DIOnavi. Surgical Manual_E Ver.5-2

Product Introduction: DIOnavi.

Surgical Process

DIO IMPLANT

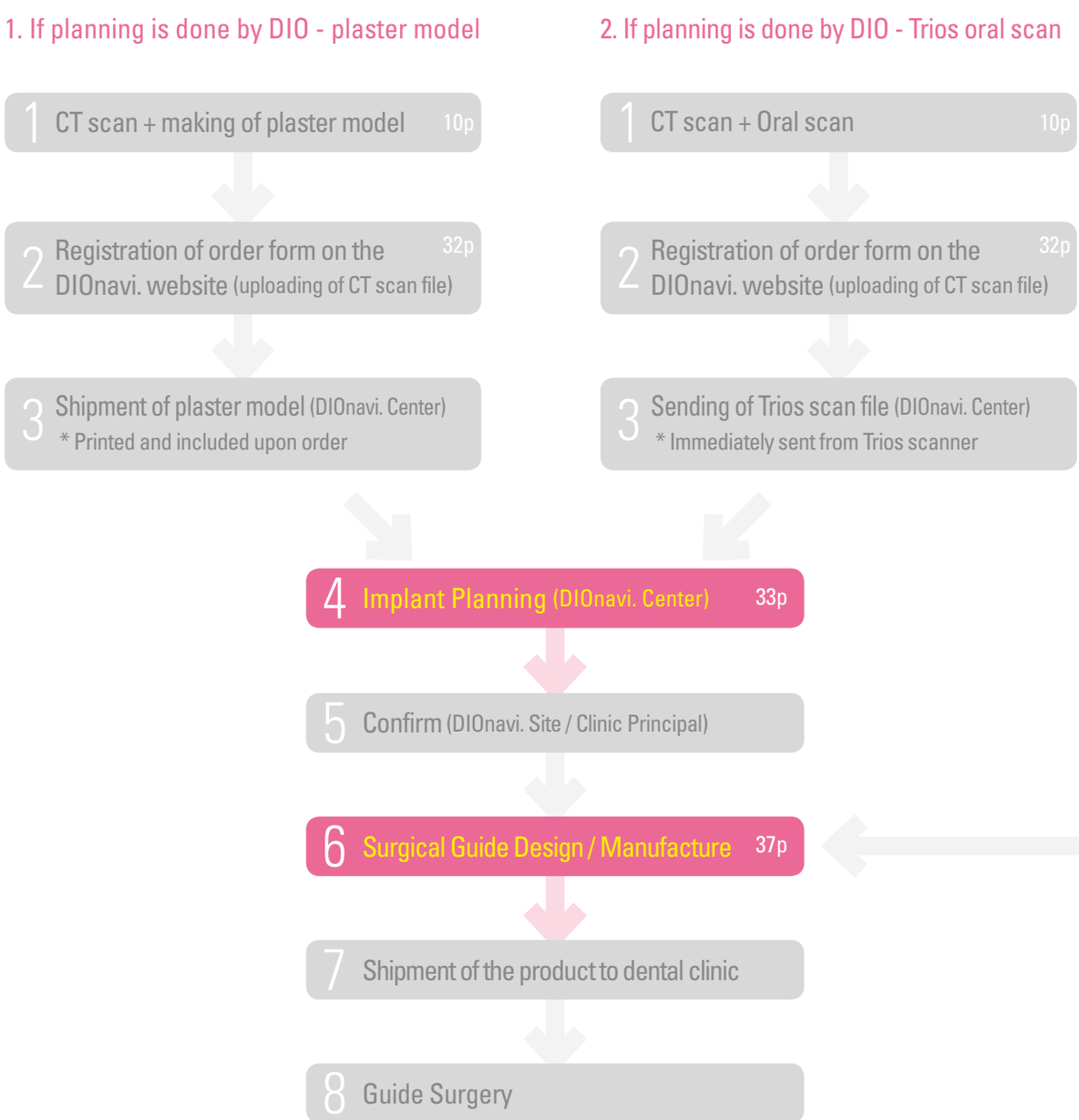
DIOnavi.

Surgical Manual Ver.5-2

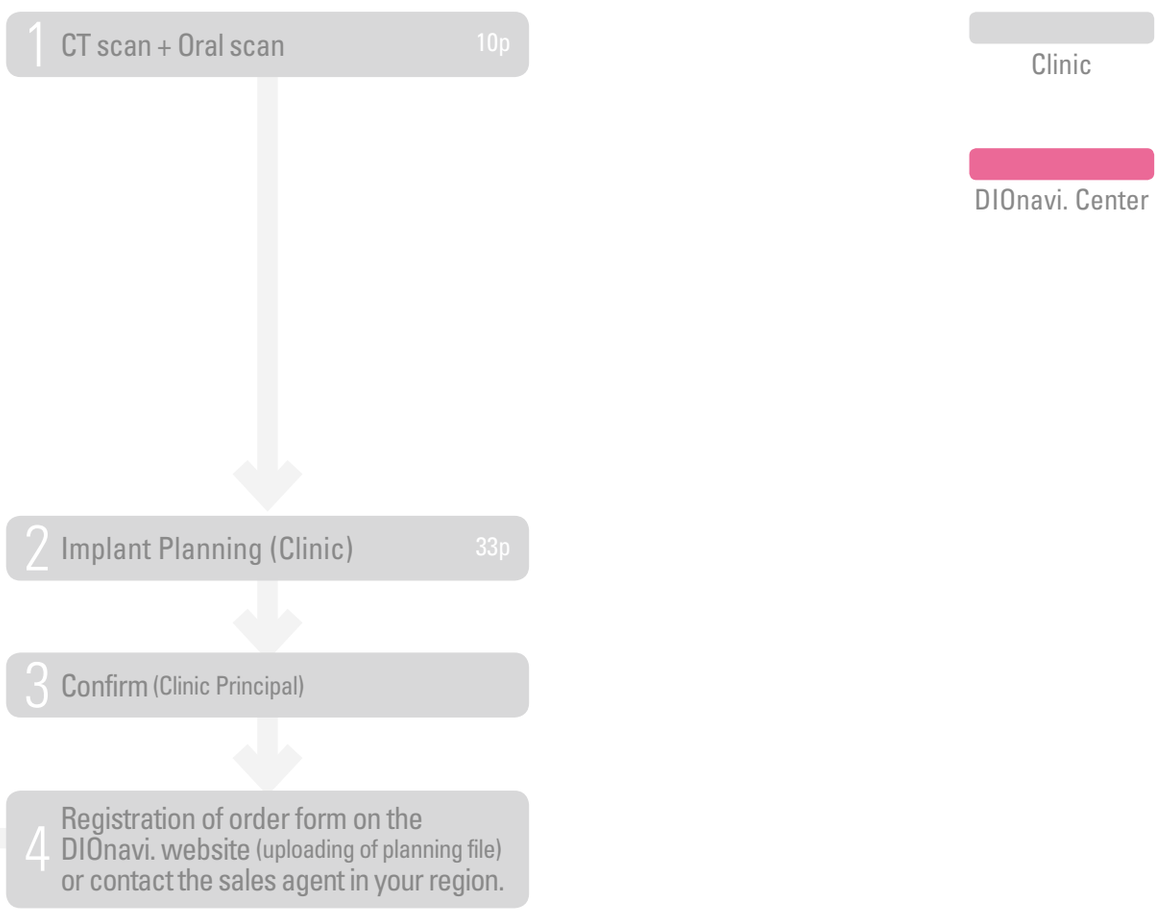
This DIOnavi. Surgical Manual serves as an instruction manual for using DIOnavi. surgical guide system intended for clinical practitioners that covers treatment planning, implant planning, and DIOnavi. product ordering.

One-Step Protocol

You can perform implant surgery with a DIOnavi. surgical guide printed by a 3D printer within a week once you send CT scan data along with intra-oral scan data to DIOnavi. Center.



3. If planning is done at the clinic - oral scan



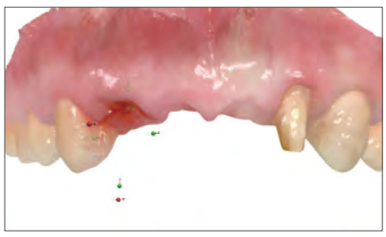
| Manufacturing period |

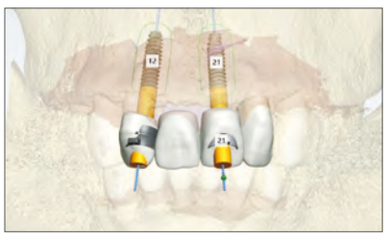
CT + plaster model / Request for confirmation of Planning after the receipt of oral scan data	When only making surgical guide	Surgical Guide + Customized Abutment + Temporary Crown
2 days required	3 days required	4 days required
After confirmation >>		

The manufacturing period excludes weekends (Saturday, Sunday) and holidays, and it assumes that the order was received or confirmed prior to 4 PM. Orders taken after 4 PM will require one additional day.

DIOnavi. System

The entire implant placement protocol of DIOnavi. is carried out 100% using digital data,
which allows for implant treatment without requiring inconveniences likes analog impression taking.
In addition, the operator can perform accurate placement based on accurate digital data analysis.
Both the operator and patient can be satisfied with this implant placement.



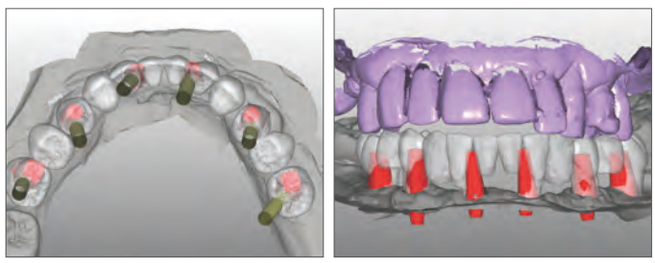
Best accuracy and stability

DIOnavi. has increased accuracy of implant placement through top-down implant planning that accounts for occlusion and stress distribution. The surgical guide with considerations of anatomical structure can help perform safe implant placement.

| DIOnavi. placement

Desirable prognosis is shown after placement because load is effectively distributed by designing the crown in accurate position first and then positioning the fixture underneath the crown.

| General implant placement



Since it is difficult to align center of the implant and crown, load cannot be distributed effectively, leading to failure of implant placement such as fracture of prosthesis.

DIOnavi.

Process

1 Preparation before order

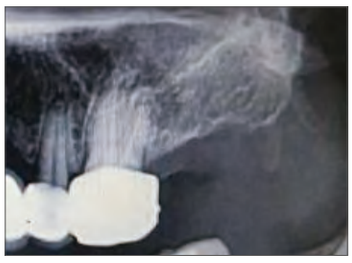
1) Checking of CT

Precision of the guide can be reduced depending on type and management of CT used at the dental clinic.
We recommend making the guide after inspecting conditions of CT at the dental clinic.

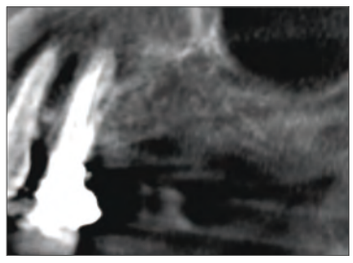
① CT resolution

If CT at the dental clinic has poor resolution, it may not be able to show bones, gum and nerves properly.
Poor resolution needs to be corrected in advance.

| Normal CT

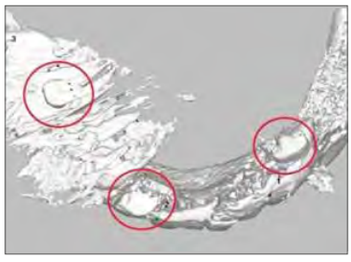


| Gum and bones cannot be distinguished well.



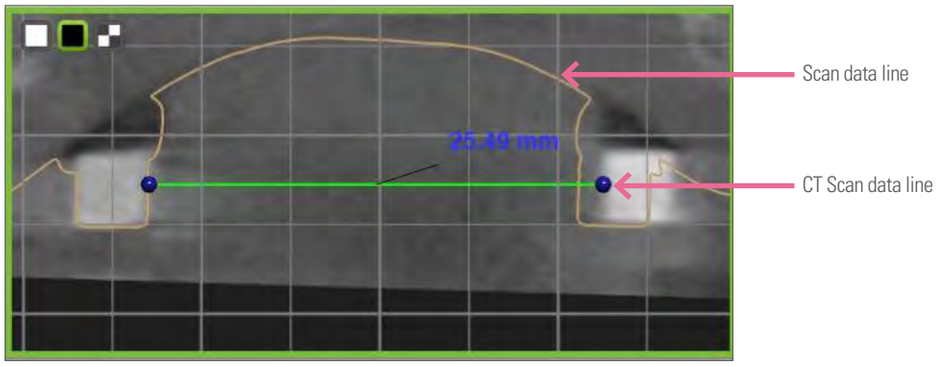
② Distortion of CT image

It is necessary to check whether the shape of reference tooth or marker is appropriate during image merging. If shape of the tooth or marker is distorted, it needs to be corrected in advance.



③ Horizontal error of CT

Horizontal error of CT may cause failure of merging or incorrect direction of placement.
Horizontal error must be checked using a CT jig, correcting error of 0.5mm or larger.



※ Horizontal discrepancy of about 1mm is created compared to CT scan data

④ How to check CT error
Error can be checked by shooting the CT jig with CT.

CT Jig

Shooting of the CT jig using CT

Sending of CT image to DIOnavi. Center through a salesperson at the dental clinic

2) Registration on DIOnavi. online order website

Please join membership on the DIOnavi. website or switch MyDIO membership.

| www.dionavi.co.kr

※ Order process is different in each country. Please contact the sales agent in your region.

3) Trios account registration

① Configure
② Connect to Lab center
③ Configure communicate
④ Enter account ID / password
⑤ Click Test Setting
⑥ Click OK

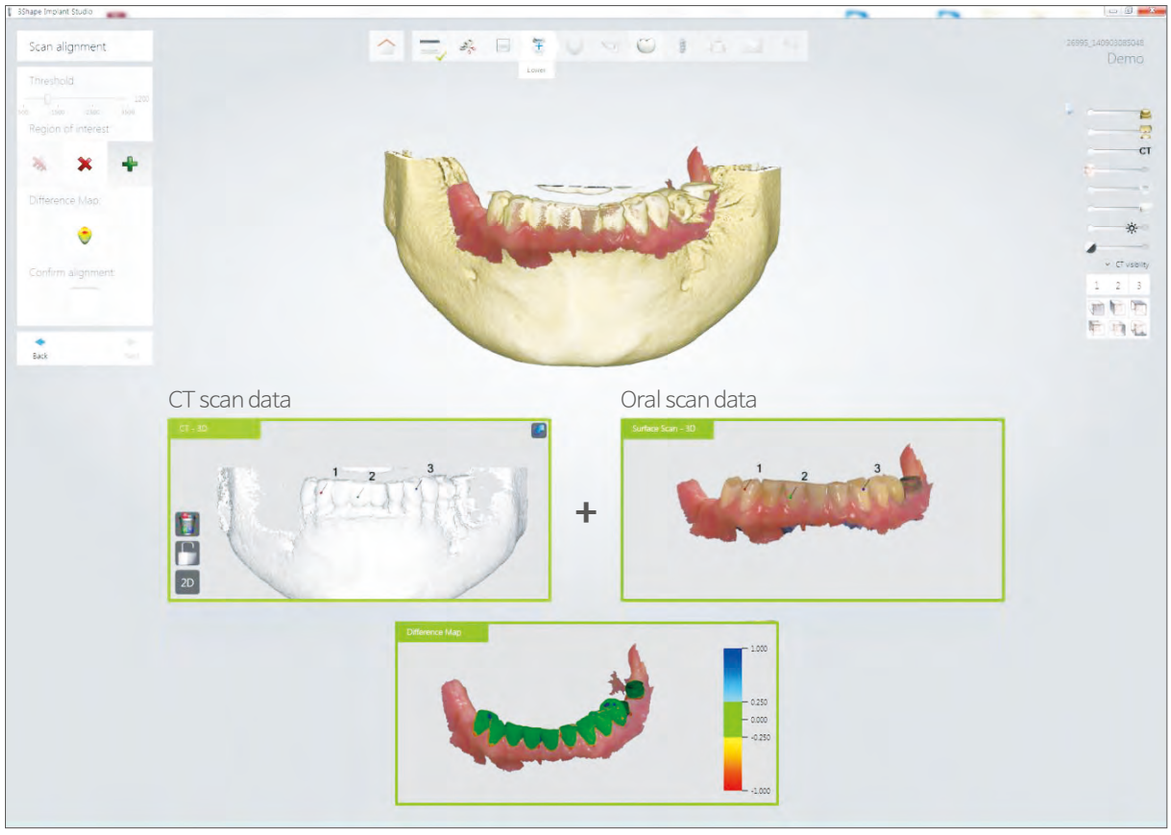
※ Remote setting service (Call Center +82 1599 3875) is available.

2 Scan Process

1) Necessity of CT and oral scan

Anatomical information of teeth and bones can be taken from CT scan data,
but the gingiva cannot be seen well. Anatomical information of teeth and gingiva can be taken from oral scan data, but information of bones cannot be acquired.

Since making of the surgical guide requires information of teeth, gingiva and bones,
we merge CT scan data and oral scan data.
*Merging criterion: Tooth information (common information of CT scan and oral scan)



2) Classification of cases according to scan method

Depending on oral conditions of the patient, you can select a case among
Normal Case / Metal Artifact Case / Partial Edentulous Case / Edentulous Case.

		Normal Case	Metal Artifact Case	Partial Edentulous Case	Edentulous Case
Indication		If there are many remaining teeth and no metallic prosthesis	If there is metallic prosthesis on the work side	If unilateral molar is missing	If there is no remaining tooth
If you have Trios	CT + oral scan	Basic method	Marker (or Resin)	Marker (or Resin)	Use of denture and marker
	Reference page	11p	12p	14p	16p
If you do not have Trios	CT + plaster model	Basic method	Marker (or Resin)	Manufacture of splint	Manufacture of splint
	Reference page	12p	13p	15p	17p

Normal Case

① If the dental clinic has Trios

CTscan

+

Oral scan

Maxillary scan / Mandibular scan / Bite scan

② If plaster model is made

CT scan

+

Plaster model

Maxillary and mandibular plaster models,
Bite scan

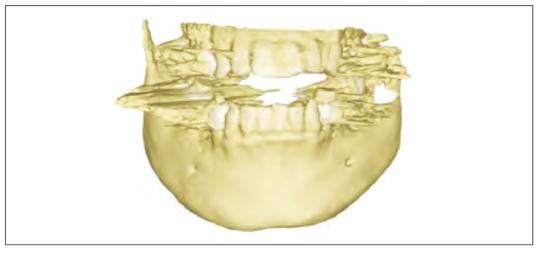
* Scanning done at DIOnavi. Center

Metal Artifact Case

① If the dental clinic has Trios

Scanning of maxillary and mandibular merging

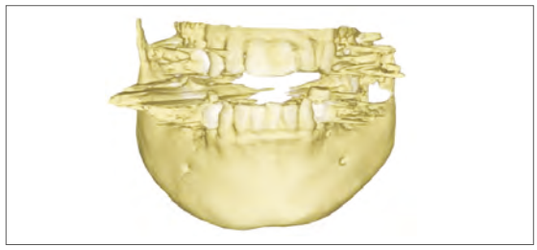
Deletion of marker position from scan data



CT scan with marker attached

Additional scanning after marker attachment

② If plaster model is made



CT scan with marker attached
(Open Bite)

Making of plaster model by taking impression of the work side with marker

Making of plaster model by taking impression of the work side after removal of marker

Making of plaster model after taking impression of the opposing teeth

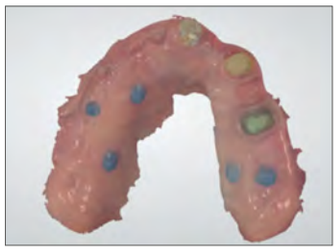
Bite taking

Caution

Plaster model of the work site with marker, plaster model of the work side without marker, plaster model of the opposing teeth, and bite index are necessary.

