PROSTHETIC PROCEDURE for HG IMPLANT SYSTEM
PROSTHETIC PROCEDURE for HG IMPLANT SYSTEM
Cement retained restoration

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HG Cover screw

**Feature & benefit**

- Coloring convenient for installation position verification at second surgery.
- Feature composition according to the installation depth of the fixture
- Tightening torque: manual (about 5~8Ncm)

---

**For mini fixture**

- Purple

**For standard fixture**

- Green

---

(Fixture Ø3.5)  (Fixture Ø4.0, Ø4.5, Ø5.0, Ø6.0, Ø7.0)
HG Healing abutment

**Feature & benefit**
- Wide range of application and emergence profile that is advantageous for keeping a design.
- Common use of mini/standard for Ø4.0.

**Selection method**
- After checking the inter-occlusal space between the opposing tooth select a height that leaves 1-2 mm exposure above the gingiva.
- Select a diameter similar to the abutment that will be used.
- Generally, it is convenient to connect the abutment when using a 0.5 mm larger diameter.
- Tightening torque: manual (about 5-8Ncm)

<table>
<thead>
<tr>
<th>Standard</th>
<th>Mini</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hₘₜ</td>
<td>4.0</td>
</tr>
<tr>
<td>Hₜ</td>
<td>2.5</td>
</tr>
<tr>
<td>Hₘ</td>
<td>6.0</td>
</tr>
<tr>
<td>Hₜ</td>
<td>4.5</td>
</tr>
<tr>
<td>Hₘₜ</td>
<td>8.0</td>
</tr>
<tr>
<td>Hₜ</td>
<td>6.5</td>
</tr>
</tbody>
</table>

|Common use of Ø4.0 Healing abutment for mini/standard fixture|
HG Rigid abutment

• Indication
  - Single/bridge/full arch restorations
  - All position
  - Only cement retained restoration

• Contraindication
  - Misalignment bridge case
  - Over angulated case

• Feature & benefit
  - Snap on impression at abutment level
  - Abutment design reflecting the tooth position/restorative prosthesis
  - Margin esthetic effect with gold coloring

• Tightening torque
  - 30 Ncm
## Product list for prosthetic procedure

<table>
<thead>
<tr>
<th>Product list</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abutment</td>
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<tr>
<td>Protect cap</td>
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<tr>
<td>Impression coping</td>
</tr>
<tr>
<td>Lab analog</td>
</tr>
<tr>
<td>Burn-out cylinder</td>
</tr>
<tr>
<td>Finishing reamer</td>
</tr>
<tr>
<td>Driver</td>
</tr>
<tr>
<td>Torque wrench</td>
</tr>
</tbody>
</table>

- Exclusive matching components for each rigid abutment of 4/5.5/7mm height.
  - Every component can be verified by color as 4mm-yellow, 5.5mm-gray, 7mm-blue.
  - Essential to check the color before using the impression coping/lab analog.
- Common use of 1.2 hex driver/outer driver with the exception of ø4.0 diameter.
  - Possible to gain an extra-stable connection by using an outer driver. (Use ø4.0-only outer driver)
Note for prosthetic process

Abutment diameter selection

- The rigid abutment has 4/5.5/7mm height, and besides to the 1/2/3/4/5mm gingival height there are a variety of margin diameters as Ø4.0/Ø4.5/Ø5.0/Ø6.0/Ø7.0 considering the prosthesis for each tooth position. It is possible to conveniently fabricate an esthetic prosthesis by referring to the recommendation table below.

<table>
<thead>
<tr>
<th>Position</th>
<th>Rigid abutment diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ø4.5</td>
</tr>
<tr>
<td></td>
<td>Ø4.0</td>
</tr>
<tr>
<td></td>
<td>Ø5.0/Ø6.0/Ø7.0</td>
</tr>
</tbody>
</table>

Mini/Standard abutment

- The Ø4.0/Ø4.5 feature has identical diameter but the applied fixture is differentiated into mini/standard. It is essential to verify the fixture that has been placed and use a correct abutment.
DENTAL CLINIC WORKING

When abutment reduction is unnecessary

Step 1 Healing abutment separation

Components & tools

Prosthetic procedure

Separate the Healing abutment with hand force using a 1.2 hex hand driver.

Healing abutment verification

Gently separate the Healing abutment with hand force.
Step2  Abutment selection and connection

Rigid abutments & tools

Prosthetic procedure

Select an appropriate abutment considering the prosthesis and oral environment of the patient and connect it using a 1.2 hex torque or outer driver set at 30Ncm. Always verify the exactness of the connection by taking an x-ray after the final connection of the abutment.

Connect with a 1.2 Torque driver

Connect with a Outer driver

Attached Rigid abutment
Step 3  Impression

Rigid impression copings

Prosthetic procedure

Select an impression coping of identical features with the abutment and press with your hand to connect. Do not forget to use an abutment height of 4/5.5/7 mm and exclusive impression coping. After connecting the coping, take an impression following the conventional method using a ready made tray.
Step 4  Protect cap connection and fabrication of the temporary prosthesis.

Rigid protect caps

Prosthetic procedure

After taking the impression, press the protect cap on until the prosthesis is completed. If temporary prosthesis is necessary, it is convenient to customize the protect cap to make a temporary prosthesis.
Step 5  Working model fabrication

Rigid lab analogs

Prosthetic procedure

Check the color of the impression coping in the impression body and connect a matching lab analog. Apply separator around the analog and replicate the gingival area with exclusive material. Use the border of the lab analog as a reference line. Pour dental stone following the conventional method to complete a working model.
Step 6 Burn-out cylinder connection wax-up & casting

Rigid burn-out cylinders & tools

You can fabricate a prosthesis with precise fit using a burn-out cylinder. Press to connect the appropriate burnout cylinder for single/bridge according to the lab analog of the working model. After reduction and modification of the burnout cylinder, proceed with the wax-up and casting procedures following the conventional method. Use a reamer tip of identical diameter with the abutment to reduce the margin of the casting body until no further reaming is possible, then check the fit of the prosthesis.
Step 7 Prosthesis setting

After checking the prosthesis that has arrived from the lab, remove the temporary prosthesis or protect cap from the mouth. Set the final prosthesis.

