- Divergence compensation up to 40° between two implants
- Minimum component height for limited occlusal space
- Dual retention for optimal abutment-denture connection
- Excellent performance due to high wear resistance of components



LOCATOR® is a registered trademark of Zest Anchors, Inc., USA.

Manufacturer

C E 0473

Zest Anchors, Inc. Escondido, CA 92029 USA

LOCATOR® Abutment – Laboratory procedure

Preparing the master cast from the implant level impression

The impression has been taken by the dental clinician (see chapter 5.2 or 5.3) and sent to the laboratory. The master model with the NNC Analogs is cast according to standard techniques using type 4 stone plaster.



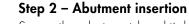
Select the height of the LOCATOR® Abutment by determining the height of the replica gingiva at its highest point on the master cast.

Example: Pick the LOCATOR® Abutment height 2 mm if the gingival height is 2 mm. The abutment is designed in a way that the top margin of the abutment will be 1 mm above the mucosa.

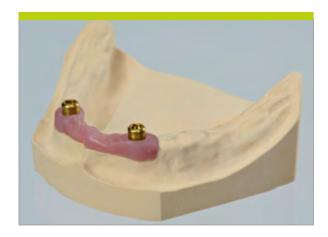


Note

Inserting the prosthesis is easier for the patient when the LOCATOR® Abutments are on the same horizontal level.



Screw the abutment hand-tight into the implant analog using the LOCATOR® Driver.



Preparing the master cast from the abutment level impression

For abutment level impression-taking (see chapter 5.5), special LOCATOR® Analogs are used.

The selection of the LOCATOR® Abutments has already been made by the prosthodontist.

Step 1 – Female analog insertion

Insert the LOCATOR® Female analogs into the LOCATOR® Impression copings.





Step 2 – Fabricating the master cast

Fabricate the master cast using standard methods and type 4 dental stone (DIN 6873).

Construction of an overdenture with LOCATOR® Denture housings

You can construct a new overdenture or upgrade an already existing and well-functioning overdenture with LOCATOR® Components.

Construction of a new overdenture – Laboratory procedure

Step 1 – Placing the white block-out spacers and denture caps

Place one white block-out spacer over each abutment on the master model.

Place the denture caps with the black processing males onto the LOCATOR® Abutments, or the LOCATOR® Analogs in the master cast.



Step 2 – Overdenture construction

Construct the overdenture according to the standard procedure, adding the LOCATOR® Denture housing.

Return the completed overdenture with the black processing males still in place to the doctor's office.

Step 3 – Final restoration

For the next steps on how to replace the black processing males with the appropriate LOCATOR® Replacement males, please see the last section in this chapter: Final restoration of a finished denture with the LOCATOR® Denture components (page 90).



Upgrading an existing overdenture – Laboratory procedure

Step 1 – Casting the model

The laboratory receives the implant level impression and the existing overdenture, and casts the model.

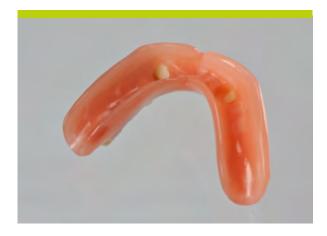
Alternatively, an abutment level impression may be taken using the patients existing overdenture. The laboratory receives the impression, inserts LOCATOR® Female analogs and casts the stone model.



Step 2 – Placing the white block-out spacers and denture caps

Place one white block-out spacer over each LOCATOR® Abutment.

Place the denture caps with the black processing males onto the LOCATOR® Abutments, or the LOCATOR® Analogs in the master cast.



Step 3 – Hollowing out the denture base

Hollow out the existing denture base in the areas of the LOCATOR® Denture caps.

Note

Ensure that the denture caps fixed on the abutments do not touch the hollowed-out areas on the prosthesis.



Step 4 – Overdenture rebase

Rebase the overdenture according to the standard procedure, adding the LOCATOR® Denture housing.