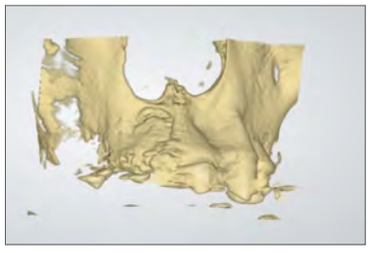
Partial Edentulous Case

① If the dental clinic has Trios



Marker (or resin) on the arch of the working site

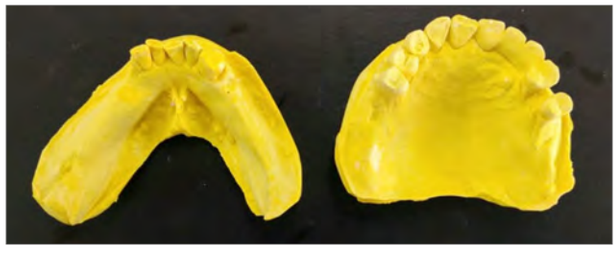
Scanning of the opposing teeth



Addition of CT scan after marker attachment

Additional scanning after marker attachment

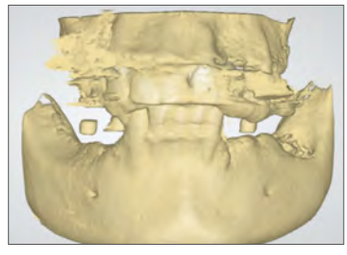
② If plaster model is made



Make maxillary and mandibular plaster models and ship to DIOnavi. Center.
(Bite index unnecessary)

DIOnavi. Center. makes the splint and ship to the dental clinic.

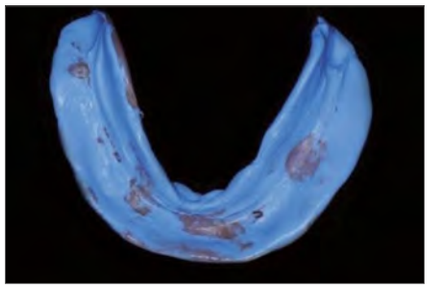
Check the bite using the splint considering VD



Settlement of the splint on the mouth
for CT scan (close bite)

Edentulous Case

① If the dental clinic has Trios and denture



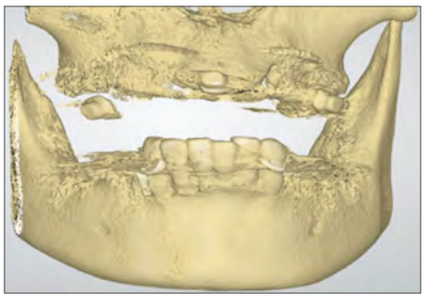
Reline of the inside of the denture with impression material

Attachment of the markers on the outside of the denture

Settlement of the denture with the marker attached in the mouth

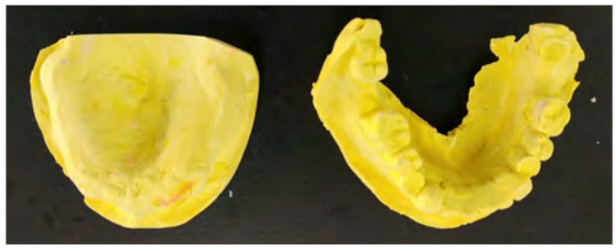
Scanning of the inside of the denture, marker and teeth

Scanning of the bite after settlement of the denture



CT scan after settlement of the denture

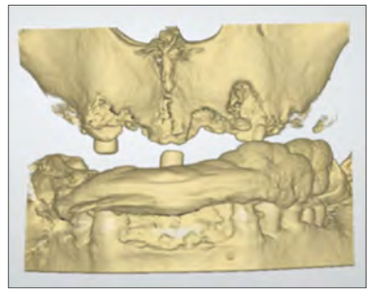
② If plaster model is made



Making of maxillary and mandibular plaster models and shipment to DIOnavi. Center

Making of the splint at DIOnavi. Center and shipment to the dental clinic

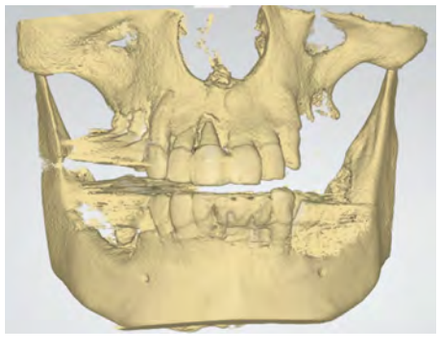
Check the bite using the splint considering VD



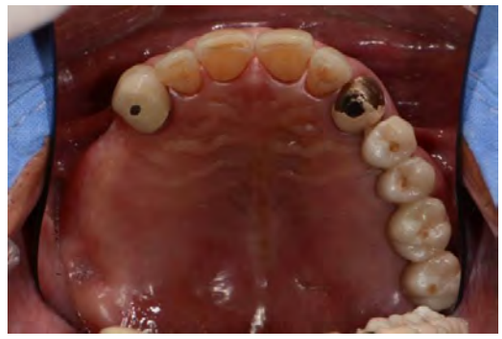
Settlement of the splint on the mouth
for CT scan

3) How to use and attach the marker

① If marker attachment is necessary



If there is a metallic prosthesis in the patient's mouth, an artifact appears on CT and causes difficulty of merging CT and oral scan.



If unilateral molar is missing in the patient's mouth, it is difficult to merge at the implant position.

② Types of marker

Marker materials are largely divided into two types.

Marker

Flow resin (radiopaque)
(CHARMFIL BLUE resin recommended)

Tip The marker can be attached and detached easily by using histoacryl (adhesive).

- **Manufacturer** : BBRAUN
- **Product name** : Histoacryl
- **Components and appearance**
  Components_ Main component : N-BUTYL 2-CVANDACRYLIC ACID
  Others : Protein, etc.
  Appearance_ Transparent liquid
- **Storage and type**
  Storage method: Room temperature of 30C°
  or below or refrigeration (5C°) recommended
  Expiration: 2 years
- **Precautions**
  ① Avoid wounded site and only use on the oral mucosa.
  ② Be careful not to have direct contact with instruments, clothes, fingers, etc.
- **Packaging unit and price**
  ① Packaging unit: 5PCS / BOX
  ② Price: 220,000 Korean won / BOX (including VAT)
  ③ Order code: 1050060

③ Marker position

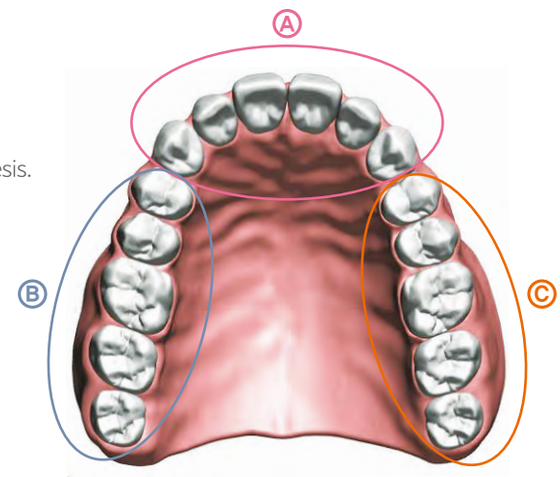
Metal Artifact Case

By default, the marker is attached on the arch for which the surgical guide is to be made.

Marker attachment method

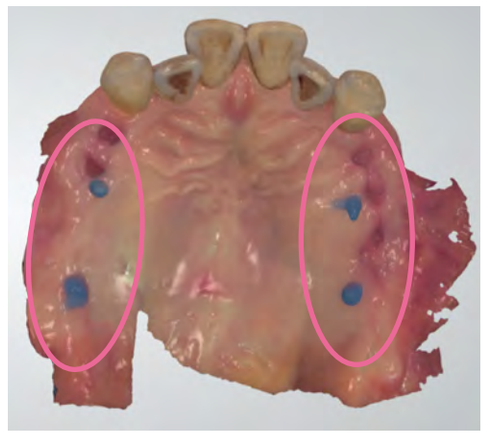
6 anterior teeth / left molar / right molar, divided into A-B-C

Divided into areas, attach to area A if there is a metallic prosthesis.
Attach to area B if there is a metallic prosthesis.
Attach to area C if there is a metallic prosthesis.



Partial Edentulous Case

Attach the marker or resin to the gum with missing molar.



④ Method of attachment for each case

Metal Artifact Case

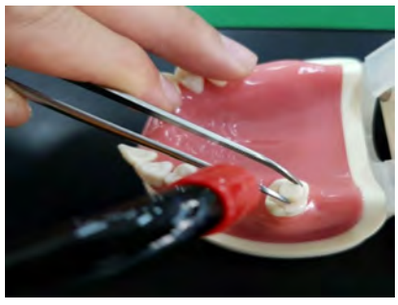
If there is a metallic prosthesis, the marker can be attached in one of the following three ways.

▶ Method of attaching the marker using flow resin

ⓐ Pour the flow resin so as to widely spread out between the marker and occlusal surface.
ⓑ Hold the marker using pincette and position it on the occlusal surface of the tooth to be attached.
ⓒ Cure for about 5~10 seconds using curing light.

▶ Method of attaching the marker using histoacryl

ⓐ Pour the flow resin so as to widely spread out between the marker and occlusal surface.
ⓑ Hold the marker using pincette and position it on the occlusal surface of the tooth to be attached.
ⓒ Cure for about 5~10 seconds using curing light.
ⓓ Apply histoacryl around the resin. (For 20 seconds)

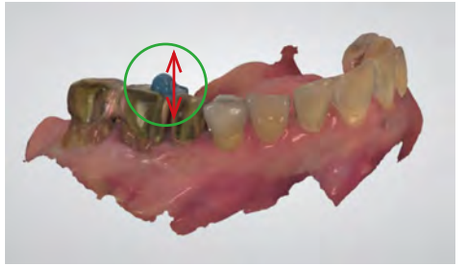


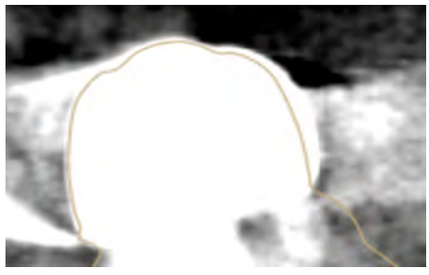
▶ Method of attaching the flow resin to the occlusal surface

ⓐ Stack the flow resin in the desired position to a height of 2mm or above.
ⓑ Cure for about 5~10 seconds using curing light.

Caution

Required height of the resin is 2mm or above.
If height of the resin is below 2mm, it may not be shown on CT.





Partial Edentulous Case

The marker can be attached to Partial Edentulous Case by selecting one of the two methods below.

▶ Method of attaching the marker using histoacryl

ⓐ Pour the flow resin onto the gum.
ⓑ Hold the marker using pincette and position it on the gum.
ⓒ Cure for about 5~10 seconds using curing light.
ⓓ Apply histoacryl around the resin. (For 20 seconds)

▶ Method of attaching the flow resin using histoacryl

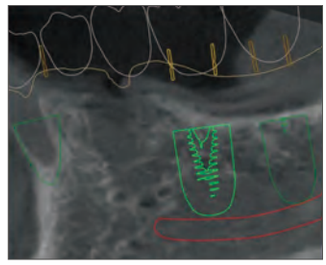
ⓐ Pour the flow resin onto the gum.
ⓑ Cure for about 5~10 seconds using curing light.
ⓒ Apply histoacryl around the resin. (For 20 seconds)

Splint Case

Free-End Case where the molar is missing can be merged up to the part where tooth exists.

It cannot be merged in the part where implant is to be placed.



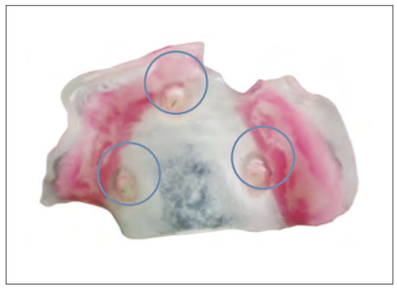


Caution

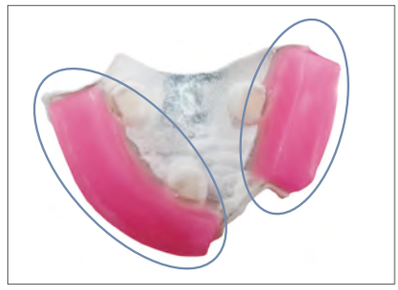
The marker can be attached to the palate in case of maxilla,
but attachment of the marker to the gum is not recommended due to difficulty.


TIP

We make a splint similar to wax rim used to make denture at dental clinics.



Markers are inserted in 3 places.



There is a part to take occlusion.

Precautions for CT scan

Caution

VD must be checked first to prevent movement of the splint during CT scan.
Make sure to check whether it has been properly sit in the mouth.

Sending of the splint to the clinic

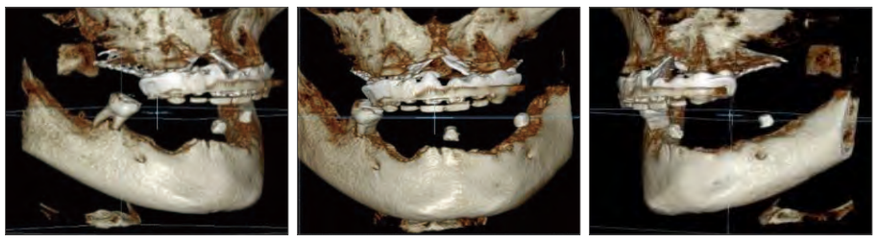
VD check in the patient's mouth

CT scan with the splin

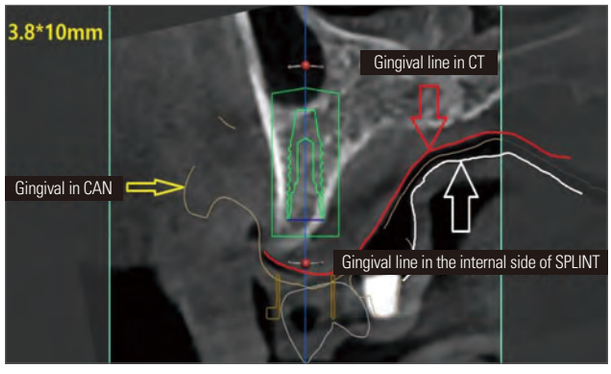
CT scan

Uploading of CT file onto the order form on the DIOnavi.

TIP The same method of bite taking conducted for fabricating denture can be used.



TIP Edentulous CT scan (actual case)



Caution If the splint is not accurately attached to the mouth, the chance of error increases and the guide cannot be made.

Edentulous Case

▶ If the dental clinic has Trios and denture

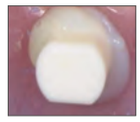
Dental Clinic
Scan

DIOnavi. Center
Planning & Design

① Denture Reline
⋮
② Attachment of the marker to the denture
⋮
③ CT scan
⋮
④ Oral scan
⋮
⑤ Merging & Reverse
⋮
⑥ Implant Panning
⋮
⑦ Design
- Surgical Guide
- Customized Abutment
- Temporary Crown

⋮
⑧ Manufacture
- Surgical Guide
- Customized Abutment
- Temporary Crown

Preparations


Marker

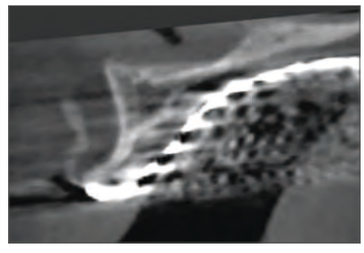

Impression material for reline
(must be hard impression material instead of soft material)


Denture used by the patient


Trios

Inappropriate case using denture

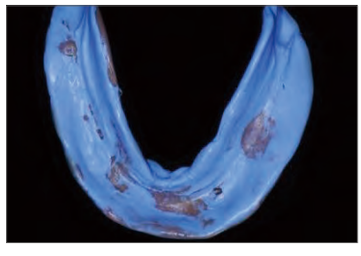




Partial denture and full denture with metallic structure cannot be used because bones become invisible due to artifact caused by metallic structure.

Ⓐ Denture Reline

Since the inner surface of the existing denture does not fit the gum well,
it must be relined precisely. We recommend using silicon impression material as relining material.


Ⓑ Attachment of the marker to the denture

Attachment of the marker to the denture using the flow resin.
Five markers are positioned, one on both sides of #1 and #7 buccal & lingual.



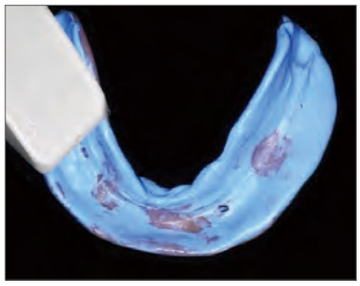
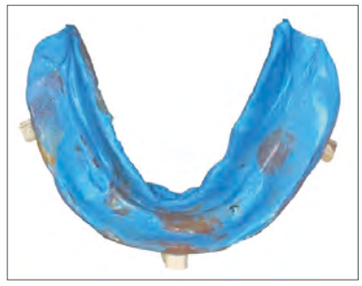
Position of the marker should be on the marginal area if possible.

Ⓒ CT scan with the denture attached to the mouth

Caution
Fix the denture onto the mouth.
Make sure to shoot in close bite.
Open bite can cause movement of the denture.

Ⓓ Denture scan

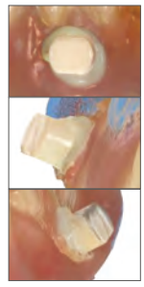
(a) Scan the inner surface of the denture that has been relined precisely.

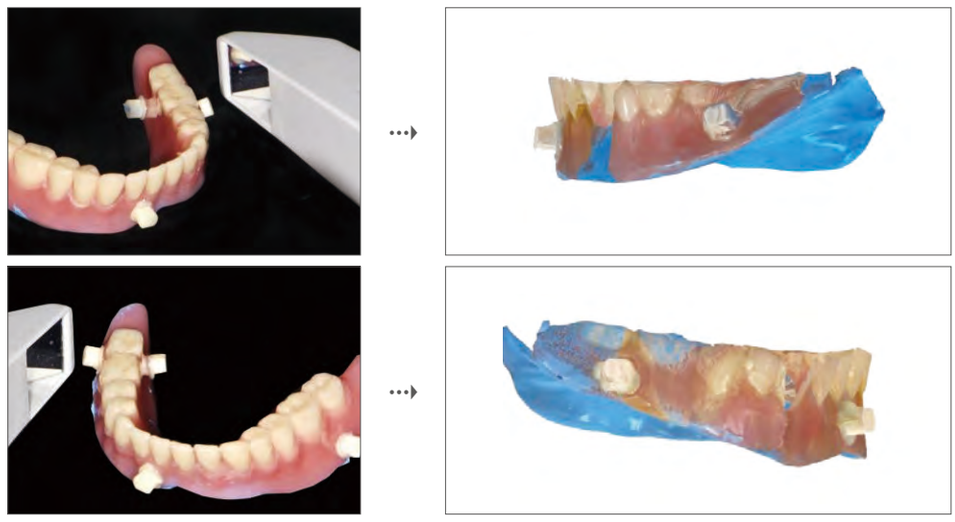
Perform precise scanning with the denture fixed in place.

(b) Surface of all markers attached to the outer surface of the denture must be scanned precisely.



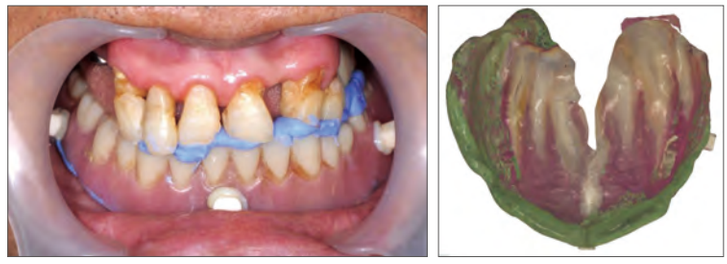


(c) Buccal side of 4#, 5#, 6# and 7# teeth on left and right sides of the denture must be scanned.
(Necessary for bite alignment with the opposing teeth)



(d) Scan image
Scan the denture, opposing teeth and occlusion.

(e) Bite scan
When scanning occlusion, make sure to scan left and right occlusions after attaching the denture to the mouth.



Caution

If the inner surface of the denture is not scanned, information of the gum cannot be acquired and the guide cannot be made.