![Final setting of the prosthesis](image-url)
Step 1 Abutment connection ~ casting

When the vertical dimension or path is not suitable after connecting the rigid abutment, it can be modified to solve this problem. (When much modification is necessary, use a FreeForm (ST) or Angled abutment) It is possible to alter the path intra-orally and take a direct impression for conventional prosthesis fabrication, in this case, inferior margin fit and over-reduction of the abutment may occur. If you use the components for the prosthesis fabrication procedure as below, an exact prosthesis will be completed.
Step 2  Lab analog reduction ~ prosthesis setting

- Margin reaming (Only precious alloy)
- Check the fit between the casting body and lab analog
- Lab analog reduction
- Connected casting body
- Completed porcelain prosthesis
- Guide cap fabrication
- Intra-oral guide cap setting and reduction
- Final prosthesis setting
Proper use of Torque wrench and Reamer

Proper usage of Torque wrench

1. Check the torque guide of the abutment (ex. Transfer abutment mini - 20Ncm)
2. Set a tightening torque at the lower part of the Torque wrench.
   *Exactly corresponding to the marking Line.
3. After connecting the Torque wrench and Torque driver, exactly position it on the screw head.
   * When connecting: ‘IN’, when removing: ‘OUT’ should be facing upwards.
4. Press the upper part of the Torque driver and rotate in the direction of the arrow until the neck of the Torque wrench is bent. **After the neck is bent**, stop applying pressure. Over torque can occur when the force is continued.

Proper usage of Reamer

1. After verifying the diameter of the abutment prepare the appropriate reamer tip for connection.
2. After fixing the reamer tip to the prosthesis, turn the reamer bite in the direction of the blade to cut the tip.
3. Continue reaming until the tip is completely removed.
   * The reamer cannot be used for nonprecious metal prosthesis, so use the laboratory bur and rubber point to remove the tip.
HG Transfer abutment

• **Indication**
  - Single/bridge/full arch restorations
  - All position
  - Cement/combi retained restoration

• **Contraindication**
  - When large amounts of abutment modification is necessary.

• **Feature & benefit**
  - A structure of abutment and screw that is more convenient to repair and maintain than Rigid abutment.
  - A design that minimizes customizing.
  - Two types of impression taking possible: Fixture level/abutment Level
  - Margin esthetic effect of gold coloring.

• **Tightening torque**
  - Mini: 20Ncm
  - Standard: 30Ncm
### Product list for prosthetic procedure

#### For fixture level impression

<table>
<thead>
<tr>
<th>Product list</th>
<th>Abutment</th>
<th>Abutment screw</th>
<th>Impression coping</th>
<th>Lab analog</th>
<th>Driver</th>
<th>Torque wrench</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Transfer Type</strong></td>
<td><img src="image1.png" alt="Image 1" /></td>
<td><img src="image2.png" alt="Image 2" /></td>
<td><img src="image3.png" alt="Image 3" /></td>
<td><img src="image4.png" alt="Image 4" /></td>
<td><img src="image5.png" alt="Image 5" /></td>
<td><img src="image6.png" alt="Image 6" /></td>
</tr>
<tr>
<td><strong>Pick-up Type</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- When taking a fixture level impression the abutment is selected on a working model, so the chair time is decreased. Both transfer/pick-up impression is possible and can be selected depending on the preference of the operator or case condition. When many implants have been placed, or the path is excessively deflected, tray may not be separable from the impression after taking a pick-up type. Thus, using transfer type is recommended.
Product list for prosthetic procedure

For abutment level impression

<table>
<thead>
<tr>
<th>Product list</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abutment</td>
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<tr>
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</tr>
<tr>
<td>Driver</td>
</tr>
<tr>
<td>Torque wrench</td>
</tr>
</tbody>
</table>

- When reducing the transfer abutment is unnecessary, an impression may be taken at the abutment level as with a rigid abutment. At this time, Transfer abutment is compatible with rigid component.
Note for prosthetic process

Abutment diameter selection

- The Transfer abutment has 4/5.5/7mm height, and besides the 1/2/3/4/5mm gingival height there are a variety of margin diameters as Ø4.5/Ø5.0/Ø6.0/Ø7.0 considering the prosthesis for each tooth position. It is possible to conveniently fabricate an esthetic prosthesis by referring to the recommendation table below.

<table>
<thead>
<tr>
<th>Position</th>
<th>Transfer abutment Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ø4.5</td>
</tr>
<tr>
<td></td>
<td>5.0/Ø6.0/Ø7.0</td>
</tr>
</tbody>
</table>

Abutment level impression

- With a Rigid abutment it is easy to fabricate a temporary prosthesis/abutment level impression and has exact and convenient prosthesis components which make it advantageous for producing an internal submerged type prosthesis. But it is easy to repair the prosthesis when various problems occur. When using a transfer abutment the screw hole makes it easier to solves these problems. The Rigid abutment and Transfer abutment have an identical upper margin design which makes it possible to use the same impression and prosthesis components, even when the transfer abutment which is easy to repair is used. The prosthetic procedures are carried out in the same manner. (For exception, the same concept can not be applied when abutment modification is necessary and for diameter(D) Ø5.0, height(H) 7mm features.)
Step 1  Healing abutment separation

Components & tools

Prosthetic procedure

Separate the Healing abutment using a 1.2 Hex hand driver.

