BASIC INFORMATION ON THE PROSTHETIC PROCEDURES

Straumann® Bone Level

COMMITTED TO SIMPLY DOING MORE FOR DENTAL PROFESSIONALS
The ITI (International Team for Implantology) is academic partner of Institut Straumann AG in the areas of research and education.
1. Straumann® Bone Level Implant – Straumann expertise applied at bone level

2. General information
   2.1 CrossFit® Connection
   2.2 Prosthetic options
   2.3 Abutment overview
   2.4 Coding

3. Preoperative planning
   3.1 Waxup/Setup
   3.2 X-ray template with reference spheres
   3.3 Custom-made drill template
   3.4 Thermoplastic drill template

4. Soft tissue management
   4.1 Soft tissue management solutions
   4.2 Prefabricated Healing Abutment
   4.3 Overview Consistent Emergence Profiles™
   4.4 Customizable Healing Abutment
   4.5 Temporary Abutment – Polymer with titanium alloy inlay
   4.6 Temporary Abutment – Titanium alloy (TAN)

5. Impression taking
   5.1 Options for impression taking
   5.2 Open tray impression
   5.3 Closed tray impression
   5.4 Bite registration

6. Restoration
   6.1 CrossFit® PLAN Set/PLAN Abutment
   6.2 Anatomic (and Meso) Abutment
   6.3 Gold Abutment for crown
   6.4 Gold Abutment for bridge
   6.5 Straumann® Anatomic IPS e.max® Abutment
   6.6 Cementable Abutment
   6.7 Multi-Base Abutment
   6.8 Abutment for bars
   6.10 LOCATOR® Abutment

7. Aids and instruments
   7.1 SCS Screwdriver
   7.2 Polishing Aid
   7.3 Ratchet and Torque Control Device
   7.4 Assembling the Ratchet and the Torque Control Device
   7.5 Tightening an abutment to 35 Ncm

8. About sterilization

9. Important guidelines

10. Index
PURPOSE OF THIS GUIDE

This guide describes the essential steps required for the fabrication and insertion of prosthetic restorations for Straumann® Bone Level implants.

For detailed information regarding implantation and soft tissue management see “Straumann® Bone Level Implant Line: Basic information on the surgical procedures” (Art. No. 152.754).

See also DVD „Surgical and Prosthetic Procedures with the Straumann® Bone Level Implant“ (Art. No. 150.760) for additional information.

Different procedures apply for dental technicians and prosthodontists. Such procedures are marked with a color code in the respective chapters of this guide:

- Lab procedure
- Prosthetic procedure

Not all products shown are available in all markets. All products shown in this guide are for single use only if not indicated otherwise.
1. STRAUMANN® BONE LEVEL IMPLANT – STRAUMANN EXPERTISE APPLIED AT BONE LEVEL

The Straumann® Bone Level Implant provides you with a solution for all bone level treatments, with Straumann expertise and quality built in. Its design is based on the latest technology and scientific know-how in implant dentistry. Moreover, it respects key biological principles, brings predictable esthetic results and offers simple handling in all indications.

**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 horizontal distance of micro gap to bone
- Reduction of micro movements while controlling the micro gap through a conical connection

**Consistent Emergence Profiles™**

Experience simplified soft tissue management from start to finish

**CrossFit® Connection**

Feel the fit of the self-guiding connection

**CrossFit® Connection**

The prosthetic connection is intuitive, self-guiding and easy to grasp. The CrossFit® Connection

- provides a clear-cut insertion through the guidance by 4 grooves and the deep, conical connection.
- ensures precision against rotation through orthogonal fit between implant and abutment.
- gives prosthetic flexibility with mechanical long-term stability through its conical connection.
2. GENERAL INFORMATION

2.1 CrossFit® Connection
The Straumann® Bone Level Implant features a new intuitive implant-abutment connection that is self-guiding and enables simple positioning. It allows clear-cut insertion with all components and provides outstanding protection against rotation as well as long-term stability.

Precision and simplicity: 4 grooves
The CrossFit® Connection features 4 grooves for the repositioning of prosthetic components. This configuration is characterized by:
- simple implant alignment
- clear-cut and guided component insertion
- flexibility in the placement of angled prosthetic components
- optimal protection against rotation ensured by orthogonal implant-abutment fit

Figure 1: Internal connection viewed from above, showing the 4 internal grooves.

Figure 2: Abutment insertion, step 1.
The abutment is placed on the 4 grooves in the implant.
Reliability and flexibility: Conical connection

The CrossFit® Connection features a cone with improved mechanical properties, providing more flexibility for prosthetic treatments. The conical prosthetic connection provides:

- reduced micro movements and minimized microgap
- outstanding mechanical long-term stability and optimized stress distribution
- exact implant-abutment fit
- simplified impression taking even with divergently positioned implants
2.2 PROSTHETIC OPTIONS

Screw-retained

Single crown

Cement-retained

Bridge

Cement-retained
2. General information

LOCATOR® Abutment

Abutment for Bars, Gold

Abutment for Bars, Titanium

Multi-Base Abutment

Gold Abutment, for bridge

Anatomic Abutment

Meso Abutment

Gold Abutment, for crown
### 2.3 ABUTMENT OVERVIEW

<table>
<thead>
<tr>
<th></th>
<th>Anatomic Abutment</th>
<th>Meso Abutment</th>
<th>Gold Abutment, for crown</th>
<th>Gold Abutment, for bridge</th>
<th>Straumann® Anatomic IPS e.max® Abutment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Single crown</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Screw-retained</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cement-retained</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td><strong>Bridge</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Screw-retained</td>
<td></td>
<td></td>
<td></td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Cement-retained</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td><strong>Removable overdentures</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telescope</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Retentive anchor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td><strong>Impression</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Implant level</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Abutment level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td><strong>Material</strong></td>
<td>Titanium</td>
<td>Titanium</td>
<td>Ceramicor®</td>
<td>Ceramicor®</td>
<td>Zirconium dioxide</td>
</tr>
<tr>
<td>Chapter</td>
<td>6.2</td>
<td>6.2</td>
<td>6.3</td>
<td>6.4</td>
<td>6.5</td>
</tr>
</tbody>
</table>

*See information on sterilization conditions in chapter 8.
<table>
<thead>
<tr>
<th>Straumann® CARES® Ceramic Abutment</th>
<th>Straumann® CARES® Titanium Abutment</th>
<th>Straumann® CARES® Variobase™ Abutment</th>
<th>Cementable Abutment</th>
<th>Multi-Base Abutment</th>
<th>Abutment for Bars, Gold</th>
<th>Abutment for Bars, Titanium</th>
<th>LOCATOR® Abutment</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Image" /></td>
<td><img src="image2" alt="Image" /></td>
<td><img src="image3" alt="Image" /></td>
<td><img src="image4" alt="Image" /></td>
<td><img src="image5" alt="Image" /></td>
<td><img src="image6" alt="Image" /></td>
<td><img src="image7" alt="Image" /></td>
<td><img src="image8" alt="Image" /></td>
</tr>
<tr>
<td><img src="image9" alt="Image" /></td>
<td><img src="image10" alt="Image" /></td>
<td><img src="image11" alt="Image" /></td>
<td><img src="image12" alt="Image" /></td>
<td><img src="image13" alt="Image" /></td>
<td><img src="image14" alt="Image" /></td>
<td><img src="image15" alt="Image" /></td>
<td><img src="image16" alt="Image" /></td>
</tr>
<tr>
<td><img src="image17" alt="Image" /></td>
<td><img src="image18" alt="Image" /></td>
<td><img src="image19" alt="Image" /></td>
<td><img src="image20" alt="Image" /></td>
<td><img src="image21" alt="Image" /></td>
<td><img src="image22" alt="Image" /></td>
<td><img src="image23" alt="Image" /></td>
<td><img src="image24" alt="Image" /></td>
</tr>
<tr>
<td><img src="image25" alt="Image" /></td>
<td><img src="image26" alt="Image" /></td>
<td><img src="image27" alt="Image" /></td>
<td><img src="image28" alt="Image" /></td>
<td><img src="image29" alt="Image" /></td>
<td><img src="image30" alt="Image" /></td>
<td><img src="image31" alt="Image" /></td>
<td><img src="image32" alt="Image" /></td>
</tr>
<tr>
<td><img src="image33" alt="Image" /></td>
<td><img src="image34" alt="Image" /></td>
<td><img src="image35" alt="Image" /></td>
<td><img src="image36" alt="Image" /></td>
<td><img src="image37" alt="Image" /></td>
<td><img src="image38" alt="Image" /></td>
<td><img src="image39" alt="Image" /></td>
<td><img src="image40" alt="Image" /></td>
</tr>
<tr>
<td><img src="image41" alt="Image" /></td>
<td><img src="image42" alt="Image" /></td>
<td><img src="image43" alt="Image" /></td>
<td><img src="image44" alt="Image" /></td>
<td><img src="image45" alt="Image" /></td>
<td><img src="image46" alt="Image" /></td>
<td><img src="image47" alt="Image" /></td>
<td><img src="image48" alt="Image" /></td>
</tr>
<tr>
<td><img src="image49" alt="Image" /></td>
<td><img src="image50" alt="Image" /></td>
<td><img src="image51" alt="Image" /></td>
<td><img src="image52" alt="Image" /></td>
<td><img src="image53" alt="Image" /></td>
<td><img src="image54" alt="Image" /></td>
<td><img src="image55" alt="Image" /></td>
<td><img src="image56" alt="Image" /></td>
</tr>
<tr>
<td><img src="image57" alt="Image" /></td>
<td><img src="image58" alt="Image" /></td>
<td><img src="image59" alt="Image" /></td>
<td><img src="image60" alt="Image" /></td>
<td><img src="image61" alt="Image" /></td>
<td><img src="image62" alt="Image" /></td>
<td><img src="image63" alt="Image" /></td>
<td><img src="image64" alt="Image" /></td>
</tr>
<tr>
<td><img src="image65" alt="Image" /></td>
<td><img src="image66" alt="Image" /></td>
<td><img src="image67" alt="Image" /></td>
<td><img src="image68" alt="Image" /></td>
<td><img src="image69" alt="Image" /></td>
<td><img src="image70" alt="Image" /></td>
<td><img src="image71" alt="Image" /></td>
<td><img src="image72" alt="Image" /></td>
</tr>
</tbody>
</table>

1) For further information regarding CARES® Implant-borne prosthetics, please see brochure 152.822 “Basic Information Straumann® CARES® Implant-borne prosthetic procedures”.

---

**Chapter 6.2 6.2 6.3 6.4 6.5 1) 6.7 6.8 6.9 6.10**

*See information on sterilization conditions in chapter 8.*

1) **Zirconium dioxide**

<table>
<thead>
<tr>
<th>Material</th>
<th>Titanium</th>
<th>ZrO₂</th>
<th>Titanium</th>
<th>Titanium alloy</th>
<th>Ceramicor®</th>
<th>Titanium</th>
<th>Titanium alloy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>6.7</td>
<td>6.8</td>
<td>6.9</td>
<td>6.9</td>
</tr>
</tbody>
</table>
2.4 CODING
The Straumann® Bone Level Implant line has a simple and thorough color coding and laser marking approach, which enables the quick and precise identification of secondary parts, surgical instruments and auxiliaries. This concept simplifies the communication substantially between the individuals involved in the treatment process.

