

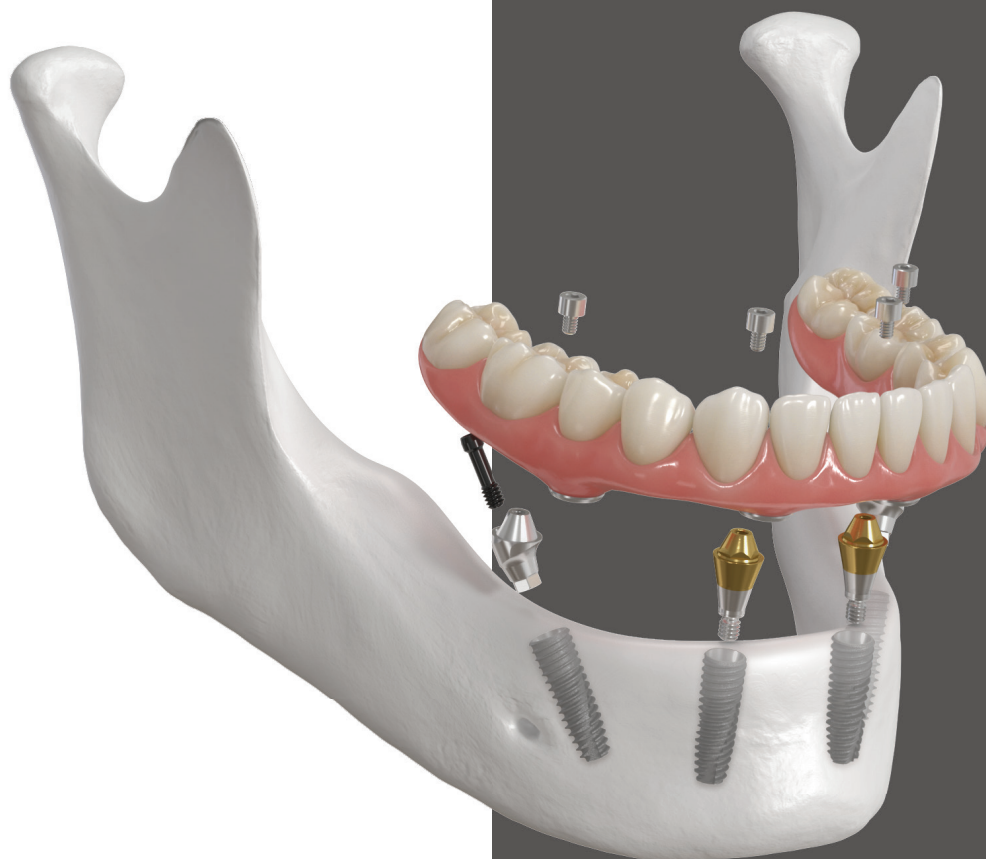


# Denture 4U System

OSSTEM'S  
FIXED DENTURE SYSTEM  
USER MANUAL

Denture 4U System

Denture 4U KIT



**OSSTEM<sup>®</sup>**  
IMPLANT



# Denture 4U System

Osstem's Fixed Denture Solution allows recovery of stable masticatory force with only 4 fixtures

**Perform Denture 4U Treatment**  
When there is vertical bone loss due to alveolar bone resorption

**Denture 4U KIT**  
**0° Posterior Guide can be used to treat patients**  
who do not lack vertical bone mass

**Up to 6 fixtures can be planted by using Denture 4U KIT**  
to acquire high fixation power on the maxillary bone with soft osseous tissue

**Place 4~6 Fixtures in tilted manner**

- Avoid inferior alveolar nerve and gain stability by placing 4~6 fixtures in a tilted manner in case the patient lacks of sufficient bone volume.
- In case the fixtures are tilted, the cantilever length can be reduced, which disperses the load efficiently on just 4 fixtures and thus making denture treatment possible.

※ It is advised to place 6 fixtures in the maxilla for securing stability.

**Semi-Permanent Use thanks to Fixed Full-Denture**

- No need for re-lining which is usually needed due to gum recession.
- Unlike removable dentures, there is no need to replace abutment components.