Healing abutment verification  Gently separate the Healing abutment with hand force.
Predict the diameter and type (Hex, Non-Hex) of the abutment to be used and select an impression coping that will be connected using a 1.2 Hex hand driver with hand force. When the vertical dimension is insufficient apply the short feature. We recommend you to block-out the driver hole of the impression coping. It is essential to take a periapical X-ray to verify the exactness of the impression coping connection.
Step 3 Impression taking & lab analog connection

First inject impression material around the impression coping to take an impression. Remove the impression body from the mouth after the impression material has set. Then, separate the impression coping from the removed impression body. Connect a fixture lab analog and impression coping of identical connection. Check the triangle-circle structure replicated on the impression and match the internal surface of the coping to reconnect it as it was before impression taking. Remember to check whether the setting is exact after connection.
Step 4  Working model fabrication & abutment selection

Transfer abutments

Prosthetic procedure

Select and connect an abutment with suitable features considering gingiva height and interocclusal relationship. The path and position of margin can be modified at the lab following orders from the clinic.

Completed working model
Connect the selected abutment
**Step5  Wax-up ~ porcelain build-up**

When adjustment of the abutment is completed, proceed with wax-up to casting following conventional methods, and porcelain build up in case of a PFM. Generally, pattern resin that shows little contraction is used for cap fabrication and wax-up is followed.

- Resin-cap fabrication
- Full wax-up
- Cut-back
- Casting
- Porcelain firing
- Completed prosthesis
Step6 Fabrication of transfer jig

When the prosthesis is finished a transfer jig is made to transfer and connect the abutment on the model inside the mouth in the same condition. It is especially important when using the HG system, which is relatively hard to exactly transfer the abutment. It is mandatory for non-hex abutment, and even when using a hex type the jig helps you to exactly settle and verify the abutment in the clinic. Remove the gum on the model, and make it with pattern resin after cleansing the abutment surface.
Step 7  Prosthesis setting

Tools

Prosthetic procedure

Connect the abutment intra-orally in the same condition using a Transfer Jig. Take a periapical x-ray to check the connection of the abutment. Set the tightening torque at 20Ncm for a mini abutment and 30 Ncm for standard and tighten the screw.

Abutment connection using a jig  Abutment screw tightening  Final prosthesis setting
Step 1 Abutment connection ~ wax-up

If the fixture path is good and Transfer abutment reduction is unnecessary, the components for the Rigid abutment can be used for a abutment level impression and prosthesis fabrication.
Step 2  Casting ~ prosthesis setting

Cut-back  Margin reaming  Connected casting body

Completed prosthesis  Final prosthesis setting
HG
Angled
abutment

• Indication
  - Single/bridge restorations
  - When path modification is necessary.
  - Cement/Combi retained restoration

• Contraindication
  - Posterior bridge crown (Only Angled abutment)

• Feature & benefit
  - 17° Axial angulation
  - Minimize the amount of reduction with A/B two hex types
  - Margin esthetic effect with gold coloring

• Tightening torque
  - Mini : 20Ncm
  - Standard : 30Ncm
Product list for prosthetic procedure

<table>
<thead>
<tr>
<th>Product list</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Abutment selector</td>
<td></td>
</tr>
<tr>
<td>Abutment</td>
<td></td>
</tr>
<tr>
<td>Abutment screw</td>
<td></td>
</tr>
<tr>
<td><strong>Impression coping</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Lab analog</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Driver</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Torque wrench</strong></td>
<td></td>
</tr>
</tbody>
</table>

- When using a hex type abutment the internal hex structure of the fixture can cause interference between the Angled abutment and adjacent teeth and tissue. Before selecting an angled abutment at the clinic or lab, choose an appropriate A/B Hex type using a selector to minimize reduction during prosthesis fabrication.
Note for prosthetic process

Path modification with Angled abutment

- In cases such as the anterior part where path modification according to anatomical structure and path compensation for bridge crown misalignment is necessary, the Angled abutment can be useful. The HG Angled abutment has a 17° axial taper and 6° tapered body which allows path compensation up to 23° without abutment reduction. But the single use of an angled abutment for the restoration of a posterior bridge case is prohibited since over cantilever force may be produced.

<table>
<thead>
<tr>
<th>Angle</th>
<th>10°</th>
<th>17°</th>
<th>23°</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design concept</td>
<td>Posterior 1° milling</td>
<td>No undercut</td>
<td>No undercut</td>
</tr>
</tbody>
</table>

Application of Angled abutment selector.

- The HG angled abutment has two directions: A/B. This enables choosing an appropriate direction after the abutment has been connected; thus enabling the minimization of the amount of reduction.
- An abutment with an appropriate direction may be chosen intra-orally or on the model using an angled abutment selector.
Step 1  Healing abutment separation

Components & tools

Prosthetic procedure

Separate the Healing abutment using a 1.2 Hex hand driver.

Verification of Healing abutment  Gently separate the Healing abutment with hand force.
Step2  Abutment type selection

Angled abutment selectors

Prosthetic procedure

When applying a hex type abutment by using an abutment selector, you can choose an appropriate abutment in the lab or clinic. When selecting an abutment at the clinic connect both the A/B selector and decide a feature before taking an impression and at the lab try it on the working model.

Good

A type selector connection (good)  B type selector connection (not-good)
Step3  Impression

Fixture transfer impression copings

Hex  Non-hex  Short  Long

Ø4.0  Ø4.0  Ø6.0
Mini  Standard
Fixture transfer impression coping

Mini  Standard  05.0
Fixture lab analog

Prosthetic procedure

Predict the diameter and type (hex, non-hex) of the abutment to be used and select an impression coping that will be connected using a 1.2 Hex hand driver with hand force. When the vertical dimension is insufficient, apply the short feature. We recommend you to block-out the driver hole of the impression coping. It is essential to take a periapical x-ray to verify the exactness of the impression coping connection.
Step 4  Working model fabrication & abutment selection

Angled abutments

Prosthetic procedure

Make a working model from the impression body following the conventional method and connect the abutment. If the abutment hex type has not been selected at the clinic it is possible to do it with a selector on the model. By choosing the correct abutment the amount of reduction will be minimized and quick and exact prosthesis fabrication is made possible.