The following scheme illustrates the above mentioned approach:

<table>
<thead>
<tr>
<th>Connection</th>
<th>Implant Ø</th>
<th>Instruments</th>
<th>Implant</th>
<th>Closure screw</th>
</tr>
</thead>
<tbody>
<tr>
<td>Narrow CrossFit® (NC)</td>
<td>3.3 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regular CrossFit® (RC)</td>
<td>4.1 mm 4.8 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laser marked (NC/RC)</td>
<td></td>
<td>●</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Color-coded</td>
<td></td>
<td></td>
<td></td>
<td>●</td>
</tr>
</tbody>
</table>
### 2. General Information

<table>
<thead>
<tr>
<th>Healing abutment</th>
<th>Impression post</th>
<th>Implant analog</th>
<th>Temporary abutment, Vita CAD-Temp®</th>
<th>Temporary abutment</th>
<th>Abutment</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Image" /></td>
<td><img src="image2.png" alt="Image" /></td>
<td><img src="image3.png" alt="Image" /></td>
<td><img src="image4.png" alt="Image" /></td>
<td><img src="image5.png" alt="Image" /></td>
<td><img src="image6.png" alt="Image" /></td>
</tr>
<tr>
<td><img src="image7.png" alt="Image" /></td>
<td><img src="image8.png" alt="Image" /></td>
<td><img src="image9.png" alt="Image" /></td>
<td><img src="image10.png" alt="Image" /></td>
<td><img src="image11.png" alt="Image" /></td>
<td><img src="image12.png" alt="Image" /></td>
</tr>
<tr>
<td><img src="image13.png" alt="Image" /></td>
<td><img src="image14.png" alt="Image" /></td>
<td><img src="image15.png" alt="Image" /></td>
<td><img src="image16.png" alt="Image" /></td>
<td><img src="image17.png" alt="Image" /></td>
<td><img src="image18.png" alt="Image" /></td>
</tr>
</tbody>
</table>

- Healing abutment
- Implant analog
- Temporary abutment, Vita CAD-Temp®
- Abutment

<table>
<thead>
<tr>
<th>Screw head</th>
<th>Screw head</th>
<th>Screw head</th>
</tr>
</thead>
</table>

*Images not available for inclusion in this text.*
3. PREOPERATIVE PLANNING

Careful treatment planning is of utmost importance. A comprehensive pre-implantation diagnosis, evaluation and plan are an absolute prerequisite to ensure treatment success. The implant forms the apical extension of the restoration and is thus the planning basis for the surgical procedure aiming at a specific prosthetic result. Close communication between the patient, dentist and dental technician is imperative to achieve excellent implant-borne restorations.

3.1 WAX-UP/SET-UP

To determine the topographical situation, axial orientation and choice of implants, making a wax-up/set up using the previously prepared study cast is recommended. Subsequently, the type of superstructure can be defined. The wax-up/set-up can later be used as the basis for a custom-made X-ray or drill template and for a temporary restoration.

Abutments should always be loaded axially. Ideally, the long axis of the implant is aligned with the cusps of the opposing tooth. Extreme cusp formation should be avoided as this can lead to unphysiological loading.

3.2 X-RAY TEMPLATE WITH REFERENCE SPHERES

For easier determination of bone availability, the use of an X-ray template with X-ray reference spheres is recommended. First, mark the selected implant positions on the study cast. Then fix the X-ray reference spheres at the marked points and make the vacuum-formed template with the spheres. The subsequently taken X-ray or computer tomography (CT) gives information on bone availability, quality and mucosal thickness. Based on these properties the number of implants, the exact implant positions, diameters and lengths can be determined.

The X-ray reference sphere has a diameter of 5 mm. The image of the sphere on the X-ray provides the reference value for the magnification scale.
3.3 CUSTOM-MADE DRILL TEMPLATE

A custom-made drill template can facilitate planning and the preparation of the implant bed and enables precise use of the cutting instruments. The basis of planning when making this surgical template should be the desired prosthetic result.

With these components, a surgical drill template can be produced in the usual manner:

<table>
<thead>
<tr>
<th>Art. No.</th>
<th>Article</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>049.810V4</td>
<td>Drill sleeve with collar</td>
<td>height 10 mm outside Ø 3.5 mm inside Ø 2.3 mm</td>
</tr>
<tr>
<td>049.818V4</td>
<td>Stepped pin for 049.810</td>
<td>height 16 mm Ø 2.2/3.5 mm</td>
</tr>
<tr>
<td>049.816V4</td>
<td>Pin for 049.810</td>
<td>height 16 mm Ø 2.2 mm</td>
</tr>
<tr>
<td>049.817V4</td>
<td>Pin for 049.810</td>
<td>height 10 mm Ø 2.2 mm</td>
</tr>
<tr>
<td>049.819V4</td>
<td>Pin for 049.810</td>
<td>height 16 mm Ø 3.5 mm</td>
</tr>
</tbody>
</table>

The Straumann brochure “Surgical fabrication and use of a custom-made drilling template” (Art. No. 152.290) contains two fabrication methods with step by step instructions.

Vacuum-formed template with integral pins as X-ray reference.

Vacuum-formed template with integrated drill sleeve as drilling template.
3.4 THERMOPLASTIC DRILL TEMPLATE

<table>
<thead>
<tr>
<th>Art. No.</th>
<th>Article</th>
<th>Dimensions</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>040.526</td>
<td>Thermoplastic Drill templates set, single tooth, contents:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Thermoplastic drill template for single-tooth sites [V5]</td>
<td>sleeve height 10 mm, inner-Ø 2.3 mm</td>
<td>titanium/polymer</td>
</tr>
<tr>
<td></td>
<td>Guide pin [V5]</td>
<td>length 20 mm, Ø 2.3 mm</td>
<td>stainless steel</td>
</tr>
<tr>
<td></td>
<td>Drill for dental laboratory</td>
<td>Ø 2.3 mm</td>
<td>steel</td>
</tr>
<tr>
<td>040.527</td>
<td>Thermoplastic drill templates set, free-end situation, contents:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Thermoplastic drill template for free-end situations [V5]</td>
<td>sleeve height 10 mm, inner-Ø 2.3 mm</td>
<td>titanium/polymer</td>
</tr>
<tr>
<td></td>
<td>Guide pin [V5]</td>
<td>length 20 mm, Ø 2.3 mm</td>
<td>stainless steel</td>
</tr>
<tr>
<td></td>
<td>Drill for dental laboratory</td>
<td>Ø 2.3 mm</td>
<td>steel</td>
</tr>
</tbody>
</table>

V5 = 5 components per pack
For more detailed information, refer to the package insert ‘Thermoplastic Drill Template Sets’ (Art. No. 150.902).

Drill a hole in the previously determined implant position and axis in the plaster anatomic cast. Then insert the pin into the drilled hole in order to check the implant position. Subsequently, heat the template in water until it is soft and transparent. Place the template on the guide pin and press it onto the plaster teeth. After it has cooled and been disinfected, the thermoplastic drill template determines exactly how the pilot drill (Ø 2.2 mm) is to be guided.

Drill hole template for single tooth gap

Drill hole template for free end saddle
4. SOFT TISSUE MANAGEMENT

The Straumann® Bone Level Implant line puts a strong emphasis on esthetic considerations. It offers tailor-made solutions that allow for natural soft tissue shaping and maintenance in all indications. A versatile portfolio of healing and temporary abutments is available, including customizable products made of polymer for easy and fast processing.

Esthetic results are crucially determined by successful soft tissue management. To optimize the soft tissue management process, various components with Consistent Emergence Profiles™ are available in the prosthetic portfolio of the Straumann® Bone Level Implant. This applies for all healing abutments, the temporary abutment and the abutments for the final restoration. Thus, the emergence profiles are uniform throughout the treatment process (for optimal healing abutment selection see chapter 4.3).

4.1 SOFT TISSUE MANAGEMENT SOLUTIONS

Healing Abutment

- Prefabricated healing abutment (titanium) chapter 4.2
- Customizable healing abutment (polymer) chapter 4.4

Temporary Abutment

- (polymer with titanium alloy inlay) chapter 4.5
- [PMMA with titanium alloy inlay] Step by step instructions on Temporary Abutments chapter 4.6
4.2 PREFABRICATED HEALING ABUTMENT

Intended use
- Soft tissue management
- Closure of implant connection for submerged and non-submerged healing

Characteristics

Simple
- One-piece design
- Color-coded and laser-marked
- Anatomically shaped emergence profiles, matching impression post and final abutments (for optimal healing abutment selection see chapter 4.3)

Reliable
- Tight connection

Prosthetic procedure: p. 17–18
4.2.1 Prefabricated Healing Abutment – Prosthetic procedure

Step 1 – Insertion
- Insert the healing abutment with the SCS screwdriver. The friction fit secures the healing abutment to the instrument during insertion and ensures safe handling.
- Hand-tighten the healing abutment. The cone-in-cone design provides a tight connection between the two components.

Step 2 – Wound closure
- Adapt the soft tissue and suture it back tightly around the abutment.
Optional: Bottle-shaped and Customizable Healing Abutment

The bottle-shaped healing abutment pre-shapes the soft tissue by allowing for a slight excess of mucosa during healing. The insertion of the final restoration pushes the formed tissue outward, supports the creation of a naturally shaped peri-implant soft tissue.

The customizable healing abutment allows for individual soft tissue management.

**Note**
Do not use the customizable healing abutment for longer than 6 months.
Healing abutments are delivered non-sterile and can be sterilized prior to use (see instructions, chapter 8).
### 4.3 OVERVIEW CONSISTENT EMERGENCE PROFILES™

Which healing abutments suit which abutments?

