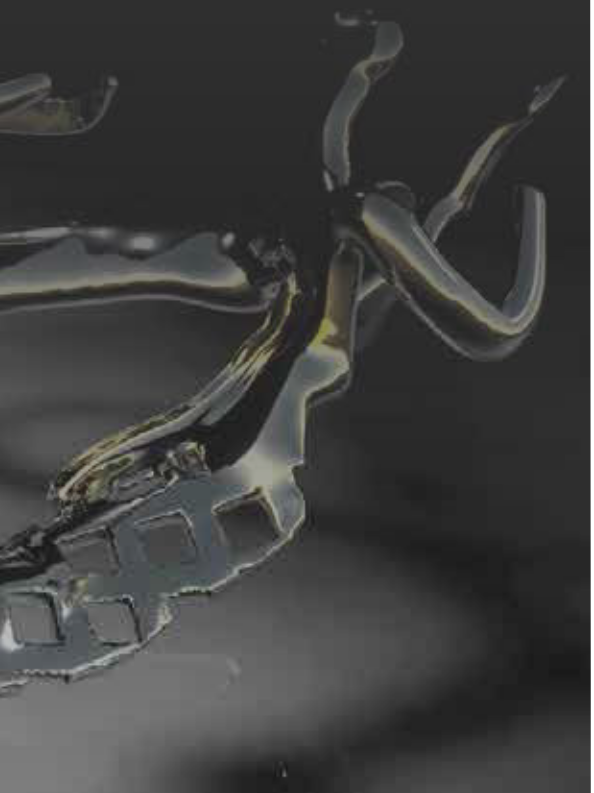
Training Guide

Phibo® Removable CAD-CAM Partial Dentures

phibo

phibo



Contents

Phibo® CAD-CAM products:
Removable Partial Dentures

Phibo® is constantly evolving and innovating in search of the very best solutions for its clients.

Phibo® Removable Partial Dentures:

- Partial Dentures
- Removable partial denture reinforcements

Pre-Training Information

Necessary requisites for designing a partial removable denture with the software 3Shape to be produced by Phibo CAD-CAM:

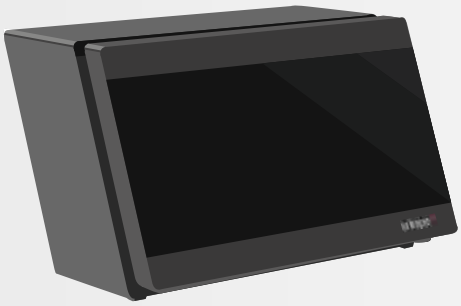
- Be registered on Phibo® CAD-CAM.
- Have a 3Shape laboratory scanner equipped with the *Removable Partial Design licence (or CAD point).*
- Have the RPD_Phibo Libraries installed.

Training for creating a removable partial denture with 3Shape to be produced by Phibo CAD-CAM:

- A technician will be trained on removable partial dentures, as well as CAD in 3Shape.
- This training will last one day.
- It will be based on real cases and the dentures involved subsequently produced.
- Monitoring and continued training will be provided over the first three months.

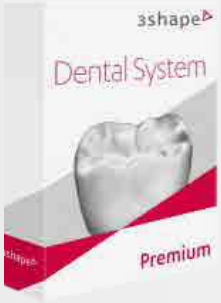
3Shape Licences

The very best scanners for removable partial denture scanning.



D-SERIES: D700 | D750 | D850 | D900 | D900L | D1000 | D2000

E-SERIES: E1 | E2 | E3



REMOVABLE PARTIAL DESIGN
RRP: €1500
ANNUAL FEE: €250

CAD-POINT

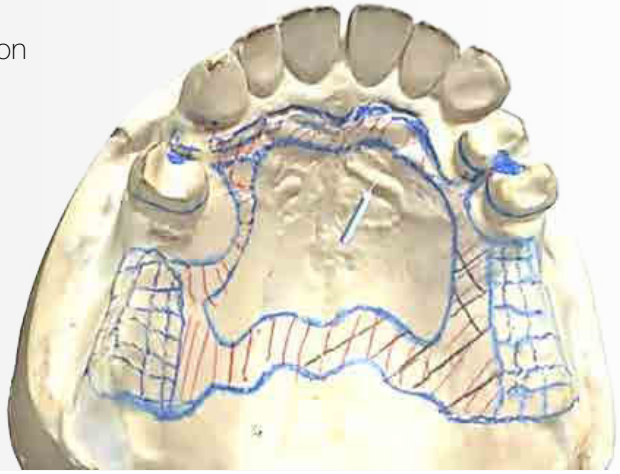
RRP	NUMBER
€125	100
€250	200
€625	500

Scanning Process for Removable Partial Dentures

1.

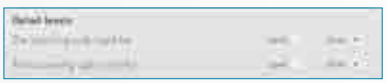
Draw your design with a coloured pencil upon the model*, in order to visualize your design when scanning it. This can be very helpful on your first CAD designs.

**Depending on your scanner model.*



2. Click on:

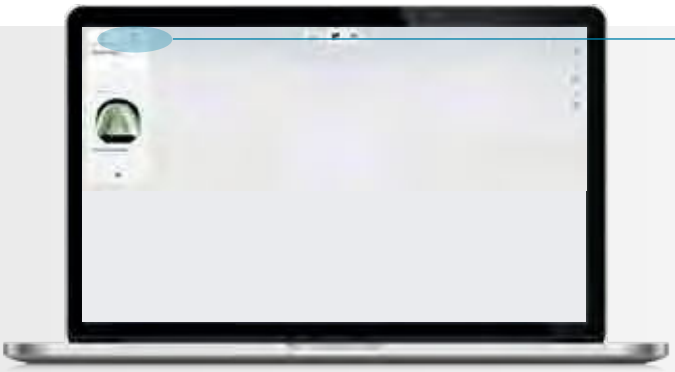
3.



You must remember that in order to create a removable partial denture, the model must be very accurate.

Do not forget to **SAVE.**

Removable Partial Denture Frame
Scanning Process



4.

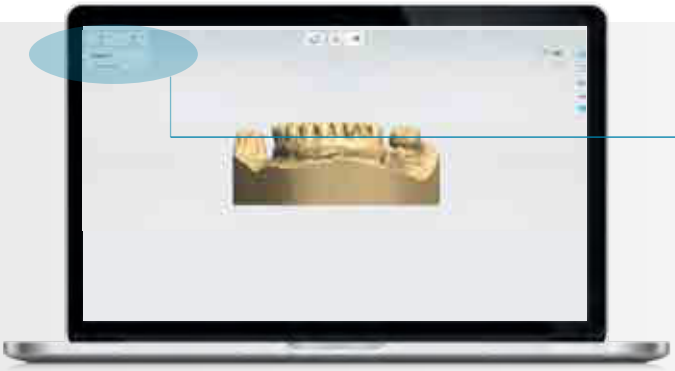
Click on:

5.

Complete Scanning

If you want, you can trim the model, clicking on Trim.

