CEMENT-RETAINED CROWNS AND BRIDGES
WITH THE SOLID ABUTMENT SYSTEM

Straumann® Solid Abutment Prosthetic System
The ITI (International Team for Implantology) is academic partner of Institut Straumann AG in the areas of research and education.
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Restoring implants with solid abutments and constructing the superstructure

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INTRODUCTION

**Indications**
Solid abutments can be used in both anterior and posterior areas of the mouth for cement-retained crown and bridge restorations. The insertion depth of the implant should allow easy access for the removal of excess cement.

The restoration is very similar to the conventional method for fabricating crowns and bridges.

The superstructure is manufactured by the dental technician and cemented in the mouth by the dentist or prosthodontist.

**Features and Benefits**

**Reliable**
- Morse taper connection for a secure frictional fit
- High strength due to solid one-piece structure
- High quality prosthetic components supported by decades of success

**Simple**
- Prefabricated impression components to precisely transfer the oral situation
- Color-coded components for identification purposes
- Easy fixation of the superstructure

**Versatile**
- Restorations for NNC*, RN and WN implants
- Abutments can be modified to fit individual needs
- For crowns and bridges
- Various temporary restorations available

The impression-taking procedure in the dental practice and the construction of the superstructure in the dental laboratory depend on whether or not the abutment was modified.

The following techniques are possible:

**Option A** = Non-modified abutments

**Option B** = Modified abutments

* For information on the NNC solid abutment, please see brochure 15x.808 “Prosthetic Procedures for the Narrow Neck CrossFit® Implant”.

### WHO IS WHO IN THE SOLID ABUTMENT SYSTEM

<table>
<thead>
<tr>
<th>Transfer parts</th>
<th>RN (Regular Neck) Ø 4.8 mm</th>
<th>WN (Wide Neck) Ø 6.5 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>048.017V4</td>
<td>048.017V4</td>
<td>048.013</td>
</tr>
<tr>
<td>048.060/061/062V4</td>
<td>048.065/066</td>
<td></td>
</tr>
</tbody>
</table>

| Analogs | | |
|---------| | |
| 048.160/161/162 | 048.117V4 | 048.165/166 | 048.140 |

<table>
<thead>
<tr>
<th>Prosthetic restoration</th>
<th>cement-retained</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case planning (only V4)</td>
<td></td>
</tr>
<tr>
<td>048.926/927/928V4</td>
<td>048.938V4</td>
</tr>
</tbody>
</table>

| Abutments | | |
|-----------| | |
| 048.540   | 048.541   | 048.542 | 048.545 | 048.546 |

| Temporary restoration/Protective caps | | |
|--------------------------------------| | |
| 048.654••/655•• | 048.047/048/049V4 | 048.656••/657•• | 048.051/052 |

| Plastic copings | | |
|----------------| | |
| ••048.246     | •048.245      | ••048.248     | •048.247     |

- Crown
- Bridge
## AUXILIARY PARTS REQUIRED

### Parts for the dentist

<table>
<thead>
<tr>
<th>Art. No.</th>
<th>Article</th>
</tr>
</thead>
<tbody>
<tr>
<td>046.400/401/402</td>
<td>SCS screwdriver for ratchet</td>
</tr>
<tr>
<td>046.410/411/412</td>
<td>SCS screwdriver for handpiece</td>
</tr>
<tr>
<td>046.067/068</td>
<td>Solid abutment driver</td>
</tr>
<tr>
<td>046.119</td>
<td>Ratchet</td>
</tr>
<tr>
<td>046.049</td>
<td>Torque control device</td>
</tr>
<tr>
<td>046.064</td>
<td>Holding key</td>
</tr>
</tbody>
</table>

### Parts for the dental technician

<table>
<thead>
<tr>
<th>Art. No.</th>
<th>Article</th>
</tr>
</thead>
<tbody>
<tr>
<td>046.242</td>
<td>Guide pin for reamer 046.243, for RN solid abutment copings</td>
</tr>
<tr>
<td>046.244</td>
<td>Guide pin for reamer 046.243, for WN solid abutment copings</td>
</tr>
<tr>
<td>046.243</td>
<td>Reamer for 45° neck</td>
</tr>
<tr>
<td>046.240</td>
<td>Handle for reamer</td>
</tr>
</tbody>
</table>
PLACING THE ABUTMENT

Procedure

Initial situation
The pictures on the right show a Standard implant Ø 4.1 mm (Regular Neck Ø 4.8 mm) in position 44 (28) and a Standard implant Ø 4.8 mm (Wide Neck Ø 6.5 mm) in position 46 (30). Following successful osseointegration, the implants can be restored. Remove any debris from the head of the healing caps and use any length SCS screwdriver to loosen, lift, and remove them. The internal aspect of the implants must then be thoroughly cleaned and dried.