Return to the dentist the completed overdenture with the black processing males still in place.

Step 5 – Final restoration

For the next steps on how to replace the black processing males with the appropriate LOCATOR® Replacement males, please see the last section in this chapter: Final restoration of a finished denture with the LOCATOR® Denture components (page 90).



Upgrading an existing overdenture – Clinical chairside procedure

For an already existing and well-functioning overdenture, the LOCATOR® System can be used in a chair-side procedure.

Step 1 – Selecting the abutment height

Select the height of the LOCATOR® Abutment by determining the height of the replica gingiva at its highest point on the master cast.

Example: Pick the LOCATOR® Abutment height 2 mm if the gingival height is 2 mm. The abutment is designed in a way that the top margin of the abutment will be 1 mm above the mucosa.

Note

Inserting the prosthesis is easier for the patient when the LOCATOR® Abutments are on the same horizontal level.



Step 2 – Inserting the abutment

Screw the abutment into the implant by hand using the LOCATOR $\ensuremath{^{\mbox{\tiny B}}}$ Driver.

Tighten the abutment to 35 Ncm using the ratchet along with the torque control device and the LOCATOR® Driver (see instructions in chapter 7.5).





Step 3 – Placing the block-out spacer

Place a white block-out spacer ring on the abutments. The spacer is used to block out the area surrounding the abutment.



Step 4 – Placing the denture caps

Place the denture caps with the black processing males onto the LOCATOR® Abutments.



Step 5 – Hollowing out the denture base

Hollow out the existing denture base in the areas of the LOCATOR $^{\mbox{\tiny B}}$ Denture caps.

Note

Ensure that the denture caps fixed on the abutments do not touch the prosthesis.



Step 6 – Filling the connecting holes

Fill the connecting holes with prosthetic resin and anchor the caps in the denture (light cure or self-curing resin). Remove any excess resin after curing and polish the denture.

Note

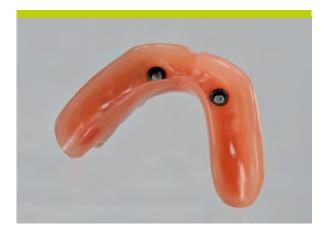
If the white LOCATOR® Block-out spacer does not completely fill the space between the gingiva and the denture caps, any remaining undercuts must be blocked out to prevent resin flowing under the caps; otherwise it would not be possible to easily remove the denture from the patient's mouth when the resin is cured.

This can be accomplished by stacking two or more LOCATOR® Block-out spacers.

Once the resin has cured, remove the denture from the mouth and discard the white LOCATOR® Block-out spacers.

Step 7 – Final restoration

For the next steps on how to replace the black processing males with the appropriate LOCATOR® Replacement males, please see the next section on final restoration of a finished denture with the LOCATOR® Denture components (page 90).



Final restoration of a finished denture with the LOCATOR® Denture components

The following section describes the process for final placement of the finished denture. The denture with the black processing males still in place, has either been returned from the dental laboratory to the dentist, or it has been constructed by the dentist at the chair side.

Step 1 – Selecting the replacement males

Implant divergence up to 10° for a single implant:

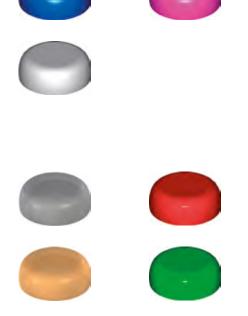
Color		Retention
	blue	0.68 kg
•	pink	1.36 kg
	clear	2.27 kg

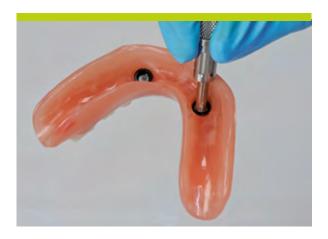
Implant divergence between 10° and 20° for a single implant:

Color		Retention
	gray	0.0 kg
•	red	0.23–0.68 kg
	orange	0.91 kg
	green	1.36–1.82 kg

Note

Always start with the lowest retention replacement males.