Good

A type selector connection (good)  B type selector connection (not-good)  Connect the selected abutment
Step 5  Abutment modification ~ porcelain build-up

Eliminate the undercut area with a stone wheel and adjust the abutment. Complete the conventional steps from wax-up to casting, and in the case of a PFM, porcelain build up.
Step6  Prosthesis setting

Prosthetic procedure

Connect the abutment intra-orally after verifying the abutment direction on the model. Take a periapical x-ray to check the connection of the abutment. Set the tightening torque at 20 Ncm for a mini abutment and 30 Ncm for standard and tighten the screw.
HG
ZioCera
abutment

- Indication
  - Single/bridge restorations
  - Anterior area
  - Cement/Screw retained restoration

- Contraindication
  - Molar area crown & bridge

- Feature & benefit
  - Zirconia material of superior strength and biocompatibility
  - Straight/17° angled two types that are more convenient for the operator.
  - A design that minimizes customizing.
  - Natural dentin color abutment shade establishment
  - A design easy to customize

- Tightening torque
  - Mini : 20Ncm
  - Standard : 30Ncm
### Product list for prosthetic procedure

<table>
<thead>
<tr>
<th>Product list</th>
</tr>
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<tbody>
<tr>
<td>Abutment</td>
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<tr>
<td>Abutment screw</td>
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<td>Lab analog</td>
</tr>
<tr>
<td>Driver</td>
</tr>
<tr>
<td>Torque wrench</td>
</tr>
</tbody>
</table>

- In such cases as the maxillary anterior portion where abutment path modification is necessary because of anatomical structures, by using the angled type ZioCera abutment you can minimize abutment customizing and make it easier to apply a screw type prosthesis. The straight type ZioCera abutment enables free customization to various shapes when abutment path modification is unnecessary.
Note for prosthetic process

Cement retained type restoration with ZioCera abutment

- The zirconia abutment is usually used as a scaffold structure for all ceramic prostheses of the cement-retained type.

After customizing the abutment on the working model using an exclusive bur for zirconia, fabricate an appropriate inner ceramic crown considering the condition of the patient and use the exclusive porcelain powder for buildup to gain the most aesthetic implant prosthesis. When reducing the abutment, use a bur exclusive for zirconia that is not rough. Spray water or wet the abutment during the procedure.

Screw retained type restoration with ZioCera abutment

- When there is 1~1.5mm space between the adjacent tooth after abutment connection you can fabricate a screw retained type prosthesis using a ZioCera abutment. In case of a screw retained type, there is no need of a coping, making it an economical and quick prosthesis fabrication is possible. In such cases as the maxillary anterior portion where an angled abutment is necessary because of anatomical structures, by using an angled ZioCera abutment it is more convenient to fabricate a screw retained type prosthesis.

(However, the porcelain must be zirconia exclusive powder.)
Step 1  Healing abutment separation

Components & tools

Prosthetic procedure

Separate the Healing abutment using a 1.2 Hex hand driver.

Healing abutment verification  Gently separate the Healing abutment with hand force.
Step 2  Impression

**Fixture transfer impression coping**

<table>
<thead>
<tr>
<th>Hex (Ø4.0)</th>
<th>Non-hex (Ø4.0)</th>
<th>Short (Ø5.0)</th>
<th>Long (Ø6.0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mini</td>
<td>Standard</td>
<td>Mini</td>
<td>Standard</td>
</tr>
<tr>
<td>Fixture transfer impression coping</td>
<td>Fixture lab analog</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Prosthetic procedure**

Predict the diameter and type (hex, non-hex) of the abutment to be used and select an impression coping that will be connected using a 1.2 Hex hand driver with hand force. When the vertical dimension is insufficient apply the short feature. We recommend you to block-out the driver hole of the impression coping. It is essential to take a periapical x-ray to verify the exactness of the impression coping connection.
Step 3  Working model fabrication & abutment selection

ZioCera & ZioCera Angled abutments

Prosthetic procedure

Make a working model from the impression body following the conventional method and connect the abutment. Check the path on the model and select an appropriate abutment. Since the ZioCera abutment is more difficult to customize than the titanium abutment, it is important to minimize tool wear and reduce time by choosing the correct abutment.
**Step 4  Abutment modification ~ porcelain build-up**

Unlike the titanium abutment you must use exclusive polishing tools for ZioCera abutment customizing. Use a soft-/medium-level bur and reduce the thermal shock by spraying water or wetting the abutment. The ZioCera abutment is for all ceramics; thus, unlike PFM, fabricate a ceramic coping. Fabricate an appropriate ceramic coping considering the adjacent space and transparency and complete the final prosthesis with porcelain exclusive for the corresponding coping.
Step 5  Prosthesis setting

Tools

<table>
<thead>
<tr>
<th>Short</th>
<th>Long</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2 hex torque driver</td>
<td></td>
</tr>
</tbody>
</table>

Torque wrench

Prosthetic procedure

Connect the abutment intra-orally after verifying the abutment direction on the model. Take a periapical x-ray to check the connection of the abutment. Set the tightening torque at 20 Ncm for a mini abutment and 30 Ncm for standard and tighten the screw.

Abutment connection  Abutment screw tightening  Final prosthesis setting
Step 1  Healing abutment separation

Components & tools

Prosthetic procedure

Separate the Healing abutment using a 1.2 Hex hand driver.

Healing abutment verification

Gently separate the Healing abutment with hand force.
Step 2  Impression

**Fixture pick-up impression coping**

<table>
<thead>
<tr>
<th>Hex</th>
<th>Non-hex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short</td>
<td>Long</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ø4.0</th>
<th>Ø4.0</th>
<th>Ø5.0</th>
<th>Ø6.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mini</td>
<td>Standard</td>
<td>Fixture pick-up impression coping</td>
<td></td>
</tr>
</tbody>
</table>

**Prosthetic procedure**

Prepare a custom open tray and predict the diameter and type (hex, non-hex) of the abutment to be used and select an impression coping. Connect the guide pin using a 1.2 Hex hand driver with hand force. It is essential to take a periapical x-ray to verify the exactness of the impression coping connection. First inject impression material around the hole of the upper part of the coping and separate the impression body by loosening the guide pin after the material has set. Connect a fixture lab analog of identical connection.
Step 3  Working model manufacture & abutment selection