1. RN solid abutments (048.540/541/542) are inserted using a solid abutment driver (046.067/068). The WN solid abutments (048.545/546) are inserted using an SCS screwdriver (046.400/401/402/410/411/412).

Working outside of the mouth and over a sterile field, align the groove of the RN solid abutment with the line on the driver shaft and insert the abutment into the driver. (When placing WN solid abutments, an SCS screwdriver is used instead. The „star“ configuration of the screwdriver tip connects to the occlusal opening of the abutment, allowing it to be picked up.) Bring the abutment to the mouth with the appropriate driver and insert it into the implant. Use finger pressure to tighten it down.

1. Tightening torque = 35 Ncm
PLACING THE ABUTMENT

Procedure

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

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

4. 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 the 35 Ncm mark.

5. After reaching the 35 Ncm mark, return the torque bar to its starting position. Lift and remove the holding key, ratchet with torque control device, and the driver. The solid abutment is now in place and ready for the impression to be taken. Once the abutment has been torqued in, it should not be removed.

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

Important:
Once the impression has been taken, any removal or repositioning of the abutment will require a new impression to capture the change in location of the flat side.

Therefore, once an abutment is torqued in, it should not be removed after the impression is taken.

Important:
Tightening torque = 35 Ncm
**Initial situation**

An RN and a WN solid abutment were inserted into the implants and torqued to 35 Ncm [see the description on pages 6–7].

**Overview**

**Color-coding**

In order to facilitate identification, the transfer system is color-coded.

- **Accessories for RN solid abutment, height 4.0 mm = yellow**
- **Accessories for RN solid abutment, height 5.5 mm = grey**
- **Accessories for RN solid abutment, height 7.0 mm = blue**
- **Accessories for WN solid abutment, height 4.0 mm = green**
- **Accessories for WN solid abutment, height 5.5 mm = brown**

**Impression taking step-by-step**

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>RN Ø 4.8 mm</th>
<th>WN Ø 6.5 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>Place the impression cap over the abutment and snap it onto the implant shoulder. Slightly rotate the cap to ensure that it is properly seated.</td>
<td>RN solid abutments 048.540/541/542</td>
<td>WN solid abutments 048.545/546</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>Push the positioning cylinder through the impression cap, taking care to align the internal flat side of the positioning cylinder with the flat side of the solid abutment. Push it until it is flush with the impression cap.</td>
<td>RN positioning cylinder 048.060V4/061V4/062V4</td>
<td>WN positioning cylinder 048.065/066</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td>Take the impression and send it to the lab.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:**

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

**Caution:**

The plastic components are for single use only. They must not be sterilized. In order to prevent any damage to the plastic components (loss of elasticity or embrittlement) they must be protected from strong light or heat irradiation.
**TAKING THE IMPRESSION: OPTION A (NON-MODIFIED ABUTMENTS)**

**Procedure**

1. **Place the impression cap**
   Both the implant shoulder and the abutment must be cleaned of any blood or tissue prior to the impression procedure. If a WN solid abutment is used, the occlusal opening of the abutment must be sealed with wax or gutta-percha.
   
   The RN impression cap (048.017) or the WN impression cap (048.013) is pushed over the abutment, and onto the implant shoulder, until the cap “clicks” into place. The impression cap is turned gently in order to check that it is securely snapped onto the implant shoulder. When the cap is seated correctly, it can be rotated smoothly on the implant.

2. **Insert the positioning cylinder**
   Positioning cylinders have a flat-side indicator (external knob) to identify where the internal flat side is. Care should always be taken to align the flat side of the positioning cylinder with the flat side of the abutment. It is then pushed down over the abutment and through the impression cap.
   
   The positioning cylinder must be pushed down as far as it will go, until it is flat and flush against the impression cap.

3. **Take the impression**
   The impression is taken using an elastomeric impression material (polyvinylsiloxane or polyether rubber).

**Important:**
In order to avoid errors during the impression procedure, it must be ensured that the shoulder and the margin of the impression cap are not damaged.