**Excellent Aesthetics Compared to Conventional Dentures**

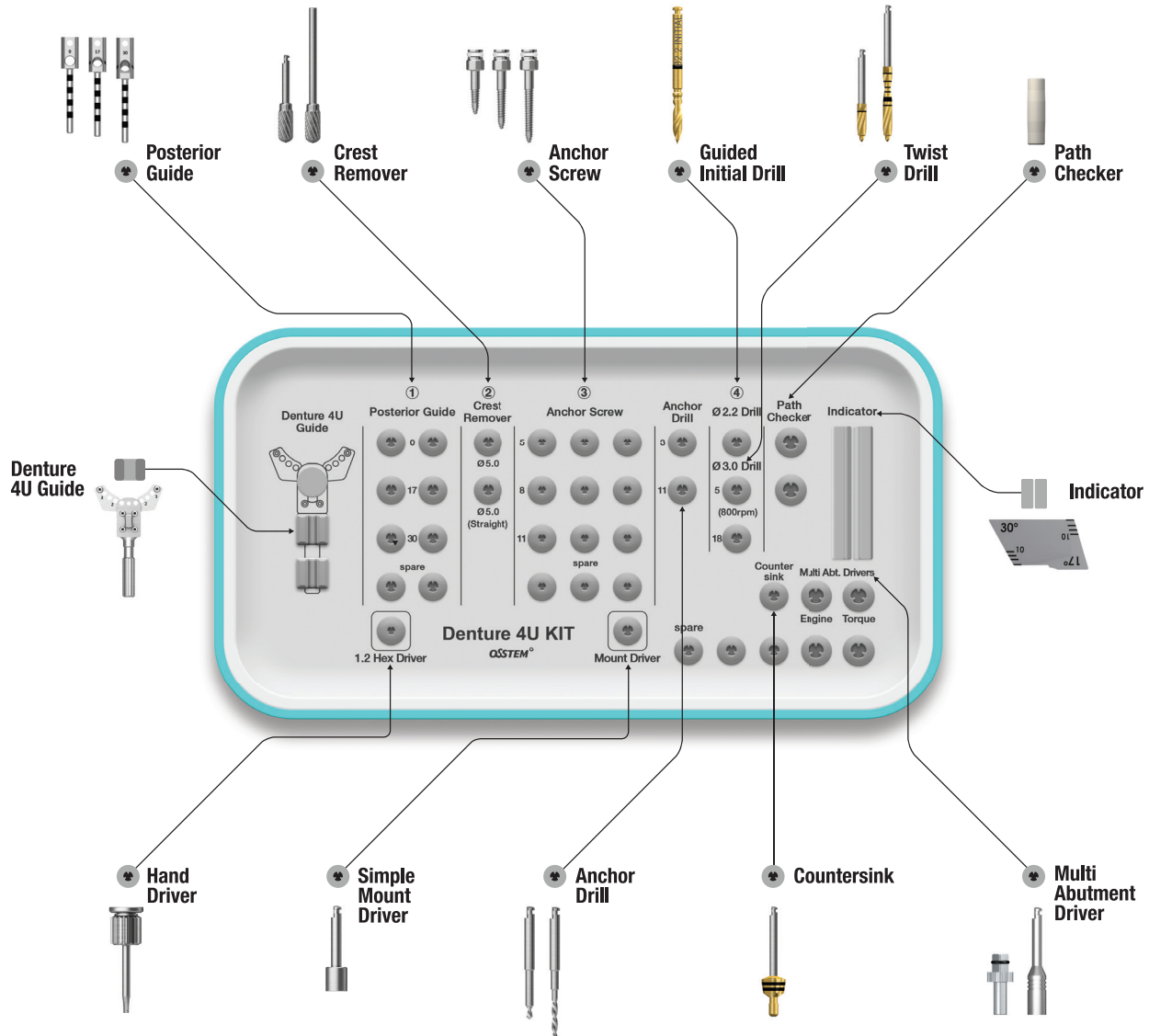
- Denture 4U enables placement of 4 fixtures in a way that they can properly disperse the pressure from masticatory movements, and therefore prevents alveolar bone resorption and involution.
- Maintains shape and volume of the jawbone, which results into better esthetics than conventional dentures.

## Denture 4U System Line-up

| Fixture   | Prosthetic  | Denture 4U KIT        |
|---|---|-----------------------|
| <p>10mm 11.5mm 13mm 15mm 18mm<br/>KS / TS / US / ET</p> | <p>Multi ABT    Multi Angled ABT    Esthetic-low Cylinder</p> | <p>Denture 4U KIT</p> |

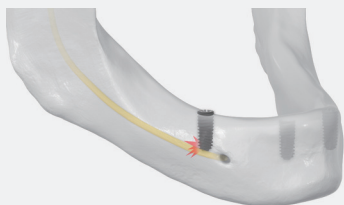
# Denture 4U KIT

KIT for Denture 4U Surgery : Enables accurate and safe Drilling



## Why Denture 4U KIT is Essential

- Most edentulous patients lack vertical bone volume due to alveolar bone resorption.



### Denture 4U Treatment

- Makes placing long fixtures possible in order to gain stability.
- Can place Implants in tilted manner in order to reduce cantilever length.

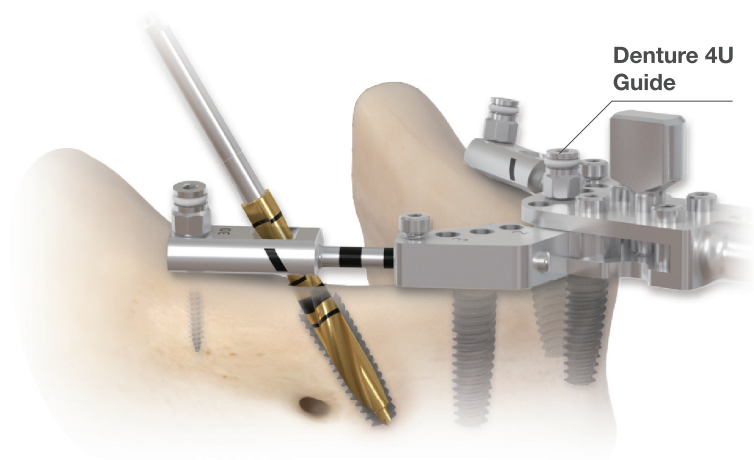
Be careful of the alveolaris inferior nerve since the long fixtures are inserted inclined.

### Denture 4U KIT

- Guides the placement site of the 4~6 fixtures in edentulous cases.
- Adjusts the angle and distance between fixtures.

Fixture placement is safe while avoiding the inferior alveolar nerve.

# Denture 4U KIT SURGICAL SEQUENCE



STEP 1 | Preparation

STEP 2 | 1-point Fixation (refer to p.5)

STEP 3 | 2-point Fixation (refer to p.8)

STEP 4 | Drilling (refer to p.8)

STEP 5 | Reaming (refer to p.10)

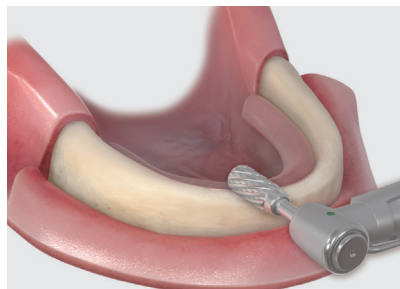
## STEP 1 | Preparation

※ Before the procedure, check the location and shape of inferior alveolar nerve, and involution of alveolar bone.