ZioCera & ZioCera Angled abutments

Prosthetic procedure

Make a working model from the impression body following the conventional method and connect the abutment. Check the path on the model and select an appropriate abutment. Since the ZioCera abutment is more difficult to customize than the titanium abutment, it is important to minimize tool wear and reduce time by choosing the correct abutment.
Step 4  Abutment modification ~ porcelain build-up

After customizing the ZioCera abutment when the space left between the opposing tooth and adjacent tooth is less than 1~1.5mm you can fabricate a screw retained type prosthesis using zirconia exclusive porcelain. In this case, unlike the cement retained type, there is no need to make a separate ceramic coping so the prosthesis fabrication procedure is economical and quick. When the porcelain thickness exceeds 2mm the porcelain may crack and then a cement retained type prosthesis must be made.
Step5 Prosthesis setting

Tools

Prosthetic procedure

Connect the prosthesis considering the contact point of the adjacent teeth. It is essential to take a periapical x-ray to check the exactness of the connection. When a mini abutment has been used set the tightening torque at 20 Ncm, and 30 Ncm for a standard feature and tighten the screw.
• **Indication**
  - Single/bridge/full arch restorations
  - All position
  - When fabricating large-volume prosthesis or extensive path modification is necessary
  - Cement/Combi retained restoration

• **Feature & benefit**
  - The large abutment volume allows free customization and secures appropriate support after reduction.
  - Enhanced convenience for the operator with straight types
  - Margin esthetic effect of gold coloring.

• **Tightening torque**
  - Mini : 20Ncm
  - Standard : 30Ncm
The limitations of prosthesis fabrication that occur from Transfer abutment usage can be overcome by FreeForm ST abutments. It can be used through customizing for expression of the gingival scallop form, overcoming bridge misalignment and fabrication of single crowns bigger than normal size.

<table>
<thead>
<tr>
<th>Product list</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abutment</td>
</tr>
<tr>
<td>Abutment screw</td>
</tr>
<tr>
<td>Impression coping</td>
</tr>
<tr>
<td>Lab analog</td>
</tr>
<tr>
<td>Driver</td>
</tr>
<tr>
<td>Torque wrench</td>
</tr>
</tbody>
</table>

- Transfer Type
- Pick-up Type
Note for prosthetic process

**FreeForm ST abutment usage**

- The FreeForm ST abutment’s large volume and design is useful for margin configuration establishment and path modification convenience. The Ø4.0 diameter FreeForm abutment can be customized and used for areas with narrow interdental space such as the mandibular anterior area.
Step1  Healing abutment separation

Components & tools

Prosthetic procedure
Separate the Healing abutment using a 1.2 Hex hand driver with hand force.

Healing abutment verification
Gently separate the Healing abutment manually
Step 2  Impression

Fixture pick-up impression copings

Prosthetic procedure

Prepare a custom open tray, predict the vertical space, abutment diameter, type (hex, non-hex) and select an impression coping. Gently connect the guide pin using a 1.2 Hex hand driver manually. Do not forget to take an x-ray to check the exactness of the coping connection. Inject impression material around the hole of the upper part of the coping and loosen the guide pin after the material has set to remove the impression body. Connect a fixture lab analog of identical connection.
**Step 3  Working model fabrication & abutment modification**

**FreeForm ST abutments**

Make a working model from the impression body following conventional methods and connect the abutment. Connect a FreeForm ST abutment and adjust the path and customize the form. Fabrication of a precise transfer jig to be used as a guide for additional prosthetic work is mandatory after customizing is completed when a non-hex type has been used.
**Step 4  Wax-up ~ prosthesis completion**

Go through the conventional steps for resin, wax-up and casting. Deliver the completed prosthesis with the transfer jig to the clinic.
**Step 5  Prosthesis setting**

**Tools**

- Short
- Long
- 1.2 hex torque driver
- Torque wrench

**Prosthetic procedure**

Connect the abutment intra-orally in the same condition as with the model using the transfer jig. Check whether the torque is set to an appropriate level, then remove the transfer jig and place the prosthesis. Always verify the exactness of the connection by taking an x-ray after the final connection of the abutment.

Abutment connection  |  Abutment screw tightening  |  Transfer jig removal

Final prosthesis setting
**Indication**
- Single/bridge/full arch restorations
- All position
- When fabricating a cement-retained prosthesis is difficult due to the limitations of spaces and paths
- Prosthesis whose precise customization is necessary
- Cement/screw/Combi retained restoration

**Contraindication**
- Non precious alloy casting

**Feature & benefit**
- Enables fabricating a prosthesis with a minimum of 4 mm vertical space from the fixture installation level
- Non-hex feature composition for bridge cases

**Tightening Torque**
- **Mini**: 20Ncm
- **Standard**: 30Ncm
Product list for prosthetic procedure

<table>
<thead>
<tr>
<th>Product list</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Abutment</td>
<td>![Image]</td>
</tr>
<tr>
<td>Abutment screw</td>
<td>![Image]</td>
</tr>
<tr>
<td>Impression coping</td>
<td>![Image]</td>
</tr>
<tr>
<td>Lab analog</td>
<td>![Image]</td>
</tr>
<tr>
<td>Driver</td>
<td>![Image]</td>
</tr>
<tr>
<td>Torque wrench</td>
<td>![Image]</td>
</tr>
</tbody>
</table>

- The goldcast abutment allows free and easy customization; a prosthesis of any type, screw/cement/combi may be fabricated through gold casting.
- Problems that limit the fabrication of a conventional prosthesis may be addressed, such as the anterior region where precise customization is necessary and posterior cases with narrow vertical space.
Note for prosthetic process

HG GoldCast abutment

- When a cement retained type prosthesis is impossible because of limitations in vertical space between the opposing tooth, a screw retained type must be made. A prosthesis can be fabricated 4mm space from the fixture level with the GoldCast abutment.