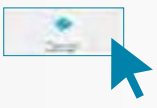
Or click on



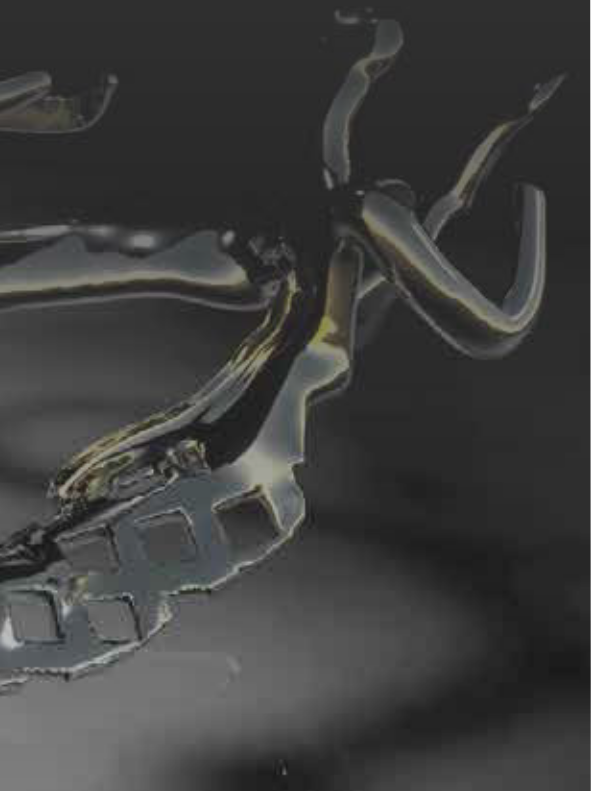
6.

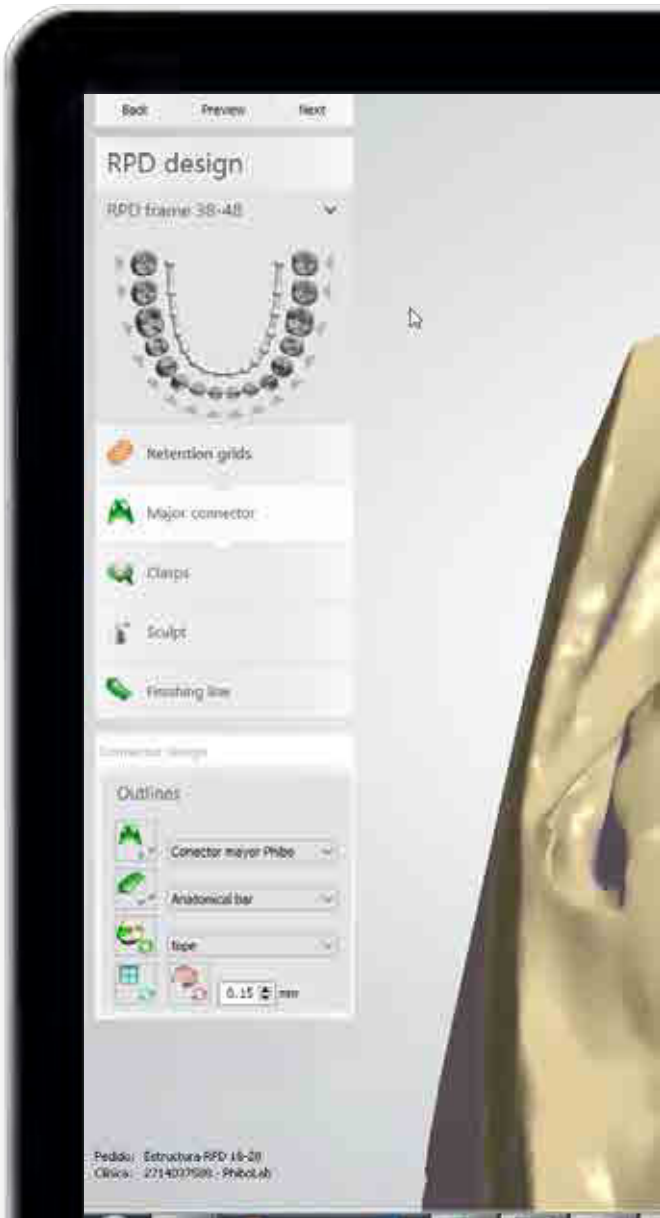
Before designing, the scan appears again for you to check it.