#### Cement-retained solutions

<table>
<thead>
<tr>
<th>Platform</th>
<th>NC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td></td>
</tr>
<tr>
<td>Material</td>
<td>Ti</td>
</tr>
<tr>
<td>Angle</td>
<td>0°</td>
</tr>
<tr>
<td>Ø [mm]</td>
<td>4.0</td>
</tr>
<tr>
<td>GH [mm]</td>
<td>2.0</td>
</tr>
<tr>
<td>GH [mm]</td>
<td>3.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Platform</th>
<th>RC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td></td>
</tr>
<tr>
<td>Material</td>
<td>Ti</td>
</tr>
<tr>
<td>Angle</td>
<td>0°</td>
</tr>
<tr>
<td>Ø [mm]</td>
<td>2.0</td>
</tr>
<tr>
<td>GH [mm]</td>
<td>2.0</td>
</tr>
<tr>
<td>GH [mm]</td>
<td>4.0</td>
</tr>
</tbody>
</table>

Conical healing abutment
Screw-retained solutions

<table>
<thead>
<tr>
<th>Platform</th>
<th>NC</th>
<th>RC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Anatomic abutment</td>
<td>Multi-base abutment</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Material</td>
<td>IFS e.max®</td>
<td>IFS e.max®</td>
</tr>
<tr>
<td>Angle</td>
<td>0°</td>
<td>15°</td>
</tr>
<tr>
<td>Ø [mm]</td>
<td>4.0</td>
<td>4.0</td>
</tr>
<tr>
<td>GH [mm]</td>
<td>2.0</td>
<td>2.0</td>
</tr>
<tr>
<td>GH [mm]</td>
<td>3.5</td>
<td>5.0</td>
</tr>
<tr>
<td>Ø [mm]</td>
<td>1.0</td>
<td>3.5</td>
</tr>
<tr>
<td>Type</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. Soft tissue management
### Hybrid solutions

<table>
<thead>
<tr>
<th>Material</th>
<th>Angle</th>
<th>Ø (mm)</th>
<th>GH (mm)</th>
<th>Ø (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ti</td>
<td>0°</td>
<td>3.5</td>
<td>1.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Ti</td>
<td>0°</td>
<td>4.5</td>
<td>2.0</td>
<td>3.5</td>
</tr>
<tr>
<td>Ti</td>
<td>25°</td>
<td>4.0</td>
<td>2.5</td>
<td>3.5</td>
</tr>
<tr>
<td>Ti alloy</td>
<td>0°</td>
<td>3.8</td>
<td>4.0</td>
<td>3.5</td>
</tr>
</tbody>
</table>

#### NC

<table>
<thead>
<tr>
<th>Platform</th>
<th>Type</th>
<th>Multi-base abutment</th>
<th>LOCATOR®</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NC</td>
<td><img src="image1" alt="Multi-base abutment" /></td>
<td><img src="image2" alt="LOCATOR®" /></td>
</tr>
<tr>
<td></td>
<td></td>
<td><img src="image3" alt="Conical healing abutment" /></td>
<td></td>
</tr>
</tbody>
</table>
4.4 CUSTOMIZABLE HEALING ABUTMENT

Intended use
- Individual soft tissue management for esthetic cases
- Closure of implant connection during healing phase

Characteristics

Simple
- Polymer material allows for easy and quick chair-side modification
- Easy-to-achieve esthetics due to gingiva-colored and modifiable polymer material

Reliable
- CrossFit® Connection

Note
Do not use for longer than 6 months.
The customizable healing abutment can be shortened vertically no more than 5 mm.
4.4.1 Customizable Healing Abutment – Prosthetic procedure

**Step 1 – Customizing**
- Individualize the healing abutment on an analog according to the mouth situation. Heatless wheels and new cross-toothed millers are recommended for grinding.

**Step 2 – Insertion**
- Hand-tighten the healing abutment in the implant with the SCS screwdriver and temporarily seal the screw channel (e.g., with composite).
4.5 TEMPORARY ABUTMENT – POLYMER WITH TITANIUM ALLOY INLAY

Intended use
- Individual soft tissue management for esthetic cases
- Screw- or cement-retained temporary crowns
- Cement-retained temporary bridges

Characteristics

Simple
- Polymer material allows for easy and quick chair-side modification
- Easy-to-achieve esthetics due to tooth-colored and modifiable polymer material

Reliable
- Precise fit and high stability due to reinforcement with titanium alloy inlay
- CrossFit® Connection

Note
Do not use for longer than 6 months.
Place temporary restoration out of occlusion.
The temporary abutment can be shortened vertically no more than 6 mm and in the lower end be reduced radially no more than 0.5 mm (NC temporary abutment) and 1 mm (RC temporary abutment) respectively.

Lab procedure: p. 28–33
Prosthetic procedure: p. 28–33
4.5.1 Temporary Abutment – Procedure
Option A: Screw-retained temporary crown

Step 1 – Customizing
- Individualize the temporary abutment on an analog according to the mouth situation. Heatless wheels and new cross-toothed millers are recommended for grinding.
- To avoid smearing of the polymer, adjust the bur speed properly (low rpm number, little pressure).

Note
For optimal adhesion of the temporary veneering material, roughen or sandblast the upper section of the abutment or integrate a means of retention.
Step 2 – First insertion

- Hand-tighten the temporary abutment in the implant/implant analog with the SCS screwdriver and temporarily seal the screw channel (e.g. with cotton).

- Use a standard technique to fabricate the temporary restoration (e.g. prefabricated crown form or vacuum-formed sheet technique as shown here).
Step 3 – Finishing
- Remove excess acrylic, reopen the screw channel and finish the temporary restoration.

Step 4 – Final insertion
- Clean the polished temporary restoration, place it on the implant and tighten the screw with a torque between 15 Ncm and 35 Ncm using the SCS screwdriver along with the ratchet and the torque control device (see instructions in chapter 7.5).
- Cover the screw head with absorbent cotton or gutta-percha and seal the screw channel with temporary veneering material (e.g. composite).
Option B: Cement-retained temporary crown

1a

Step 1 – Customizing

- Individualize the temporary abutment on an analog according to the mouth situation. Heatless wheels and new cross-toothed millers are recommended for grinding.
- To avoid smearing of the polymer, adjust the bur speed properly (low rpm number, little pressure).

1b

Note

For optimal adhesion of the cement-retained temporary crown, roughen or sandblast the upper section of the abutment.
Step 2 – Fabricating the cement-retained temporary single crown

- Use a standard procedure to fabricate the cement-retained single crown (e.g. grind out a prefabricated plastic tooth).
Step 3 – Placing the customized abutment
- Place the abutment on the implant and tighten the screw with a torque between 15 Ncm and 35 Ncm using the SCS screwdriver along with the ratchet and the torque control device (see instructions in chapter 7.5).

- Cover the screw head with absorbent cotton or gutta-percha and seal the screw channel temporarily (e.g. with absorbent cotton).

Step 4 – Cementing the temporary single crown
- Coat the internal configuration of the crown with temporary cement and cement it on the temporary abutment.
4.6 TEMPORARY ABUTMENT – TITANIUM ALLOY (TAN)

Intended use

- Engaging abutments are used for
  - Screw- or cement-retained temporary crowns
  - Cement-retained temporary bridges
- Non-engaging abutments are used for
  - Screw-retained temporary bridges

Characteristics

More solutions

- Narrow diameter for narrow interdental spaces
- Crowns and bridges
- Screw- and cement-retained
- Anterior and posterior region

Reliable

- Precise fit and high stability due to titanium alloy (TAN) material
- CrossFit® Connection for engaging abutments

Note

Do not use for longer than 180 days.
Place temporary restorations out of occlusion.
The temporary abutment can be shortened vertically no more than 6 mm with usual tools and technique.
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 sterilised (134°C/5 Min).

Lab procedure: p. 35–36
Prosthetic procedure: p. 35–36
4.6.1 Temporary Abutment – Procedure for a screw retained bridge temporary restoration

Step 1 – Preparation
- Mount the temporary abutment on the master cast or in patient’s mouth.
- Mark the appropriate heights according to the individual situation.
- Remove the abutment from the patient’s mouth.

- Shorten the abutment as necessary using standard technique.
- The upper section of the abutment should be sandblasted before opaquing.
- 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).

Note
Proceed similar for screw- or cement-retained crown provisional restoration by using the engaging temporary abutments.
Use standard screwdriver 046.401 or 046.402.
Tightening torques between 15 Ncm and 35 Ncm depending on implant stability in patient mouth.
Hand tightening torque on master cast.
The abutment should not have more than 30° divergence for a screw-retained bridge. Manufacture a meso structure with a cemented restoration in order to compensate a divergence greater than 30°.
Step 2 – Creating the provisional
- Use a standard technique to fabricate the provisional (e.g. prefabricated crown or bridge form or vacuum-formed sheet technique as shown here). The retention elements ensure proper mechanical bonding of the veneering material to the temporary abutment.
- Remove excess acrylic, reopen 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 (see instructions in chapter 7.5).
- Cover the screw head with absorbent cotton or gutta-percha and seal the screw channel with temporary veneering material (e.g. composite).
5. IMPRESSION TAKING

5.1 OPTIONS FOR IMPRESSION TAKING

Impressions for the Straumann® Bone Level Implant can be taken by either of the two following procedures:

- Open tray technique
- Closed tray technique

The technique used depends on the user’s preference and the clinical situation. Both techniques are described in the following chapters.
5.2 OPEN TRAY IMPRESSION

**Intended use**
- Open tray impression technique

**Characteristics**

**Simple**
- Color-coded components corresponding to prosthetic connection
- Slender emergence profile accommodates space limitations
- Guide screw can be tightened either by hand or with the SCS screwdriver

**Reliable**
- High precision impression components give an exact replica of the intraoral situation
- Clear-cut tactile response from the prosthetic connection verifies proper seating of components

**Note**
Open tray impression procedure requires a custom-made tray with perforations. Impression posts are intended for single use only to ensure optimal fit and precise impression taking for each patient.

Prosthetic procedure: p. 39–40
Lab procedure: p. 41
5.2.1 Open tray impression – Prosthetic procedure

1. **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).

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

- Uncover the screws before the material is cured.
- Once the material is cured, loosen the guide screws and remove the tray.
5.2.2 Open tray impression – Lab procedure

Step 1 – Analog repositioning and fixing
- Reposition and fix the analog in the impression using the guide screw. To avoid inaccuracies when connecting, the analog must be positioned exactly 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 with a shortened post.

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 crown is optimally contoured.
5.3 CLOSED TRAY IMPRESSION

**Intended use**
- Closed tray impression technique

**Characteristics**

**Simple**
- Color-coded components corresponding to prosthetic connection
- Slender emergence profile to accommodate space limitations
- No additional preparation (i.e. perforation) of tray required

**Reliable**
- High precision impression components give an exact replica of the intraoral situation
- Clearcut tactile response from the prosthetic connection verifies proper seating of components

**Note**
Impression posts are intended for *single use only* to ensure optimal fit and precise impression taking for each patient.
A spare cap is provided with each package in case there is a need to retake the impression immediately.

- Prosthetic procedure: p. 43–44, 46–47
- Lab procedure: p. 45
5.3.1 Closed tray impression – Prosthetic 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 tighten the guide screw hand-tight (using the SCS screwdriver).

Note
Ensure that the lateral planar areas of the post are facing mesial and distal.

- Place the polymer impression cap on top of the fixed impression post. Ensure that the color of the cap corresponds to the color of the positioning screw in the post and 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).

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 with the removal of the tray.

- Unscrew and remove the impression post and send it together with the impression tray to the dental technician.
5.3.2 Closed tray impression – Lab 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 exactly in line with the grooves of the impression post before screwing it in.

Note

Ensure that the color code of the guide screw corresponds to the color code of the analog and that the color code of the analog corresponds to the 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 gingiva mask should always be used to ensure that the emergence profile of the crown is optimally contoured.
5.4 BITE REGISTRATION

To simplify bite registration after impression taking, plastic bite registration aids are available in various heights. For repositioning on the master cast, the bite registration aids have a flat side laterally.

Step 1 – Insertion
- Insert the bite registration aids into the implants. Each component is fitted with a snap mechanism that holds it in the internal configuration.

Note
Protect the components against aspiration (e.g., use a throat pack or a thread).
Step 2 – Shortening
- Shorten the bite registration aids (if needed) and apply the bite registration material. To ensure the repositioning from the mouth to the master cast, the occlusal area and the lateral flat side of the bite registration aids must be adequately surrounded with the registration material.