Screw Retained type restoration for HG

- Compared to the HS System, it is difficult to fit screw retained type prosthesis with the HG system which is an internal submerged type. It can be impossible to gain a passive fit with a hex typed GoldCast abutment when the path is wrong in a bridge case or difficult to connect the prosthesis. A non-hexed type must be used for a bridge and the passivity of the fit must be checked with a x-ray. Use a GS Convertible abutment when the path error exceeds 22°. Please contact your sales representative for more details.
Step 1  Healing abutment separation

Components & tools

Prosthetic procedure

Separate the Healing abutment using a 1.2 Hex hand driver with hand force.

Healing abutment verification

Gently separate the Healing abutment manually
Step 2  Impression

**Fixture pick-up impression coping**

**Prosthetic procedure**

Prepare a custom open tray, predict the vertical space, abutment diameter, type (hex, non-hex) and select an impression coping. Gently connect the guide pin using a 1.2 Hex hand driver manually. Do not forget to take a x-ray to check the exactness of the coping connection. Inject impression material around the hole of the upper part of the coping and loosen the guide pin after the material has set to remove the impression body. Connect a fixture lab analog of identical connection.
Step 3  Working model fabrication & abutment modification

GoldCast abutments

Prosthetic procedure

Make a working model from the impression body following conventional methods and connect the abutment. Select a non-hexed type for a bridge case. Eliminate the plastic area considering prosthesis fabrication space and path.
**Step 4  Wax-up ~ prosthesis completion**

While maintaining the screw hole, do wax-up on the abutment after finishing height adjustment and customizing. It is convenient to use the guide pin of the pick-up impression coping. Cast the precious alloy metal following appropriate procedures for the gold crown/PFG. Non-precious metal alloy may damage the abutment and its use is prohibited.
Step 5  Prosthesis setting

Check the prosthesis and verify the recommended tightening torque.
Set the torque at 20 Ncm for mini and 30 Ncm for standard and connect the final prosthesis. Insert cotton into the screw hole on the occlusal surface and final block out with resin.
What happens when casting non-precious metal to a Gold abutment/cylinder?

GoldCast abutment and GoldCast cylinder products made of gold alloy are casting abutments exclusive for precious alloy of dental use. Since the melting point of gold abutment and non-precious metal is similar, casting with non-precious metal will cause damage and deformation to the abutment or cylinder during casting, so the use of non-precious metal is prohibited.

<table>
<thead>
<tr>
<th>Alloy</th>
<th>Melting range (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GoldCast abutment/cylinder</td>
<td>1400~1450</td>
</tr>
<tr>
<td>Dental Ni-Cr alloy</td>
<td>1200~1400</td>
</tr>
<tr>
<td>Dental Gold alloy</td>
<td>950~1150</td>
</tr>
</tbody>
</table>

Casted with non-precious alloy metal  
Casted with precious alloy metal
- **Indication**
  - Stud type overdenture

- **Contraindication**
  - Path error over 20° (based on two fixtures)

- **Feature & benefit**
  - Fabrication of a functional overdenture with a small number of implant installation.
  - O-ring/Dalbo, two types of attachments.
  - 4N and 6N retention of O-ring
  - Gold coloring considering esthetics

- **Tightening torque**
  - Abutment: 30Ncm
### Product list for prosthetic procedure

<table>
<thead>
<tr>
<th>Product list</th>
<th><img src="image1.png" alt="Image" /></th>
<th><img src="image2.png" alt="Image" /></th>
</tr>
</thead>
<tbody>
<tr>
<td>Abutment</td>
<td><img src="image3.png" alt="Image" /></td>
<td></td>
</tr>
<tr>
<td>Lab analog</td>
<td><img src="image4.png" alt="Image" /></td>
<td><img src="image5.png" alt="Image" /></td>
</tr>
<tr>
<td>Retainer (cap) + processing O-ring / Duplicate aid</td>
<td><img src="image6.png" alt="Image" /></td>
<td><img src="image7.png" alt="Image" /></td>
</tr>
<tr>
<td>Denture O-ring / Dalbo plus attachment</td>
<td><img src="image8.png" alt="Image" /></td>
<td></td>
</tr>
<tr>
<td>Retention screw driver</td>
<td><img src="image9.png" alt="Image" /></td>
<td></td>
</tr>
<tr>
<td>Abutment driver</td>
<td><img src="image10.png" alt="Image" /></td>
<td></td>
</tr>
<tr>
<td>Torque wrench</td>
<td><img src="image11.png" alt="Image" /></td>
<td></td>
</tr>
</tbody>
</table>

- By using the HG Stud abutment it is possible to fabricate a functional implant overdenture with 2 implants. You can use not only the O-ring silicone but also the Dalbo attachment of CM and select and apply the abutment right for the patients condition.
Note for prosthetic process

O-ring system of Stud abutment

- In normal cases, use a retainer cap with good removability. When vertical dimension is limited, the dimension may be decreased by 1.5 mm using a retainer. The initial retention of the yellow-colored O-ring is about 4 N, and that of the orange-colored one about 6N. You can conveniently regain retention when decreased by usage by changing the O-ring. The O-ring system allows path adjustment of up to 20°, although the replacement cycle decreases with increasing deflection; hence the need for caution during path adjustment at the fixture installation step.

Dalbo system of Stud abutment

- The Dalbo system is maintained by precious metal lamella and the retention can be conveniently adjusted between 2~15 N level using an exclusive driver. The retention can be regained by turning the driver in the clockwise direction. The Dalbo system can compensate a path up to 20° but be cautious since a value larger than this may cause fracture of the lamella.
**Step 1** Healing abutment separation

**Components & tools**

- **1.2 Hex hand driver**
- **Mini Cover screw**
- **Stud abutment**

**Prosthetic procedure**

Remove the Healing abutment using a 1.2 Hex hand driver.

Since the diameter of the Stud abutment is Ø3.5, it is convenient to use the exclusive Slim Healing abutment for prosthesis fabrication.