If all is correct, click on

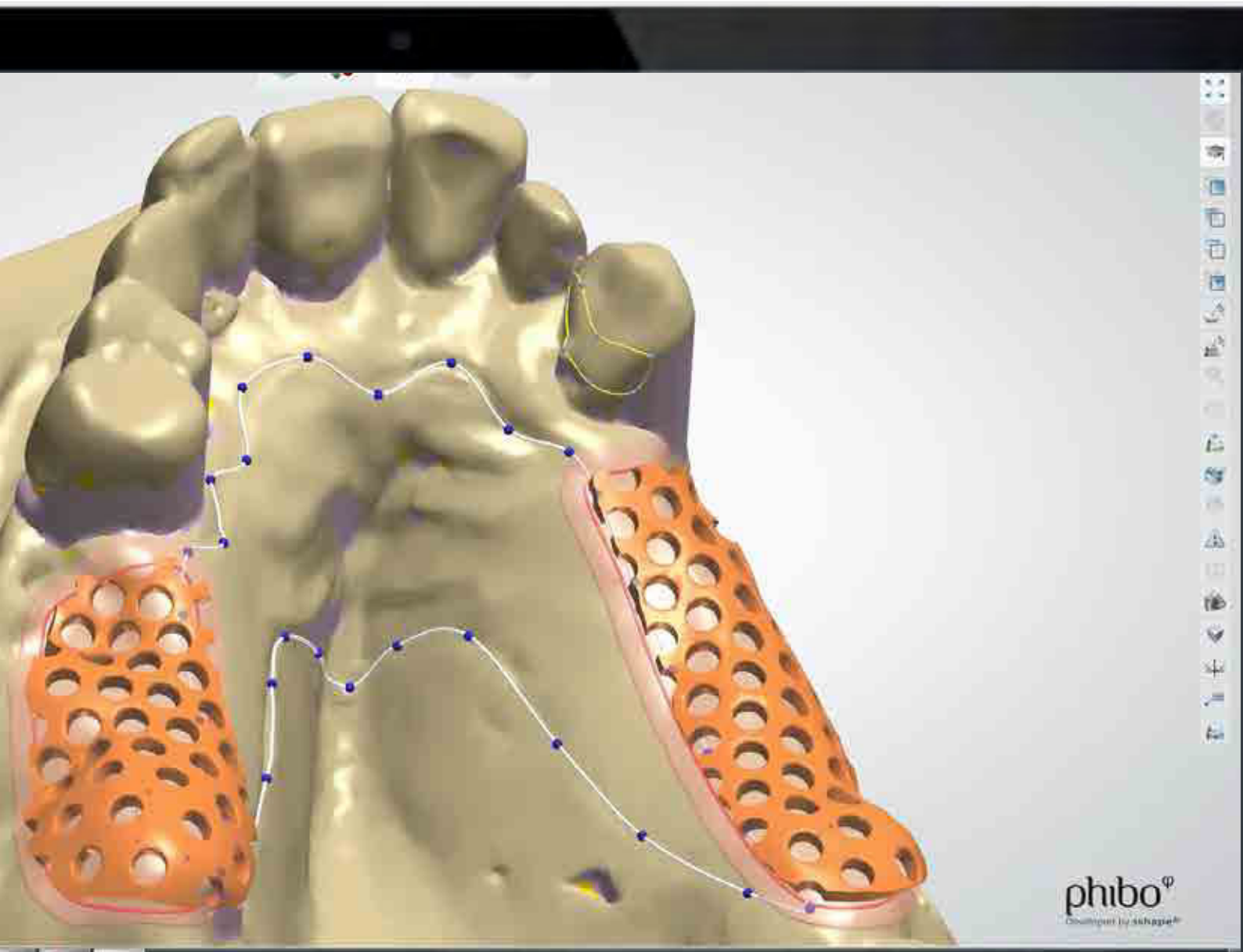


phibo

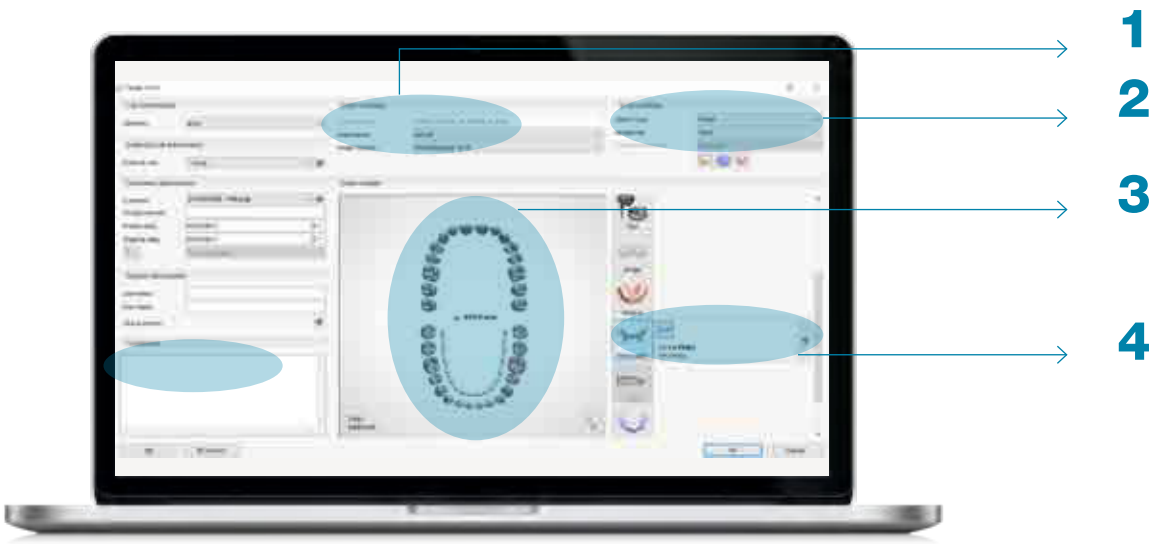



Back
Preview
Next
RPD design
RPD frame 38-48
Retention grids
Major connector
Clasps
Sculpt
Finishing line
Outlines
Conector mayor Phibo
Anatomical bar
tape
0.15
mm

Removable
Partial Dentures



Ordering Removable Partial Dentures



1.

2.

Choose:

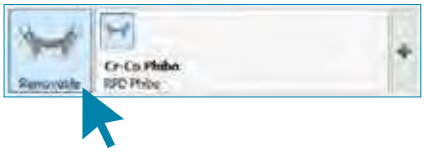
- Type of object: Model, to be scanned in the laboratory.
- Antagonist: Depends on the requirements of the work.
- Scanning of the surrounding area: This is automatically set to **Selected.**

Purchase Order for Removable Partial Denture Frameworks

3.

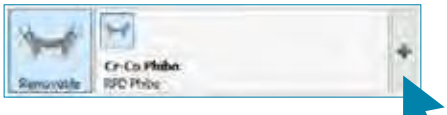
On the **odontogram**, choose any tooth on the arch area, where you´re going to create the removable partial denture (RPD) upon, and then click on: **Removable.**

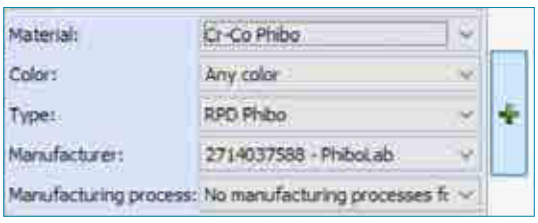
A removable partial denture can be created on each arch at the same time.



4.

Click on the (+) button to view the following options:

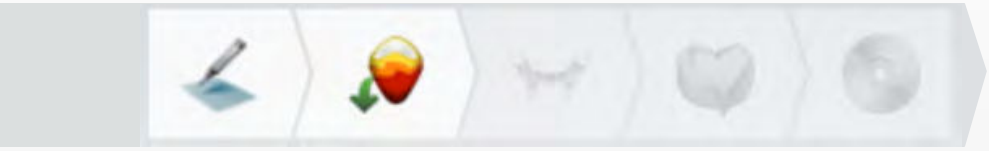




CREATE A REMOVABLE PARTIAL DENTURE

For **type** select RPD_Phibo.

Designing Removable Partial Dentures



You will go through each step from left to right, although you can return to previous steps at any time, if necessary, without losing information.

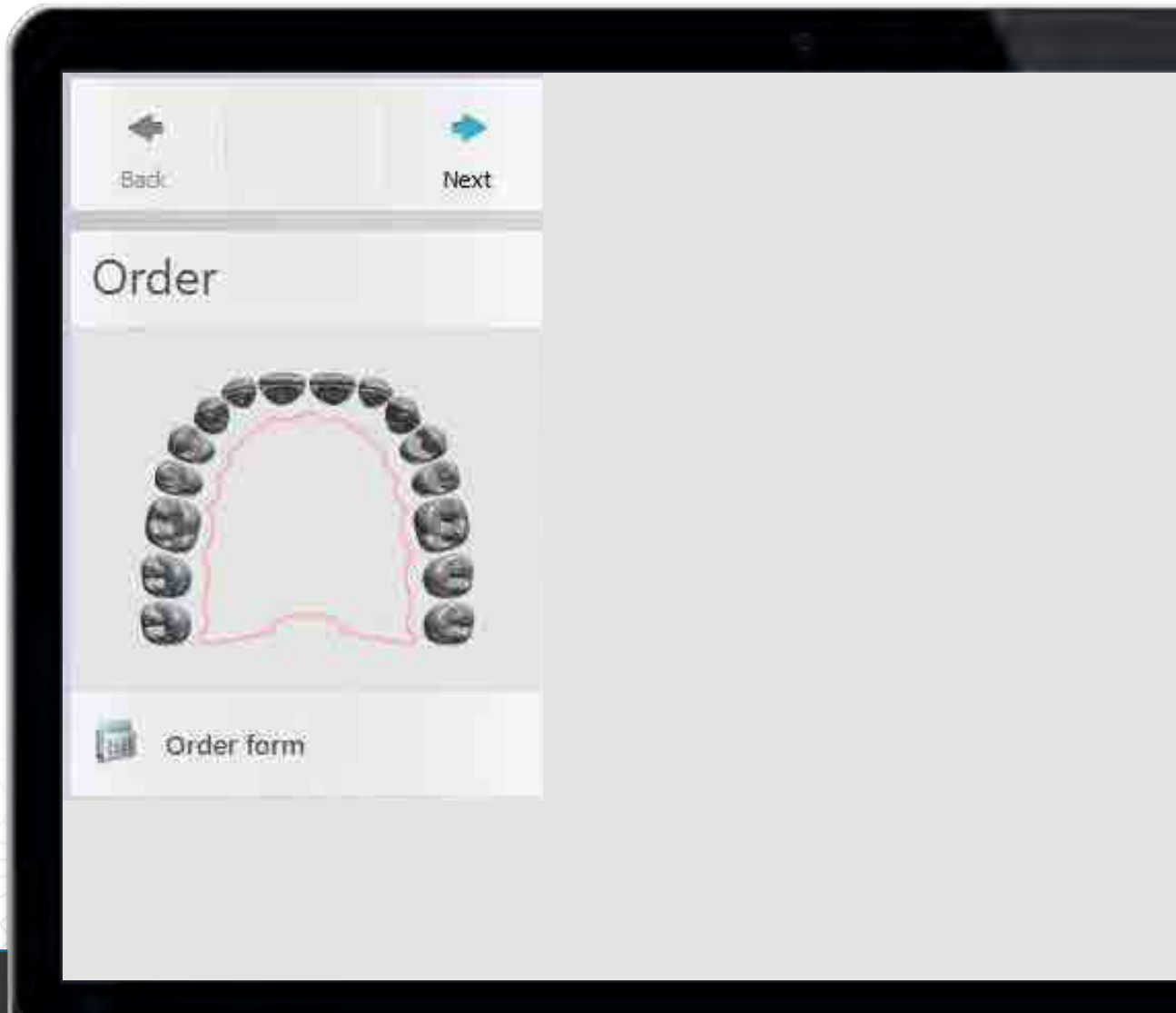
Minimum recommended thicknesses for production:

Major connector Clasps Stops	**0.6mm**
Lingual bar	**3.5mm x 2.5mm**
Thickness recommended by Phibo® for clasps	**1.6mm**

Designing Removable Partial Denture Frameworks: **Order**

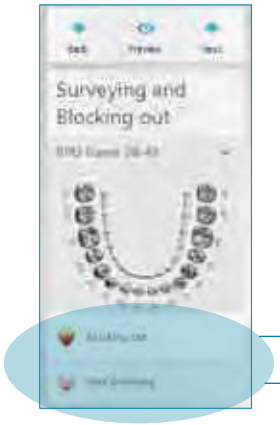
The system allows you to change your order.

Not all steps of your order can be modified. Depending on the changes made, the system will ask you if you want to scan again.



Designing Removable Partial Denture Frameworks: **Inspect & lock**

1.



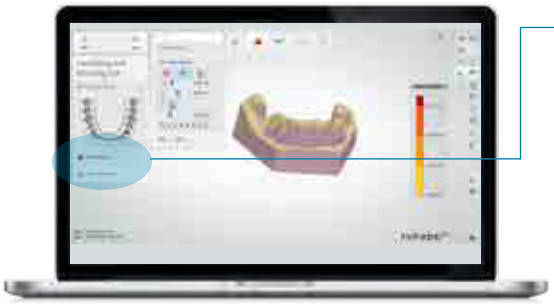
LOCKING:
Define the insertion of the removable partial denture.

TRIM WAX:
Remove from or add wax to the denture in order to customise it as required.

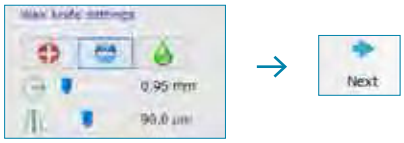
Wax colour.
Transparency option.

Designing Removable Partial Denture Frameworks: **Inspect & lock**

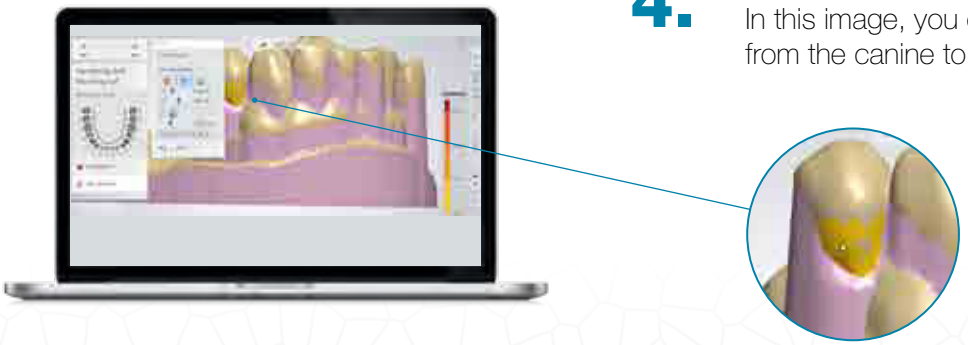
2. When you have set the insertion direction (view) for the RPD, click on:



3. You can use the toolbox to add, remove and smooth the wax.

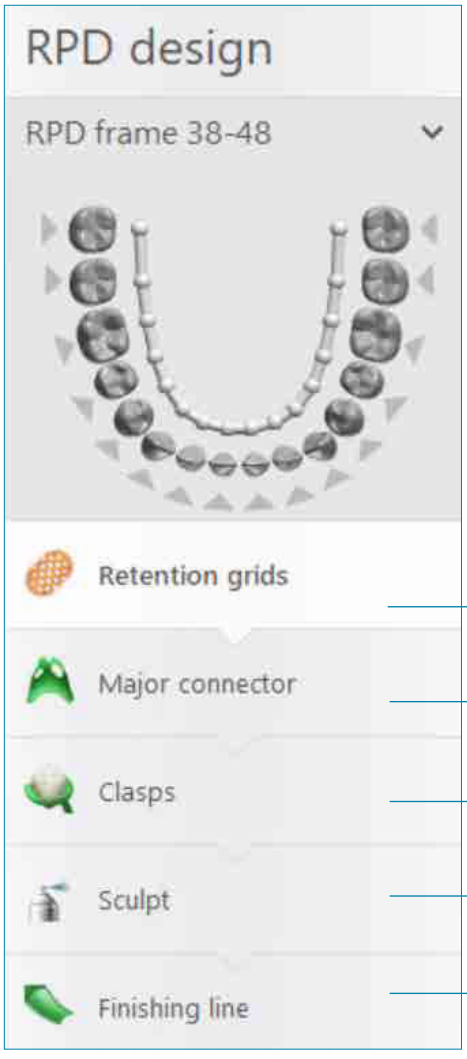


When creating the retainers for the clasps, the technician should ponder between aspects of functionality and of aesthetic aspects of the RPD.



4. In this image, you can see wax being removed from the canine to create the clasp retainer.

Designing Removable Partial Dentures: **Designing the RPD**

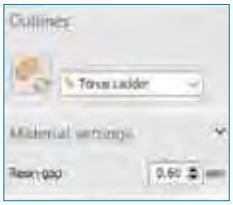


1. **Retention grids.** Create the retention where the acrylic teeth will go. Metal Reinforcement.
2. **Major connector.** Create the major connectors and occlusal stops.
3. **Clasps.** Create clasps and minor connectors.
4. **Sculpt.** Edit/change the parts previously put in place.
5. **Finishing line.** The metal line where the resin is joined to the metal.