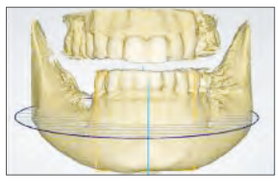
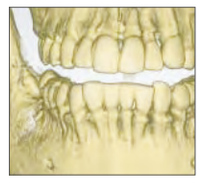
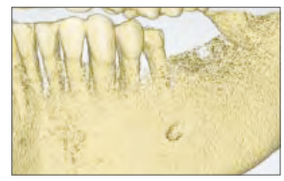
4) Precautions for scanning

① CT scan

Normal Case

▶ Precautions for CT scan

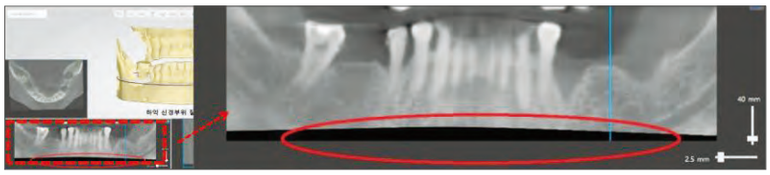
ⓐ Check F.O.V size of CT at the dental clinic in advance. Cases can be limited according to F.O.V size.

	10 X 8.5cm	8 X 8cm	8 X 5cm
Scan Image			
Indication	Can be done on full arch	Can be done on unilateral last molar ~ premolar on the opposite side (1~8 unit)	Can be done on unilateral last molar ~ anterior tooth (1~8 unit)
Note	-	Two surgical guides are made if the case becomes longer.	

※ If F.O.V of CT is small, matching is difficult and making of the guide is limited.

ⓑ Anatomical structure must be normal.
(Common: Anterior teeth / maxilla: Sinus / mandible: Nervus alveolaris inferior)

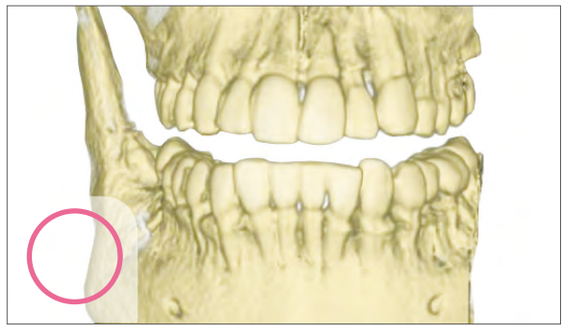
Structure of the maxillary sinus does not appear on CT image. Panorama of the maxilla



Neural structure of the mandible does not appear on CT image. Panorama of the mandible

ⓒ CT scanning must be done in open bite.

Close Bite



Open Bite

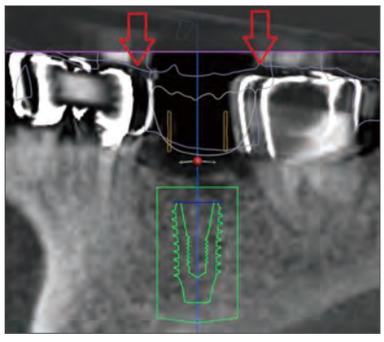
Caution

If CT scanning is done in close bite,
information of teeth can be inaccurate.

TIP

Open bite can be made easily by letting the patient bite a gauze.

④ If the patient moves during CT scan, CT image can be shaken.



Caution

Matching cannot be done if CT images overlap,
and implant cannot be positioned accurately.

② Oral scan

The maxilla / mandible / occlusion must be scanned because implant planning is done by top-down method.

Precautions for arch scan

Both the gum and teeth must be shown for implant planning and manufacture of the surgical guide.

Precautions for Bite scan

Bite is necessary for crown and customized abutment design.
Make sure to check and send bite matching in the scan.

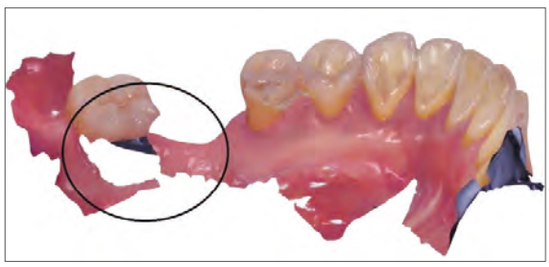
Precautions for sending

Trim unnecessary parts other than the gum and teeth such as cheeks and tongue during post-processing before sending.
※ Unnecessary parts can adversely affect making of the guide.

Examples of oral scan error

If oral scan error occurs, making of the guide can be limited or the guide may not fit in the mouth.

Distortion during scanning
Caution The guide may not fit in the mouth.



Non-scanned area during scanning
Caution The guide cannot be made.

Bite scan alignment error
Caution
The guide cannot be made accurately since position of implant is determined after arranging the crown by top-down method.

Select DIOnavi. as the lab center account for Trios.

File name must be Clinic Name-Patient Name.
Caution Work can be omitted if the file name is unclear.

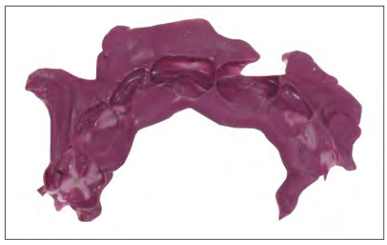
③ Impression taking and making of a model

| Important points for plaster models

The maxillar model, mandibular model and matching index are necessary.

Plaster model (maxillar)

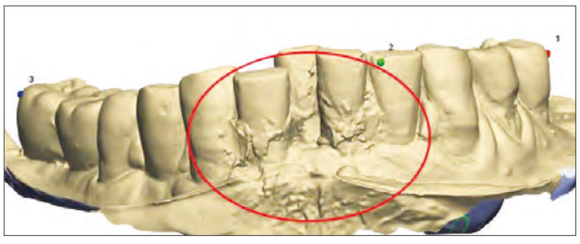
Plaster model (mandibular)



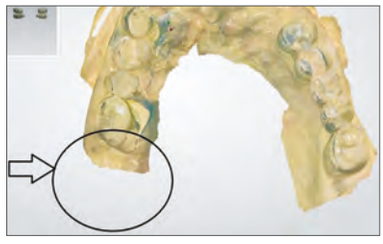
Matching index

| Examples of plaster model error

If the plaster model becomes inaccurate due to deformation of impression, it is difficult to make the guide.



Caution
If there is an error during impression taking,
the guide cannot be sit in the mouth.



Caution
The guide cannot be made
if impression of proposed implant site is not taken.

| Shipment of plaster model

Caution
Surround the plaster model with packaging bubble wraps to prevent damage.

Send the three models above, including the DIOnavi. order form, to the DIOnavi. Center plaster scan manager of DIO.

3 Order Process

Order process is varied by the country.

Please contact the sales agent in your region.

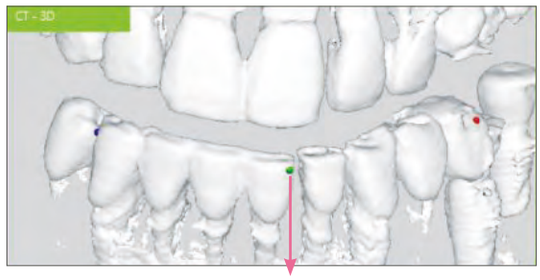
DIO navi. Center

4 DIOnavi. Surgical Guide Design

Design process using 3-Shape Implant Studio

CT + Oral scan merging ···› Implant Planning ···› Implant Planning Confirmation ···› Surgical Guide Design ···› Customized Abutment + Abutment Jig + Temporary Crown Design

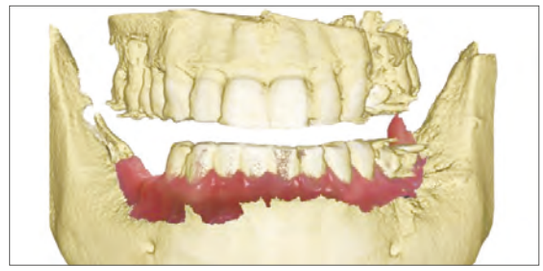
1) Merging



Merging with 3points on the same teeth No. of both data.

Caution

Condition in the mouth must be the same during CT scan, oral scan and impression taking.



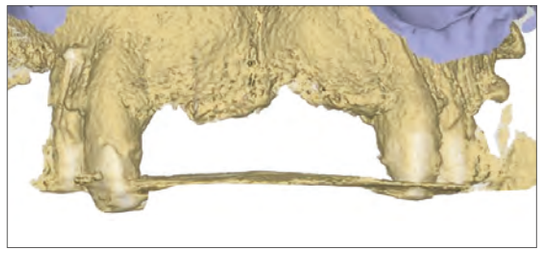
Caution

Take a CT with open bite as the teeth are not show properly in the closed bite.

If anterior teeth are cut off on CT

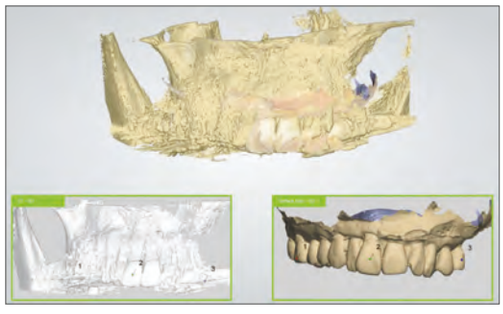
After taking CT, check whether CT scan range is appropriate.

If there is a temporary crown

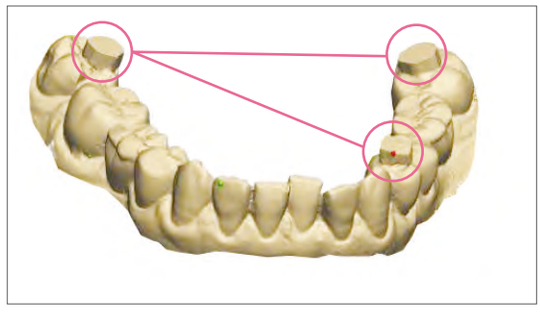


If there is a temporary crown in the mouth, remove the temporary crown or attach a marker to the occlusal surface before CT scan.

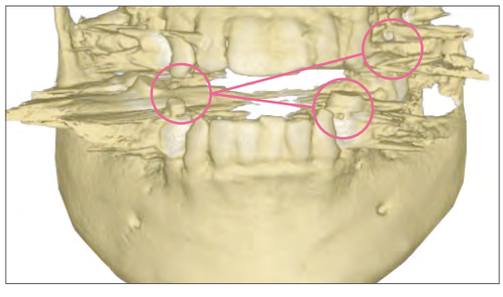
If artifact phenomenon occurs from CT due to metallic prothesis



If there is a metallic prosthesis in the mouth, artifact is created on CT and the distortion is spread horizontally.



Attach the marker to 3 points on the occlusal surface before CT scan.



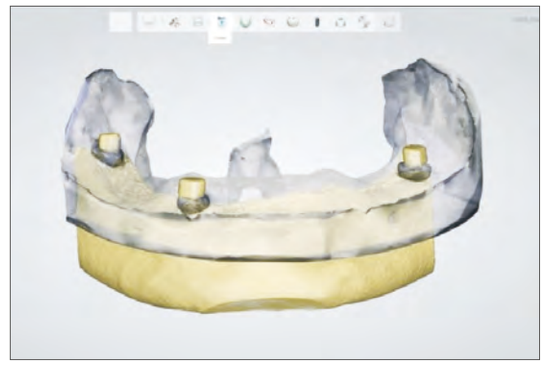
Caution

The surgical guide must be attached on top of the occlusal surface of the arch to be made. Position of the marker must be the same between CT and scan data.

2) Implant Planning

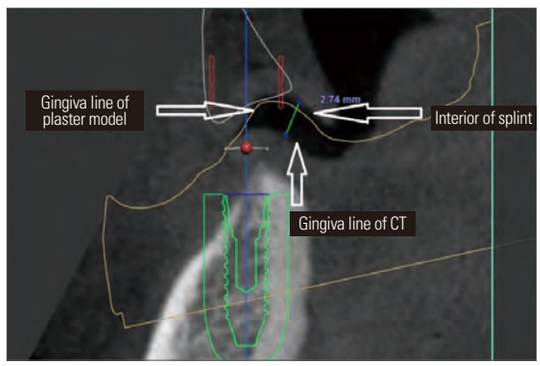
① Edentulous Case

Since reference points of merging and occlusal dimension are unknown, an existing denture or splint is necessary.



Making of the splint

※ Precautions for the splint: Refer to P23~24.



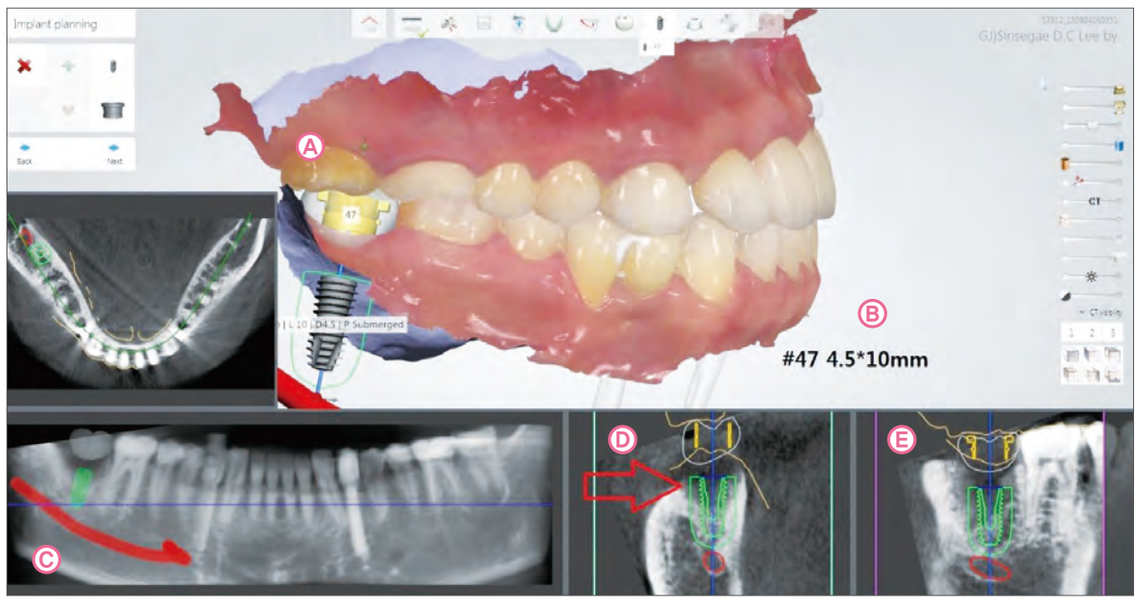
Caution

Make sure to check the inner surface and proper attachment through CT scan for denture or splint.

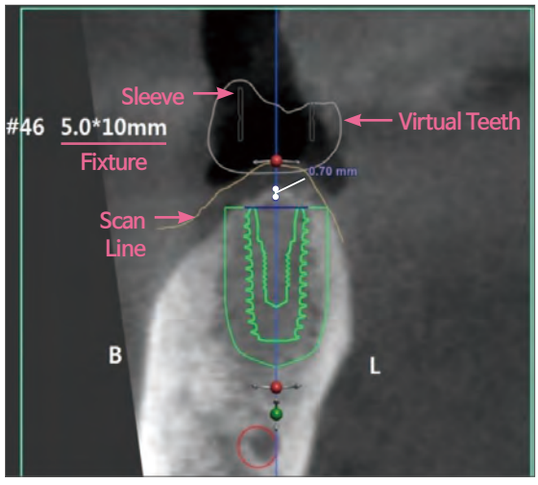
TIP

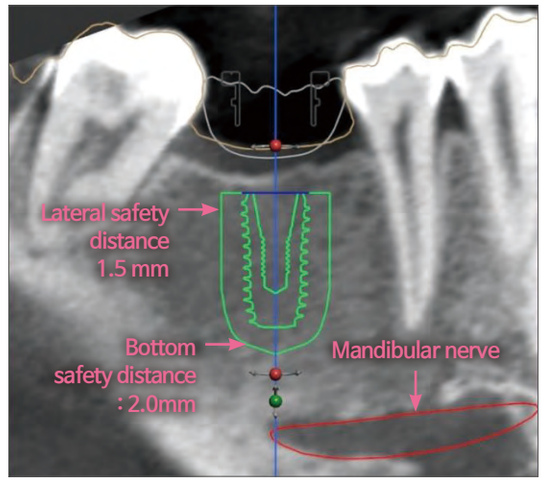
There must be no gap between the gum and inner surface of the splint on CT.

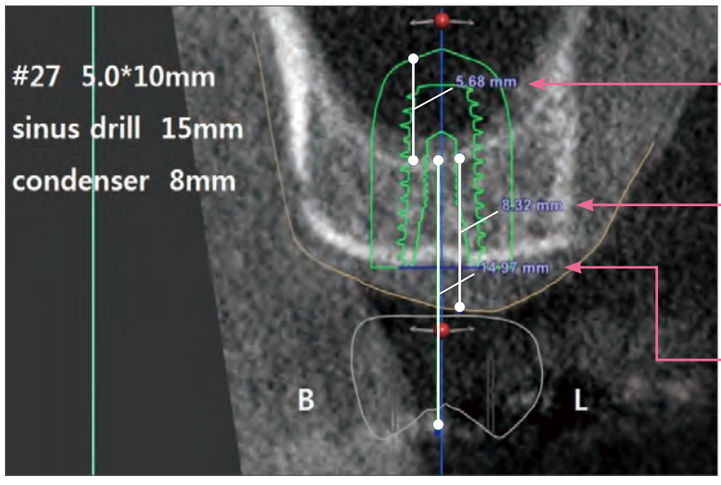
② Normal Case



Ⓐ Scan-View: Check relation of the prosthesis.
Ⓑ Relevant Information of the Implant Fixture
Ⓒ Panoramic View
Ⓓ Buccal-Lingual View
Ⓔ Mesial-Distal View







Height of sinus lift

Select length of the stopper using distance from the gum to the sinus wall or length of the bone condenser that pushes the bone during bone graft.

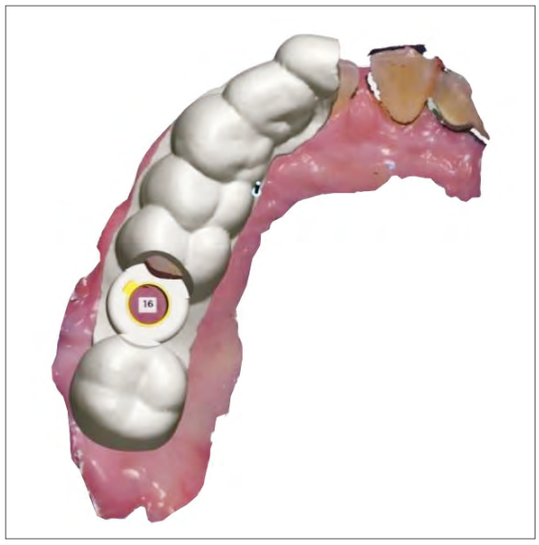
Distance from the sleeve top to the sinus wall, length of the drill, and length of the stopper used can be found.

Surrounding anatomical information and implant position can be checked.
Determine bone quality based on white balance of the bone.

3) Implant Planning Confirmation

Implant planning confirmation process is different in each country.
Please contact the sales agent in your region.

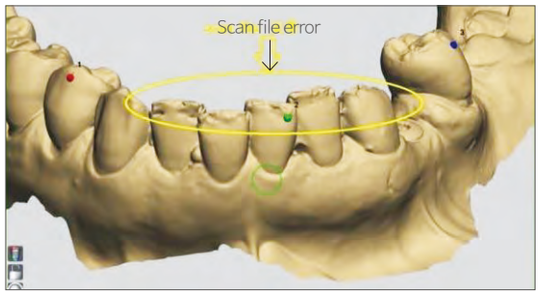
4) Surgical Guide Design

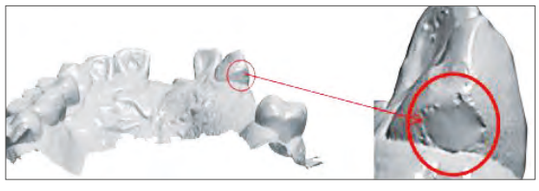


The surgical guide is designed based on scan data.