01

### Bone Flattening

- Flatten the bone with crest remover in order to set conditions for Guide Positioning.



#### Crest remover

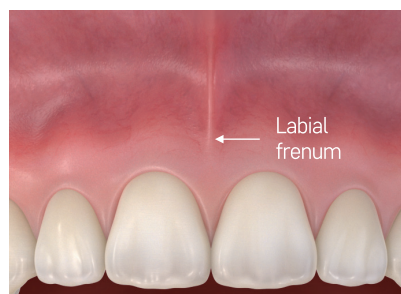
- Diameter : Ø5.0
- Recommended speed
  - Angled type : 1,200~1,500rpm
  - Straight type : 15,000~30,000rpm

02

### Check the median line

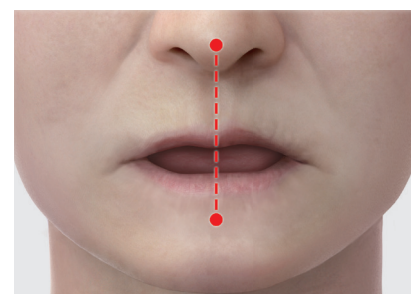
- Find and set the median line by checking the labial frenum or the mid line of the nose and chin.

#### Guide 1 | Check labial frenum



Set the median line by checking the labial frenum.

#### Guide 2 | Check the midline of the nose and chin



Connect the midline of the nose and chin. The line will run over the alveolar bone, which will be the median line.

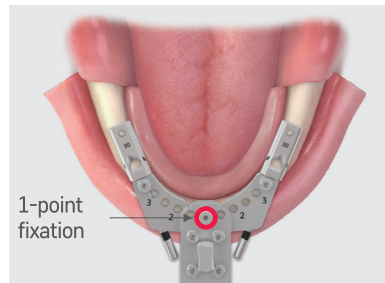


## STEP 2 | 1-point Fixation

01

### 1-point fixation in Anterior region

- Use an Anchor Screw to firmly fix the guide on the bone.



#### TIP User Guide

- Try to fix the guide with an Anchor Screw first. If the Anchor Screw can not be inserted because the bone quality is hard, use the Anchor Drill before placing the Anchor Screw.
  - Soft Bone : Possible to fix guide with Anchor Screw.
  - Normal/Hard Bone : Fix the guide with Anchor Screw after drilling a hole with the Anchor Drill.
- ※ Stop the engine when the mount driver reaches the guide in order to prevent tickover of the Anchor Screw.

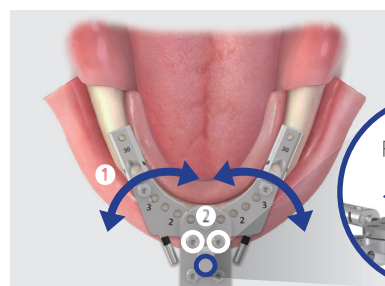
#### Select specifications for Anchor Screw

- Perform drilling with the 3mm Anchor Drill first, before drilling with 11mm Anchor Drill.
  - ※ There is no contact between the drill and the guide, if the surgeon performs the initial drill with the 11mm Anchor Drill.

02

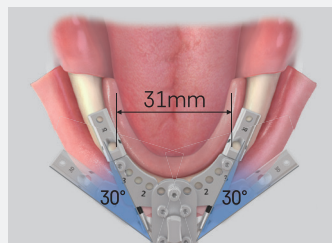
### Guide Positioning in Anterior region (adjust Anterior Guide)

- Position the guide according to the patient's dental arch.



- Position the guide and manually adjust **1** according to the patient's dental arch

- In order to fix position **1**, tighten **2** with hand driver.



■ : Drilling range

#### TIP User Guide

- Based on first premolar, the most narrow space is 31mm, and from that point on, the angle can be widened for 30°.
- Guide can be well positioned even on asymmetric dental arches, because each left & right side, anterior & posterior region can be adjusted separately.



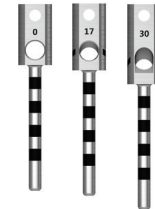
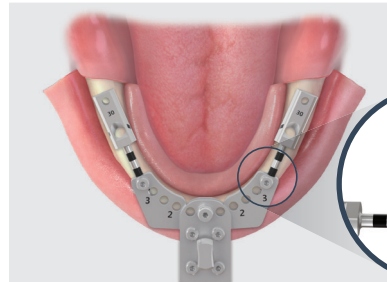


# Denture 4U KIT SURGICAL SEQUENCE

03

## Guide Positioning in Posterior region (adjust Posterior Guide)

- Adjust and fix the Posterior Guide according to the patient's dental arch.



### Posterior Guide

- Option : 0°, 17°, 30°

※ The Posterior Guide enables adjustment of the Implant's placement angle, distance between Implants and the buccal/lingual angle. The surgeon can therefore place the Implants in the desired way without damaging the alveolar nerves.

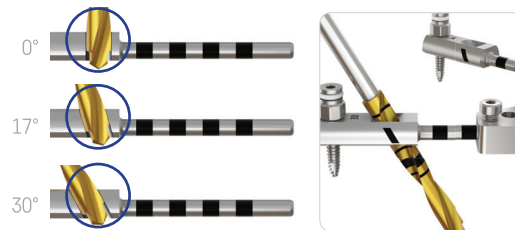
### TIP Usage Guide

- Adjust placement angle, distance between implants and buccal/lingual angle, and then tighten screw with hand driver to fix the adjustments.