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- **Important:**
  Due to its insufficient tensile strength, hydrocolloid is not suitable for this application.
Taking the impression: option B (modified abutments)

Overview

Initial situation
It is sometimes necessary to modify the shape or size of a solid abutment. A different impression procedure must be used in such cases. In this case, an RN solid abutment was inserted into the implant and torqued to 35 Ncm [see the description on pages 6–7].

Then the solid abutment was modified in the patient’s mouth by the dentist using an appropriate grinding wheel with sufficient irrigation. To help ensure proper stability and retention of the restoration, the solid abutment must maintain a minimum height of 3.0 mm.

Steps in impression-taking

<table>
<thead>
<tr>
<th>Steps in impression-taking</th>
<th>For implants with RN Ø 4.8 mm</th>
<th>For implants with WN Ø 6.5 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td><img src="048.540/541/542" alt="RN solid abutments" /></td>
<td><img src="048.545/546" alt="WN solid abutments" /></td>
</tr>
<tr>
<td>Place the impression cap</td>
<td><img src="048.017v4" alt="RN impression cap" /></td>
<td><img src="048.013" alt="WN impression cap" /></td>
</tr>
<tr>
<td>over the abutment and snap</td>
<td></td>
<td></td>
</tr>
<tr>
<td>it onto the implant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>shoulder. Slightly</td>
<td></td>
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</tr>
<tr>
<td>rotate the cap to ensure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>that it is properly</td>
<td></td>
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<tr>
<td>seated.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inject impression material</td>
<td></td>
<td></td>
</tr>
<tr>
<td>through the holes of the</td>
<td></td>
<td></td>
</tr>
<tr>
<td>impression cap, and take</td>
<td></td>
<td></td>
</tr>
<tr>
<td>the impression. Send it to</td>
<td></td>
<td></td>
</tr>
<tr>
<td>the lab.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note:
All parts of the solid abutment transfer system are supplied non-sterile. The parts can be disinfected as required using standard commercial disinfection agents for plastic products [refer to the manufacturer’s instructions].

Caution:
The plastic components are for single use only. They must not be sterilized. In order to prevent any damage to the plastic components (loss of elasticity or embrittlement) they must be protected from strong light or heat irradiation.
TAKING THE IMPRESSION: OPTION B (MODIFIED ABUTMENTS)

Procedure

**Important:**
In order to avoid errors during the impression procedure, it must be ensured that the shoulder and the margin of the impression cap are not damaged.

1. **Place the impression cap**
Both the implant shoulder and the abutment must be cleaned of any blood or tissue prior to the impression procedure. If a WN solid abutment is used, the remaining occlusal opening of the abutment must be sealed with wax and gutta-percha.

The RN impression cap (048.017) or the WN impression cap (048.013) is pushed over the abutment, and onto the implant shoulder, until the cap “clicks” into place. The impression cap is turned gently in order to check that it is securely snapped onto the implant shoulder. When the cap is seated correctly, it can be rotated smoothly on the implant.

2. **Take the impression**
Impression material is injected through the occlusal and lateral openings and an impression is taken.

An elastomeric impression material (polyvinylsiloxane or polyether rubber) is used for the impression procedure. Send it to the lab.

**Important:**
Due to its insufficient tensile strength, hydrocolloid is not suitable for this application.
TEMPORARY RESTORATION

Procedure

While the superstructure is being fabricated, the solid abutments must be temporized in some fashion. Keeping them covered will be more comfortable for the patient and also keep the abutments clean.

The use of temporary plastic copings [048.654/655/656/657] is recommended for the fabrication of crowns and small temporary bridges for creating an ideal emergence profile.

If the temporary restoration is intended only as a protective measure, protective caps [048.047/048/049/051/052] are ideal as an interim solution.

Initial situation

An RN solid abutment was inserted into the implant and torqued to 35 Ncm (see the description on pages 6–7). The impression is taken next, after which the abutment can be temporarily restored.

A) Restoration with temporary copings

1. Mark the appropriate height of the provisional restoration and modify the coping accordingly

Snap the temporary coping onto the corresponding analog and mark the appropriate height according to the individual clinical situation and the abutment used. The coping can then be shortened as necessary, using the vertical retention rings of the coping as a guide.

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

2. Fabricate the provisional restoration

If necessary, you can modify the margin of the coping. Then snap the temporary coping onto the implant shoulder and create the provisional restoration on the temporary coping according to standard techniques (e.g., prefabricated polycarbonate crowns or vacuum stents). The retention rings 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 implant shoulder.
3. Finalize fabrication of the provisional restoration
Remove the provisional restoration/temporary coping and place it back onto the analog. Grind down and polish the emergence profile of the coping and the restoration to achieve an even profile. To avoid tissue irritation, it is important to finish the interface until it's smooth and the coping is flush with the restoration. **Important:** The restoration must always be out of occlusion.