Caution

Scan data must be accurate to make a surgical guide that perfectly fits in the mouth.





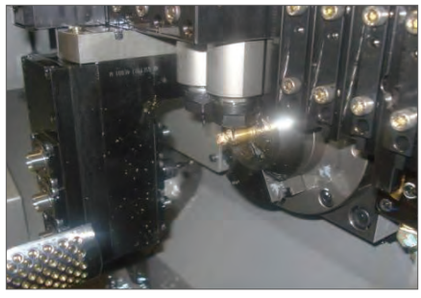
The guide cannot be attached if there is an error in the plaster model or oral scan.

Once the design of the guide is completed after planning, a file with coordinates of the implant is created.
Dental clinic, or cooperating laboratory asks design of Customized Abutment + Abutment Jig, the scan file with relevant coordinates will be sent.

5) Manufacture

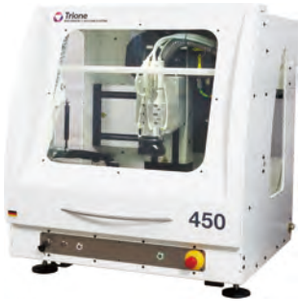
① A precise surgical guide is fabricated by using 3D printer.

② Customized abutments are precisely manufactured with CNC machine.



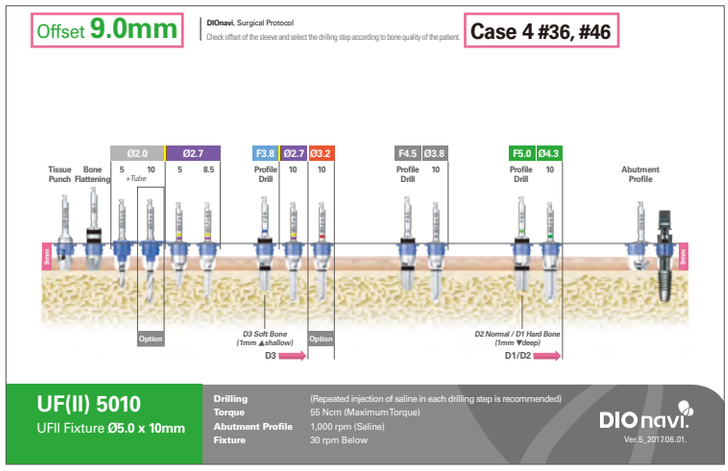
To customize and precisely make all products, it takes 3 days after confirmation to make the surgical guide and 4 days to make the surgical guide, a customized abutment and a temporary crown.

③ The temporary crown is precisely processed by a partner laboratory of DIO using a milling machine.



Check details of planning and reply via e-mail in an area where DIOnavi. site service is not provided.
Making of the case is started after receiving e-mail confirmation from DIO.

6) Matters to be confirmed after receiving DIOnavi. product



TIP

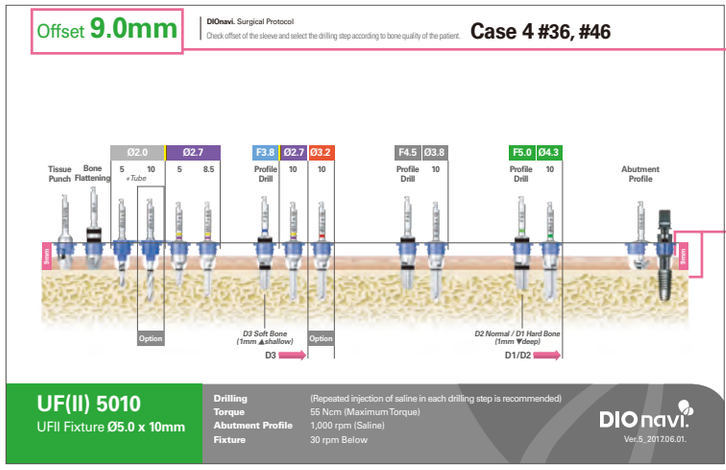
Attach the report to the operation room and use it as reference during operation.

Check the surgical guide, and check for the exact fit of the customized abutment and abutment jig.

Implant information		
Implant position (FDI)	36	37
Manufacturer	DIO	DIO
Type	UF(II) 5010	UF(II) 5008
Order number	UF(II) 5010	UF(II) 5008
Length, mm	10	8.5
Diameter (Ø), mm	5	5
Color	Green	Green
Sleeve information		
Name	DIO GS 53	DIO GS 53
Type	Fully guided	Fully guided
Order number	GS 53	GS 53
Offset, (mm)	9	10.5
Drill information		
Minimum drill length	19	19

Surgical report.pdf (1.8MB)
Drilling protocol.pdf (204KB)

Content shown
in the surgical report mail



Check offset value in
drilling protocol

Surgical Process

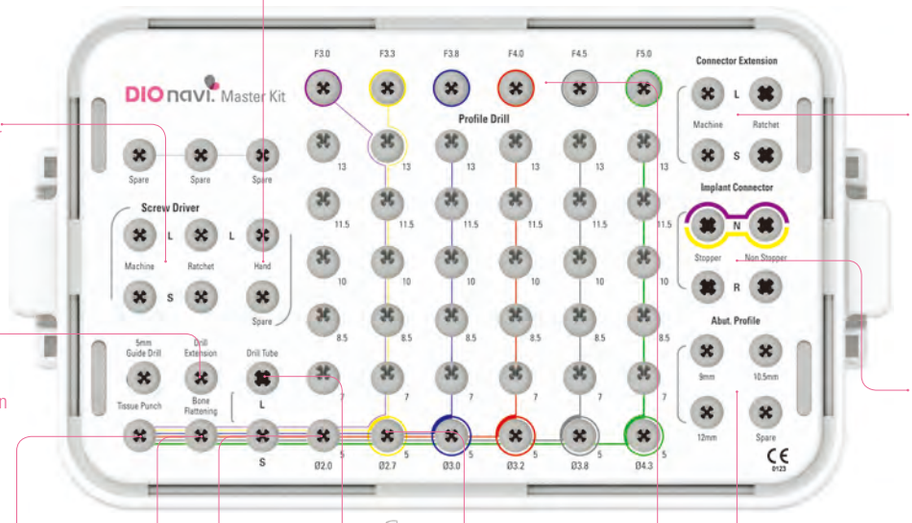
1 DIOnavi. Master Kit

General operation process + DIOnavi. Master Kit

Guide Sleeve [GS 53]

Screw Driver
HD 1215A

Square Screw Driver
SHD 1215
SHD 1220



Connector Extension
CE 6512M · CE 6512A
CE 6508M · CE 6508A

Drill Extension
DE 3811

Implant Connector
GNIC 5309 · GNIC 5317
GIC 5309 · GIC 5317

Tissue Punch
GTP 5125

Bone Flattening Drill
UBFD 5127M

Guide Drill
UGT 2005R

Drill Tube
UDT 20
UDTE 20

Initial Drill
ISD 2013M
ISD 2011M
ISD 2010M
ISD 2008M
ISD 2007M
ISD 2005M

Profile Drill
GPD 3005M
GPD 3305M
GPD 3805M
GPD 4005M
GPD 4505M
GPD 5005M

Abutment Profile Drill
UAPD 5123
UAPD 5124
UAPD 5126

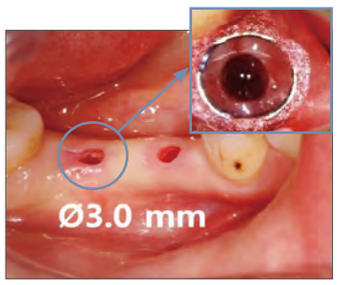
Final Drill
USD 2713M · USD 3013M · USD 3213M · USD 3813M · USD 4313M
USD 2711M · USD 3011M · USD 3211M · USD 3811M · USD 4311M
USD 2710M · USD 3010M · USD 3210M · USD 3810M · USD 4310M
USD 2708M · USD 3008M · USD 3208M · USD 3808M · USD 4308M
USD 2707M · USD 3007M · USD 3207M · USD 3807M · USD 4307M
USD 2705M

Torque Wrench
DTW 0080

1) Tissue Punch

Incise the gingiva in the position of implant and remove the gum tissue.

Ø3.0 [GTP 5125]



Benefits of a small-diameter tissue punch

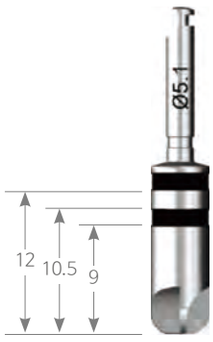
① Postsurgical hemostatic effect due to the contact between mucosa and abutment surface
② Faster healing of the wound
③ Healing with smaller scars

TIP

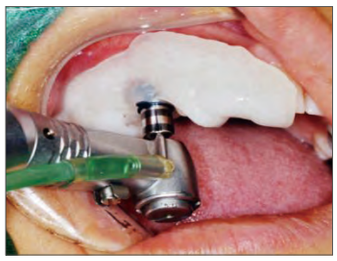
Since residues after operation can result in rust, they must be managed cleanly. They can be removed easily using explore or steam.

2) Bone Flattening Drill

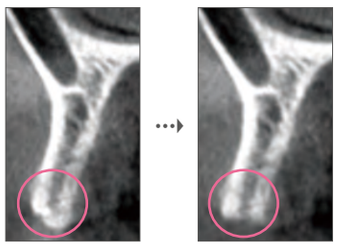
The bone flattening drill flattens the surface of the alveolar bone.
(If the bone surface is not flat, the drill can slip and be drilled in an unwanted position.)
Use the tissue punch and remove soft tissues remaining in the alveolar crest.
If the cortical layer is thick, use 800 RPM while irrigating.



[UBFD 5127M]



Bone Flattening Drill

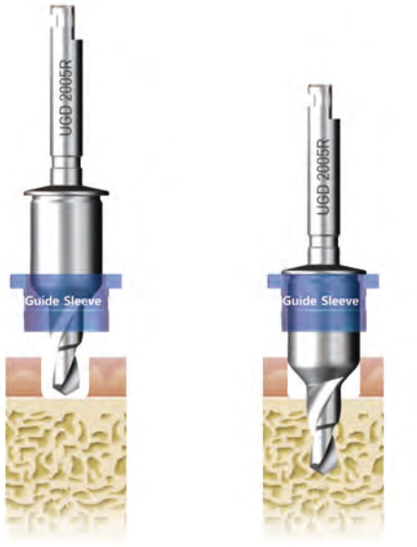


Before use After use

1) Ø2.0x5mm Guide Drill

Use the Ø2.0x5mm Guide Drill for a case of limited mouth opening(※Optional)
If opening is small, it can be used without a drill tube.

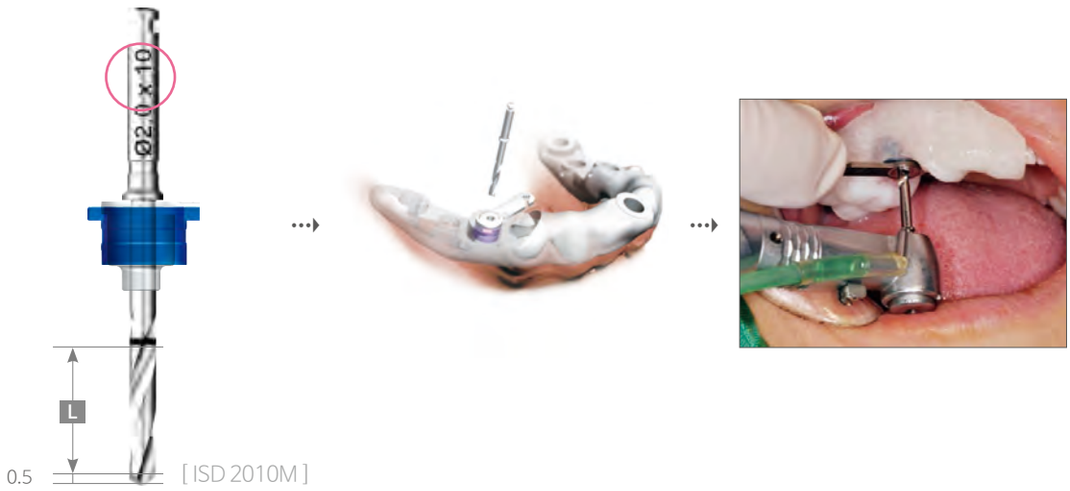
[UGD 2005R]



Drilling is done stably after fixing the drill
onto inner surface of the guide sleeve.

2) Ø2.0 Initial Drill

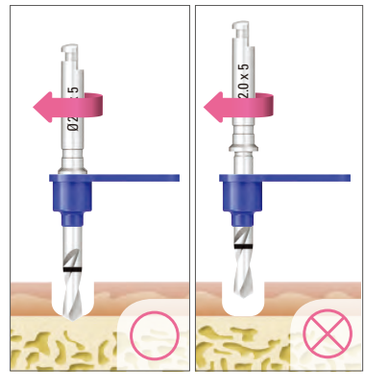
Secure accurate position and direction of the initial drilling hole.
After drilling 5mm, select and use a drill appropriate for fixture size.
※ Maintain accurate position and direction of the drill using a drill tube.
※ Drilling at 50 RPM without irrigation.



L Length=5/7/ 8.5/10/11.5/13 /15mm ※Sold separately

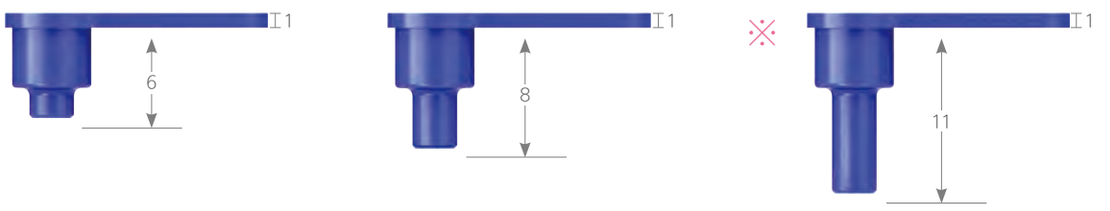
Caution

Drilling starts after the drill passes the drill tube and stably settles down on the bone.
The drill can get jammed in the drill tube if it enters while rotating.



Ø2.0 Drill Tube

Select and use according to sleeve offset and drill length. Drilling can be more stable if fixing area is larger.



Standard Size [UDT 20]

Extension Size [UDTE 20]

Extension Size [UDTL 20] ※Sold separately

※ Irrigation after drilling

① Correct method of irrigation during flapless guide surgery

▶ We recommend performing surgery with irrigation.

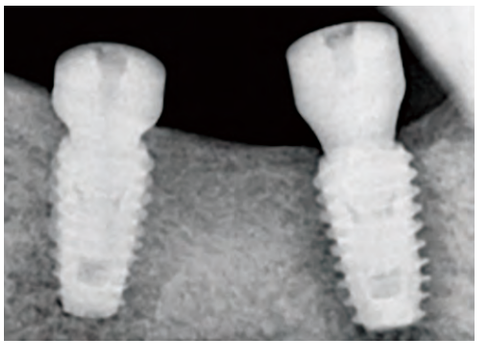
When irrigating external water during flapless guide surgery,

it is difficult to irrigate into bones because of the mucous and guide.

Therefore, during flapless guide surgery, it is necessary to minimize heat generation through low-speed drilling and irrigate after removing the drill and positioning the irrigation needle on the bone cavity.

② Correct method of irrigation during low-speed drilling

▶ It is recommended to repeat cleaning and suction of the drilling hole in each drilling step.



Bone Heating

No water is sprayed during low-speed drilling at 50 RPM or below.
For prevention of bone heating and complete removal of particles in the bone cavity, it is recommended to repeat cleaning and suction of the drilling hole to the bone cavity in each drilling step.

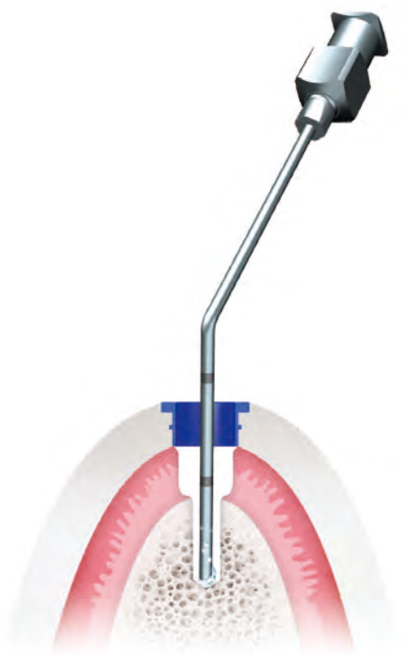
TIP

Drilling 10-second rule!

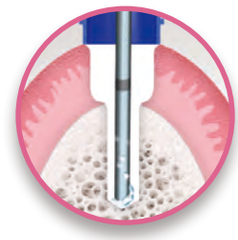
If low-speed drilling is done in a case with high bone density, increased drilling time involves risk of bone heating. Drilling time should not exceed 10 seconds. If drilling time is too long, perform drilling for less than 10 seconds and remove the drill. Resume drilling after irrigation into the bone cavity.

③ Method of using metal needle

The irrigation needle needs to be positioned as deep as the bone cavity to prevent bone heating and completely remove particles in the bone cavity.

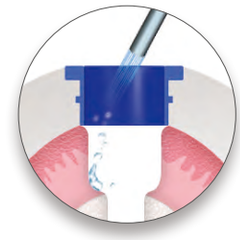


O

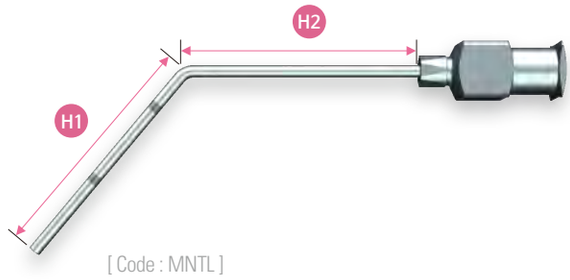


The needle is positioned as deep as the bone cavity for irrigation.

X



The needle is not deep enough to irrigate into the bone.



[Code : MNTL]

TIP

Spec. : 18G OD : 1/2"

Code	H1	H2
MNTE	30	50
MNTL	25	25

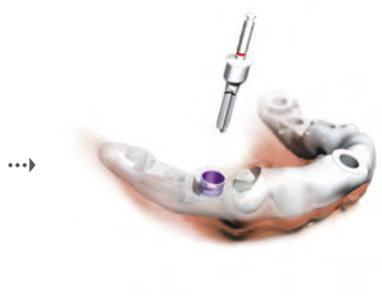
Recommended syringe spec : 30~50cc
(refrigerated for storage before operation)

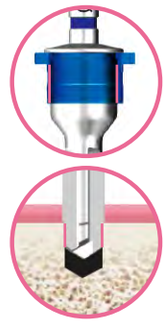
3) Final Drill

The drill body and guide sleeve are fixed by touching one another without a drill tube. Select a drill appropriate for fixture size.

※ Drilling at 50 RPM without irrigation.

[USD 2711M]





L Length=7/8.5 /10 /11.5 /13/15mm
※Sold separately

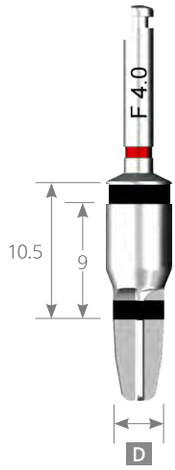
Caution

The drill body and sleeve settle down on the drilling hole for double contact. Slipping can only be prevented by starting with a short drill.

4) Profile Drill

Excessive torque is prevented when inserting the fixture by expanding the cortical bone in the D1 or D2 mandible. Also, this helps flattening of bone and stable drill entry.

※ Drilling at 50 RPM without irrigation.