Note
Bite registration aids must be shaped out of the mouth. If they need to be shortened occlusally due to lack of space, ensure that the lateral flat side is not ground off.

Step 3 – Positioning
- To transfer the bite, put the bite registration in the analogs on the master cast. Fix the bite wax model and mount the maxilla and mandible casts on the articulator.
6. RESTORATION

6.1 CrossFit® PLAN SET/PLAN ABUTMENT

Intended use
- Intra- and extra-oral planning of prosthetic restoration

Characteristics

Simple
- Color-coded, well-marked and easily readable PLAN abutments
- Comprehensive PLAN set containing all PLAN abutments arranged clearly
- Easy handling with the SCS screwdriver

Reliable
- Proper seating of PLAN abutments verified through the clear-cut response from the prosthetic connection
- PLAN abutments fabricated of sterilizable polymer material

Note
After intraoral use clean and sterilize PLAN abutments with moist heat.
Do not sterilize the cassette or its components.
Replace non-functional PLAN abutments.

Lab procedure: p. 49
Prosthetic procedure: p. 49–50
6.1.2 CrossFit® PLAN Set/PLAN abutment selection

The Straumann® CrossFit® PLAN Set allows for optimal planning of the restoration in the mouth and on the model. It gives the dentist and the dental technician greatest flexibility in cooperative planning and minimizes the quantity of stock abutments. The PLAN set contains all PLAN abutments available for the Straumann® Bone Level Implant (anatomic, cementable, gold, Multi-Base, LOCATOR®).

Step 1 – Selecting the right abutment

- Open the PLAN set, pick up a PLAN abutment and secure it with the SCS screwdriver (empty mold for instruments built in).

Step 2 – Ordering the stock abutment

- Once the best fitting PLAN abutment is determined, order the corresponding stock abutment (titanium, gold) using the allocation chart on the PLAN set inlay card.
6.1.3 Cleaning and sterilizing PLAN abutments

- Clean the PLAN abutments thoroughly with water or ethanol after intra-oral use.
- After cleaning, sterilize PLAN abutments with moist heat (autoclave) for 18 minutes at 134 °C (273 °F).
- Refer to the manufacturer’s specifications for the heat-sterilization device.

>Note

Do not sterilize PLAN abutments more than 20 times.
Do not gamma-sterilize PLAN abutments.
Do not sterilize the cassette or its components.
6.2 ANATOMIC (AND MESO) ABUTMENT

Intended use
- Cement-retained restorations

Characteristics

Simple
- Less grinding necessary due to prepared mucosa margins
- Adaptation to natural soft tissue contour due to prepared mucosa margins in different heights
- Oval shape resembles emergence profile of a natural tooth

Reliable
- CrossFit® Connection

Note
Not suitable for direct ceramic veneering.
A minimum height of 3 mm above the mucosa margin of the abutment must be maintained in order to maintain proper stability of the abutment.
The cement margin must not be more than 2 mm below the mucosa.
Use a new basal screw for the final insertion of the abutment.

Lab procedure: p. 52-56
Prosthetic procedure: p. 57
6.2.1 Anatomic (and Meso) Abutment – Lab procedure
The following case describes the fabrication of a cement-retained single crown by using the anatomic abutment.

Step 1 – Fabricating the master cast and wax-up
• Fabricate the master cast including a gingiva 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 wax-up in order to define the optimal shape of the customized abutment.
Step 2 – Preparing the Anatomic or Meso Abutment

- The anatomic abutment and the meso abutment (see following page) consist of titanium and can be modified as required.

**Note**
To maintain proper stability of the abutment, a minimum height of 3 mm above the mucosa margin of the abutment must be maintained.

- The anatomic abutment after modification.
If the anatomic abutment does not fit your individual demands or if you prefer grinding the mucosa margins yourself, you can use the **meso abutment**. The processing of the meso abutment corresponds to the one of the anatomic abutment.
Step 3 – Fabricating the superstructure
Fabricate the superstructure on the modified abutment using the standard modelling, casting and veneering methods.

- Place the modified abutment on the polishing aid/analog and hand-tighten the screw using the SCS screwdriver.
- Wax an individual resin cap onto 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.
6.2.2 Anatomic Abutment – Prosthetic procedure

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

**Step 1 – Preparation**
- 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 a later removal of the customized abutment in case a crown replacement is required.
- Cement the superstructure to the abutment.
- Remove superfluous cement.
6.3 GOLD ABUTMENT FOR CROWN

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

Characteristics

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

Reliable
- Superfluous cement easily removable by raising the cement margin using an individually designed mesostructure
- CrossFit® Connection

Note
Not suitable for direct splinting with other gold abutments. For screw-retained bridges the gold abutment for bridge must be used (see instructions in chapter 6.4).
Use a new basal screw for the final insertion of the abutment.
Do not shorten the gold abutment for crown by more than 1.5 mm.

Lab procedure: p. 59–68
Prosthetic procedure: p. 69
6.3.1 Gold Abutment for crown – Lab procedure

The following case describes the fabrication of a cement-retained single crown by utilizing the custom abutment technique.

1a

Step 1 – Fabricating the master cast and wax-up
- Fabricate the master cast including a gingiva mask with the corresponding implant analog (see instructions in chapter 5).

1b

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

1c

- Make a silicone key over the full wax-up in order to define the optimal shape of the customized abutment.
Step 2 – Preparing the Gold Abutment

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

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

- Attach the gold abutment to the polishing aid for easier handling during manipulation outside of the model.
Step 3 – Wax modelling

- Contour a wax-up shape according to the individual anatomical situation. The silicone key shows the exact space for the cement-retained crown, which will be made over the customized abutment.

- 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 with the silicone key.

Note

The picture displays the optimal configuration of a customized abutment, showing an ideal emergence profile. This configuration ideally adapts the crown contours to the margin of the gingival contour. For reasons of hygiene, the cement margin must not be more than 2 mm below the gingival level.
Step 4 – Investment

- Invest the customized 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 modelling aid. Otherwise, the dental casting alloy will not or only too thinly flow out at the upper coping rim.

Ensure that there is no wax on the delicate margin. The use of investment materials for rapid heating methods (speed investment materials) is not recommended.

When processing the investment material, follow the manufacturers’ instructions. Observe the recommended mixing ratio and preheating time exactly.
Step 5 – Casting and devestment

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

Note

For the devestment of the gold abutment with sandblasting (maximum pressure: 2 bars; maximum alumina particle size: 50 µm), the inner configuration has to be protected from infiltration with sand with the polishing aid.

- The wax-fixed polishing aid allows better fixation and protects the pre-polished part of the gold abutment.
The gold abutment after sandblasting.

**Note**
Do not sandblast the inner configuration of the gold abutment.
Step 6 – Polishing
- After trimming, polish the finished customized abutment.

The customized abutment is now ready for the fabrication of the cement-retained single crown.

Step 7 – Fabricating the cement-retained single crown
- Block out the screw channel and wax the framework directly over the customized abutment.

The silicone key shows the spatial relations for the restoration.
Cast the framework in the conventional manner. After trimming the cast, the metal crown fits precisely on the customized abutment.

The silicone key shows the spatial relations for veneering.

Veneer the superstructure.
Casting errors and incorrect handling

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

The entire procedure has to be repeated if...
- ...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).
- ...the cast-on gold did not flow out entirely.
- ...intruded 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 can not 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 high-fusing 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

Note
The alloy manufacturer’s recommendation must be followed. Due to diffusion at the alloy and the cast-on coping interface, components made from an unsuitable alloy may form phases with low-strength, reduced corrosion resistance or a lower melting range.

Ceramicor® is a registered trademark of Cendres & Métaux SA (Biel-Bienne, Switzerland).
6.3.2 Gold Abutment for crown – Prosthetic procedure

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

Step 1 – Preparation
- 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

Option A: Screw-retained crown
- 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.

Option B: Cement-retained crown
- 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.
- Cement the crown to the mesostructure.
- Remove superfluous cement.

Note
The figure displays the optimal configuration of a customized abutment, showing an ideal emergence profile. This configuration ideally adapts the crown contours to the margin of the gingival contour. For reasons of hygiene, the cement margin must not be more than 2 mm below the gingival level.
6.4 GOLD ABUTMENT FOR BRIDGE

Intended use
- Screw-retained bridges
- Screw-retained customized bars

Characteristics

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

Reliable
- No cement gap
- One-screw solution

Note
Not suitable for single crowns. For single crowns the gold abutment for crown must be used (see instructions in chapter 6.3).
Use a new basal screw for the final insertion of the abutment.
Do not shorten the gold abutment for bridge by more than 2.5 mm.

Lab procedure: p. 71–78
Prosthetic procedure: p. 79
6.4.1 Gold abutment for bridge – Lab procedure

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

Step 1 – Fabricating the master cast and wax-up
- Fabricate a master cast including a gingiva 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 anatomical wax-up in order to define the optimal shape of the customized 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 modelling aids to the height of the occlusal plane according to individual circumstances. Working with the modelling aid ensures a clean and sharp-edged finish of the screw channel.

- To avoid a deformation of the conical design of the connection it is highly recommended to always attach the gold abutment to the polishing aid while working outside of the model.
Step 3 – Wax modelling
- 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 absolutely tension-free 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).

Ensure that there is no wax on the delicate margin.

The use of investment materials for rapid heating methods (speed investment materials) is not recommended.

When processing the investment material, follow the manufacturer’s instructions. Observe the recommended mixing ratio and preheating time exactly.
5a

Step 5 – Casting and devestment

- Cast the bridge framework.

**Note**

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, similar to the examples on p. 67.

5b

- 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.

For the devestment of the gold abutments with sandblasting (maximum pressure: 2 bars; maximum alumina particle size: 50 µm), the inner configuration has to be protected from infiltration from sand with the polishing aid.

5c

- The wax-fixed polishing aid allows better fixation and protects the pre-polished part of the gold abutments.
Note
To help ensure success of the restoration, a perfect prosthetic fit in the internal connection of the implant is mandatory. Take particular care not to let the bridge reconstruction fall down onto any surface. Due to the weight of the bridge construction, this might have a negative impact on the high precision connection of the gold abutment. If the construction falls down at anytime, repeat the entire 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.

**Note**
In order to take the bridge off the master cast, all basal screws need to be removed first.
6d

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

7

**Step 7 – Veneering**

- Veneer the superstructure.
6.4.2 Gold abutment for bridge – Prosthetic procedure

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

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.

Note
Do not insert the bridge in case of 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 or composite). This allows later removal of the bridge work if needed.
6.5 STRAUMANN® ANATOMIC IPS e.max® ABUTMENT

Intended use
- Cement-retained crowns and bridges via mesostructure
  - Conventional procedure
  - Temporary restoration chairside
- Screw-retained crowns
  - Direct veneering (with IPS e.max® Ceram®)
  - Press-on technique (with IPS e.max® ZirPress®)

Material
- Zirconium dioxide

Characteristics

Simple
- Processing of a highly esthetic ceramic abutment in different colors with conventional lab methods
- Less grinding necessary due to prepared mucosa margins
- Adaptation to natural soft tissue contour due to prepared mucosa margins in different heights
- Oval shape resembles emergence profile of a natural tooth

Reliable
- Biocompatible and low thermal conductivity
- High-performance all-ceramics thanks to a high strength and high fracture toughness
- Reduced risk of margins shining through the soft tissue even with thin mucosa biotype
- CrossFit® Connection
- Precise fit

Note
Only use an original Straumann® basal screw for ceramic abutment for the final insertion of the Straumann® Anatomic IPS e.max® Abutment. The Straumann® Anatomic IPS e.max® Abutment is available in the following shades: MO 0 and MO 1 (MO = Medium Opacity). Recommendations regarding the sterilization procedure can be found in the instructions for use.