4. Remove the snap-on mechanism
**Important:** Remove the lip of the snap-on mechanism from the temporary coping by using the reamer instrument or a hand piece/rubber wheel. It is mandatory to remove the lip of the snap-on mechanism to allow proper extrusion of excess cement.

5. Cement the provisional restoration onto the abutment
Apply temporary cement to the inner part of the coping, and cement it onto the abutment and the implant shoulder. **Important:** Temporary copings must be attached with temporary cement. Adequate and secure attachment is only provided by the use of temporary cement. **Note:** Temporary copings must not be kept in the mouth longer than 30 days.

6. Use conventional techniques to remove the temporary coping with the attached provisional restoration (see package insert). **Important:** To prevent abutment shifting, provisional restorations must not be removed with rotational movements.

B) Restoration with protective caps
Only temporary cement should be used to secure the protective caps. **Important:** Protective caps are removed the same way as a temporarily cemented crown. In order to prevent any displacement of the abutment, the protective cap must not be removed using a rotary movement.
# Constructing the Superstructure: Option A

## Overview

### Initial situation
An RN and a WN solid abutment were inserted into the implants by the dentist and torqued to 35 Ncm (see the description on pages 6–7). The abutments were not modified. Then the impression was taken (pages 8–9) and sent to the dental laboratory.

### Steps in construction

<table>
<thead>
<tr>
<th>Step 1</th>
<th>For implants with RN Ø 4.8 mm</th>
<th>For implants with WN Ø 6.5 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select the appropriate analog. Align the flat side of the analog with the flat side of the positioning cylinder (captured in the impression). Insert the analog into the impression until it snaps (“clicks”) securely into place. Pour up in stone (extra hard stone, type 4).</td>
<td><img src="048.160/161/162" alt="RN analogs" /></td>
<td><img src="048.165/166" alt="WN analogs" /></td>
</tr>
<tr>
<td>Step 2</td>
<td>Select the appropriate coping (crown/bridge) and snap it (“click”) over the analog. Trim the height as necessary.</td>
<td><img src="048.245/246" alt="RN plastic copings" /></td>
</tr>
<tr>
<td>Step 3</td>
<td>The framework is then modeled in the usual way.</td>
<td><img src="048.245/246" alt="RN plastic copings" /></td>
</tr>
<tr>
<td>Step 4</td>
<td>After fabrication, the final restoration is delivered to the doctor. It is placed over the solid abutment with permanent cement.</td>
<td></td>
</tr>
</tbody>
</table>

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

### Caution:
The plastic components are for single use only. They must not be sterilized. In order to prevent any damage to the plastic components (loss of elasticity or embrittlement) they must be protected from strong light or heat irradiation.
CONSTRUCTING THE SUPERSTRUCTURE: OPTION A
(NON-MODIFIED ABUTMENTS)

Procedure

1. Casting the model
The color of the positioning cylinder in the impression identifies which analog must be used. In the laboratory, the corresponding analog (048.160/161/162/165/166) is positioned in the impression. Care should be taken to properly align the flat side of the analog with the flat side of the positioning cylinder. The analog is then pushed into the impression until it snaps securely into place.

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

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

2. Place the plastic coping
The plastic coping is selected in accordance with the planned superstructure: 048.245 for crowns RN, 048.246 for bridges RN, 048.247 for crowns WN, 048.248 for bridges WN.

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

Important:
Cusps must not be over-contoured as this may lead to non-physiological loading. Wide Neck implants Ø 6.5 mm are recommended for the molar region, provided that sufficient bone is available, since this allows for optimal shaping of the crown.

For all Regular Neck implants Ø 4.8 mm, the crowns must be reduced to the size of premolars – this reduces the risk of non-axial loading and diminishes plaque accumulation due to over-contouring.

3a. Wax up and cast the framework
The framework is waxed up using the conventional technique and cast in a high-gold alloy.
CONSTRUCTING THE SUPERSTRUCTURE: OPTION A
(NON-MODIFIED ABUTMENT)

Procedure

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

• Burn-out plastics are characterized by the fact that they swell up when they are burned out. For that reason, it is important that the outside of the plastic coping is completely covered with wax. The wax burns off and therefore creates sufficient space in the mold for expansion when burned out in the oven. There must be a wax layer of at least 0.3 mm in the marginal region (caution: do not wax above the delicate margin).