01

#### Adjust Placement Angle

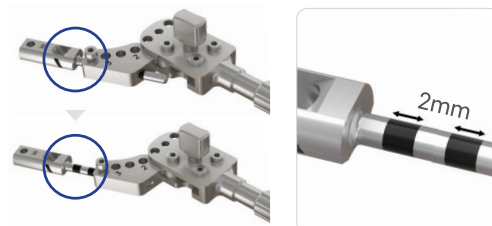
Posterior guide can be change during the surgery, but it is advised to select appropriate specification with CT image before the surgery.



02

#### Adjust Distance between Implants

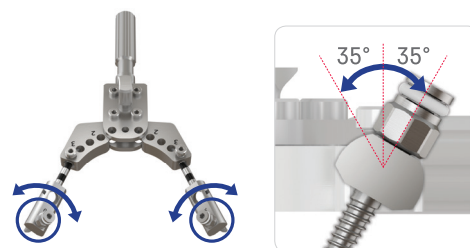
Adjust the distance with the help of the laser markings that come in 2mm units.



03

#### Adjust the Buccal/Lingual Angle

Buccal/lingual angle can be adjusted up to  $\pm 35^\circ$ .



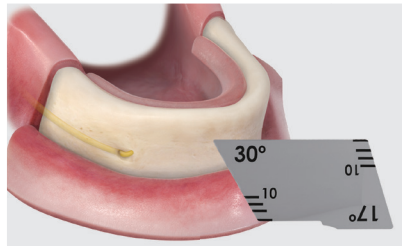
**04**

**Check Surgery Safety  
(check alveolar nerve)**

※ Needs to be checked before drilling stage.

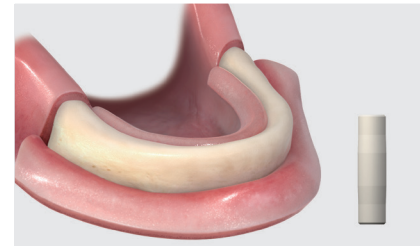
- The location of the alveolar nerve needs to be checked after positioning the guide but before the drilling stage.
- Denture 4U Guide knobs can be removed. (better Panorama images can be acquired with CT checker, when knobs are removed.)

**Guide 1 | Check with Indicator**



Perform a full flap surgery in order to spot the mental foramen with naked eye. Safety can be checked with the indicator.

**Guide 2 | Check with Path Checker**

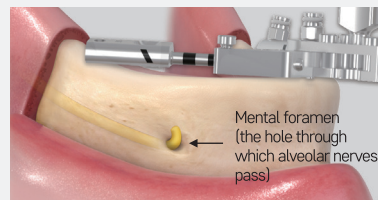


In case the mental foramen is not visible with the naked eye, place Path Checker and check location of the nerve with CT image.

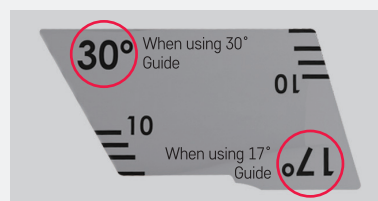
**TIP Usage Guide**

**Guide 1 | Locate with indicator**

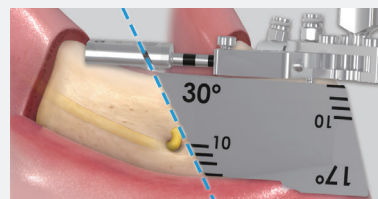
Case for visual confirmation of the mental foramen (Hold the indicator with instruments such as hemostat or needle holder.)



The alveolar nerves goes through the mental foramen, and therefore the drilling path should be more in the mesial direction.



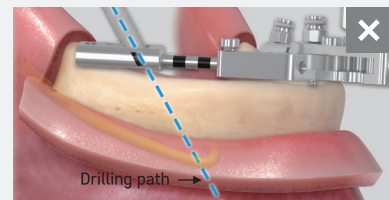
Check drilling path by placing the indicator in correct direction depending on the guide that will be used.



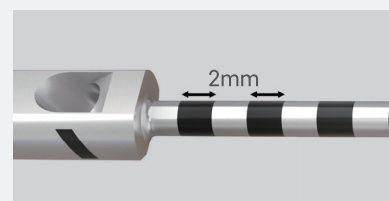
Check the drilling path with naked eye and adjust distance between implants.

**Guide 2 | Locate with path checker**

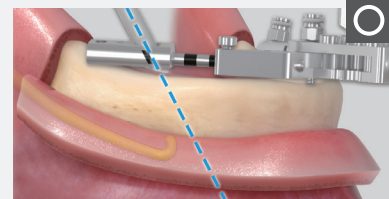
Case for ordinary flap surgery



Place path checker inside the drilling hole and check drilling path on panorama or CT image.



Readjust the guide in case the drilling path passes through the alveolar nerve. (Laser markings come in 2mm units)



Posterior Guide adjustment is completed so that drilling path does not pass over alveolar nerves.