Step 2 – Removing the processing males

To place the replacement males in the denture housing, remove the black processing males from the housing (see section 3 in chapter 7.6).



Step 3 – Inserting the replacement male

Insert the replacement male with the core tool (see chapter 7.6).



Step 4 – Inserting the finished denture

Insert the finished denture and check the occlusion.

7. AIDS AND INSTRUMENTS

7.1 SCS screwdriver

The SCS* screwdriver is used for the fixation of the prosthetic parts and healing components.

The star shape of the screwdriver tip connects to the top of the healing components and abutment screw heads for friction-fit pick-up and handling.

* SCS = **S**crew **C**arrying **S**ystem SCS screwdriver for manual use Article: extra short, short, long Lengths: 15 mm, 21 mm, 27 mm Art. Nos.: 046.400, 046.401, 046.402 Material: stainless steel



7.2 NNC Reamer

In order to remove the "snap-on mechanism" of the burn-out copings, a finishing instrument (NNC Reamer) with a guide pin is available.



The following three items are required:

	Article number	Article
1	046.249	Guide pin for reamer 046.237, for NNC Solid abutments
2	046.237	NNC Reamer
3	046.240	Handle for guide pins, reamers and tap for TS

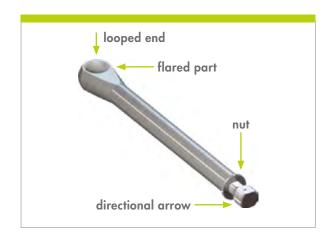
Note

The NNC Reamer does not have an automatic stopping mechanism. Only remove as much as necessary, until the protruding lip of the casting is flush with the implant shoulder. This will allow the restoration to be placed on the analog or implant.

7.3 Ratchet and torque control device

The ratchet (Art. No. 046.119) is a two-part lever arm instrument with a rotary knob for changing the direction of force. It is supplied with a service instrument (Art. No. 046.108), which is used to loosen the headed screw. After loosening, the ratchet bolt can be removed from the body of the ratchet. The ratchet gap must be disassembled for cleaning and sterilization.

To apply a certain torque when tightening an abutment screw, use the ratchet together with the torque control device (Art. No. 046.049) and the holding key (Art. No. 046.064).





The ratchet is used in combination with the torque control device to torque in all Straumann® abutments and screws (it is the same ratchet used for placing Straumann® implants manually).



The ratchet and service instrument are packaged together.





Torque control device

Connected to the ratchet, the torque control device is used to measure the value of Ncm (Newton centimeter) applied when inserting Straumann[®] abutments and screws.



Service instrument

The service instrument is used to assemble and disassemble the ratchet.

~	
pin	forked end

Holding key

The forked end of the holding key can be used to assemble and disassemble the ratchet. The pin can be used to stabilize drivers when abutments and screws are placed (also used for implant placement).

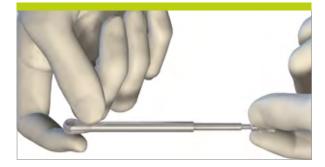




Step 1 – Loosening

Loosen the ratchet nut with the service instrument or the holding key.







Step 2 – Removing

Unscrew and remove the internal bolt from the ratchet body.



Step 3a – Insertion

Insert the ratchet body into the torque control device (flared part of the ratchet must be flush with fluted end of torque control device).

Step 3b - Insertion

Insert the internal bolt into the opposite end of the torque control device. Tighten it firmly by hand.

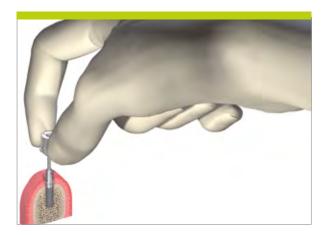


Step 4 – Tightening

Tighten the nut of the ratchet with the service instrument or the holding key. Do not overtighten.