Designing Removable Partial Denture Frameworks: **Designing the RPD**

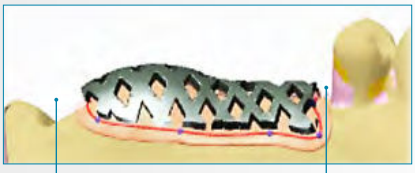
1. Retention grids

Open the list and choose the type of mesh you want to create.



Click on the button 

The cursor will change to a pencil and you can now begin designing the mesh.



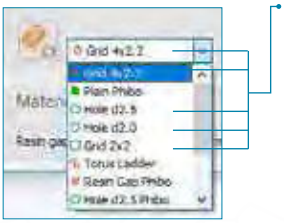
It is recommended that a space should be left between the mesh and tooth

You can set the space between the mesh and the model

Types of retentive mesh:

- Grid 2x2
- Grid 4x2
- Hole d2.5
- Hole d2.0
- Torus Ladder
- Resin Gap
- Plain

- **Grid 2x2 | Grid 4x2 | Hole d2.5 | Hole d2.0**

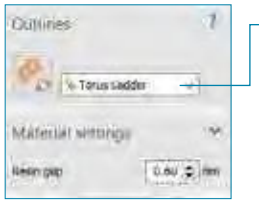


To create this type of mesh, you must begin and finish in the same place.

This type of shape tends to be used for the upper jaw.

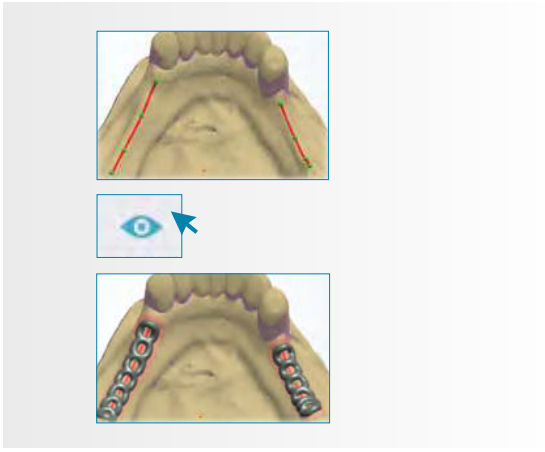
Designing Removable Partial Denture Frameworks: **Designing the RPD**

Torus Ladder

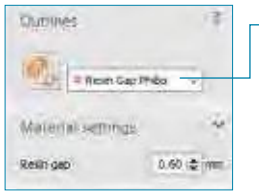


For this type of mesh, create a line and double click on the last point.

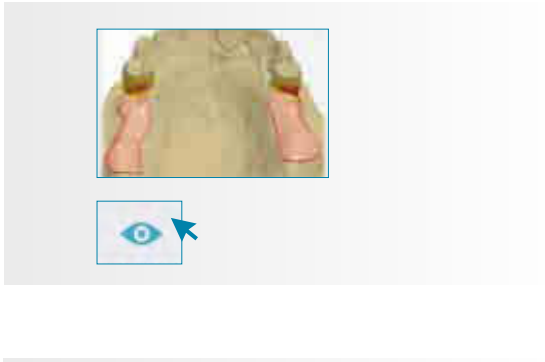
This type of shape tends to be used for the lower jaw



Resin Gap

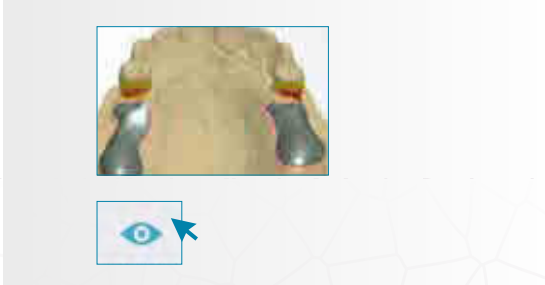


Requires no rest or metal retention, is acrylic and connects by means of a major connector or minor connectors.



Plain

A metal plate which is normally adapted to the anatomy of the gum without using resin, although in certain cases resin may be used.

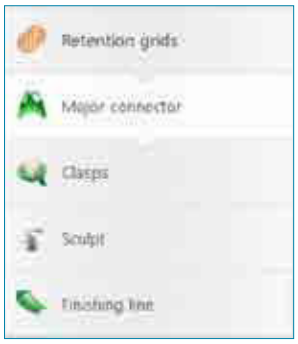


Designing Removable Partial Denture Frameworks: **Designing the RPD**

2. Major connector

In order to join all the parts of the removable partial denture, a **main connector (A)** is used.
On the **upper jaw (B)** it is known as a strap.
On the **lower jaw (C)** it is known as a bar.
The **stop (D)** is positioned in the occlusal/incisal area or on the cingulum of the tooth, provided it does not interfere with the patient's bite.

(A)



(B)
(C)
(D)

Here you can set the number of mm you want to remove from the selected area.

(B)

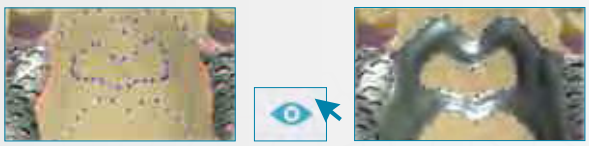
(C)

The major connector or lingual bar must be in contact with the mesh.

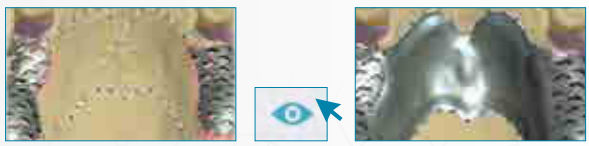
(D)

The stops may be connected to the major connector or lingual bar using minor connectors.

Create a window on the main connector

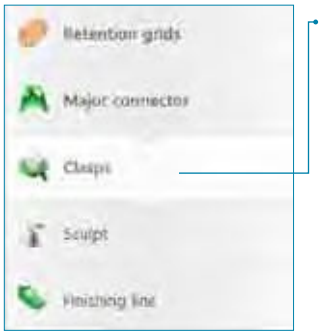


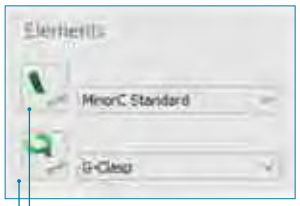
Create an alleviated area on the main connector



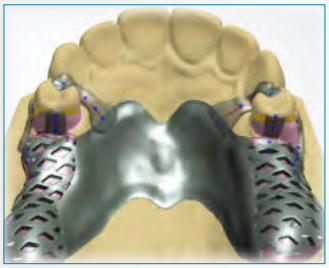
Designing Removable Partial Denture Frameworks: **Designing the RPD**

3. Clasps

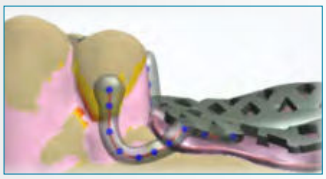




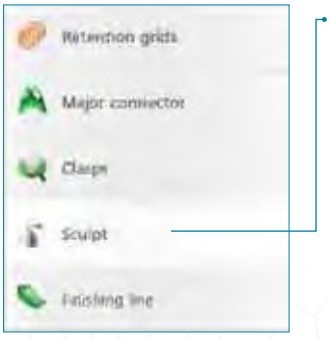
The minor connectors are created by making a line and double clicking on the last point.