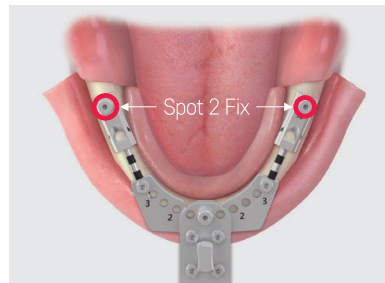
# Denture 4U KIT SURGICAL SEQUENCE

## STEP 3 | 2-point Fixation

01

### 2-point Fixation in Posterior region

- When Guide Positioning is finished by taking the location of the alveolar nerve into consideration, the guide needs to be fixed on 2 points in order to prevent movements of the guide.
- ※ Use Anchor Screws to fix Posterior Guide on 2 points. (The guide is then firmly fixed on 3 points, including the fixation in the Anterior region, and therefore drilling can be performed in a stable manner.)



### TIP User Guide

- Try to fix the Guide with an Anchor Screw first. If the Anchor Screw can not be inserted because the bone quality is hard, use the Anchor Drill before placing the Anchor Screw.
  - Soft Bone : Possible to fix guide with Anchor Screw.
  - Normal/Hard Bone : Fix the guide with Anchor Screw after drilling a hole with the Anchor Drill.
- ※ Stop the engine when the mount driver reaches the guide in order to prevent tickover of the Anchor Screw.

### Choosing Anchor Screw specification

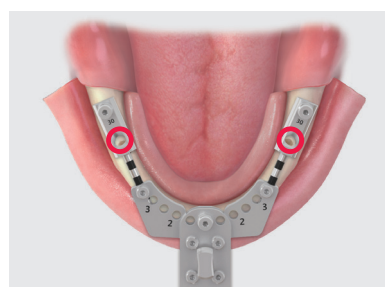
- When 2-point fixing guide in Posterior region, choose appropriate Anchor Screw, depending on the severity of the bone resorption. (11mm Anchor Screws are available, in order to provide stable fixation in regions with severe bone resorption.)
- Perform drilling with the 3mm Anchor Drill first, before drilling with 11mm Anchor Drill.
  - ※ There is no contact between the Drill and the Guide, if the surgeon performs the initial drill with the 11mm Anchor drill.

## STEP 4 | Drilling

01

### Drilling in Posterior region (Ø3.0)

- Perform Drilling in Posterior region with Ø3.0 Twist Drill.

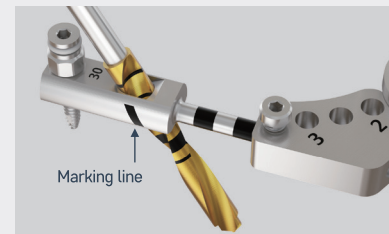
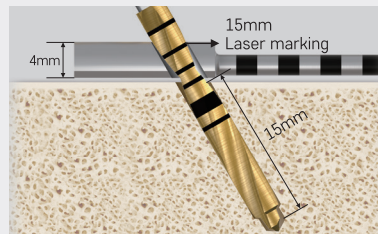






### TIP Usage Guide

- Place the drill carefully into the guide hole by referring to the marking line which is marked in the lateral side of the guide.
- Control the drilling depth by referring to the drill's marking line in the mesial direction. Use the 5mm drill first and then the 18mm drill, in case the surgeon uses a 0° Guide or experiences interference from occluding teeth.



Check mesial direction when referring to the markings.

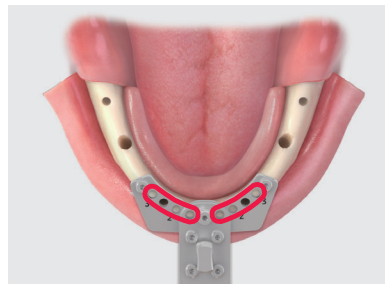
### Tips for Preventing jumps of the drills

- Set angle of the drill by taking the guide angle into consideration, and press the pedal as you advance carefully with the drill. (In case your hand is relaxed and the drill angle matches with the guide hole angle, the drill will glide into the hole and drill as planned.)

## 02

### Drilling in Anterior region (Ø2.2)

- Perform drilling in Anterior region with Ø2.2 Twist Drill



### Ø2.2 Twist Drill

- Recommended rpm : 800rpm

### TIP Checklist Before Anterior Drilling

- ① Check whether the Dental arch's curve is the same in the Anterior and Posterior region.
  - In case the Guide does not fit due to the curve difference, re-position the guide before performing drilling in the Anterior region.
- ② Check whether the Posterior Guide is blocking the guide hole for the Anterior region.
  - In case it's blocked, remove the Posterior Guide first, and then perform drilling in Anterior region.



Posterior Guide is blocking the guide hole for Anterior region.



Perform drilling after removal of Posterior Guides.

- Since the Posterior Guides need to be removed in the 2 cases above, firmly hold the Guide, which has then only 1-point fixation, and perform drilling.



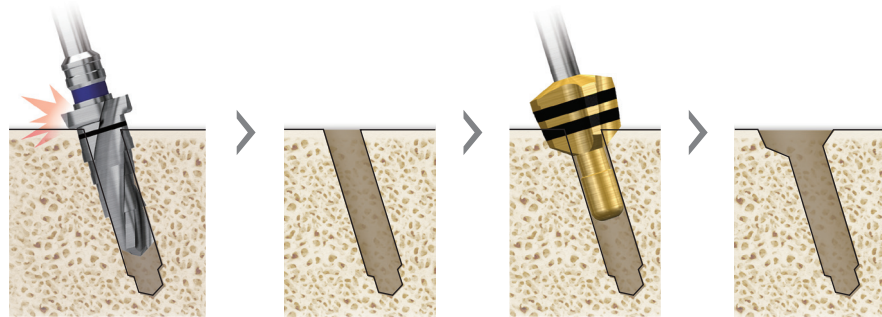
# Denture 4U KIT SURGICAL SEQUENCE

## STEP 5 | Reaming

01

### Countersink Drilling (to prevent interference from Stoppers and Prostheses)

- Remove Denture 4U Guide and perform Countersink Drilling in order to prevent interference from Taper Drill Stoppers and Prostheses.