The ratchet and torque control device are now assembled and ready for use.



7.5 Tightening an abutment to 35 Ncm

Step 1 – Insertion and tightening

Insert the abutment into the implant. Tighten the abutment screw by hand using the SCS screwdriver.



Step 2 – Placing the ratchet

Place the looped end of the assembled ratchet with the torque control device over the driver handle. The directional arrow must be pointing clockwise (towards the torque bar with tear drop). If not, pull the arrow out, flip it over, and let it snap in.



Step 3 – Stabilizing the ratchet

For stabilization, put the pin end of the holding key into the coronal hole on the driver handle.



Step 4 – Positioning of appropriate Ncm mark

Use one hand to hold the holding key and use the other hand to hold the torque bar. Grasp only the tear drop and move the torque bar to 35 Ncm mark.

Step 5 – Removing the ratchet

After reaching the 35 Ncm mark, return the torque bar to its starting position.

Lift and remove the holding key, the ratchet with torque control device and the driver.

Note

Proper care and maintenance are important to ensure correct function of the ratchet and torque control device. Always clean and sterilize disassembled.

For detailed instructions on how to care for these instruments, please refer to their package inserts.

Recommended tightening torques

Tightening torque	Component
Hand-tight	Closure screws, healing abutments
15 Ncm	Temporary copings
15-35 Ncm	Temporary abutments
35 Ncm	Final abutments

D Note

Tighten the Solid abutment using one of the Solid abutment drivers (048.155/156).

Tighten the LOCATOR® Abutment using the LOCATOR® Driver for ratchet (046.416/417).



7.6 LOCATOR® Abutment – Further references

1. Using the LOCATOR® Core tool

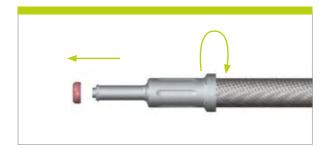
The LOCATOR $\ensuremath{^{\circledast}}$ Core tool is a three-piece multifunction instrument.



The tip is used for removing replacement males from the denture caps. To do this, the tip must be unscrewed by two full turns. A gap is visible between the tip and the middle section.



The tip is passed in a straight line into the denture cap with a replacement male. The sharp edges of the tip hold the replacement male while it is being removed. The instrument is drawn out of the denture cap in a straight line.



To remove the replacement male from the instrument, the tip must be screwed clockwise completely onto the middle section. This activates the loosening pin inside the tip, which releases the replacement male.



The LOCATOR® Abutment holder sleeve makes it easier to deliver a LOCATOR® Abutment, and it retains the abutment while threading it into the implant.

The LOCATOR® Abutment holder sleeve can be autoclaved.



The middle section of the LOCATOR® Core tool is used for inserting replacement males into the denture caps. To do this, the tip is unscrewed. The exposed end of the replacement male is pressed into the denture cap. The replacement male is fixed firmly in the cap when a click is heard.



The end (gold-colored) of the LOCATOR® Core tool is used by the dental technician for screwing and unscrewing the LOCATOR® Abutments to and from the analogs.

2. Determining the implant divergences

Snap the LOCATOR® Parallel posts onto the LOCATOR® Abutments. Use the LOCATOR® Angle measurement guide to determine the angulation of the LOCATOR® Abutments in relation to each other. Hold the angle measurement guide behind the placed parallel posts and read off the angle for each abutment.

Note

Choose the appropriate LOCATOR® Replacement males according to the angulation measured for each abutment. Tie dental floss through the lateral holes of the angle measurement guide to prevent aspiration.



3. Using the black processing male

Both the LOCATOR® Female analog and the LOCATOR® Denture cap are supplied with a preassembled black processing male. The black processing male functions as a space keeper for the various LOCATOR® Replacement males. For the relining of a LOCATOR®-anchored overdenture, the LOCATOR® Replacement males must be removed from the denture caps and exchanged with black processing males. The black processing males keep the denture in a stable vertical position during the relining procedure. When the relining of the denture is finished, the black processing males are exchanged with the corresponding new LOCATOR® Replacement males.