- Lab procedure: p. 82–93
- Prosthetic procedure: p. 94–99
The following cases describe the fabrication of:

**Option A:** cement-retained crowns and bridges using the Straumann® Anatomic IPS e.max® Abutment;

**Option B:** screw-retained crowns directly veneered using the Straumann® Anatomic IPS e.max® Abutment and IPS e.max® Ceram®;

**Option C:** screw-retained crowns using the Straumann® Anatomic IPS e.max® Abutment in combination with the press-on technique. In this case IPS e.max® ZirPress® has been used.

Cement-retained restorations need to fulfill the following criteria (see graphic 2c on p. 84):

- Individualized abutments must have cusp and marginal ridge support.
- The maximum thickness of the veneering material on top of the coping must not exceed a maximum of 2.0 mm in all directions.
- Avoid any sharp edges.

Screw-retained restorations need to fulfill the following criteria (see graphic 2c on p. 84):

- In the anterior region, screw hole access must be located in the palatal/lingual area of the restoration.
- The screw hole position in the incisal or labial area is contraindicated.
- In the posterior area, screw hole position must be located in the center of the occlusal area of the restoration.
- Before veneering or press-on procedure, the individualized abutment must have a reduced, anatomically supporting design (cusp and marginal support).
- The maximum thickness of the veneering material on top of the individualized abutments (layering ceramic and/or press-on ceramic) must not exceed a maximum of 2.0 mm in all directions of the screw retained restoration.

---

1. IPS e.max®, IPS e.max® Ceram, IPS e.max® ZirPress, IPS e.max® Ceram ZirLiner, IPS e.max® Ceram Liner are registered trademarks of Ivoclar Vivadent AG, Liechtenstein

2. Ivoclar Vivadent AG, Liechtenstein
6. Restoration

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, design a full anatomical wax-up.

6.5.1 Straumann® Anatomic IPS e.max® Abutment – Lab procedure
2a

Place the abutment on the polishing aid / analog and hand tighten the screw using the SCS screwdriver.

For the individualization of the Straumann® Anatomic IPS e.max®1 Abutment, it is recommended to work with a water-cooled turbine and abrasive instruments that are appropriate for grinding sintered ZrO₂ material. Work with a low grinding pressure and avoid any spark formation. The Ivoclar Vivadent grinding instrument recommendations for IPS e.max®1 must be followed.

Step 2 – Preparing the Straumann® Anatomic IPS e.max®1 Abutment

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

2b

1c
In order to keep sufficient stability of the abutment, do not deviate from the dimensions shown in the following graphics (2c). The height of the abutment must achieve at least 65% of the complete restoration.

The final geometry of the abutment has to meet the requirements of the material of the final restoration for cement-retained crowns and bridges.

The final geometry of the abutment has to meet the requirements of the veneering material for screw-retained crowns, directly veneered or using the press-on technique.
Step 3 – Fabricating the superstructure

Use a standard procedure to fabricate the ceramic coping with the Straumann® CARES® Scan CS2 scanner and the Straumann® CARES® Visual software.

Veneer the coping with conventional veneering material synchronized to the thermal expansion coefficient of the ceramic coping.

Coefficient of thermal expansion² (CTE) |100 – 500 °C| 10.80 ± 0.25 10⁻⁶ K⁻¹

For veneering follow the recommendations of the ceramic material manufacturer.
3c

3d

Note
In case of adhesive bonding, sandblast the portions of the abutment surface which will be covered with cement with Al₂O₃ (type 100 microns) at 0.5 – 1.0 bar (15 – 30 psi). While sandblasting, the implant configuration must be protected with the polishing aid.
Option B – Screw-retained crowns, directly veneered

3a

Step 3 – Veneering

- For the veneering of the Straumann® Anatomic IPS e.max® Abutment, use conventional veneering material synchronized to the thermal expansion coefficient of the abutment.

- Coefficient of thermal expansion (CTE) (100–500 °C) 10.80 ± 0.25 × 10^-6 K^-1

- In this case IPS e.max® Ceram® has been used. For further details please consult the brochure “Instructions for use IPS e.max® Ceram®” (www.ivoclarvivadent.com).

- Steam clean the abutment and apply the IPS e.max® Ceram ZirLiner® only where IPS e.max® Ceram® will be applied later on.

- The implant configuration must be protected with the polishing aid while applying the IPS e.max® Ceram ZirLiner®.

Note

Do not sandblast the abutment before applying the IPS e.max® Ceram Liner®. Avoid any application of IPS e.max® Ceram ZirLiner® into the screw channel.

3b

Note

Do not apply IPS e.max® Ceram ZirLiner® on the inner configuration. In case of an adaptation of the emergence profile it is recommended to place the abutment upside down on the firing tray to prevent the ZirLiner® from flowing towards the inner configuration during firing.
Particular attention must be given to an even layer thickness of the porcelain veneered on the abutment.

**Note**
Observe the maximum thickness of the layering ceramic material (max. 2 mm).
Option C – Screw-retained crowns using the press-on technique

Step 3 – Process of press-on technique

- For pressing onto the Straumann® Anatomic IPS e.max® Abutment, use conventional press-on material synchronized to the thermal expansion coefficient of the abutment.

- Coefficient of thermal expansion (CTE) (100 – 500 °C) $10.80 \pm 0.25 \times 10^{-6} K^{-1}$

- In this case IPS e.max® ZirPress1 has been used. For further details please consult the brochure “Instructions for use IPS e.max® ZirPress1” (www.ivoclarvivadent.com).

- Steam clean the abutment and apply the IPS e.max® Ceram ZirLiner1 only where IPS e.max® ZirPress1 will be applied later on.

- The implant configuration must be protected with the polishing aid while applying the IPS e.max® Ceram ZirLiner1.

**Note**

Do not sandblast the abutment before applying the IPS e.max® Ceram Liner1. Avoid any application of IPS e.max® Ceram ZirLiner1 into the screw channel.

**Note**

Do not apply IPS e.max® Ceram ZirLiner1 on the inner configuration. In case of an adaptation of the emergence profile it is recommended to place the abutment upside down on the firing tray to prevent the ZirLiner1 from flowing towards the inner configuration during firing.
In order to prevent IPS e.max® ZirPress1 to intrude into the screw channel of the abutment do not cover the screw channel with wax.

Sprueing
Cover the whole abutment with investment material and ensure that the screw channel is also completely filled.

Before pressing, ensure that the pressing furnace is sufficiently preheated.

The implant configuration must be protected with the polishing aid (e.g. sandblasting).
Note

The long term success of the prosthetic work depends on the accurate fit of the restoration. Therefore the following recommendations must be observed:

- Allow for enough cooling time of the press-on abutment before divestment
- Rough divestment is carried out with glass polishing beads at 4 bar (60 psi) pressure
- Fine divestment is carried out with glass polishing beads at 2 bar (30 psi) pressure
- Do not use Al₂O₃ for rough or fine divestment
- Do not sandblast the conical portion of the abutment and always protect the implant/abutment interface with the polishing aid

Immerse the pressed objects into the IPS e.max® Press In-vex Liquid (min. 5 minutes, max. 10 minutes) and ensure that they are completely covered.

Carefully remove the white reaction layer on the pressed objects with Al₂O₃ (type 100 microns) at 1 – 2 bar (15 – 30 psi) pressure.
Lab procedure

■ Veneer, shade and glaze the restoration according to the individual situation.

📖 Note
The implant configuration must be protected with the polishing aid while applying the IPS e.max® Ceram®.

■ Final restoration
6.5.2 Straumann® Anatomic IPS e.max® Abutment – Prosthetic procedure

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

**Option A – Cement-retained crowns and bridges**

**Step 1 – Preparation**
- 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.
- Prepare the surface of the abutment corresponding to the cementation material which will be used (e.g. in case of adhesive bonding apply primer).
- Condition the inner surface of the superstructure according to the instructions for use given by the according manufacturer (e.g. in case of adhesive bonding apply primer).

**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 screw channel with cotton and sealing compound (i.e. gutta-percha). This allows for later removal of the modified abutment in the event a restoration replacement is required.
- Cement the superstructure onto the abutment.
- Remove any excess cement.

**Note**
Only use an original Straumann® basal screw for ceramic abutment for the final insertion of the Straumann® Anatomic IPS e.max® Abutment.
Options B + C – Screw-retained crowns, directly veneered or using the press-on technique

Step 1 – Preparation
- Remove the healing cap or temporary restoration.
- Remove the veneered abutment from the master cast.
- Clean and dry the interior of the implant and the abutment thoroughly.

Step 2 – Final insertion
- Position the cleaned and veneered abutment in the implant. Tighten the screw to 35 Ncm using the SCS screwdriver along with the ratchet and the torque control device (see instruction in chapter 7.5).
- Close the SCS screw channel with cotton and sealing compound (i.e. gutta-percha, composite). This allows for later removal of the modified abutment in the event a restoration replacement is required.

Note
Only use an original Straumann® basal screw for ceramic abutment for the final insertion of the Straumann® Anatomic IPS e.max® Abutment.
6.5.3 Straumann® Anatomic IPS e.max®1 Abutment – Chairside procedure for temporary restorations
The following case describes the usage of the Straumann® Anatomic IPS e.max®1 Abutment chairside.

Step 1 – Preparing the Straumann® Anatomic IPS e.max®1 Abutment
- For preparing the Straumann® Anatomic IPS e.max®1 Abutment chairside, follow the procedure for cement-retained restorations outlined in step 2 on p. 83–85.
- Following the Ivoclar Vivadent grinding instrument recommendations for IPS e.max®1 a regeneration firing for cement-retained crowns and bridges is not required. The regeneration firing has to be conducted if the Ivoclar Vivadent grinding instrument recommendations for IPS e.max®1 are not followed or if a further thermal processing is necessary. The regeneration firing parameter are: 65 °C (117 °F) per minute heating up to 1050 °C (1922 °F) / 15 minute holding time and long term cooling down with 25 °C (45 °F) per minute to 750 °C (1382 °F).

Note
Before taking the abutment level impression the abutment needs to be torqued with 35 Ncm.

Step 2 – Placing the modified Straumann® Anatomic IPS e.max®1 Abutment
- Place the abutment on the implant and tighten the screw with a torque between 15 Ncm and 35 Ncm using the SCS screwdriver along with the ratchet and the torque control device (see instructions in chapter 7.5).

Cover the screw head with absorbent cotton or gutta-percha and seal the screw channel temporarily (e.g. with absorbent cotton).
**Prosthetic procedure**

**Step 2c**  
- Take an impression with a custom-made impression tray and order the final restoration.

**Step 3 – Fabricating the cement-retained temporary single crown**  
- Use a standard procedure to fabricate the cement-retained single crown (e.g., grind out a prefabricated plastic tooth).
Step 4 – Cementing the temporary single crown

- Coat the internal configuration of the crown with temporary cement and cement it onto the Straumann® Anatomic IPS e.max® Abutment.