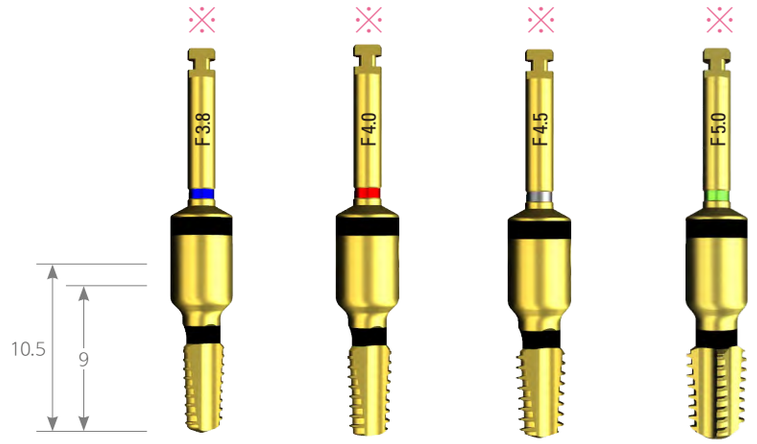


[GPD 4005M]

D Diameter=Ø3.0/Ø3.3/Ø3.8/Ø4.0/Ø4.5/Ø5.0mm

5) Tap Drill

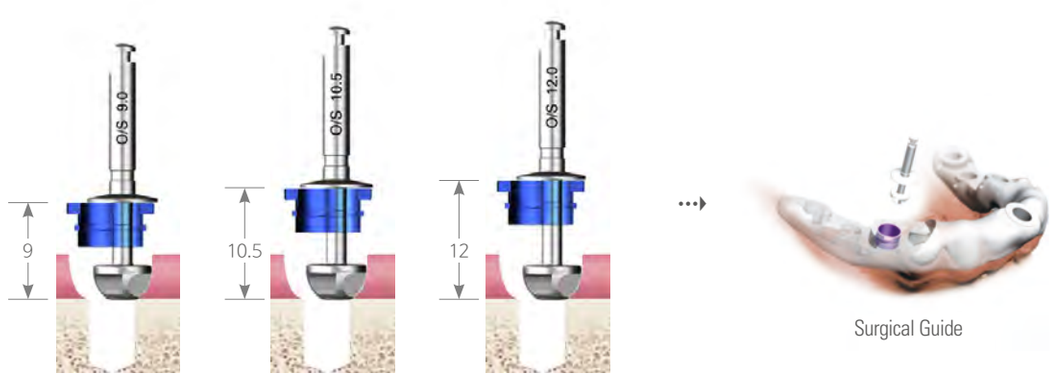
Excessive torque is prevented when inserting the fixture. ※Sold separately



[GTD 3815] [GTD 4015] [GTD 4515] [GTD 5015]

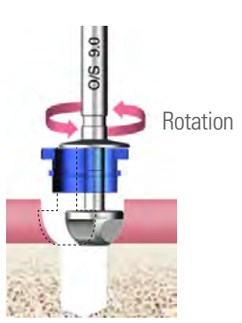
6) Abutment Profile Drill

The alveolar bone, which interferes connection of the abutment or H-scanbody, is removed.
The drill is rotated along inner surface of the sleeve to form the abutment profile.
※ If the cortical layer is thick, increase RPM while irrigating. (1,000 RPM)

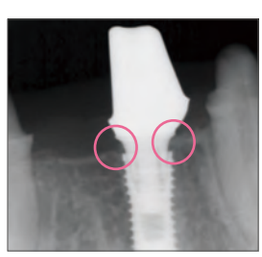


[UAPD 5123] [UAPD 5124] [UAPD 5126]

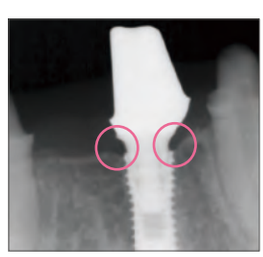
Surgical Guide



Rotation



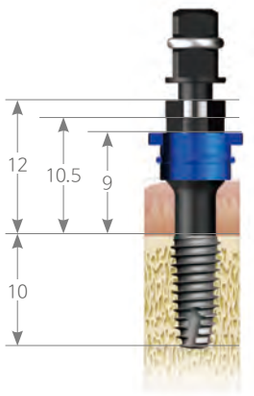
Abutment Profile Drill
before use



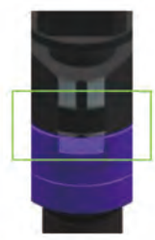
Abutment Profile Drill
after use

7) Implant Connector

The fixture is stably pulled to the guide sleeve for insertion.
Sleeve offset is matched with depth of the implant connector.

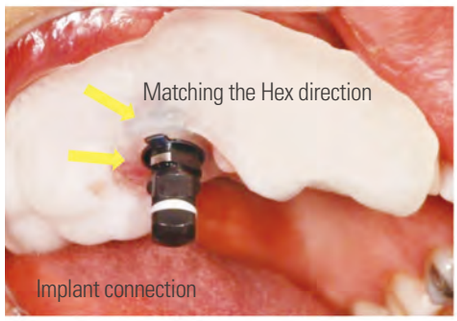


- Match the Hex direction
- Match the depth



Caution

When connecting the customized abutment,
both depth and direction of the implant connector
and sleeve must be matched.

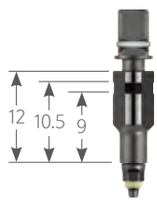


TIP

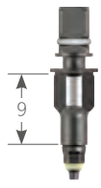
If the implant connector is jammed in the sleeve,
put the crown remover into the groove and
remove the connector using the principle of the lever.

K UF II Regular

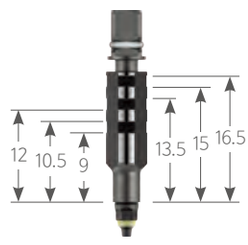
Type



Stopper
[GIC 5309]



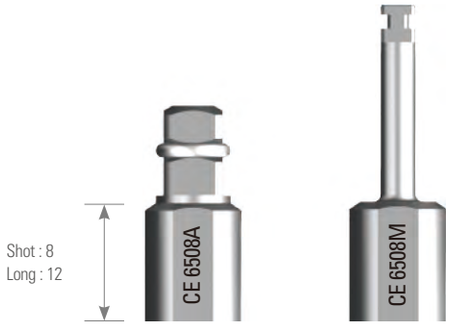
Non-Stopper
[GIC 5309ST]



Multi
[GIC 5317]

8) Connector Extension

Extend the implant connector and insert the fixture using the ratchet and handpiece.



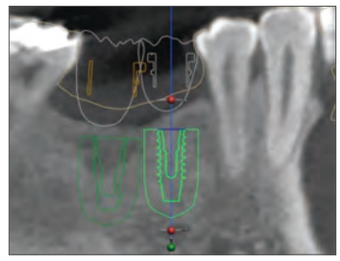
Ratchet [CE 6508A]

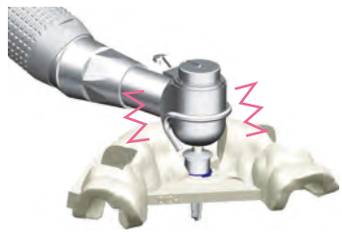
Machine [CE 6508M]

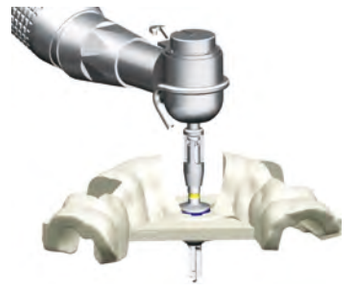
9) Drill Extension

Extend the drill to perform drilling with the handpiece.

[DE 3811]







Before use
If the handpiece is interfered by the guide

After use

TIP This can be useful if the fixture is inserted into the lower part of bone level because of bone loss or the handpiece is caught by the guide due to interference of adjacent teeth.

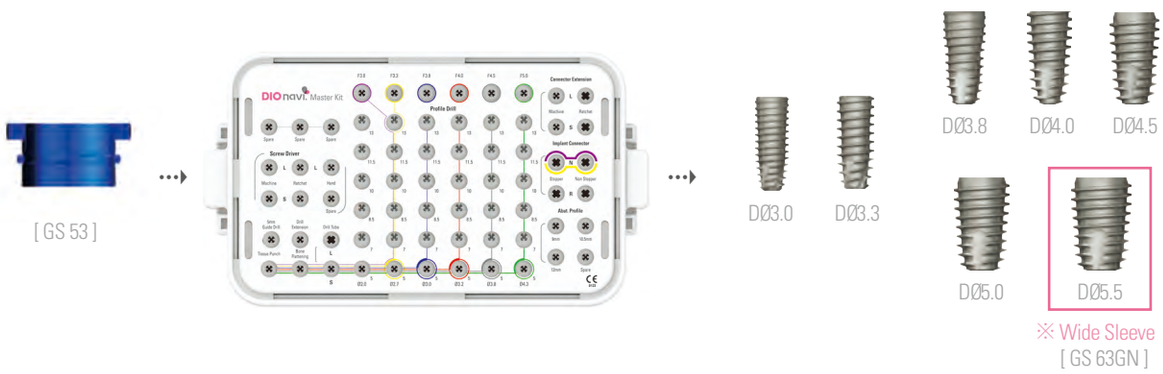
10) Torque Wrench

This is used during insertion of the fixture using the implant connector.

[DTW 0080]

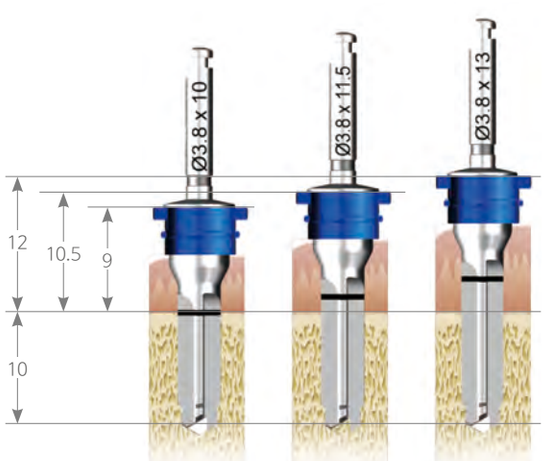
Understanding of offset

1) Selection of product according to sleeve



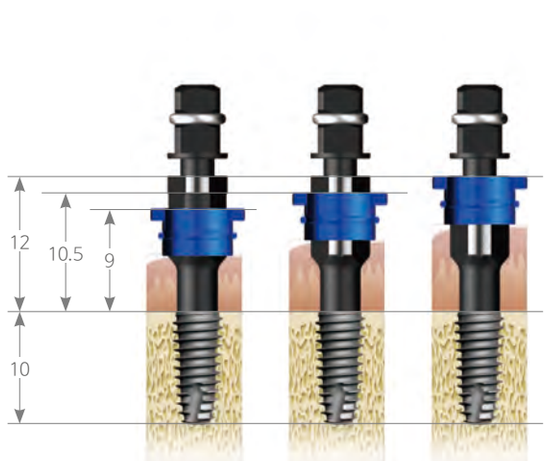
Sleeve | Master Kit | Narrow Fixture | Regular Fixture

2) Use of sleeve offset and product



Method of selecting drill according to sleeve offset (For 10mm drill)

_ Select 10mm drill in case of 9mm offset
_ Select 11.5mm drill in case of 10.5mm offset(Increased by 1.5mm)
_ Select 12mm drill in case of 13mm offset(Increased by 3mm)



Reference height of the implant connector according to sleeve offset (for 10mm fixture)

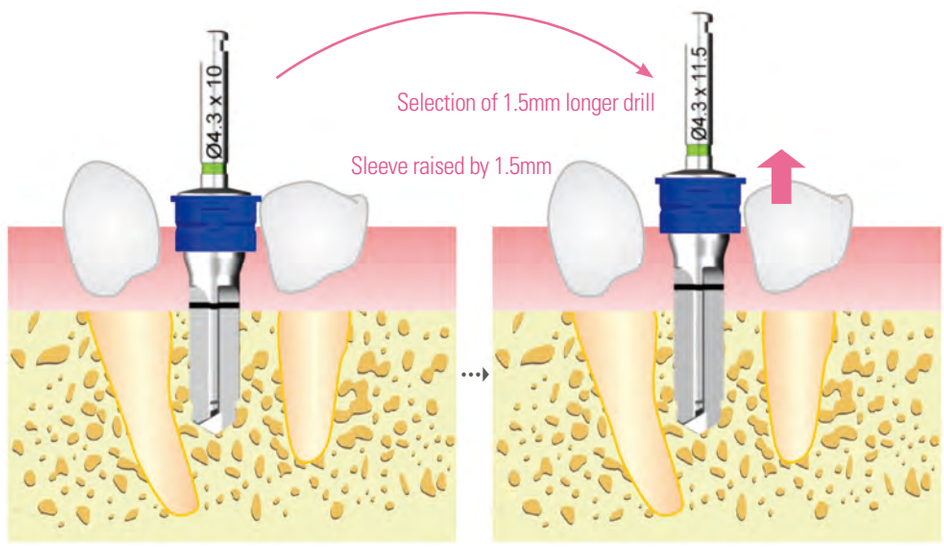
_ To the first mark in case of 9mm offset
_ To the second mark in case of 10.5mm offset (increased by 1.5mm)
_ To the third mark in case of 12mm offset (increased by 3mm)
※ Interval between marks: 1.5mm

Caution When connecting the customized abutment, both depth and direction of the implant connector and sleeve must be matched.

3) Sleeve offset application

If the gum is thick that the guide is pushed up during connection or there is interference during entry into the sleeve due to narrow space with adjacent teeth, offset the guide sleeve by 3 steps (9/10.5/12mm).

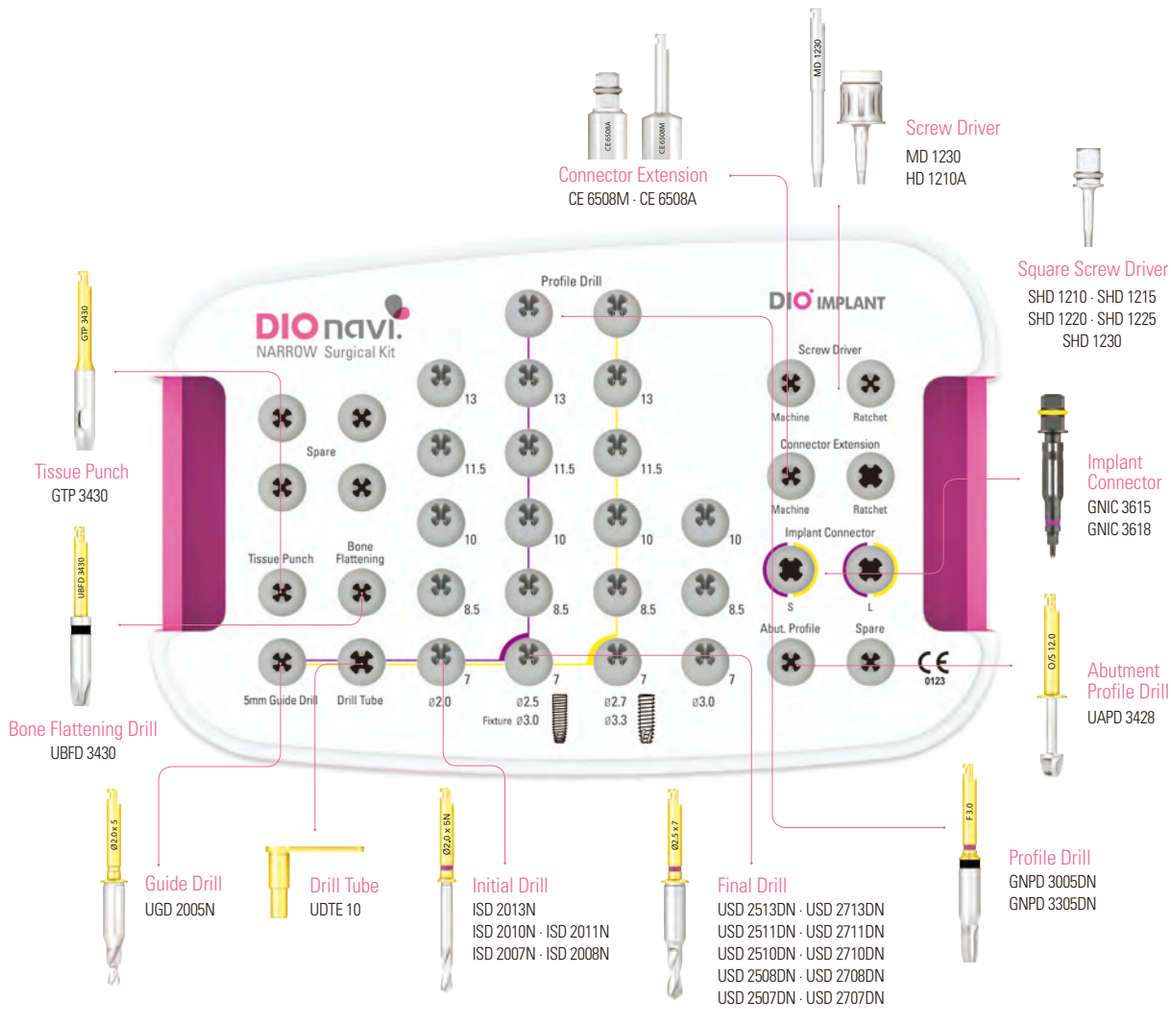
Sleeve lifted by 1.5mm, 3mm



Selection of 11.5mm drill when sleeve offset is 10.5mm during placement of 10mm implant

2 DIOnavi. Narrow Kit

Use of narrow-only sleeve + DIOnavi. Narrow Kit
[GSL 36] [GS 36]



1) Use of narrow-only sleeve

When more precise drilling is necessary because of narrow width of tooth like the anterior tooth or narrow bone width

A narrow-only sleeve (GSL 36 / GS 36) with smaller diameter than standard size sleeve (GS 53) is used.

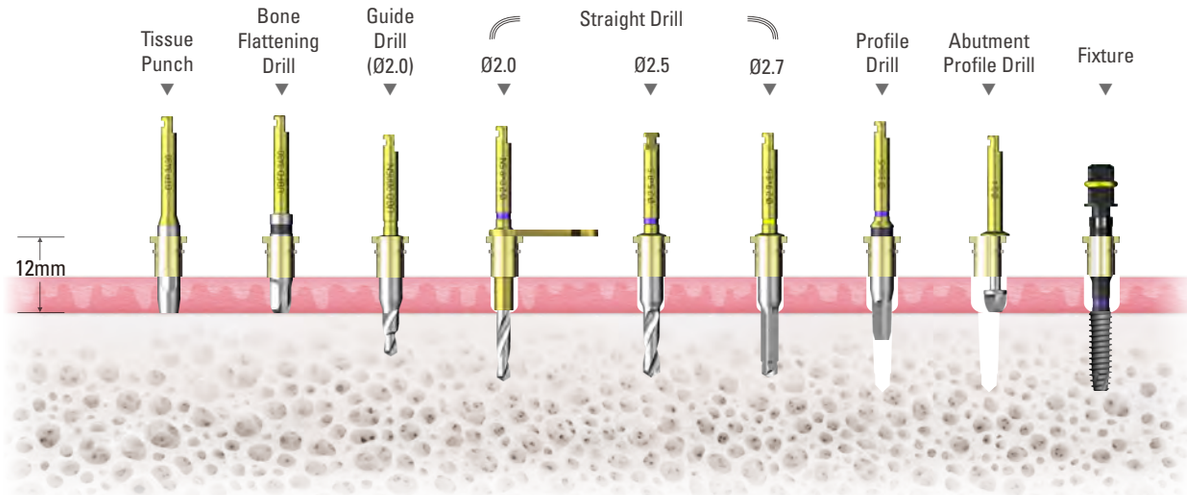
A narrow kit exclusive for DIOnavi. is used.

Sleeve | Narrow Kit | Narrow Fixture

Caution

The narrow-only sleeve only has 12mm offset, and drill length does not change according to offset.
Depth of the implant connector is the same as well.