The clasps are created by making a line and double clicking on the last point.



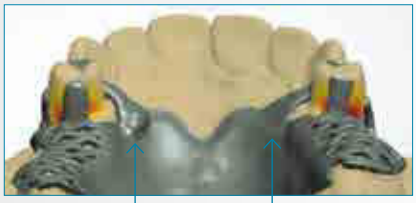
4. Sculpt



Add Material

Remove Material

Smooth areas

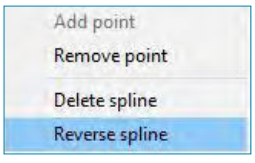


Designing Removable Partial Denture Frameworks: **Designing the RPD**

5. Finishing line

Create the **finish line**, where the resin will rest on the major connector.

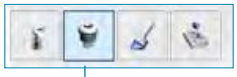
The concave section must be where the grid is.
If this is not the case, select the line,
If this is not the case, right click on the mouse and select Switch selected curve.



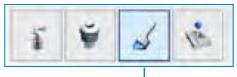
Designing Removable Partial Denture Frameworks: **Finish**

1.

Add, remove or smooth the structure.
In order to achieve a greater polish, avoid making constant changes.



Add retentive parts.



Select (in red) the area where the palatal ridges will go.
In order to achieve a greater polish, do not create ridges greater than 0.10mm.

2.

Click on the drop-down list to select the type of ridges.

Using the **Pattern Height** option, you can set the intensity of the ridges.

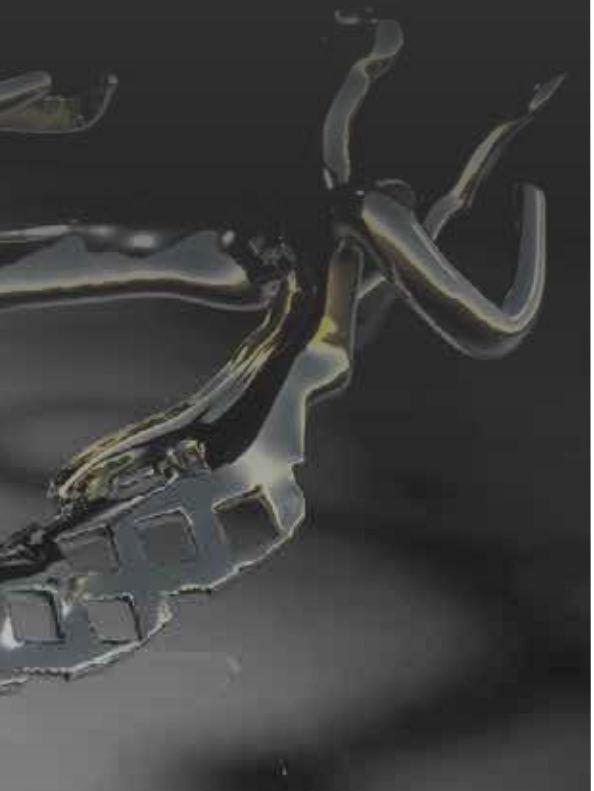
Designing Removable Partial Denture Frameworks: **Saving**

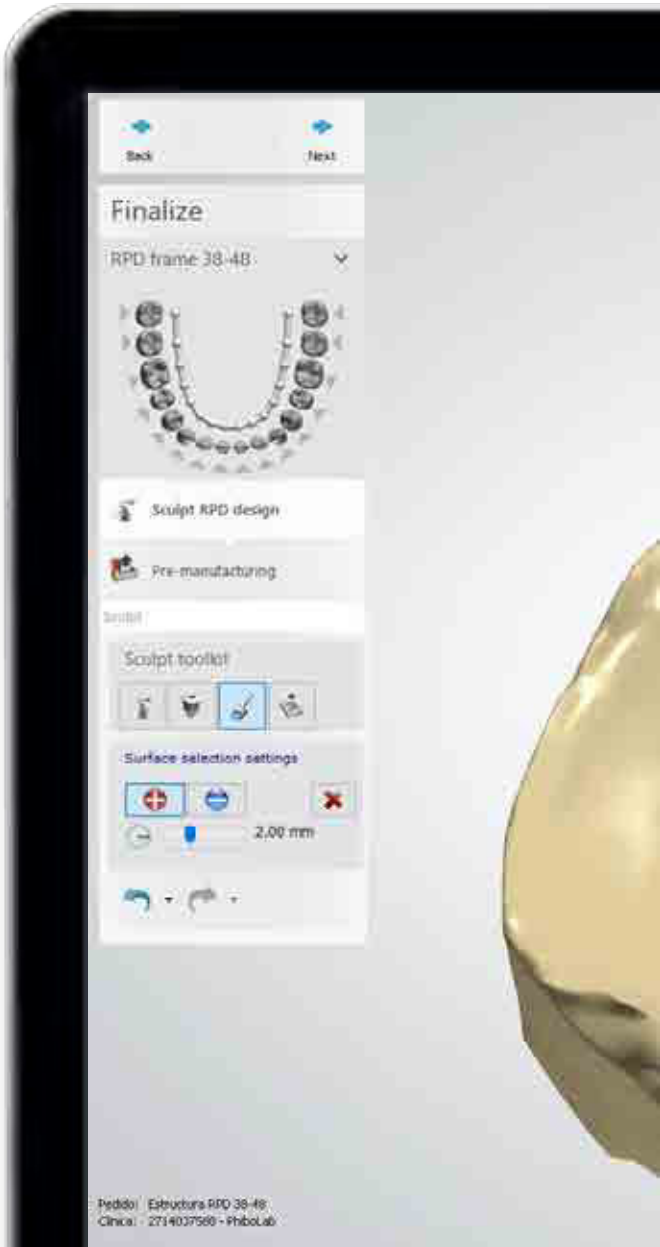
1.

Design **completed and saved**.