- Remove any excess cement.
Step 5 – Insertion of the final restoration

- Remove the temporary restoration.
- Clean and dry the interior of the abutment thoroughly.
- Close the SCS screw channel with cotton and sealing compound (i.e. gutta-percha). This allows for later removal of the modified abutment in the event a restoration replacement is required.
- Cement the superstructure onto the abutment.
- Remove any excess cement.
Straumann® CARES® Implant-borne prosthetics

Straumann® CARES® CADCAM offers you a range of implant-borne prosthetic solutions in order to achieve high-quality dental implant restorations. Straumann® CARES® Implant-borne elements are designed for high reliability and predictability.

All implant-borne prosthetic solutions can be ordered via Straumann® CARES® Visual software. Straumann® CARES® Abutments may also be ordered via the Straumann® CARES® Scan and Shape service.

### Straumann® CARES® Abutments

For customized patient solutions
- For cement-retained crowns and bridges via mesostructure
- For screw-retained crowns (ceramic abutments only)
- Available in two different materials: titanium and ceramic

### Characteristics
- Customized shape and emergence profile
- Control over cement gap
- Proven Straumann precision fit

### Straumann® CARES® Screw-retained bridges and bars

For complex customized patient solutions
- For screw-retained bridges
- For bars (Dolder®, MP-Clip, Ackermann, round)
- In two different materials: titanium grade 4 and cobalt-chromium alloy (coron*)

### Characteristics
- Direct connection to the implant, no additional abutment needed
- High precision

For further information regarding Straumann® CARES® Implant-borne prosthetics, please see brochure 152.822 “Basic Information Straumann® CARES® Implant-borne prosthetic procedures”.
6.7 CEMENTABLE ABUTMENT

Intended use
- Cement-retained crowns and bridges

Characteristics

Simple
- Flexible impression taking on implant or abutment level
- Easy handling of prefabricated copings
- Reduce adjustment work (e.g. height adjustment)
- Easy choice of components thanks to color-coding

Reliable
- CrossFit® Connection
- Perfect fit due to prefabricated components
- Proper fit of abutment level impression cap verified by clear-cut response

Note
Cement margin must be no more than 2 mm below the gingiva.
A minimum height of 3 mm above the mucosa margin of the abutment must be maintained to ensure proper stability and retention of the restoration.

Lab procedure: p. 106–109, 111
Prosthetic procedure: p. 100–105, 110, 112
### 6.7.1 Cementable abutment coding

<table>
<thead>
<tr>
<th>Diameter (D)</th>
<th>Narrow CrossFit®</th>
<th>Regular CrossFit®</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.5 mm</td>
<td>5 mm (blue coding)</td>
<td>5 mm (grey coding)</td>
</tr>
<tr>
<td>5.5 mm</td>
<td>(yellow coding)</td>
<td></td>
</tr>
<tr>
<td>4 mm</td>
<td></td>
<td>(black marking)</td>
</tr>
<tr>
<td>5.5 mm</td>
<td>(white marking)</td>
<td></td>
</tr>
</tbody>
</table>

**D** = Diameter  **AH** = Abutment Height  **GH** = Gingiva Height
Option A: Impression taking on abutment level – Prosthetic procedure

Step 1 – Abutment insertion

- Select the appropriate size of the cementable abutment using the PLAN set (see instructions in chapter 6.1).

- Thoroughly clean and dry the interior of the implant.

- Position the 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).
Step 2 – Customizing the abutment
- Make height adjustments according to the individual situation. This can be done down to the bottom of the black/white ring.

Note
The abutment level impression does not carry any information of potential customizations. In this case, the abutment level impression has to be taken without any auxiliaries. We recommend taking the impression on implant level, and then ask the technician to customize the abutment according to the individual situation. We recommend customizing the abutment right before the final crown is integrated, if the spatial surroundings allow it (no chewing forces against the abutment). Ask your dental lab to supply you with a grinding template.
Step 3 – Impression taking on abutment level

- Click the impression cap onto the abutment.
- The white ring on the abutment indicates the abutment height (AH). It corresponds to the white arrow on top of the impression cap and the white clicking mechanism inside of the impression cap.

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

Note

Due to its low tensile strength, hydrocolloid materials are not suitable for this application.
Chairside temporization of the abutment

Using the temporary coping*

Step 4 – Preparation

- Snap the temporary coping onto the abutment in the mouth of the patient.

- Mark the appropriate height according to the individual situation and shorten the coping as necessary.
- If you intend to provisionalize a bridge, remove the rotational feature of the temporary coping.

Note

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

* Using the protective cap look at step 4, p. 130
Step 5 – Creating the provisional

- Use a standard procedure to fabricate the provisional (e.g., prefabricated crown form or vacuum-formed sheet technique). The retention rings ensure 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 abutment.

- After the polymerization is completed, take the provisional out of the mouth and place it on the analog.

- Grind down and polish the emergence profile of the coping and the restoration to achieve an even profile. To avoid tissue irritation, the interface needs to be smooth and flush with the restoration.
**Step 6 – Inserting the provisional**

- Close the SCS configuration of the screw with cotton and sealing compound (e.g. gutta-percha). This allows a later removal of the provisional.
- Apply temporary cement to the inner part of the coping and cement it onto the abutment.

**Note**
Keep the temporary restoration out of occlusion.
Use temporary cement in order to remove the temporary restoration in due time.
Temporary copings must not be kept longer than 30 days in the mouth.

**Using the protective cap**

**Step 4 – Cementing the protective cap**

- Close the SCS configuration of the screw with cotton and sealing compound (e.g. gutta-percha). This allows a later removal of the provisional.
- Apply temporary cement to the inner part of the protective cap and cement it onto the abutment.

**Note**
Use temporary cement in order to remove the temporary restoration in due time.
Protective caps must not be kept longer than 30 days in the mouth.
Lab procedure

Step 1 – Fabricating the master cast
- Click the corresponding analog in the impression.

Note
Ensure that the color code of the analog corresponds to the color code of the impression cap. The white ring on the abutment indicates the abutment height (AH). It corresponds to the white arrow on top of the impression cap and the white clicking mechanism inside of the impression cap.

Step 2 – Preparation
- Fabricate the master cast in a conventional manner (see instructions in chapter 5).
- Model a full anatomical wax-up for optimal esthetic planning. Use the corresponding burn-out coping 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 restoration.
Step 3 – Customizing
- Depending on the individual situation, height adaptations can be made without harming the anti-rotational grooves.
- Individualize the abutment portion of the analog according to the individual situation.
- Fabricate a grinding template for the practitioner. This will enable the precise transfer of the individualization into the mouth of the patient.

Note
To ensure proper stability and retention of the restoration, a minimum height of 3 mm above the mucosa margin of the abutment must be maintained.
Step 4 – Fabricating the crown

- Select the burn-out coping and place it on the analog.

- Shorten it, if necessary.

- Fabricate the superstructure on the (modified) abutment using standard modeling methods.

- Check the wax-up with the silicone key.
**Step 5 – Casting and veneering**

- Cast the framework using the standard casting methods.
- Adjust the framework so that it can be attached to the analog. Remove the clamping ring using a circular motion. Do not harm the rotational faces nor the exact margin fit.

- Check the spatial conditions with the silicone key.

- Veneer the superstructure.
Prosthetic procedure

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

1. **Step 1 – Final insertion**
   - Remove the temporary restoration in a conventional manner.
   - If necessary, do the required customization of the abutment by using the reduction coping from the dental technician.
   - Clean the abutment thoroughly and remove all remaining temporary cement.
   - Cement the crown to the abutment.
   - Remove superfluous cement.
Option B: Impression taking on implant level

Take the impression according to the instructions in chapter 5.

Lab procedure

Step 1 – Abutment insertion
- Select the correct size of the cementable abutment by using the PLAN set (see instructions in chapter 6.1).
- Hand-tighten the abutment on the analog in the master cast.

Step 2 – Customizing
- Make height adaptations according to the individual situation without harming the anti-rotational grooves.

Note
The ensure proper stability and retention of the restoration, a minimum height of 3 mm above the mucosa margin of the abutment must be maintained. Follow the corresponding steps as described for the impression on abutment level (p. 131).

- Apply the transfer aid and attach it to the adjacent teeth.
- Deliver the customized abutment with the attached transfer aid and the final restoration to the doctor’s office for insertion.
Prosthetic procedure

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

1. **Step 1 – 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).
   - Insert the abutment together with the transfer aid for a better orientation.
   - Close the SCS configuration of the screw with cotton and sealing compound (e.g. gutta-percha). This later allows removal of the abutment.
   - Cement the crown to the abutment.
   - Remove superfluous cement.
6.8 MULTI-BASE ABUTMENT

Intended use
- Screw-retained bridges
- Bar-retained implant-borne dentures in the mandible and maxilla

Characteristics

Simple
- Flexible impression taking on implant or abutment level
- Easy choice of components thanks to color-coding
- Highly flexible due to 30° cone and low occlusal height

Reliable
- CrossFit® Connection
- Perfect fit due to prefabricated components
- Proper fit of abutment level impression cap verified by clear-cut response

Note
Do not use the multi-base abutment for single-tooth restorations. Use new occlusal screws for the final insertion of the bar.

Prosthetic procedure: p. 140–144, 153, 155
Lab procedure: p. 145–152, 154
### 6.8.1 Multi-Base abutment coding

#### Multi-Base Abutment, straight

<table>
<thead>
<tr>
<th>Diameter (D)</th>
<th>Narrow CrossFit®</th>
<th>Regular CrossFit®</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.5 mm (blue coding)</td>
<td><img src="image1" alt="Image" /></td>
<td><img src="image2" alt="Image" /></td>
</tr>
<tr>
<td>4.5 mm (yellow coding)</td>
<td><img src="image3" alt="Image" /></td>
<td><img src="image4" alt="Image" /></td>
</tr>
<tr>
<td>4.5 mm (grey coding)</td>
<td><img src="image5" alt="Image" /></td>
<td><img src="image6" alt="Image" /></td>
</tr>
<tr>
<td>6.5 mm (brown coding)</td>
<td><img src="image7" alt="Image" /></td>
<td><img src="image8" alt="Image" /></td>
</tr>
</tbody>
</table>

**D** = Diameter  
**GH** = Gingiva Height

#### Multi-Base Abutment, angled 25°

<table>
<thead>
<tr>
<th>Diameter (D)</th>
<th>Narrow CrossFit®</th>
<th>Regular CrossFit®</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.5 mm (blue coding)</td>
<td><img src="image9" alt="Image" /></td>
<td><img src="image10" alt="Image" /></td>
</tr>
<tr>
<td>4.5 mm (yellow coding)</td>
<td><img src="image11" alt="Image" /></td>
<td><img src="image12" alt="Image" /></td>
</tr>
<tr>
<td>4.5 mm (grey coding)</td>
<td><img src="image13" alt="Image" /></td>
<td><img src="image14" alt="Image" /></td>
</tr>
<tr>
<td>6.5 mm (brown coding)</td>
<td><img src="image15" alt="Image" /></td>
<td><img src="image16" alt="Image" /></td>
</tr>
</tbody>
</table>

**D** = Diameter  
**GH** = Gingiva Height

---

Narrow CrossFit®

<table>
<thead>
<tr>
<th>GH</th>
<th>a</th>
<th>b</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 mm</td>
<td>5.0 mm</td>
<td>4.1 mm</td>
</tr>
<tr>
<td>2.5 mm</td>
<td>6.5 mm</td>
<td>5.6 mm</td>
</tr>
<tr>
<td>4 mm</td>
<td>8.0 mm</td>
<td>7.1 mm</td>
</tr>
</tbody>
</table>
Option A: Impression taking on abutment level – Prosthetic procedure

1a

Step 1 – Abutment insertion
- Select the appropriate size of the multi-base abutments using the PLAN set (see instructions in chapter 6.1).