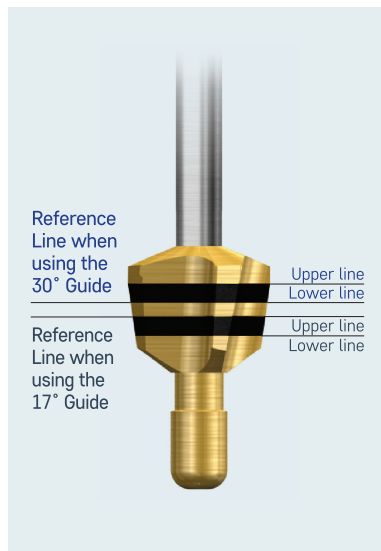


**Interference from Stoppers and Prostheses**

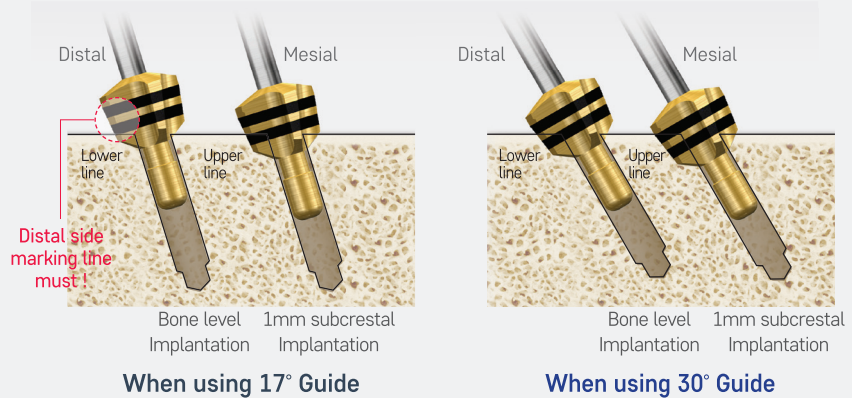
When fixtures need to be placed in a tilted way, there will be interference from the drill's stopper and prostheses.

Initiate drilling performed with Denture 4U Guide.

Countersink drilling In order to prevent interferences.



### TIP Placement Guide for Marking Line

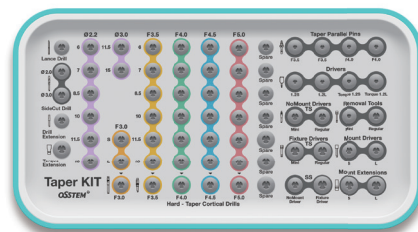


※ Refer to the lower line in the distal direction when Implant needs to be placed at bone level. Refer to the upper line in the distal direction when Implant needs to be placed 1mm subcrestal.

02

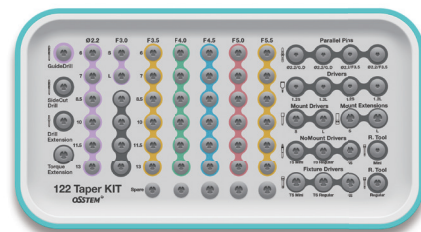
### Drill hole expansion with Taper Drill

- Perform additional drilling with Taper KIT or 122 Taper KIT in order to have appropriate drill hole for the implant.



**Taper KIT**

The tapered drills form optimal drill holes for tapered fixtures that gain good initial stability in the alveolar bone.



**122 Taper KIT**

A Kit with simple drill protocol : 1 drilling in soft bone, and 2 drillings in normal and hard bone.