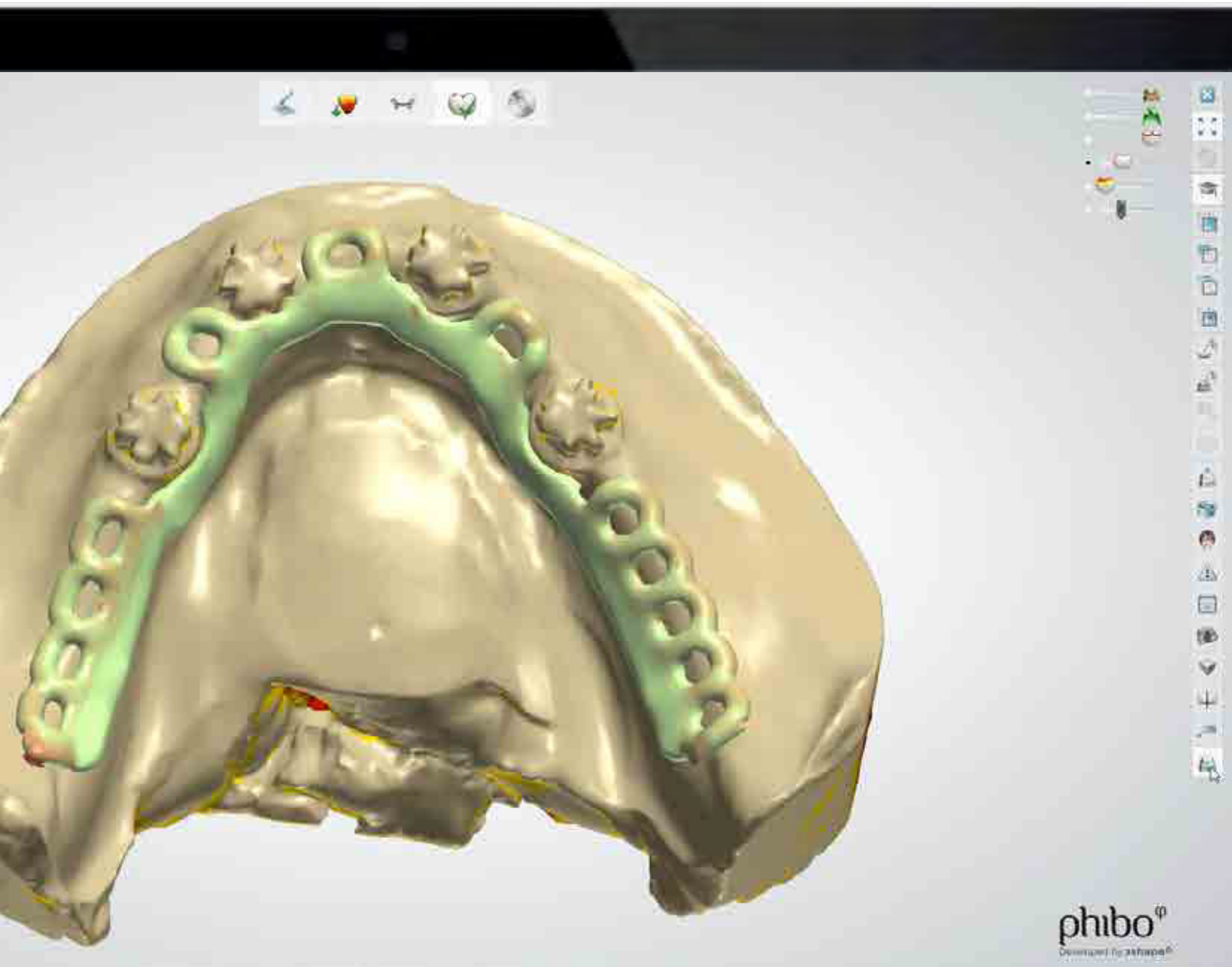
Preview

phibo




Back
Next
Finalize
RPD frame 38-48
Sculpt RPD design
Pre-manufacturing
Sculpt toolkit
Surface selection settings
2,00 mm
Pedido: Estructura RPD 38-48
Clínica: 2714037568 - PhiboLab

Removable Partial Denture Reinforcements



Ordering Removable Partial Denture Reinforcements

1.

Choose:

- Type of object: Model, to be scanned in the laboratory.
- Antagonist: Depends on the requirements of the work.
- Scanning of the surrounding area: This is automatically set to **Selected.**

Ordering Removable Partial Denture Reinforcements

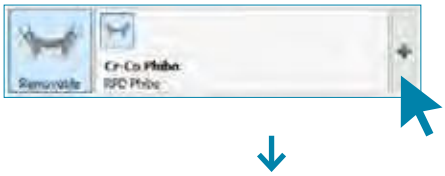
2.

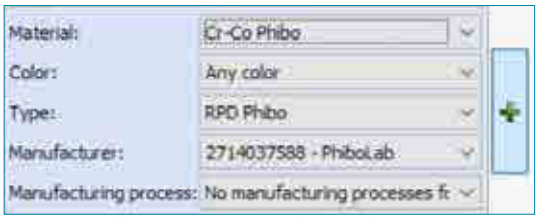
On the **odontogram** choose any tooth on the arch for which are you are going to create the removable partial denture and then click on: **Removable.**

A reinforcement may be created on each arch at the same time.

3.

Click on the (+) button to view the following options:





CREATE A METAL REINFORCEMENT

For type select
RPD_Refuerzo_Interno_Phibo

Designing Removable Partial Denture Reinforcements

You will go through each step from left to right, although you can return to previous steps at any time, if necessary, without losing any information.

Minimum recommended thicknesses for production:

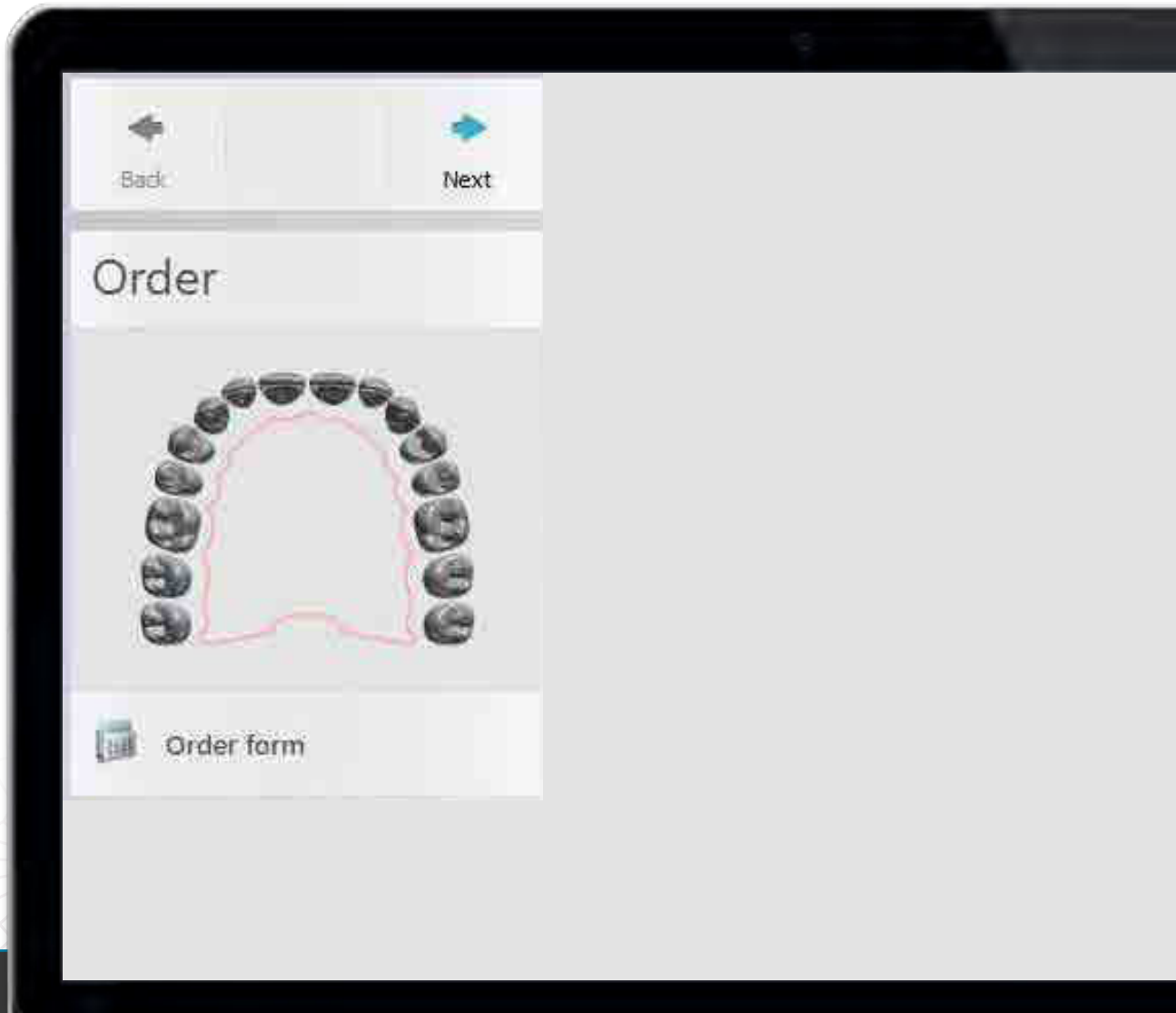
Minimum thickness Recommended by Phibo® for reinforcements