• If there is insufficient waxing in the marginal region of the coping, there is a risk that the frustum will break in the interior of the invested coping, due to the effects of the expansion of the plastic in the mold. This can result in a casting error.

• To avoid casting errors due to wax particles, insulating agents, etc., careful cleaning of the interior and the inside and outside of the delicate edge of the coping prior to investment (e.g. with a cotton bud soaked in alcohol) is recommended.

• The sprues must encourage elimination of the wax and plastic and must not impede the direction of flow of the alloy (i.e. there should be no sharp angles or edges). Follow the investment material manufacturer’s recommendations on the selection and positioning of sprues.

• Do not use wax wetting agents, if possible. The plastic is so smooth that the investment material will fill all the fine contours of the coping’s interior very well during investment (with the aid of a fine blunt instrument or a fine brush). However, if wetting agents are utilized, ensure that no aggressive wetting agents are used which could attack the surface of the plastic copings. Then blow-dry the copings carefully with compressed air. Wetting agent residues can lead to a reaction with the investing material and thus to casting errors.
CONSTRUCTING THE SUPERSTRUCTURE: OPTION A (NON-MODIFIED ABUTMENTS)

Procedure

• The use of phosphate-bonded investment materials that allows a staged burn-out is recommended. These must be matched with the alloy used.

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

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

• Use only high gold content alloys, and refer to the alloy manufacturer’s alloy tables.

General casting tips for plastic copings

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

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

Never use sand-blasting for devesting.
This would destroy the fine margins and the internal configuration, which would lead to reduced accuracy of the fit (poor marginal fit and rotation of the copings).

Important:
Casting defects like insufficient discharge, casting beads or casting flashes considerably affect the precision of the prefabricated parts and jeopardize the long-term success of the restoration. The work then has to be repeated.
CONSTRUCTING THE SUPERSTRUCTURE: OPTION A
(NON-MODIFIED ABUTMENT)

Procedure

3b. Remove the snap-on mechanism

The plastic copings for solid abutments are fitted with a “snap-on mechanism,” which makes it easy to fit the plastic coping on the analog. This allows the plastic copings to be perfectly positioned and fixed on the analog and therefore makes the modeling process easier.

However, once the coping has been cast, the snap-on mechanism no longer works, because unlike plastic, the casting alloy has no elasticity. Following the casting, this “snap-on mechanism” must be removed using the finishing instrument (046.243) or a rubber/silicone wheel polisher before the cast coping is placed on the analog. Working under a stereo microscope is recommended.

Important:
The “snap-on mechanism” must be completely removed after casting using the finishing instrument (reamer) and working under a stereo microscope, otherwise it will not be possible to position the construction on the analogs and implants.

Tip

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

Important:
The finishing instrument (reamer) does not have an automatic stopping mechanism. Only remove as much as is necessary, until the protruding lip is flush with the implant shoulder. Then the crown can be placed on the analog.
CONSTRUCTING THE SUPERSTRUCTURE: OPTION A (NON-MODIFIED ABUTMENTS)

Procedure

In order to remove the “snap-on mechanism”, a finishing instrument (reamer) with various guide pins is available.

The following three items are required:

<table>
<thead>
<tr>
<th>Article</th>
<th>Art. No.</th>
</tr>
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<tbody>
<tr>
<td>© Guide pin for RN solid abutments</td>
<td>046.242</td>
</tr>
<tr>
<td>or Guide pin for WN solid abutments</td>
<td>046.244</td>
</tr>
<tr>
<td>© Reamer for 45° neck</td>
<td>046.243</td>
</tr>
<tr>
<td>© Handle</td>
<td>046.240</td>
</tr>
</tbody>
</table>
CONSTRUCTING THE SUPERSTRUCTURE: OPTION A (NON-MODIFIED ABUTMENT)

Procedure

3c. Finish and veneer the framework

The final processing of the frame is then carried out and the facing is built up according to the anatomical guidelines, allowing for premolarization (exception: Wide Neck). The “freedom in centric” concept should be used for the occlusion as described below.