1b

- Clean and dry the interior of the implants thoroughly.
- Position the abutments in the implants. Tighten them to 35 Ncm using the SCS screwdriver along with the ratchet and the torque control device (see instructions in chapter 7.5).

Note
Do not modify the abutments.
Step 2 – Impression taking on abutment level
- Click the impression caps or screw the impression posts onto the abutments. Check the proper fit of the impression cap by rotating it on the abutment.
- To ensure accuracy of the impression procedure, do not damage the inner aspect of the impression cap.

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

Note
Due to its low tensile strength, hydrocolloid materials are not suitable for this application.
Chairside temporization of the abutments

Using the temporary coping

**Step 3 – Preparation**
- Mount the temporary copings on analogs.
- Mark the appropriate heights according to the individual situation and shorten the copings as necessary.
- Sandblast the copings and coat them with opaquer to avoid the titanium showing through.
- Screw the copings onto the abutments in the patient's mouth and seal the screw channels (e.g., with cotton).
Step 4 – Creating the provisional

- Use a standard technique to fabricate the provisional (e.g. prefabricated crown form or vacuum-formed sheet technique as shown here). The retention elements ensure proper mechanical bonding of the veneering material to the coping.

- Remove excess acrylic, reopen the screw channel and finish the temporary restoration.
Step 5 – Inserting the provisional
- Clean the polished temporary restoration, place it on the abutments and tighten the screw to 15 Ncm using the SCS screwdriver along with the ratchet and the torque control device (see instructions in chapter 7.5).
- Cover the screw head with absorbent cotton or gutta-percha and seal the screw channel with temporary veneering material [e.g. composite].

Note
Keep the temporary restoration out of occlusion.

Using the protective cap

Step 3 – Mounting the protective caps
- Hand-tighten the screws of the protective caps with the SCS screwdriver on the abutments.

Note
Do not keep protective caps in the patient’s mouth longer than 30 days.
Lab procedure for bridge restoration

Step 1 – Fabricating the master cast
- Click the corresponding analogs into the impression or reposition and fix the analog in the impression using the guide screw.

Note
Ensure that the color code of the analogs corresponds to the color code of the impression caps or posts. Impression material can get under the cap. In this case, remove the remains prior to repositioning the analogs.

Step 2 – Preparation
- Fabricate the master cast in a conventional manner (see instructions in chapter 5).
- Model a full anatomical wax-up for optimal esthetic planning. Use the corresponding gold or burn-out copings as a basis for the wax-up (here the procedure using a gold coping is shown).
- You can define the optimal shape of the restoration by making a silicone key over the full wax-up.
Step 3 – Fabricating the bridge

- Place the gold copings on the analogs and hand-tighten the occlusal screws using the SCS screwdriver.

**Note**

When using burn-out copings, do not overtighten the copings. This precaution prevents the wax framework from undergoing excessive stress while loosening the occlusal screw after the wax modellation.

- Shorten the modelling aids to the height of the occlusal plane according to the individual situation. Working with the modelling aid ensures a clean and sharp-edged finish of the screw channel.

- Fabricate the superstructure on the abutments using standard modelling methods.
- 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 copings with wax.
Check the spatial conditions before casting the bridge framework with the silicone key of the wax-up.
Check the wax-up with the silicone key.

Step 4 – Investment
- Check that the wax framework of the bridge is absolutely tension-free 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, clean the copings thoroughly prior to investment (removal of wax particles, insulating agents with a cotton pellet or brush moistened with alcohol).

Ensure that there is no wax on the delicate margin. The use of investment materials for rapid heating methods (speed investment materials) is not recommended.

When processing the investment material, follow the manufacturer’s instructions. Observe the recommended mixing ratio and preheating time exactly.

Make sure the screw channel and the internal configuration of the copings are filled with investment material from the bottom to the top in order to avoid air bubbles (see graphic).
Step 5 – Casting and veneering

- Cast and devest the framework using standard methods (see also instructions in chapter 6.4.1).

Note
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, similar to the examples on p. 67.

- Check the spatial conditions with the silicone key.

- Control for tension-free fitting on the master cast by applying the Sheffield test. If the bridge is not tension-free and wiggles, cut the bridge and resplint it tension-free.

Note
In order to take the bridge off the master cast, all occlusal screws need to be removed first.
Do an additional try-on of the tension-free fit of the framework in the patient’s mouth.

Veneer the superstructure.
Lab procedure for bar restoration

Step 1 – Fabricating the master cast
- Click the corresponding analogs into the impression or reposition and fix the analog in the impression using the guide screw.

Note
- Ensure that the color code of the analogs corresponds to the color code of the impression caps or posts.

Impression material can get under the cap. In this case, remove the remains prior to repositioning the analogs.
Step 2 – Preparation
- Before placing the copings, we recommend mounting the occlusal screws onto the SCS screwdriver. After this step, place the occlusal screws into the copings for bars.
- Mount the copings onto the abutment and hand-tighten the occlusal screws using the SCS screwdriver.

Step 3 and following steps – Fabrication of the bar
- Follow the steps described on p. 158–163 for the fabrication of the soldered gold bar or laser-welded titanium bar.

Note
Always use stabilization pins for the soldering of a gold bar.
Prosthetic procedure
The final restoration is delivered to the doctor’s office on the master cast.

1. **Step 1 – Final insertion**
   - Remove the temporary restoration.
   - Clean the abutments thoroughly.
   - Check the tension free fit of the bridgework or bar before tightening it in the patient’s mouth. Do not insert the bridge or bar in case of movements due to tensions in the bridgework or bar.
   - Tighten the occlusal screws to 15 Ncm using the SCS screwdriver along with the ratchet and the torque control device (see instructions in chapter 7.5).
   - For bridgework, close the SCS configuration of the screws with cotton and sealing compound (e.g. gutta-percha or composite). This allows later removal of the bridge work if needed.
Option B: Impression taking on implant level
Take the impression according to the instructions in chapter 5.

Lab procedure for bridge and bar restoration

Step 1 – Abutment insertion
- Select the correct size of the multi-base abutments by using the PLAN set (see instructions in chapter 6.1).
- Hand-tighten the abutments on the analogs in the master cast.

Step 2 and following steps – Fabrication of the bridge/bar
- Follow the corresponding steps described on p. 145 for the fabrication of the bridge.
- Follow the corresponding steps described on p. 158–163 for the fabrication of the soldered gold bar or laser-welded titanium bar.

Note
Always use stabilization pins for the soldering of a gold bar.
Prosthetic procedure
The final restoration is delivered to the doctor’s office on the master cast.

1. **Step 1 – Final insertion**
   - Position the cleaned abutments in the implants. Tighten them to 35 Ncm using the SCS screwdriver along with the ratchet and the torque control device (see instructions in chapter 7.5).
   - Check the tension-free fit of the bridgework/bar before tightening it in the patient’s mouth. Do not insert the bridge/bar in case of movement due to tensions in the bridgework/bar.
   - Tighten the occlusal screws to 15 Ncm using the SCS screwdriver along with the ratchet and the torque control device (see instructions in chapter 7.5).
   - For bridgework, close the SCS configuration of the screws with cotton and sealing compound (e.g. gutta-percha or composite). This allows later removal of the bridge work if needed.
6.9 ABUTMENT FOR BARS

Intended use
- Bar-retained implant-borne dentures in the mandible and maxilla
- Stabilisation and primary splinting of the implants

Characteristics

Simple
- Effective one piece solution provides uncomplicated bar restorations for standard situations.
- A 15° cone allows implant divergence flexibility up to 30°.
- Abutment can be easily shortened due to 7 mm distance from soft tissue level.

Reliable
- Flexible design for soldered and laser-welded bar constructions with prefabricated components

Note
Use a new basal screw for the final insertion of the abutment.

Lab procedure: p. 132–139
Prosthetic procedure: p. 140
6.9.1 Abutment for bars – Lab procedure

1. **Step 1 – Fabricating the master cast**
   - Fabricate the master cast using standard methods and type 4 dental stone (DIN 6873).

2a. **Step 2 – Preparation**
   - Place the abutment for bars on the analogs and hand-tighten the screw using the SCS screwdriver.
Step 3 – Placing the bar segments
- Place the individual bar segments between the abutment units.

Note
The space between the bar and the gingiva must be at least 2 mm. To achieve a good joint, the gap between the abutment and the bar should be as small as possible.

Step 4 – Fixation of the bar segments
- Use a residue-free burn-out plastic to fix the bar segments to the abutments.

Note
Do not cover the basal screws.
Step 5 – Removing the bar framework

- Carefully remove the bar framework after loosening the screws.
- Place the framework on the polishing aids and hand-tighten the screws. The polishing aids ensure that the abutments are anchored accurately in the soldering investment during soldering.
Step 6 – Soldering the bar

Note
To prevent possible distortion of the bar through uneven preheating with the flame, preheat the soldering investment to 500–600 °C (932–1112 °F) in a preheating furnace.

- After preheating, solder the invested bar according to standard procedure.
- Once soldering is complete, cool down the investment to room temperature.
- Devest and clean the bar in an ultrasonic bath.
- Remove the oxides and soldering flux residues in an acid bath.

Note
Do not sandblast the framework.

- Check the fit.

Note
Stress-free repositioning of the bar on the implant analogs should be possible without securing it with the screws.
Shorten the bar in height if necessary and polish it.

Send the finished bar with 4 new basal screws to the doctor’s office.

**Note**
At this point the screws used for soldering are extremely oxidized. Therefore, do not use them to secure the bar in the mouth.

See p. 165 for the prosthetic procedure.
Laser-welded titanium bar

3a

Step 3 – Placing the bar segments
- Fit the bar segments to the master cast, allowing for a certain gap that will be offset by the addition of titanium (see graphic 3b).

Note
The space between the bar and the gingiva must be at least 2 mm.
Step 4 – Welding of the segments

- Weld the segments together with adequate argon gas rinsing.

- Check the fit.

- If necessary, shorten the height of the bar and polish it.

**Note**
Stress-free repositioning of the bar on the implant analogs should be possible without securing it with the screws.
Send the finished bar with 4 new basal screws to the doctor’s office.