Gently separate the Healing abutment manually.
Step2  Abutment selection and connection

Stud abutments & tools

Prosthetic procedure
Select an abutment of appropriate gingival height considering the prosthesis and oral environment of the patient. Connect the abutment to the fixture using an exclusive O-ring driver with 30Ncm force. Always take an x-ray to check the exactness of the connection.
Step3  Impression ~ working model fabrication

**Stud lab analog**

Prosthetic procedure

Prepare a conventional custom tray for prosthesis impression taking and first inject impression material around the abutment. Take a functional impression same as denture fabrication. After the impression body has set, place the lab analog using the replicated hex structure as a guide.
Step 4  Retainer cap/duplicate aid setting ~ curing

Processing components

Prosthetic procedure
Connect the retainer cap with an attached processing O-ring to the lab analog exposed on the working model and block-out the lower area. Complete the prosthesis by following the conventional steps for denture fabrication from wax denture to curing. Use the included Duplicate aid when using the Dalbo system.

O-ring
- Retainer cap connection
- Block-out of lower area
- Completed overdenture

Dalbo
- Duplicate aid connection
- Block-out of lower area
- Completed overdenture
Step 5 Prosthesis setting (O-ring system)

Final O-rings

Prosthetic procedure

Remove the processing O-ring of the retainer using tweezers and place the prosthesis after selecting between 4N/6N and connecting the O-ring of appropriate retention.
Step 5  Prosthesis Setting (Dalbo System)

Dalbo plus attachment & tools

Dalbo plus attachment
Dalbo screw driver
Dalbo system

Prosthetic procedure

Remove Duplicate aid from the completed prosthesis and attach the Dalbo plus attachment intra-orally. Do not forget to block-out the undercut of the lower part to stop the resin inflow. Form a lingual hole on the prosthesis and reposition intra-orally. Then inject resin into the hole to complete. Inject an abundant amount until the resin overflows.

Set the prosthesis with suitable retention by turning the exclusive screw driver in a clockwise manner.

Duplicate aid removal  Lingual hole formation  Undercut block-out
Inject resin  Retention adjustment  Placed overdenture
• **Indication**
  - Implant retained overdenture on the mandible or maxilla

• **Contraindication**
  - Tooth and implant supported overdenture
  - Divergences greater than 40° between two implants

• **Feature & benefit**
  - Stable dual retention & optimal holding capabilities against various torque values (6N, 12N, 22N)
  - Excellent durability
  - Possible denture restorations even at small vertical dimension
  - Accommodate up to 40° divergence between two implants
  - Easy access toward Inserts using core tool

• **Tightening torque**
  - Abutment : 30 Ncm
### Product List for Prosthetic procedure

<table>
<thead>
<tr>
<th></th>
<th>![Image]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Abutment</strong></td>
<td>![Image]</td>
</tr>
<tr>
<td><strong>Lab analog</strong></td>
<td>![Image]</td>
</tr>
<tr>
<td><strong>Block out spacer</strong></td>
<td>![Image]</td>
</tr>
<tr>
<td><strong>Denture cap</strong></td>
<td>![Image]</td>
</tr>
<tr>
<td><strong>Replacement male</strong></td>
<td>![Image]</td>
</tr>
<tr>
<td><strong>Extended replacement male</strong></td>
<td>![Image]</td>
</tr>
<tr>
<td><strong>Impression coping</strong></td>
<td>![Image]</td>
</tr>
<tr>
<td><strong>Torque driver</strong></td>
<td>![Image]</td>
</tr>
<tr>
<td><strong>Core Tool</strong></td>
<td>![Image]</td>
</tr>
<tr>
<td><strong>Torque wrench</strong></td>
<td>![Image]</td>
</tr>
</tbody>
</table>

- By using the HG Locator abutment it is possible to fabricate a functional implant overdenture.
- You can Accommodate up to 40° divergence between two implants by using Extended Replacement Males.
Note for prosthetic process

Selecting the replacement males

- When selecting males, it is recommended to use the blue male (least retention) first. If the patients feel that they are too loose, then use the ones with greater retention force.

- In the case of implant divergences of more than 10° to 20°, using extended replacement males (red or green) can give much retention and durability.

Using the locator core tool

1. Unscrew the tip until the gap between the tip & the body is visible
2. Press on the male inside of denture cap with the tip and remove.
3. Twist the tip clock-wise until the male separates.

When inserting replacement males into denture cap

When tightening abutment by hand

When removing replacement male from denture cap
Step 1 Healing abutment separation

Components & tools

Prosthetic procedure

Remove the Healing abutment using a 1.2 Hex hand driver.
Since the diameter of the Locator abutment is Ø3.7 it is convenient to use the exclusive slim Healing abutment for prosthesis fabrication.

Gently separate the Healing abutment manually.
Step2  Abutment selection and connection

Locator abutments & tools

Prosthetic procedure

Select an abutment of appropriate gingival height considering the prosthesis and oral environment of the patient. Connect the abutment to the fixture using an exclusive locator torque driver with 30Ncm force. Always take a X-ray to check the exactness of the connection.
Step3  Impression ~ working model fabrication

Locator impression coping & lab analog

Prosthetic procedure

Prepare a conventional custom tray for prosthesis impression taking. First connect locator impression coping over locator abutment and inject impression material. Take a functional impression same as denture fabrication. After the impression, connect locator lab analog to impression coping in the impression material. Fabricate working model by pouring dental stone.
**Step 4  Denture curing**

- **Processing components**

  Denture cap with black processing male

---

**Prosthetic procedure**

Connect the denture cap with a black processing male to the lab analog exposed on the working model and complete the denture curing by conventional step.