4. Important cleaning instructions

The proper cleaning of the LOCATOR®-borne denture and the LOCATOR® Abutments is a prerequisite to ensure the long-term performance of both the abutments and the nylon processing inserts. An accumulation of plaque on the abutment that imbeds into the nylon processing insert can abrade, over time, the titanium abutment to a smaller diameter and thus cause it to lose retention. According to the specific situation, the patient might be put on shorter recall appointments to monitor the proper cleaning of the denture and the abutments.

8. ABOUT STERILIZATION

Straumann® abutments and components are not sterile when delivered. Use the following procedure for sterilization prior to use.

Material	Sterilizing method	Sterilizing parameters
Ti, Ti alloy		
PEEK, PEEK with Ti/Ti alloy inlay		
POM		134 °C (273 °F) for 5 min
Metal alloy Ceramicor® Composition in weight %: Au 60%, Pd 20%, Pt 19%, Ir 1%	Autoclave, moist heat	
ZrO ₂ (zerion®)		
PMMA with TAN inlay	Autoclave, moist heat	121 °C (250 °F) for 20 min

D Note

Use devices directly after sterilization. Do not store sterilized devices.

Consult the brochure "Guideline for Cleaning, Disinfection and Sterilization of Straumann® Implantborne Prosthetic Components".

To prevent tension cracks in temporary copings made from PMMA for solid and cementable abutments, do not use the following: alcohol, UV radiation, sterilization, immersion in liquid for more than one hour or temperatures over 60 $^{\circ}$ C (140 $^{\circ}$ F).

9. IMPORTANT GUIDELINES

Please note

Practitioners must have appropriate knowledge and instruction in the handling of the Straumann CADCAM products or other Straumann products ("Straumann Products") for using the Straumann Products safely and properly in accordance with the instructions for use.

The Straumann Product must be used in accordance with the instructions for use provided by the manufacturer. It is the practitioner's responsibility to use the device in accordance with these instructions for use and to determine, if the device fits to the individual patient situation.

The Straumann Products are part of an overall concept and must be used only in conjunction with the corresponding original components and instruments distributed by Institut Straumann AG, its ultimate parent company and all affiliates or subsidiaries of such parent company ("Straumann"), except if stated otherwise in this document or in the instructions for use for the respective Straumann Product. If use of products made by third parties is not recommended by Straumann in this document or in the respective instructions for use, any such use will void any warranty or other obligation, express or implied, of Straumann.

Availability

Some of the Straumann Products listed in this document may not be available in all countries.

Caution

In addition to the caution notes in this document, our products must be secured against aspiration when used intraorally.

Validity

Upon publication of this document, all previous versions are superseded.

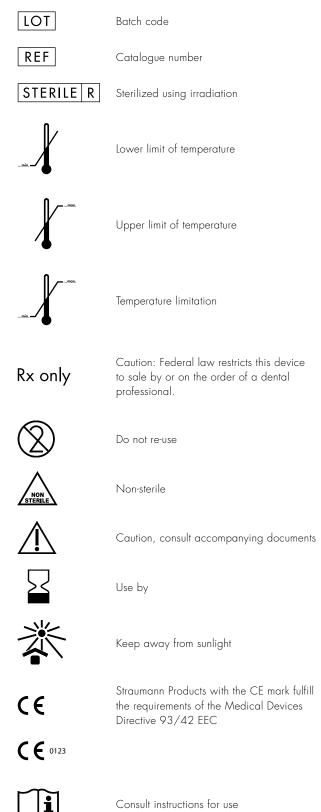
Documentation

For detailed instructions on the Straumann Products contact your Straumann representative.

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Explanation of the symbols on labels and instruction leaflets



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