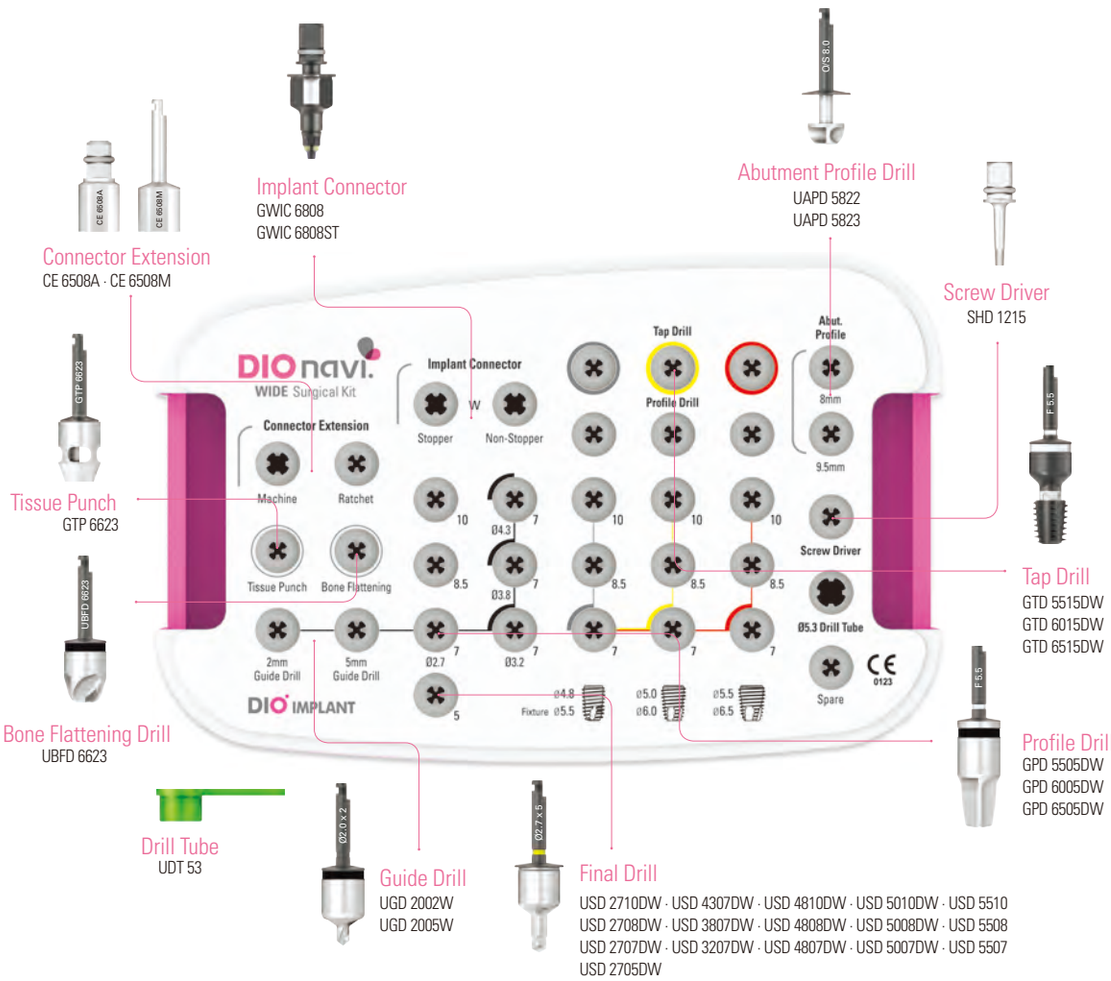
Surgical Protocol



	Bone Density	Tissue Punch	Bone Flattening Drill	Guide Drill	Initial Drill (Ø2.0)	Straight Drill Ø2.5	Straight Drill Ø2.7	Straight Drill Ø3.0	Profile Drill	Abutment Profile Drill
Ø3.0	Soft	▶	▶	▶	▶	▷				▷
	Medium	▶	▶	▶	▶	▶				▷
	Hard	▶	▶	▶	▶	▶			▶	▷
Ø3.3	Soft	▶	▶	▶	▶		▷			▷
	Medium	▶	▶	▶	▶		▶			▷
	Hard	▶	▶	▶	▶		▶		▶	▷

3 DIOnavi. Wide Kit

DIOnavi. If wide sleeve is used + DIOnavi. Wide Kit
[GS 68GN]



Implant Connector
GWIC 6808
GWIC 6808ST

Abutment Profile Drill
UAPD 5822
UAPD 5823

Connector Extension
CE 6508A · CE 6508M

Screw Driver
SHD 1215

Tissue Punch
GTP 6623

Tap Drill
GTD 5515DW
GTD 6015DW
GTD 6515DW

Bone Flattening Drill
UBFD 6623

Profile Drill
GPD 5505DW
GPD 6005DW
GPD 6505DW

Drill Tube
UDT 53

Guide Drill
UGD 2002W
UGD 2005W

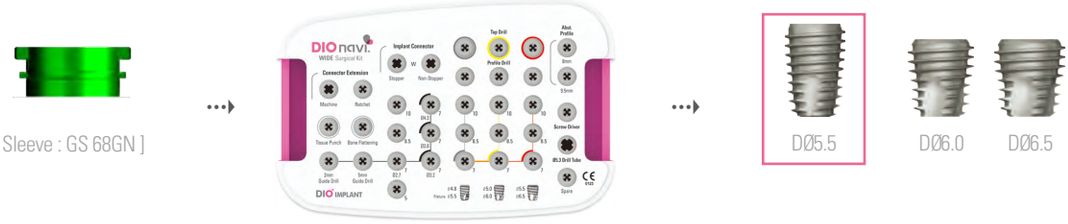
Final Drill
USD 2710DW · USD 4307DW · USD 4810DW · USD 5010DW · USD 5510
USD 2708DW · USD 3807DW · USD 4808DW · USD 5008DW · USD 5508
USD 2707DW · USD 3207DW · USD 4807DW · USD 5007DW · USD 5507
USD 2705DW

Torque Wrench
DTW 0080

1) Use of wide-only sleeve

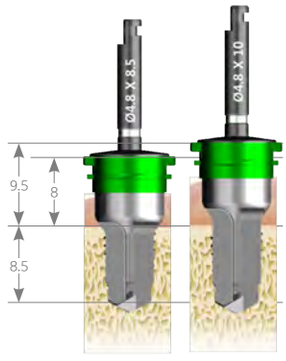
When inserting the wide fixture into a molar with small opening, the guide is made using a wide-only sleeve. A wide-only kit is used.

Caution Offset steps are 8 and 9.5mm.



Sleeve | Wide Kit | Regular Fixture | Wide Fixture

2) Sleeve Offset



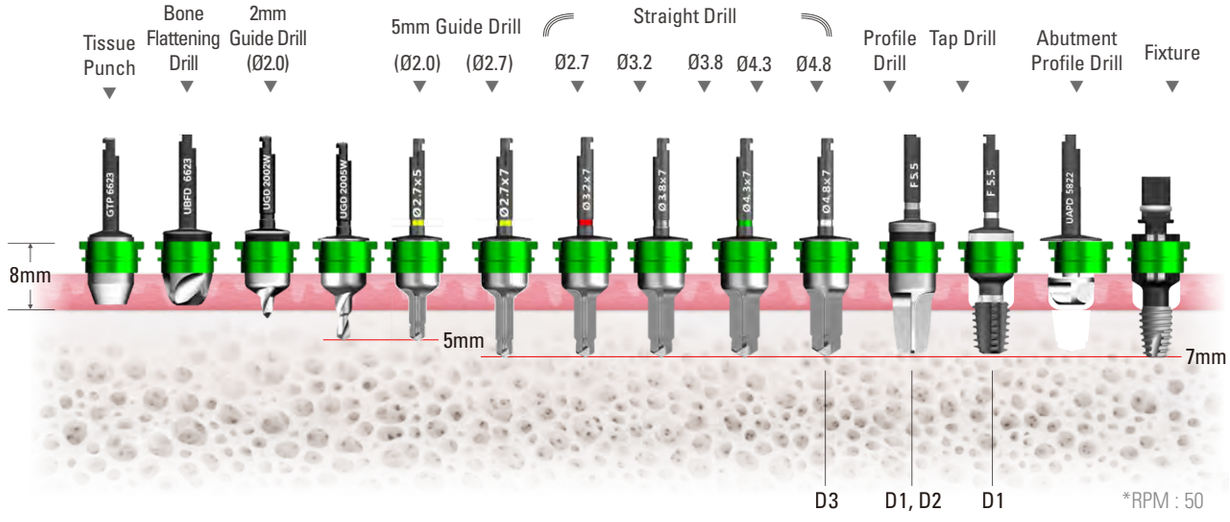
Method of selecting drill according to sleeve offset (for 8.5mm drill)

_ Select 8.5mm drill in case of 8mm offset
_ Select 10mm drill in case of 9.5mm offset (increased by 1.5mm)

Reference height of the implant connector according to sleeve offset (for 8.5mm drill)

_ To the first mark in case of 8mm offset
_ To the second mark in case of 9.5mm offset (increased by 1.5mm)
※ Interval between marks: 1.5mm

| Surgical Protocol



4 DIOnavi. Flapless Crestal Sinus Kit

Crestal sinus using the DIOnavi.guide

Main : DIOnavi. Flapless Crestal Sinus Kit
Sub : DIOnavi. Master Kit

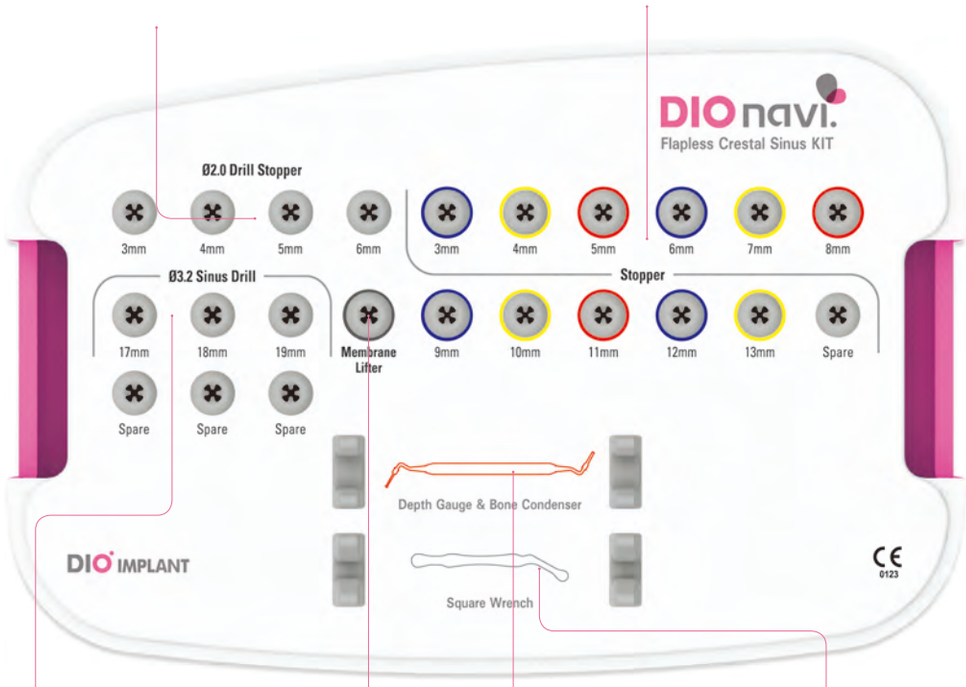
Ø2.0 Drill Stopper

GST 2030BL GST 2040YE GST 2050RD GST 2060BL

Ø3.2 Drill Stopper

GST 03BL GST 04YE GST 05RD GST 06BL GST 07YE GST 08RD

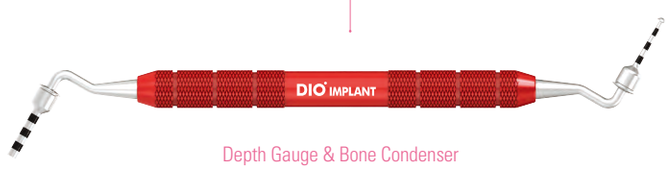
GST 09BL GST 10YE GST 11RD GST 12BL GST 13YE



Sinus Drill
GSRD 3217
GSRD 3218
GSRD 3219

Membrane Lifter
WML 6627

Square Wrench
DSW 050



Depth Gauge & Bone Condenser
GSDB 2619

1) Drill stopper for Ø2.0 drill

Engage the stoppers with the Ø2.0 initial drills and perform drilling to desired depth.

[ISD 2005M] [ISD 2007M]

TIP

① Range is 3~6mm with 1mm interval.
② Anodizing and laser marking are done according to length.

2) Sinus drill (crestal) & stopper

Front blade with round shape approaches the sinus without damaging the membrane.
※ No irrigation, low-speed drilling (50 RPM)

[GSRD 3217] [GSRD 3218] [GSRD 3219] [GSRD 3221]
※Sold separately

TIP

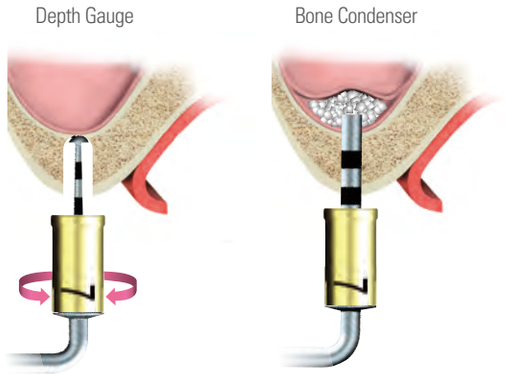
① Used with Straight Drill (DIOnavi. Master Kit), Initial Drill, Sinus Drill, Depth Gauge & Bone Condenser.
② Range is 3~13mm with 1mm interval for a total of 11 lengths
③ Height of the stopper refers to length.

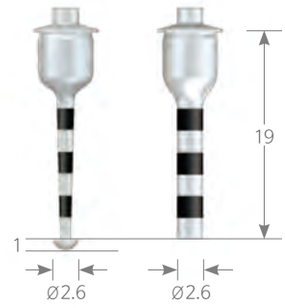
3) Depth Gauge & Bone Condenser

Check thickness of residual bone and perforation of the membrane, and push the bone into the perforated sinus.

TIP

Use afterimage guide. Make sure the stopper is engaged before use.





[GSDB 2619]

4) Membrane Lifter

Append the method of hydraulic pressure technic using saline 0.8cc is slowly injected in general per a sinus.

TIP

① Do not use for the patient with sinus inflammation
② If morphology of the sinus floor is complex (septum, etc.), It is prohibited.
③ Use saline or the patient's own blood.
④ Use after removing the guide.

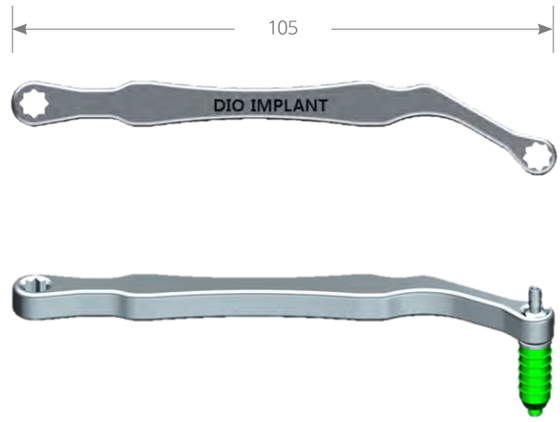
Caution

Use after autoclaving before the surgery.
Use the Membrane Lifter one time only since multiple uses can cause cross infection.

[WML 6627]

5) Square Wrench

Settle and fix the membrane lifter on the drilling hole.



6) Syringe & Tube

Syringe

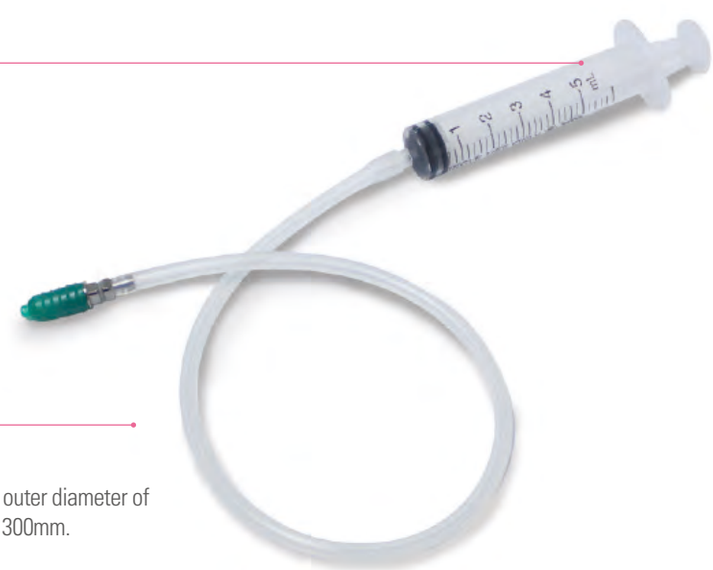
It must be a needleless syringe of 5mL / cc capacity with clear 0.2mL / cc marks.
※ Disposable sterile medical device
※Sold separately

Membrane Lifter

Tube

[MLT 40300]

This is a semi-transparent silicon tube with outer diameter of Ø4.0 / inner diameter of Ø2.0 and length of 300mm.
※Sold separately



TIP

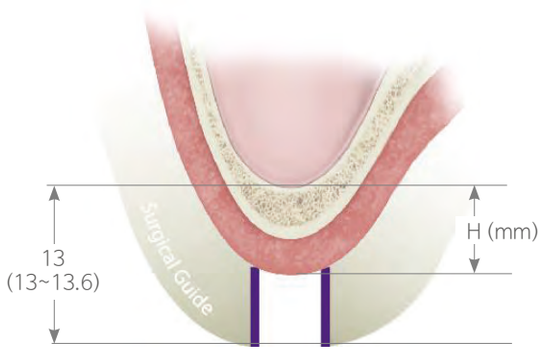
Primary packaging with sterile paper and secondary packaging with User Manual included
→ Secondary package opened by the customer
→ Used after performing autoclave on primary package (sterile paper)

Caution

Use the devices one time only since multiple uses can cause cross infection.