- denture cap connection
- Completed overdenture
- Fabricate lingual spill way
Step 5  Prosthesis setting

Replacement males

![Replacement males](image)

Prosthetic procedure

- Inserting block out spacer
- Connecting denture caps with black processing male
- Filling self-curing resin
-Trying & curing
- Removing excess resin
Step 5  Prosthesis setting

Core tool

Locator Core tool

Prosthetic procedure

Removing black processing male by core tool
inserting replacement male by core tool

Locator overdenture
Setting
## Screw tightening torque guide of HG system

<table>
<thead>
<tr>
<th>Type of product</th>
<th>Mini (5–8)</th>
<th>Standard (5–8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cover screw</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Healing abutment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impression coping</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rigid abutment</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Stud abutment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LOCATOR® abutment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transfer abutment</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>Angled abutment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freeform ST abutment</td>
<td></td>
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<tr>
<td>ZioCera abutment</td>
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<td></td>
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<tr>
<td>ZioCera angled abutment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GoldCast abutment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temporary abutment</td>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>
Torque wrench user guide

• When an infinite amount of torque is needed.
  - When a torque over 50 Ncm is necessary in cases such as it is difficult to completely install a fixture with an engine or removal is needed the Torque wrench can be transformed to be used.
  ① Loosen the torque modifying area of the lower part to under 10 Ncm.
  ② Release by pulling at the upper head part and body.
  ③ Complete right angle locking by turning the head 90°

• Tightening torque adjustment
  - The tightening torque value is different depending on prosthesis type and screw. Set at exact torque value by matching the line at the lower part and bend until the neck of the Torque wrench is bent to tighten the prosthesis with the exact torque.
The Bite index is a product to help the bite taking step after impression taking. It is only possible at abutment and fixture level impression. By using a Bite index, the bite is taken simultaneously with the impression when using an abutment with Fixture level impression such as Transfer, Angled, Goldcast, etc. Then the number of hospital visits decrease for the patient. An extra bite jig is unnecessary which lessens the procedure steps. The convenience is maximized by allowing adjustment of bite indexing material thickness with five features (4, 6, 8, 10, 12).

- **Bite index characteristics**
  1. The hospital visits are decreased for the patients by easily and exactly registering the bite right after impression.
  2. Extra jig fabrication is unnecessary by using a reusable bite exclusive component.
  3. Easy and rapid connection possible free from limitations of the gingival tissue.
  4. Applicable to various oral environments of patients with 4, 6, 8, 10, 12 mm features.
Bite indexing procedure

After fixture level impression with pick-up/transfer type, you can register a bite using the Bite index. When a large number of implants have been used or bite indexes of various height have been applied you must provide exact information, such as marking to the lab so it is possible to know the position of the Bite index used intra- orally.

**Clinic process**

- Fixture level impression
- Bite index connection
- Bite index height verification

**Lab process**

- Bite indexing material injection
- Registered bite information
- Working model fabrication

- Verify exact setting after cutting
- Fixation of upper and lower working model
- Mounting completed
The Fixture transfer impression coping allows easy and exact coping repositioning after impression taking by using the triangle-circle structure ( ) for superior direction and position identification. Also the long/short (12.5mm /9.5mm) two features overcome path and intermaxillary interference. The vertical impression error can be prevented by blocking-out the driver hex hole after connecting the coping.
Benefit of Fixture pick-up impression coping

You can take an exact impression even when the conventional pattern resin connecting procedure is omitted since the Fixture pick-up impression coping has a hole (Hex) structure that allows stable impression material fixation in the rotation/vertical direction. We overcame the interference caused by upper part asymmetry (Non-hex) and interference between tray and opposing tooth with long/short feature.

When inevitably placed in the B-L direction, fabricate a tray with coping space that prevents interference between the coping and tray while taking an impression.

- Pick-up impression coping arrangement

Single

Free end bridge

Fixation by the hole
• Verify the exactness of the connection with the upper structure using an x-ray!

With an internal subgingival-type implant such as the HG system, there is a need to verify the connection with the abutment and impression coping by taking an x-ray. Incomplete connection can directly cause the loosening of the screw and abutment and fracture. To verify the exact connection, check the 11° taper setting with an x-ray.

Exact connection of the healing abutment

- A wrong connection such as that in the right picture may be caused by interference with bone or adjacent tissue surrounding the installed fixture.
- After removing the interference using tools such as a bone profiler, verify the exact connection as in the left picture.
Exact connection of the fixture pick-up impression coping

- A wrong connection of the fixture pick-up impression coping such as that in the right picture may be caused by the incorrect setting of the hex with the fixture hex. The connection can be verified as in the left picture by aligning the notch (A) in the connecting part of the coping body with the upper part of the fixture or removing the gap on the 11° taper area as with the healing abutment.

Exact connection of the fixture transfer impression coping

- The connection of the fixture transfer impression coping can also be verified by aligning the notch (A) in the connecting part of the coping body with the upper part of the fixture or removing the gap at the 11° taper area. With this product, connecting the guide pin is structurally impossible when the hex part is incompletely set, thus minimizing user error.
Exact connection of the abutment

- **Rigid abutment**

  ![Right connection](image1.png) ![Wrong connection](image2.png)

  - A wrong connection of the rigid abutment such as that in the right picture may be caused by interference with bone or adjacent tissue surrounding the installed fixture. After removing the interference using tools such as a bone profiler, verify the exact connection as in the left picture. Including the rigid abutment, verify the exact connection using an x-ray prior to prosthesis setting with convertible and stud abutments.

- **Transfer abutment**

  ![Right connection](image3.png) ![Wrong connection](image4.png)

  - A wrong connection of the transfer abutment such as that in the right picture may be caused by the incorrect setting of the hex with the fixture hex or interference with bone or adjacent tissue surrounding the installed fixture. The former can be corrected by fixing the hex part setting and checking with an x-ray, and the latter, by removing the interference using tools such as a bone profiler and verifying the exact connection as in the left picture. Including the transfer abutment, verify the exact connection using an x-ray before prosthesis setting with angled, Goldcast, Freeform (ST), and ZioCera abutments.
Compatible Relation of HG System

Mini connection

Ø3.5

Incompatible

Mini connection

Ø4.0 / Ø4.5

Standard connection

Ø4.0

Compatible

Standard connection

Ø4.0 / Ø4.5

Ø4.5

Incompatible

Standard connection

Ø5.0

Compatible

Standard connection

Ø5.0 / Ø6.0

Ø6.0

Incompatible

Standard connection

Ø7.0

Compatible

Standard connection

Ø7.0

Ø7.0
Prosthetic Procedure for **HG IMPLANT SYSTEM**