**Note**
At this point the screws used for soldering are extremely oxidized. Therefore, do not use them to secure the bar in the mouth.
6.9.2 Abutment for bars – Prosthetic procedure

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

Step 1 – Final insertion
- Position the cleaned bar in the implants. Ensure the stress-free repositioning of the bar on the implants.
- 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).
6.10 LOCATOR® ABUTMENT

Intended use
- Dentures retained by implants in the mandible and maxilla

Characteristics

Simple
- Divergence compensation up to 40° between two implants
- Minimum component height for limited occlusal space

Reliable
- Dual retention for optimal abutment-denture connection
- Excellent long-term performance due to high wear resistance of components

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

Manufacturer
Zest Anchors, Inc.
Escondido, CA 92029
USA

Lab procedure: p. 142–145
Prosthetic procedure: p. 146–153
6.10.1 LOCATOR® Abutment – Lab procedure

Option A: Master cast from implant level impression

Take the impression according to the instructions in chapter 5.

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 – Abutment insertion

- Screw the abutment hand-tight into the implant analog using the LOCATOR® driver.
**Option B: Master cast from abutment level impression**

For abutment level impression-taking, special LOCATOR® analogs are used. The selection of the LOCATOR® abutments has already been made by the prosthodontist.

1. **Step 1 – Female analog insertion**
   - Insert the LOCATOR® female analogs into the LOCATOR® impression copings.

2. **Step 2 – Fabricating of 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.

**Option A: Construction of a new overdenture**

1. **Step 1 – Placing the white block out spacers and denture caps**
   - Place one white block-out spacer over each abutment.
   - Place the denture caps with the black processing males onto the LOCATOR® abutments, or the LOCATOR® analogs in the master cast.

2. **Step 2 – Overdenture construction**
   - Construct the overdenture according to the standard procedure, adding the LOCATOR® denture housing.
   - Return the completed overdenture to the doctor’s office with the black processing males still in place.
Option B: Upgrading an existing overdenture

1. Place one white block-out spacer over each abutment.
2. Place the denture caps with the black processing males onto the LOCATOR® abutments, or the LOCATOR® analogs in the master cast.

Step 2 – Hollowing out the denture base
- Hollow out the existing denture base in the areas of the LOCATOR® denture caps.

Step 3 – 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.
6.10.2 LOCATOR® Abutment – Prosthetic procedure (standard)

Impression taking

Option B: Abutment level impression taking
For abutment level impression taking, special LOCATOR® impression components are used. As a consequence, abutment heights are selected by the doctor on the patient.

Step 1 – Selecting the abutment height
- Make sure the top of the implant is not covered by hard or soft tissue.

Note
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.

Note
Prosthesis insertion is easier for the patient if the LOCATOR® abutments are on the same horizontal level.
Step 2 – Abutment insertion
- Screw the abutment into the implant hand-tight, using the LOCATOR® 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 6.10.4).

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.
Final restoration

The dental technician returns the completed LOCATOR® overdenture to the doctor’s office for final placement. The finished denture is delivered with the black processing males still in place.

Step 1 – Selecting the replacement males

- Implant divergence up to 10° for a single implant:

<table>
<thead>
<tr>
<th>Color</th>
<th>Retention</th>
</tr>
</thead>
<tbody>
<tr>
<td>blue</td>
<td>0.68 kg</td>
</tr>
<tr>
<td>pink</td>
<td>1.36 kg</td>
</tr>
<tr>
<td>clear</td>
<td>2.27 kg</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Color</th>
<th>Retention</th>
</tr>
</thead>
<tbody>
<tr>
<td>gray</td>
<td>0.0 kg</td>
</tr>
<tr>
<td>red</td>
<td>0.45 kg</td>
</tr>
<tr>
<td>orange</td>
<td>0.91 kg</td>
</tr>
<tr>
<td>green</td>
<td>1.82 kg</td>
</tr>
</tbody>
</table>

**Note**

Always start with the lowest retention replacement males (see chapter 6.10.4).
Step 2 – Removing the processing males
- Remove the black processing males from the housing (see chapter 6.10.4).

Step 3 – Inserting the replacement male
- Insert the replacement male with the core tool (see chapter 6.10.4).

Step 4 – Inserting the finished denture
- Insert the finished denture and check the occlusion.
6.10.3 LOCATOR® Abutment – Prosthetic procedure (chairside)

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

1. Step 1 – Selecting the abutment height
   - Make sure the top of the implant is not covered by the gingiva.
   - Select the height of the LOCATOR® abutment by determining the height of the gingiva at its highest point.
   - 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**
   Prosthesis insertion is easier for the patient if the LOCATOR® abutments are on the same horizontal level.

2. Step 2 – Inserting the abutment
   - Screw the abutment into the implant by hand using the LOCATOR® 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 attached (see chapter 6.10.4).

3. 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® 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 from lingual and anchor the caps in the denture (lightcure or selfcuring 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. 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 – Selecting the replacement males

- Implant divergence up to 10° for a single implant:

<table>
<thead>
<tr>
<th>Color</th>
<th>Retention</th>
</tr>
</thead>
<tbody>
<tr>
<td>blue</td>
<td>0.68 kg</td>
</tr>
<tr>
<td>pink</td>
<td>1.36 kg</td>
</tr>
<tr>
<td>clear</td>
<td>2.27 kg</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Color</th>
<th>Retention</th>
</tr>
</thead>
<tbody>
<tr>
<td>gray</td>
<td>0.0 kg</td>
</tr>
<tr>
<td>red</td>
<td>0.45 kg</td>
</tr>
<tr>
<td>orange</td>
<td>0.91 kg</td>
</tr>
<tr>
<td>green</td>
<td>1.82 kg</td>
</tr>
</tbody>
</table>

Note
Always start with the lowest retention replacement males.
Step 8 – 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 6.10.4).

Step 9 – Inserting the replacement male
- Insert the replacement male with the core tool (see chapter 6.10.4).

Step 10 – Inserting the finished denture
- Insert the finished denture and check the occlusion.
6.10.4 LOCATOR® Abutment – Further references

1. Using the LOCATOR® core tool

The LOCATOR® 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.
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 safe pick-up and handling.

*SCS = Screw Carrying System
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 POLISHING AID

The polishing aid is used during polishing and other lab procedures to protect the abutment’s prosthetic connection and to establish a convenient fixation extension.

Art. Nos.: 025.2920, 025.4920
Material: Stainless steel
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).

Ratchet

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).

Note

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.

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).
7.4 ASSEMBLING THE RATCHET AND THE TORQUE CONTROL DEVICE

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

<table>
<thead>
<tr>
<th>Hand-tight</th>
<th>15 Ncm</th>
<th>15–35 Ncm</th>
<th>35 Ncm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Closure screws</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Healing abutments</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temporary copings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Copings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temporary abutments</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final abutments</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
8. ABOUT STERILIZATION

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

### Table: Sterilizing Methods and Parameters

<table>
<thead>
<tr>
<th>Material</th>
<th>Sterilizing method</th>
<th>Sterilizing Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ti, Ti alloy</td>
<td>Autoclave, moist heat</td>
<td>134 °C (273 °F) for 5 min</td>
</tr>
<tr>
<td>PEEK, PEEK with Ti/Ti alloy inlay</td>
<td></td>
<td></td>
</tr>
<tr>
<td>POM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metal alloy Ceramicor®</td>
<td>Autoclave, moist heat</td>
<td>134 °C (273 °F) for 5 min</td>
</tr>
<tr>
<td>Composition in weight %:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Au 60%, Pd 20%, Pt 19%, Ir 1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZrO₂ (CARES® Abutments and IPS e.max® Abutments)</td>
<td>Dry heat</td>
<td>160 °C (320 °F) for 4 h</td>
</tr>
<tr>
<td>ZrO₂ (zerion®)</td>
<td>Autoclave, moist heat</td>
<td>134 °C (273 °F) for 5 min</td>
</tr>
<tr>
<td>PMMA with TAN inlay</td>
<td>Autoclave, moist heat</td>
<td>121 °C (250 °F) for 20 min</td>
</tr>
</tbody>
</table>

**Note**

Use devices directly after sterilization. Do not store sterilized devices. Consult the brochure “Guideline for Cleaning, Disinfection and Sterilization of Straumann® Implant-borne 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 °C (140 °F).
9. IMPORTANT GUIDELINES

Please note
Practitioners must have appropriate knowledge and instruction in the handling of the Straumann CAD/CAM 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 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.

Copyright and trademarks
Straumann® documents may not be reprinted or published, in whole or in part, without the written authorization of Straumann. Straumann® and/or other trademarks and logos from Straumann® mentioned herein are the trademarks or registered trademarks of Straumann Holding AG and/or its affiliates.

Explanation of the symbols on labels and instruction leaflets

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOT</td>
<td>Batch code</td>
</tr>
<tr>
<td>REF</td>
<td>Catalogue number</td>
</tr>
<tr>
<td>STERILE R</td>
<td>Sterilized using irradiation</td>
</tr>
<tr>
<td></td>
<td>Lower limit of temperature</td>
</tr>
<tr>
<td></td>
<td>Upper limit of temperature</td>
</tr>
<tr>
<td></td>
<td>Temperature limitation</td>
</tr>
<tr>
<td>Rx only</td>
<td>Caution: Federal law restricts this device to sale by or on the order of a dental professional.</td>
</tr>
<tr>
<td></td>
<td>Do not reuse</td>
</tr>
<tr>
<td></td>
<td>Non-sterile</td>
</tr>
<tr>
<td></td>
<td>Caution, consult accompanying documents</td>
</tr>
<tr>
<td></td>
<td>Use by</td>
</tr>
<tr>
<td></td>
<td>Keep away from sunlight</td>
</tr>
<tr>
<td></td>
<td>Straumann Products with the CE mark fulfill the requirements of the Medical Devices Directive 93/42 EEC</td>
</tr>
<tr>
<td></td>
<td>Consult instructions for use</td>
</tr>
</tbody>
</table>
Abutment
- Anatomic 48
- Cementable 98
- for bars 131
- Gold, for bridge 67
- Gold, for crown 55
- LOCATOR® 141
- Meso 48
- Multi-Base 113
- PLAN 45
- Straumann® Anatomic IPS e.max® Abutment 77
- Temporary (polymer with titanium alloy inlay) 24
- Temporary (titanium alloy) 31

Anchorage
- Cement-retained 6
- Screw-retained 6

Auxiliary
- Modelling aid 55, 67
- Polishing aid 158
- Scanbody for Sirona® System 90
- Stabilization pin 127

Connection 4

Healing Abutment
- Bottle shape 18
- Conical 16
- Customizable 22

Instrument
- Holding Key 160
- Ratchet 159
- SCS Screwdriver 157
- Service Instrument for Ratchet 160
- Torque Control Device for Ratchet 160

Planning
- PLAN Set/Abutment 45
- Pre-operative 12

Polymer
- Impression cap 102
- Healing Abutment 22
- Modelling aid 55, 67
- Protective Cap 103
- Temporary Abutment 24
- Temporary Coping 103

Prosthetics
- Abutment Overview 8
- Prosthetic options 6

Removable overdenture 6, 131, 141

Restoration
- Final 48, 55, 67, 77, 98, 113, 131, 141
- Temporary 24

Soft tissue management 15

Template
- Drill 13
- Thermoplastic drill 14
- Xray 12

Tightening torque 164