7) Drilling Protocol

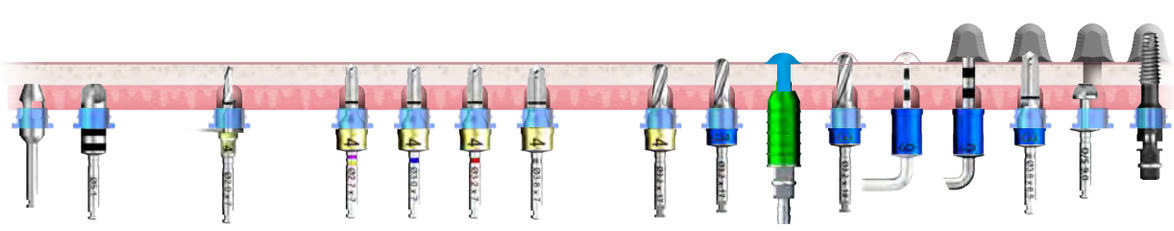
ex) Protocol : 4.5x10_Offset 9



Drilling : 100 RPM
Torque: 55 Ncm (Maximum Torque)

※ Opened while exerting an external force of 10 RPM or below (minimum RPM)

Tissue Punch	* Bone Flattening	Approach to the Membrane	Opening		Lifting	Opening	Penetration / Bone graft	Bone graft	Final Drilling	Abut. Profile Saline	* Fixture
		12.5mm	13mm	14mm	0.8cc	15mm	15mm	15mm	50 RPM	1000 RPM	30 RPM



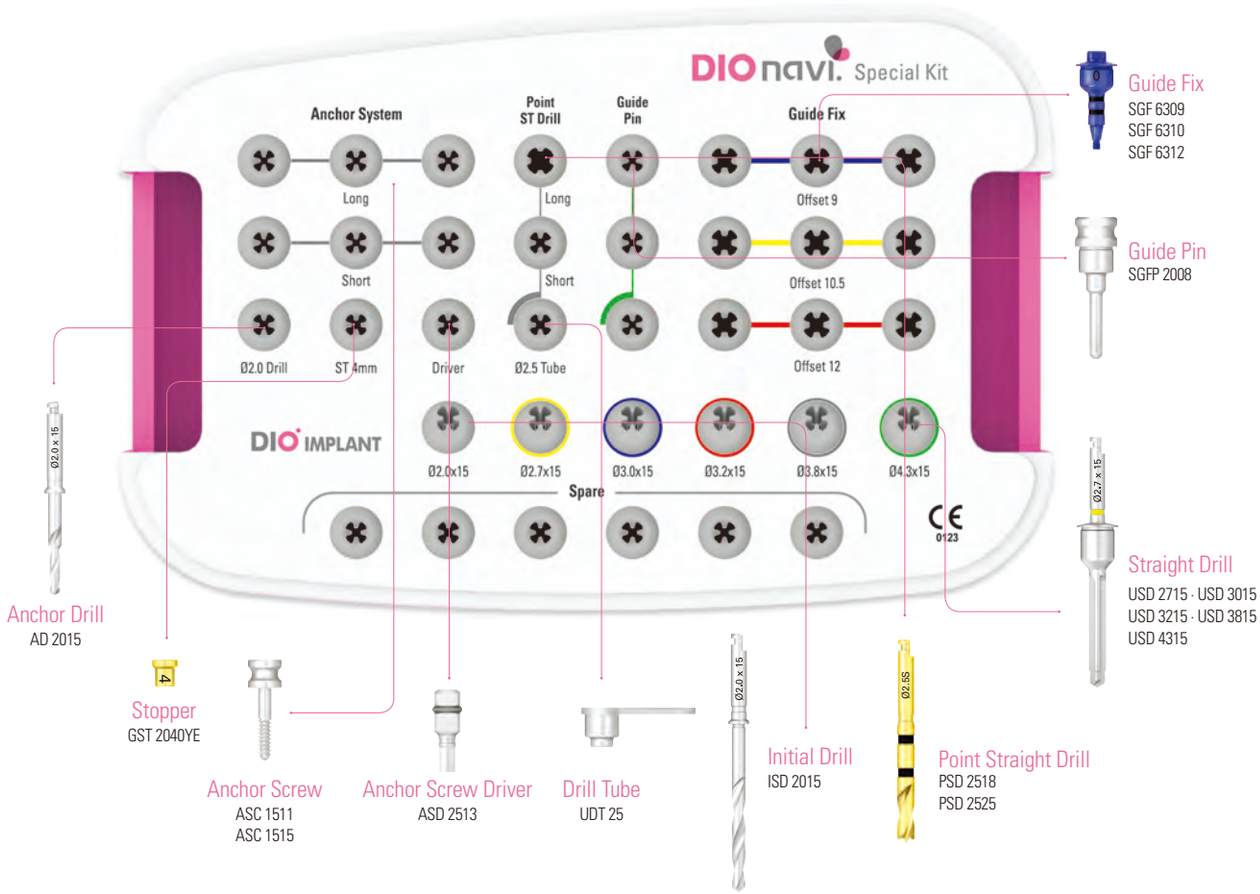
Stopper	4mm	4mm	4mm	4mm	4mm	4mm	3mm	After guide removed	3mm	9mm	3mm		
Drill Length	7mm	7mm	7mm	7mm	7mm	17mm	17mm		18mm	19mm - H	8.5mm		
Ref	Ø2.0 Initial	Ø2.7	Ø3.0	Ø3.2	Ø3.8	※ Sinus Drill			※ Sinus Drill	Condenser	Final Drill		

5 DIOnavi. Special Kit

Process of fixing the DIOnavi. guide
if edentulous or missing range is broad

+

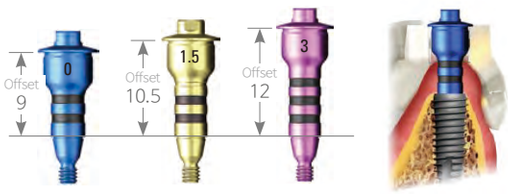
Main : DIOnavi. Special Kit
Sub : DIOnavi. Master Kit



1) Surgical Guide Fix & Fix pin

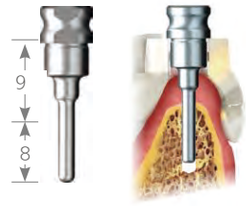
Connect to the drilling hole or pre-inserted fixture and fix the surgical guide in place.

Fix(Fixture + Surgical Guide)



[SGF 6309] [SGF 6310] [SGF 6312]

Fix Pin(Ø2.0 Drill Hole + Surgical Guide)



[SGFP 2008]

Caution

Make sure the fix is connected to the fixture according to the sleeve offset.

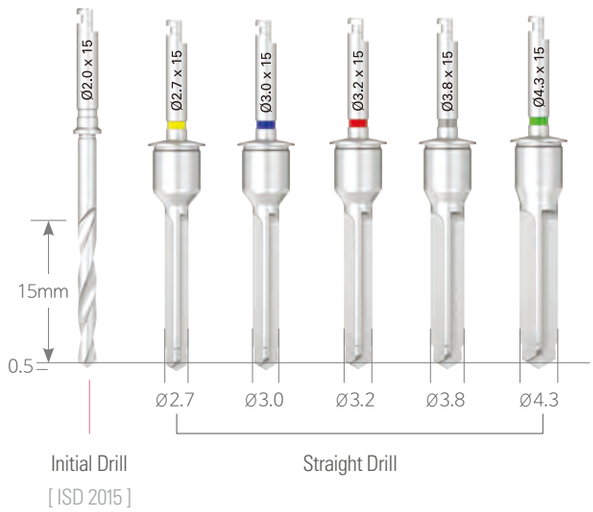
TIP

We recommend using a Bone flattening drill to reduce interference of the gum. Use Ø2.0 x 8.5㎜ drilling.

2) Initial Drill & Straight Drill

Form an accurate initial hole with 5mm drilling, and try to make stable depth and direction during subsequent drilling.

※ Drilling at 50 RPM without irrigation.



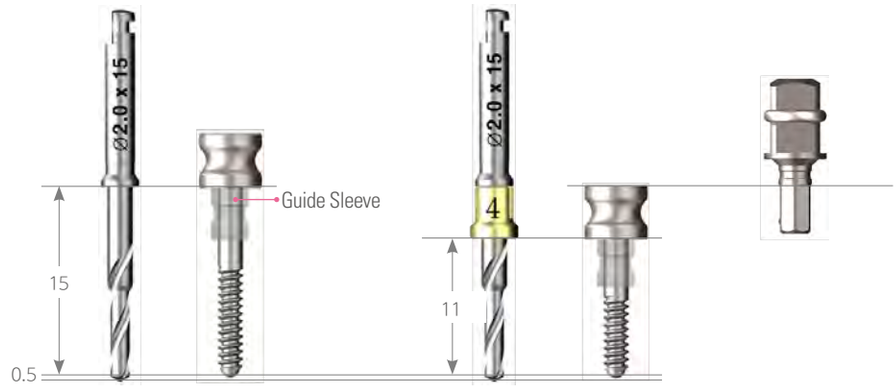
[ISD 2015]

Ø2.7 [USD 2715]
Ø3.0 [USD 3015]
Ø3.2 [USD 3215]
Ø3.8 [USD 3815]
Ø4.3 [USD 4315]

3) Anchor Drill & Anchor Screw

Drilling into anchor sleeves and tighten an anchor screw.

TIP In case of the mandible, a 4mm stopper and exclusive anchor screw must be used.



Maxilla

Anchor Drill [AD 2015]

Anchor Screw [ASC 1511]

Mandible

Anchor Drill [AD 2015]

Stopper [GST 2040YE]

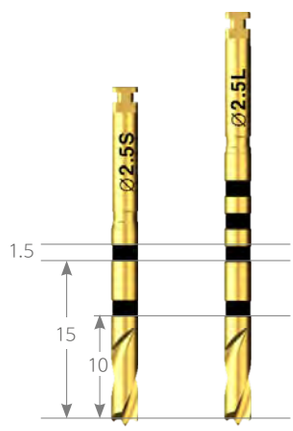
Anchor Screw [ASC 1515]

Anchor Screw Driver [ASD 2513]

4) Ø2.5 Point Straight Drill

This is a specialized drill to prevent slipping in a slanted bone and form the guide hole in accurate position.

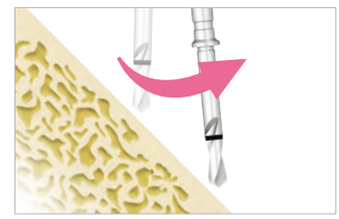
Caution Drilling at 800~1,000 with irrigation.



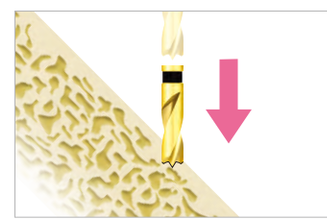
Short [PSD 2518]

Long [PSD 2525]

Exclusive drill tube [UDT 25]



Drill slipped could be happened



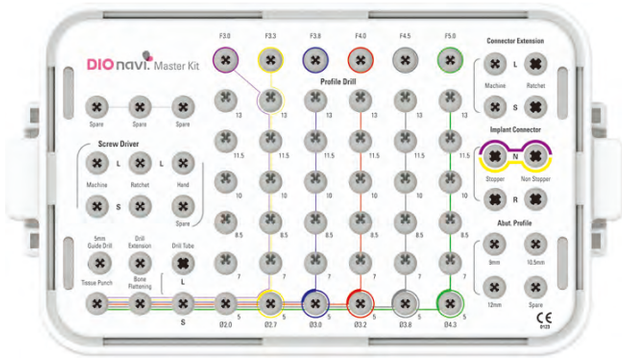
When point straight drill is used
Stable drilling

TIP

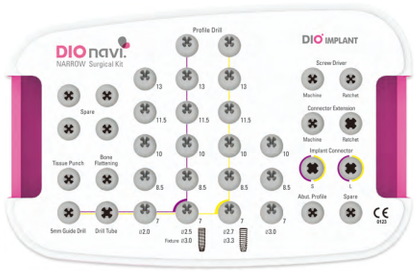
Matters to be confirmed before the surgery

1 DIOnavi. surgical kit for surgery cases

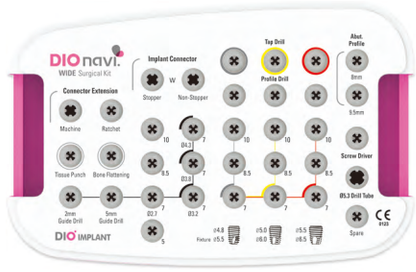
1) Composition of DIOnavi. Kit (2017. 04. 20)



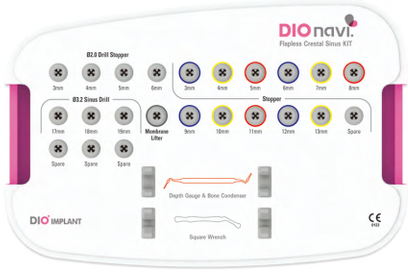
DIOnavi. Master Kit



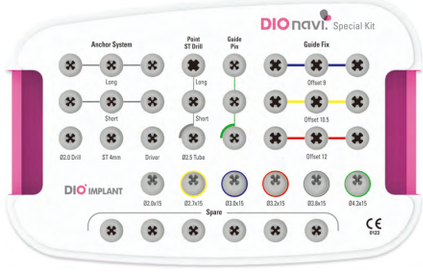
DIOnavi. Narrow Kit



DIOnavi. Wide Kit



DIOnavi. Flapless Crestal Sinus Kit



DIOnavi. Special Kit

2) Kit preparations for each case

Sleeve Size Case

Regular | Wide | Narrow

Regular

DIOnavi. Master Kit

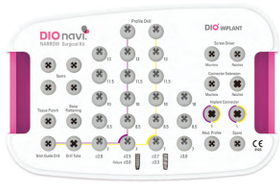
[GS 53]

Narrow

DIOnavi. Narrow Kit

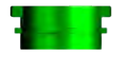
[GSL 36]

[GS 36]

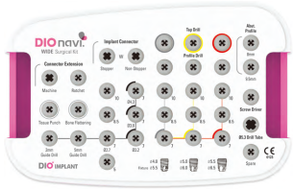


Wide

DIOnavi. Wide Kit



[GS 68GN]



Surgical Case

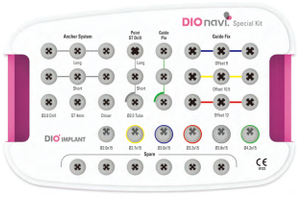
Sinus | Edentulous

Sinus Case

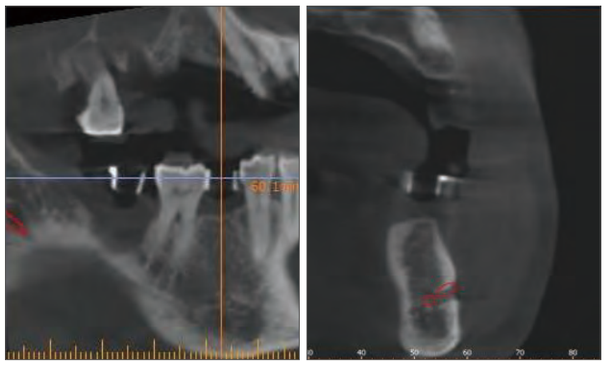
DIOnavi. Master Kit &
DIOnavi. Flapless Crestal Sinus Kit

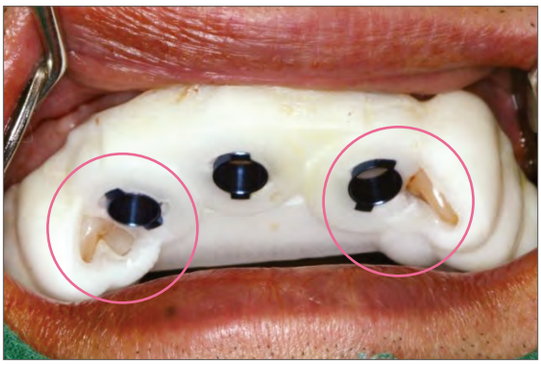
Edentulous

DIOnavi. Master Kit & DIOnavi.
Special Kit



2 Prior to surgery checking the guide





Before starting the surgery, take CT with the surgical guide attached to the patient's mouth and check direction of the guide sleeve.

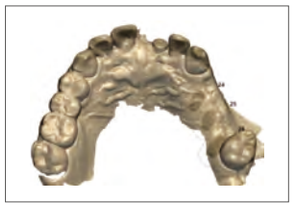
TIP Check proper binding of the guide to the tooth through the guide window.

If the guide does not fit well

If the guide is interfered.

TIP

Place a check-bite inside the guide. Adjust the marked part and then place the guide.



TIP

Since distortion can occasionally occur in the arch part of the anterior teeth or if a metallic prosthesis exists during Trios scan, cut the part irrelevant to the operation before connecting.

Cases of loose surgical guide

TIP

Apply a self-curing resin into loose part of the guide. Repeatedly take it out and insert it before connecting.

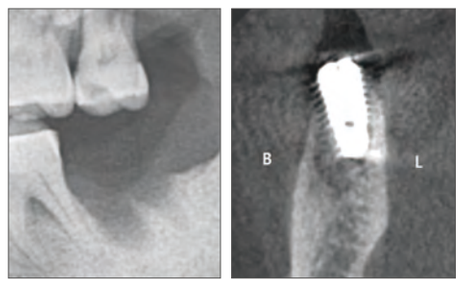
TIP

Method of using the surgical tool for each surgery type

1 Immediate case after tooth extraction

Tooth extraction on the day of the operation + DIOnavi. Master Kit

The drill can slip from unhealed extraction socket immediately after tooth extraction.



Solution 1

[ISD 2005M] [ISD 2007M] [ISD 2010M]

The Ø2.0 initial drill connected to the drill tube allows for stable drilling with stable fixing force. Error range can be minimized by sequentially increasing length of the drill, starting with a short drill.

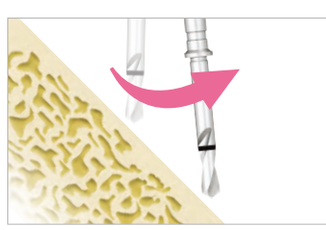
[USD 2705] [USD 2707] [USD 2710]

Select a short drill of Ø2.7 to secure fixing force of the guide sleeve.

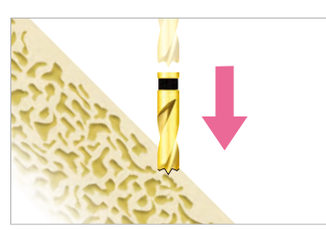
Solution 2

The Ø2.5 point straight drill in Special Kit is an exclusive drill designed to prevent slipping.

Short Long



Drill slipping could be happened

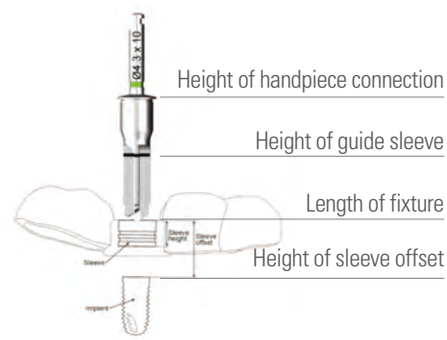


Stable drilling when point straight drill is used

2 Case with small opening

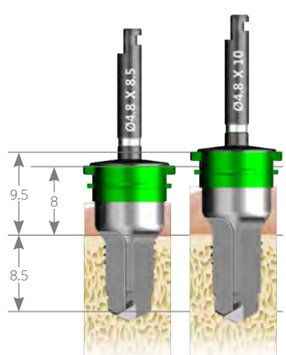
When performing operation on the molar of a patient with small opening (primarily on 2nd molar) + DIOnavi. Master Kit

Opening is about 20mm higher during DIOnavi. operation compared to other operations, causing difficulty of drill entry into the molar.



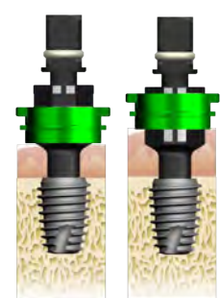
| Solution 1

Use a wide sleeve and Wide-only Kit.



Method of selecting the drill according to sleeve offset (For 8.5mm drill)

_ In case of 8mm offset
Select 8.5mm drill
_ In case of 9.5mm offset
(Increased by 1.5mm)
Select 10mm drill



Reference height of the implant connector according to sleeve offset (For 8.5mm drill)

_ In case of 8mm offset
To the first mark
_ In case of 9.5mm offset
(increased by 1.5mm)
To the second mark
※ Interval between marks: 1.5mm

| Solution 2

The burden of height can be reduced by carrying the Ø2.0X5mm drill inserted into the drill tube from the outside of the patient's mouth to the guide hole.

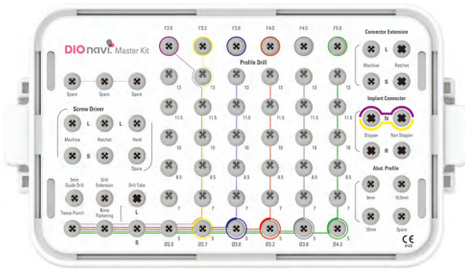
| Solution 3

Start with a short drill and sequentially increase length to 5, 7 and 10mm without using a drill tube.

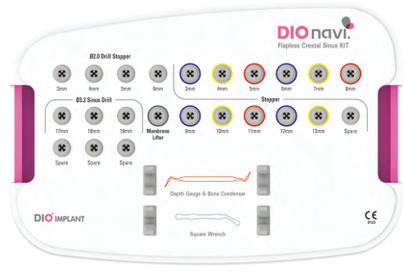
3 Sinus Case

1) Preparation of DIOnavi. Surgical Kit

When performing sinus case operation using a guide,
DIOnavi. Master Kit and DIOnavi. Flapless Crestal Sinus Kit must be prepared in advance.

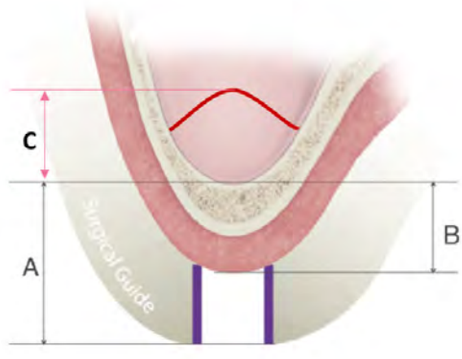


DIOnavi. Master Kit

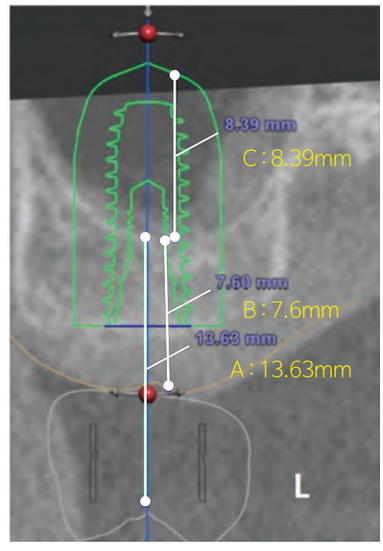


DIOnavi. Flapless Crestal Sinus Kit

| Figures to be checked before the surgery



A : Length from the top of the surgical guide sleeve to the maxillary sinus floor
B : Length from the maxillary sinus floor to the tissue
※ When using the bone condenser and depth gauge, depth can be checked using scale mark.
C : Height of the lifted maxillary sinus and grafted bone



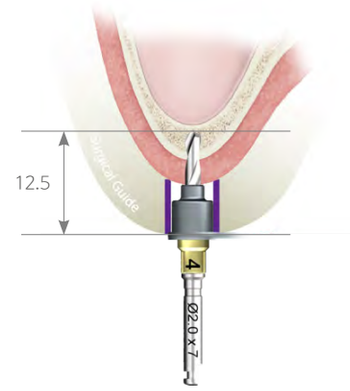
2) Use of tool during sinus case surgery

① Initial Drill & Straight Drill
After using the tissue punch and bone flattening drill in DIOnavi. Master Kit,
Connect a stopper to the initial drill and straight drill to perform sequential drilling.