# Denture 4U Prosthetic PROCESS

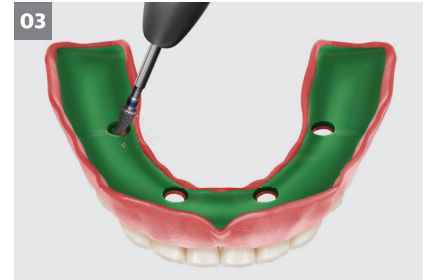
## Temporary Denture



Abutment Placement



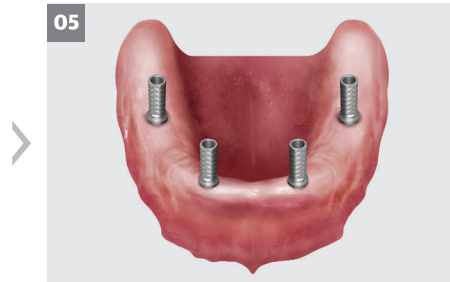
Impression Taking & Try in



Create through holes



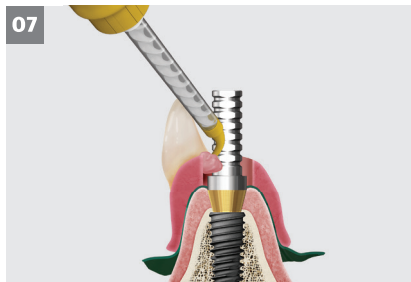
Check Abutment Location



Place Temporary Cylinder



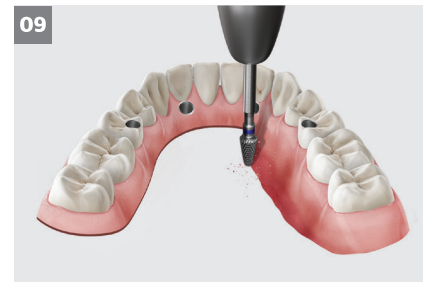
Seat Temporary Denture



Inject Resin to attach



Cut out excessive part of the Cylinder



Cut excessive parts of the Temporary Denture

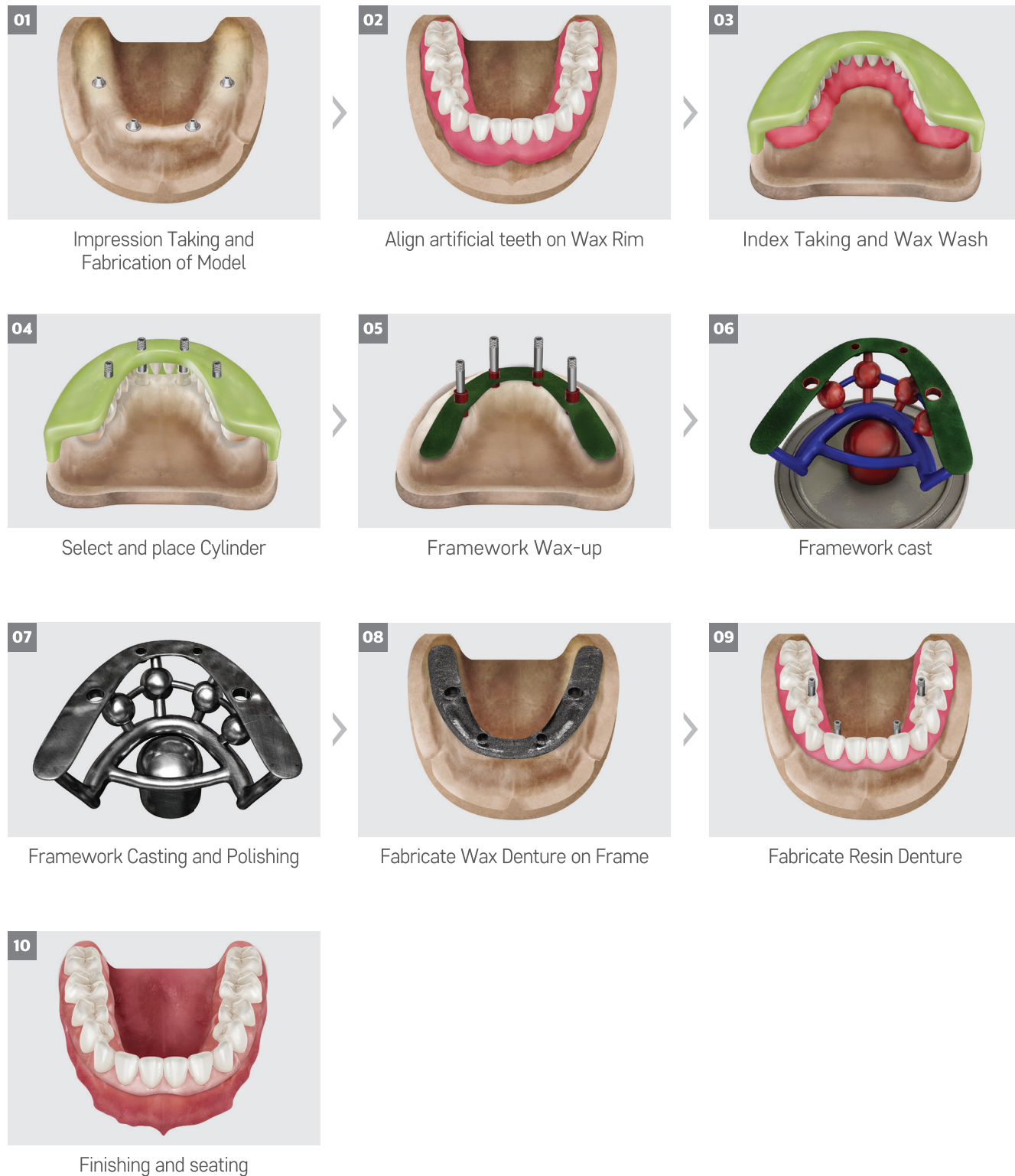


Final seating and finishing

※ Please refer to TS Prosthetics Manual for detailed fabrication protocol.

# Denture 4U Prosthetic PROCESS

## Final Denture



※ Please refer to TS Prosthetics Manual for detailed fabrication protocol.