The concept of “freedom in centric”

Natural teeth are suspended elastically in the alveolar bone by the periodontium. In comparison, implants are retained rigidly as they undergo ankylosis with the bone. Loads exerted on implant-borne crowns and bridges are transferred directly into the bone. Wherever possible, these loads should be transferred during a physiological movement, i.e., by a correctly designed occlusion, as the integrated implants may be disturbed by inadequately designed occlusal surfaces. The “freedom in centric” concept is ideal for the occlusion for implant-borne bridge-work. “Freedom in centric” involves the creation of an area of approximately 1 mm² which permits lateral freedom of approximately 1 mm in habitual intercuspidation. This surface permits the cusps to slide smoothly between the retruded contact position and maximum intercuspidation. The position of maximum intercuspidation is considered to be the centric occlusion.

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

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

Overview

Initial situation
An RN solid abutment was inserted into the implant by the dentist and torqued to 35 Ncm (see the description on pages 6–7). The abutment is modified. Then the impression was taken (pages 10–11) and sent to the dental laboratory.

Important:
With modified abutments, the RN and WN analogs (048.160/161/162/165/166) cannot be used to make the working model.

<table>
<thead>
<tr>
<th>Steps in construction</th>
<th>For implants with RN Ø 4.8 mm</th>
<th>For implants with WN Ø 6.5 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Snap (“click”) the appropriate shoulder analog onto the impression. Trim the length of the reinforcement pin as necessary. Pour up half way in stone, insert reinforcement pin, finish pouring up in stone.</td>
<td></td>
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<tr>
<td><strong>Step 2</strong></td>
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<tr>
<td>The framework is cast without plastic copings using the conventional technique.</td>
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<td></td>
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<tr>
<td><strong>Step 3</strong></td>
<td></td>
<td></td>
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<tr>
<td>After fabrication of the restoration, the final superstructure is delivered to the doctor. It is placed over the solid abutment with permanent cement.</td>
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</tr>
</tbody>
</table>

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

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

In the laboratory, the RN shoulder analog (048.117) or the WN shoulder analog (048.140) is repositioned in the impression; the shoulder analog must **audibly click into place**. The shoulder analog is turned gently in order to check that it has been snapped on securely. When the shoulder analog has been placed correctly, it can be rotated smoothly. The shoulder analog (048.117V4) comes with a reinforcement pin that can be used when casting the model (exception: WN shoulder analog does not require a pin). The pin strengthens the plaster die in order to reduce the risk of die breaking. It should be used in all cases.

**Hint**

Where there are markedly divergent abutments, we recommend pouring the die with modeling resin, in order to reduce the risk of breakage. The use of the reinforcement pin is also possible with modeling resin (any possible contraction of the modeling resin is minimized by the material reduction).

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

The working model is cast using type 4 extra hard stone plaster. The impression is filled as far as the implant shoulder in the region of the abutments. The tip of the reinforcement pin is dampened with plaster and is then pushed as far as it will go into the still liquid plaster by a gentle rotational movement. The remainder of the impression is then filled.
CONSTRUCTING THE SUPERSTRUCTURE: OPTION B (MODIFIED ABUTMENTS)

Procedure

**Important:**
The reinforcement pin is automatically sized to match the length of the 7.0 mm solid abutment. Therefore, the tip of the pin must be shortened for use with the shorter abutments (4.0 and 5.5 mm).

There are 2 notches located at the tip of the pin:
First notch = 5.5 mm
    RN solid abutment
Second notch = 4.0 mm
    RN solid abutment
The pin should be trimmed accordingly until the rectangular end of the pin fits flat and flush against the shoulder analog.

2. **Construct the superstructure**
The subsequent procedure is identical to the procedure for conventional crown and bridge work.
The modeling is carried out and the facing is built up in accordance with the same guidelines (premolarization, axial loading, “freedom in centric”) as described for Option A on page 20.

**Important:**
The prefabricated plastic copings cannot be used to construct the superstructure on modified abutments.

**Additional information**
In the event that the implant shoulder has been modified, it is then necessary to take a direct impression of the abutment.
No auxiliary components can be used when there are modifications to the implant shoulder. In this case, the impression procedure and the model casting are carried out in the conventional way using injection molding and an individual impression procedure.

**Note:**
In the case of the WN solid abutment, the occlusal opening must be sealed with wax or gutta-percha prior to the impression procedure.

The procedure is identical to that for natural teeth. The modeling is carried out and the facing is built up in accordance with the same guidelines (premolarization, axial loading, “freedom in centric”) as described for Option A on page 20.

**Important:**
Modifying the implant shoulder is not recommended and should only be done when it is absolutely necessary.
IMPORTANT GUIDELINES

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

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

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

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

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

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

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

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Explanation of the symbols on labels and instruction leaflets

<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>
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<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>CE</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>