(1) Initial Drill – Formation of placement hole (osteotomy site)

Use the Ø2.0 initial drill to form the drilling hole.
Drilling depth is based on height of the lower bone of the maxillary sinus floor measured on CT.
Drilling is done to 0.5~1mm depth directly below the maxillary sinus floor.
※ Drill tube: Used to secure fixing force for more accurate position and direction.

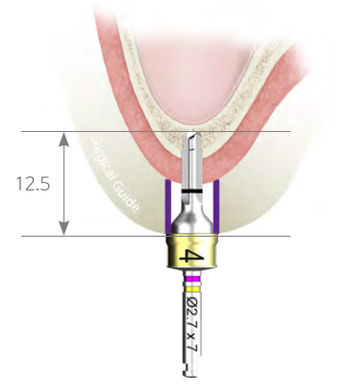
Caution
① Make sure to use the stopper to adjust depth.
② No irrigation, low-speed drilling (100 RPM, 55Ncm)
③ Use of Ø2.0 initial drill in DIOnavi. Master Kit



(2) Straight Drill – Expansion of the drilling hole and approach of the floor

Sequentially use the straight drill to expand the drilling hole.

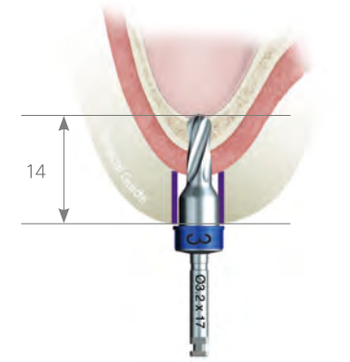
Caution
① Make sure to use the stopper to adjust depth.
② No irrigation, low-speed drilling (100 RPM, 55Ncm)
③ Use of final drill in DIOnavi. Master Kit



② Perforation of the lower bone of the maxillary sinus floor using the sinus drill
Drilling is done 1mm deeper than the previous drilling step.

Caution
Make sure to use the stopper to adjust depth. / No irrigation, low-speed drilling (50 RPM)

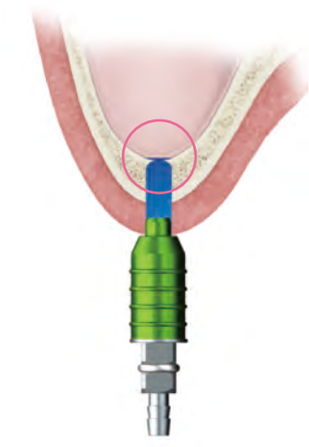
TIP Method of adjusting depth when using the sinus drill
① Length can be adjusted by the stopper.
② Drill length can be changed by fixing the stopper in place.
③ Types of sinus drill: 17mm, 18mm, 19mm, 21mm (option)

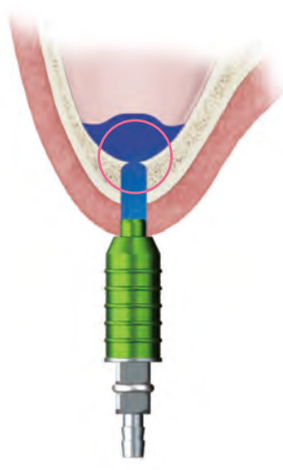


③ Water Membrane Lifter - Lifting of the sinus membrane

After removing the guide, use the water membrane lifter to inject saline solution into the drilling hole.

- Inject about 0.4cc for lifting of the membrane.
- Start calculating injection dose when injection pressure can be felt.





| Pressured part

Inject about 0.4cc before pressure is applied.
Inject about 0.4cc more to lift the membrane.

※ Volume injected before pressure is applied differs according to height and expansion of the bone.

| Opening of the floor (A) of the maxillary sinus

Pressure can be felt during injection of saline solution. As the membrane is lifted, pressure drops and saline solution will be injected.

| No opening of the floor (A) of the maxillary sinus

After pressure is felt during injection of saline solution, no more pressure can be exerted or the nozzle is pushed out.
→ Retry after drilling the sinus drill 1mm deeper.

| Checking of perforation of the maxillary sinus membrane

Perform aspiration of saline solution while keeping the nozzle on the hole. If aspiration volume is the same as volume of saline solution injected, it suggests that the membrane is good.

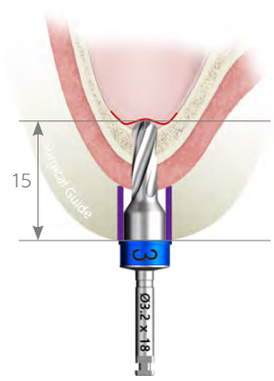
※ Blood comes out together.

④ Sinus Drill - penetration of the floor of the maxillary sinus

After lifting the maxillary sinus membrane, drill the sinus drill 1mm deeper to completely open the floor of the maxillary sinus.
Opening of the floor of the maxillary sinus can be checked using the bone condenser.

Caution

① Make sure to use the stopper to adjust depth.
② No irrigation, low-speed drilling (50 RPM, 55Ncm)
③ The stopper connected to the bone condenser
④ The bone graft material may not be injected
If the membrane is not open



⑤ Bone Condenser - Injection of the bone graft material

Remove the surgical guide and inject the bone graft material through the drilling hole into the maxillary sinus using the bone condenser.

- Sponge-type bone graft material is recommended for DIOnavi.
- Space can be maintained as the bone graft material lifts the membrane in the maxillary sinus.
- In the case of immediate implant placement after bone graft, implant helps maintain space in the maxillary sinus along with the bone graft material, facilitating bone.

Caution Make sure to use the stopper to adjust depth.

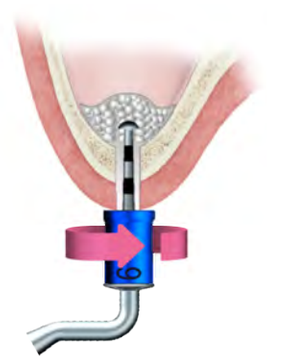
Volume of the bone graft material

Lifting height of the sinus membrane	1mm	2mm	3mm	4mm	5mm	6mm	7mm	8mm	9mm	10mm
Implant placement	0.1cc	0.2cc	0.3cc	0.4cc	0.5cc	0.6cc	0.7cc	0.8cc	0.9cc	1.0cc
No implant placement	0.3cc	0.6cc	0.9cc	1.2cc	1.5cc	1.8cc	2.1cc	2.4cc	2.7cc	3.0cc

⑥ Depth Gauge - Distribution of the bone graft material (option)

After removing the surgical guide, insert the depth gauge into the maxillary sinus and rotate it so as to evenly distribute the bone graft material.

Caution Make sure to use the stopper to adjust depth.

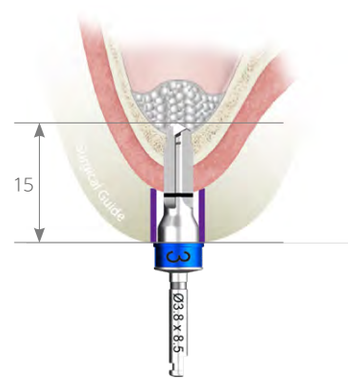


⑦ Final Drilling

After attaching the surgical guide, perform drilling 2mm deeper than the sinus drill.

Caution

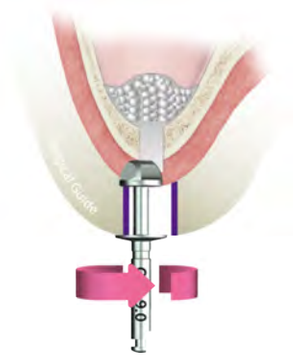
① Make sure to use the stopper to adjust depth.
② No irrigation, low-speed drilling (100 RPM, 55Ncm)
③ We recommend using a drill of one or two steps lower if the bone is weak.



⑧ Abutment Profile Drill

This drill removes the alveolar bone, which interferes connection of the abutment or H-scanbody.
Rotate the drill along inner surface of the sleeve to form the abutment profile.

※ If the cortical layer is thick, increase RPM while irrigating. (1,000 RPM)



⑨ Implant Connector - Insertion of the fixture

Implant is placed using the surgical guide so that implant in the maxillary sinus pushes the bone graft material away for distribution.

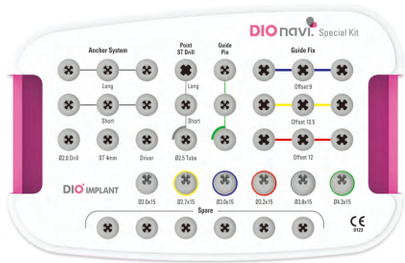
TIP Insertion of the fixture according to residual bone

- Desirable initial fixing force can be secured if residual bone is 4mm or larger. Implant can be placed immediately and the temporary crown can be restored.
- If residual bone is 3mm or smaller and initial fixing of implant cannot be secured, only bone graft is done on the maxillary sinus and implant is not placed at the same time.

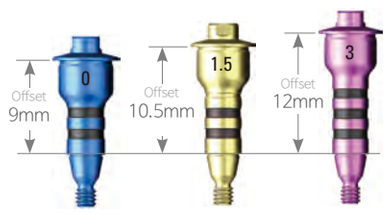
Caution Implant placement with no irrigation and at low speed (30 RPM, 55Ncm)

4 Edentulous Case

Process of fixing in an edentulous patient + DIOnavi. Special Kit



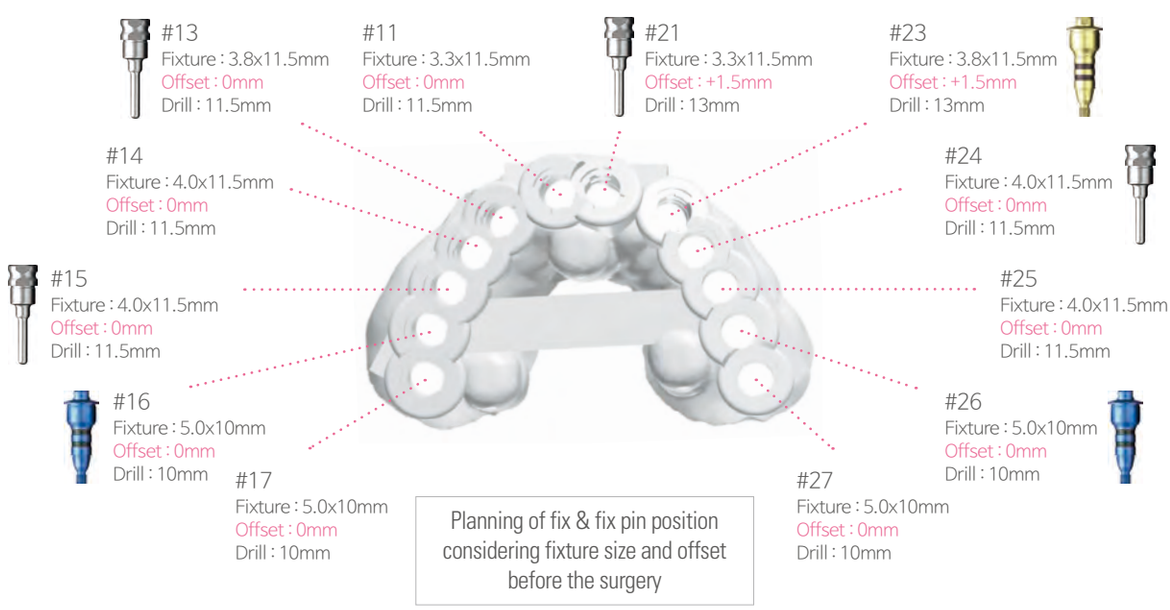
Pin



Fix is divided into 9mm, 10.5mm and 12mm according to sleeve offset.

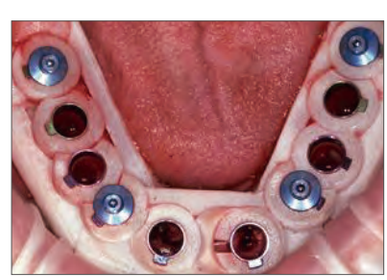
1) Edentulous fixing guide fix & fix pin

Fixing can be secured in the position of implant placement without having to form a separate hole.



Planning of fix & fix pin position considering fixture size and offset before the surgery

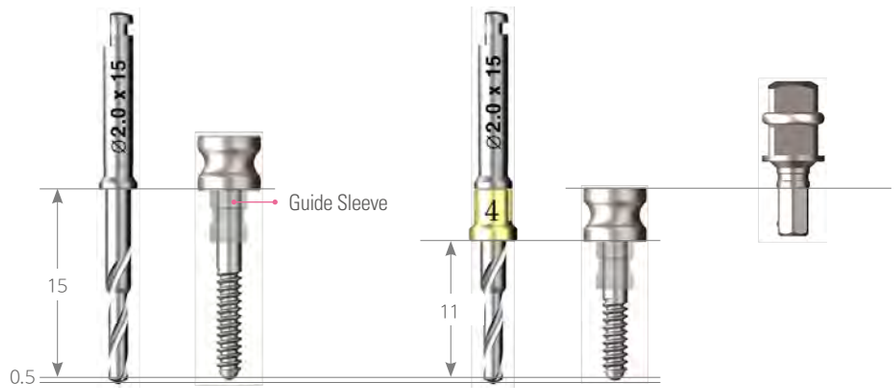
| Example of fixing in an edentulous patient



Caution We recommend fixing the fix pin onto a part with desirable bone thickness.

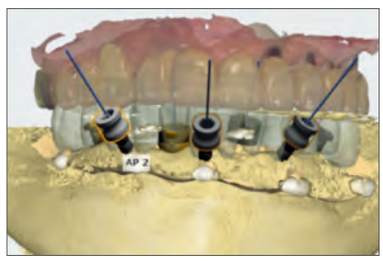
2) Anchor System

Fix on the side of the guide.

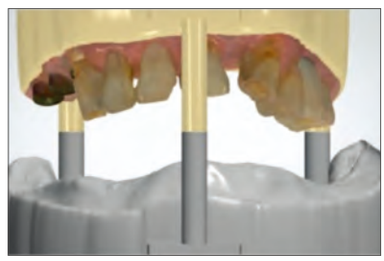


TIP In case of the mandible, make sure to use a 4mm stopper and exclusive anchor screw.

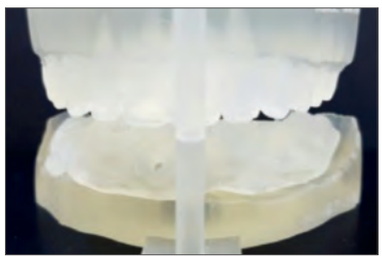
| Anchor Process



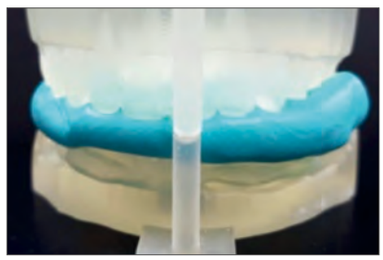
Anchor Planning



Articulator design



Making of the articulator



Making of the fixing bite using the articulator

Attachment of the guide to the mouth using the fixing bite

3) Edentulous scan - Scan Retractor

This increases accuracy of edentulous oral scan and shortens scanning time by removing disruptive factors.

| Method of use

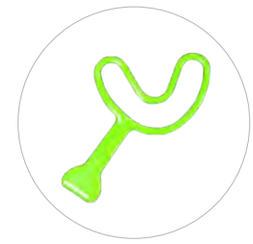
① Clearly recognize the maxillary opening.
② Control movement of tongue / cheeks (mandible).
③ Set the reference point for oral scan.

	Maxilla		Mandible	
Scan Retractor before use		Difficulty of identifying boundaries of attached gingiva and alveolar mucosa		Failure of oral scan due to movement of tongue
Scan Retractor after use		Clear recognition of the maxillary opening		Can control movement of tongue

| Shape and specifications

For maxilla Set (5 Piece)
For mandible Set (5 Piece)

For maxilla
[Code : SCANR 01S]



For mandible
[Code : SCANR 02S]

1 Set
(5 pieces / single use)

| Example of use (mandible)

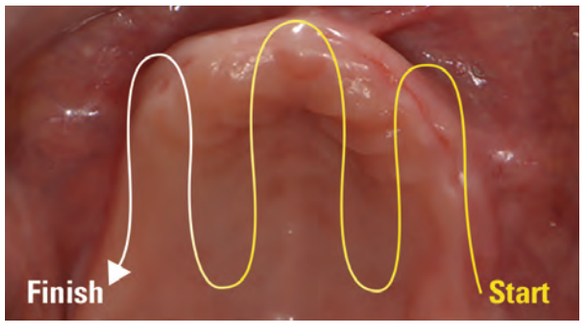


Select an appropriate scan retractor based on the arch and bend it to fit the mouth.

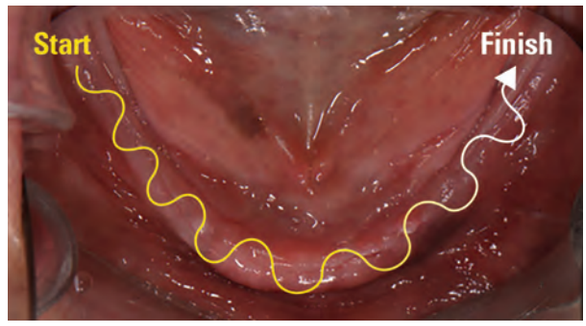
Method of use

① Wet the area where the retractor is to be used to prevent dryness.
② Insert a finger into the mouth while wearing a surgical glove.
Lift a corner of the mouth from the tooth and start inserting one end of the retractor into the mouth.
③ Check with fingers to make sure that lips and cheeks are not pressed by the retractor.
④ During oral scan, grab the handle of the retractor to prevent its movement in the mouth.
⑤ After using, carefully remove the retractor from the patient's mouth so that dry lips of the patient are not damaged.

Order of scanning



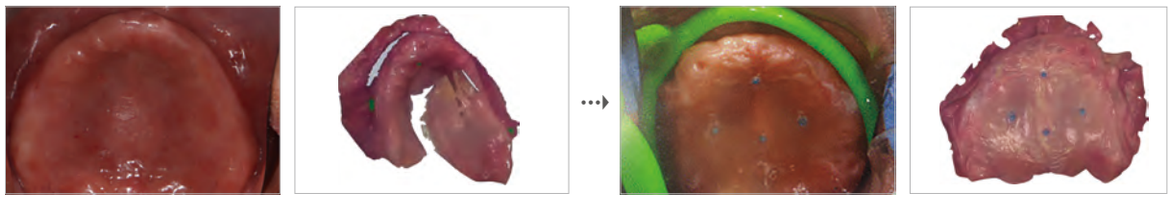
Maxilla
Left molar of the maxilla → anterior teeth → palate of left molar → from center of palate to anterior teeth → from anterior teeth to right palate → from anterior teeth to right molar



Mandible
Right molar of the mandible → anterior teeth → left molar of the mandible (moving in zigzag between buccal side-lingual side / labial side-lingual side)

Preparations for use

① Scanning can be difficult if the patient's palate is overly flat.



Glue flow resin to palatal soft tissue and then scan

② The retractor should not move. Be careful about excessive expansion or suppression of soft tissues.
③ The patient must breathe through the nose and not move while scanning.

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