# Denture 4U KIT ORDER CODE

## Denture 4U KIT | OD4UK

### Denture 4U Guide

D4UG



### Posterior Guide

Degree

0° D4UPG0

17° D4UPG17

30° D4UPG30

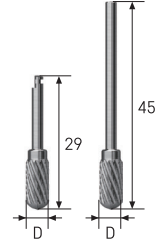


### Crest Remover

L D Ø5.0

29 CERM50A

45 CERM50S



### Anchor Screw

L D Ø1.65

5 D4UAS5

8 D4UAS8

11 D4UAS11



### Anchor Drill

L D Ø1.65

3 D4UAD3

11 D4UAD11



### Guided Initial Drill

L D Ø2.2

5 GD2208NC



### Twist Drill

L D Ø3.0

5 D4U2D3005

18 D4U2D3018



### Countersink

D4UCS



### Indicator

D4UI



### Path Checker

D4UPC



### Simple Mount Driver

L

Short ASMDS



### Multi Abutment Machine Driver

MAMD



### Multi Abutment Outer Driver

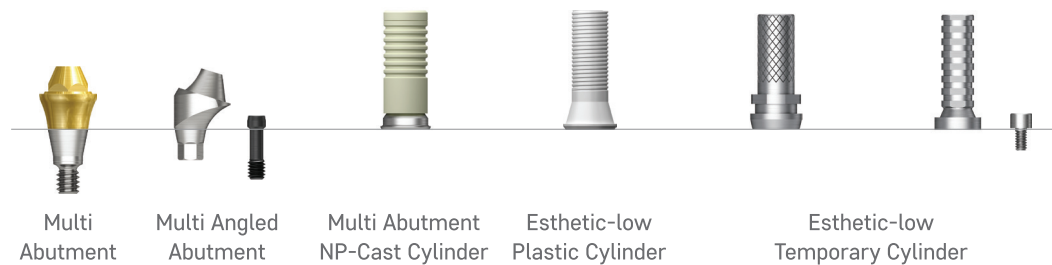
MAOD





# Denture 4U KIT ORDER CODE

## Prosthetic | TS



Multi Abutment

Multi Angled Abutment

Multi Abutment NP-Cast Cylinder

Esthetic-low Plastic Cylinder

Esthetic-low Temporary Cylinder



### Multi Abutment

| G/H      | 1.0       | 2.0       | 3.0       | 4.0       | 5.0       |
|----------|-----------|-----------|-----------|-----------|-----------|
| <b>M</b> | TSMA5010M | TSMA5020M | TSMA5030M | TSMA5040M | TSMA5050M |
| <b>R</b> | TSMA5010  | TSMA5020  | TSMA5030  | TSMA5040  | TSMA5050  |



### Multi Angled Abutment

| 17°      | G/H         | 2.5         | 3.0         | 4.0         | 5.0 |
|----------|-------------|-------------|-------------|-------------|-----|
| <b>M</b> | GS17MAM4820 | GS17MAM4830 | GS17MAM4840 | -           |     |
| <b>R</b> | GS17MAS4820 | GS17MAS4830 | GS17MAS4840 | GS17MAS4850 |     |
| 30°      | G/H         | 3.5         | 4.0         | 5.0         |     |
| <b>M</b> | GS30MAM4830 | GS30MAM4840 | GS30MAM4850 |             |     |
| <b>R</b> | GS30MAS4830 | GS30MAS4840 | GS30MAS4850 |             |     |



### Multi Abutment NP-Cast Cylinder

| Hex     | Non-hex  |
|---------|----------|
| TSMN500 | TSMN500N |



### Esthetic-low Plastic Cylinder

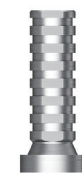
| Hex    | Non-hex |
|--------|---------|
| MGR200 | MGR100  |



### Esthetic-low Temporary Cylinder

| Hex    | Non-hex |
|--------|---------|
| MTR200 | MTR100  |

\*Regular : Non-hex



### Esthetic-low Temporary Cylinder (Narrow type)

| Hex     | Non-hex |
|---------|---------|
| NMTR200 | NMTR200 |

\*Regular : Non-hex

※ Please refer to the Product Catalog for information on KS and ET system.

# Denture 4U KIT ORDER CODE

## Prosthetic | US



Esthetic-low Abutment

Multi Angled Abutment

Esthetic-low Gold Cylinder

Esthetic-low Plastic Cylinder

Esthetic-low Temporary Cylinder

### US Esthetic-low Abutment



| G/H                   | 1.0     | 2.0     | 3.0     | 4.0     | 5.0    |
|-----------------------|---------|---------|---------|---------|--------|
| <b>M</b>              | MEM100  | MEM200  | MEM300  | MEM400  | -      |
| <b>R</b>              | MER100  | MER200  | MER300  | MER400  | MER500 |
| <b>W</b>              | MEW100  | MEW200  | MEW300  | MEW400  | -      |
| <b>W<sup>PS</sup></b> | TMEW100 | TMEW200 | TMEW300 | TMEW400 | -      |

### Multi Angled Abutment



| 17°      | G/H         | 2.0 | 3.0         | 4.0         |
|----------|-------------|-----|-------------|-------------|
| <b>M</b> | US17MAM4820 |     | US17MAM4830 | -           |
| <b>R</b> | US17MAR4820 |     | US17MAR4830 | US17MAR4840 |
| 30°      | G/H         | 3.0 | 4.0         | 5.0         |
| <b>R</b> | US30MAR4830 |     | US30MAR4840 | US30MAR4850 |

### Esthetic-low Gold Cylinder



| Type                          | Hex    | Non-hex |
|-------------------------------|--------|---------|
| <b>Ø4.8/Ø4.8</b>              | MGR200 | MGR100  |
| <b>Ø5.5/Ø5.5<sup>PS</sup></b> | MGW200 | MGW100  |

### Esthetic-low Plastic Cylinder



| Type                          | Hex     | Non-hex |
|-------------------------------|---------|---------|
| <b>Ø4.8/Ø4.8</b>              | MEPR200 | MEPR100 |
| <b>Ø5.5/Ø5.5<sup>PS</sup></b> | MEPW200 | MEPW100 |

### Esthetic-low Temporary Cylinder



| Type                          | Hex    | Non-hex |
|-------------------------------|--------|---------|
| <b>Ø4.8/Ø4.8</b>              | MTR200 | MTR100  |
| <b>Ø5.5/Ø5.5<sup>PS</sup></b> | MTW200 | MTW100  |

### Esthetic-low Temporary Cylinder (Narrow type)



| Type                          | Hex     | Non-hex |
|-------------------------------|---------|---------|
| <b>Ø4.8/Ø4.8</b>              | NMTR200 | NMTR100 |
| <b>Ø5.5/Ø5.5<sup>PS</sup></b> | NMTW200 | NMTW100 |

※ Please refer to the Product Catalog for information on KS and ET system.



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