0.6mm

Designing Removable Partial Denture Reinforcements: **Order**

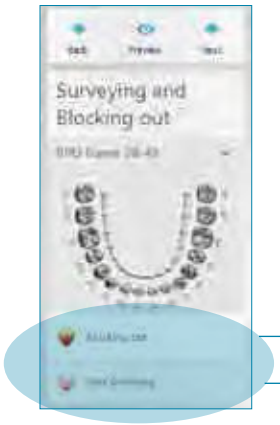
The system allows you to change your order.

Not all parts of the order can be changed.
Depending on the changes made, the system will ask you if you want to scan again.



Designing Removable Partial Denture Reinforcements: **Inspect & lock**

1.



LOCKING:
You will define the insertion.

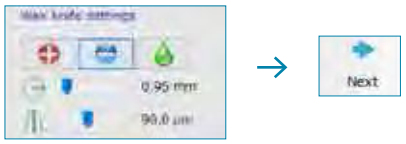
TRIM WAX:
Remove or add wax to the denture in order to customise it as required.

Wax colour.
Transparency option.

Designing Removable Denture Frame Reinforcements: **Inspect & lock**

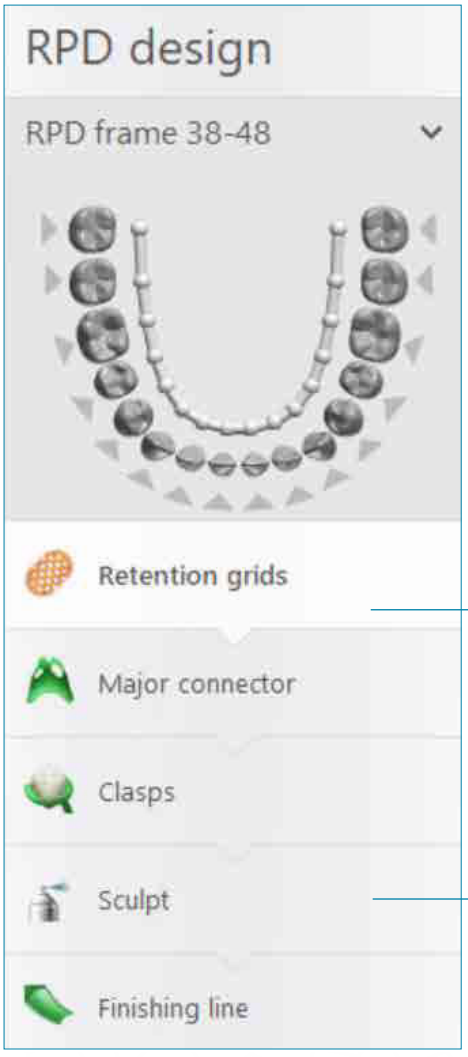
2. Once you have set the insertion direction (view) for the partial removable denture, click on:

3. You can use the toolbox to add, remove and smooth the wax.



The technician must decide which areas to add, remove or smooth.

Designing Removable Denture Frame Reinforcements: **Designing the RPD**



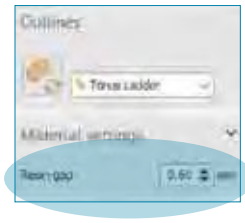
1. Retention grids. Create the metal reinforcement for the removable partial denture.

2. Sculpt. Edit/change the parts previously put in place.

Designing Removable Denture Frame Reinforcements: **Designing the RPD**

1. Retention grids

Open the list and choose the type of reinforcement (mesh) you want to create.



Click on the button 

The cursor will change to a pencil and you can now begin to design the mesh.

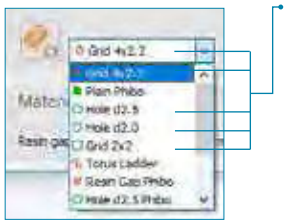
Preview

You can set the distance between the reinforcement and gum depending on the amount of resin.

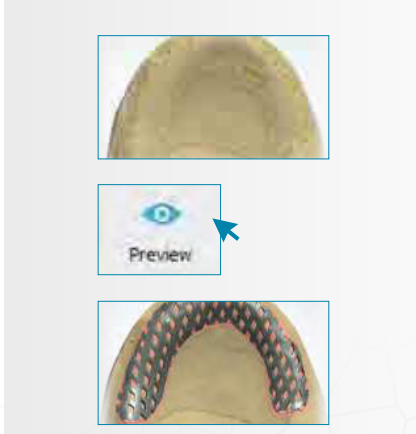
Types of retentive mesh:

- Grid 2x2
- Grid 4x2
- Hole d2.5
- Hole d2.0
- Torus Ladder
- Plain

✔ Grid 2x2 | Grid 4x2 | Hole d2.5 | Hole d2.0



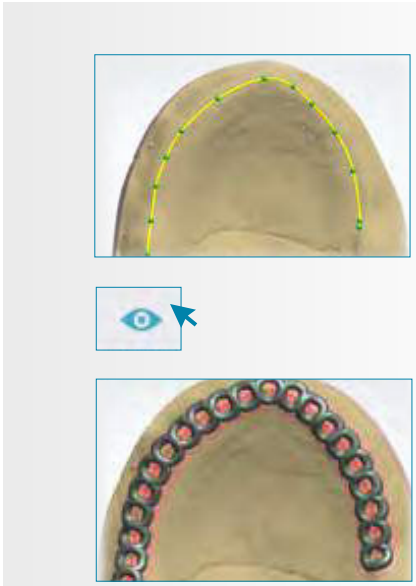
To create this type of mesh, you must begin and finish in the same place.



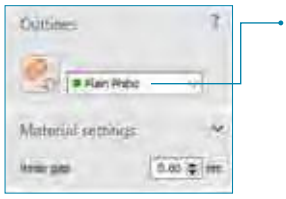
Designing Removable Denture Frame Reinforcements: **Designing the RPD**

Torus Ladder

In order to create this type of mesh, make a line and double click on the last point.



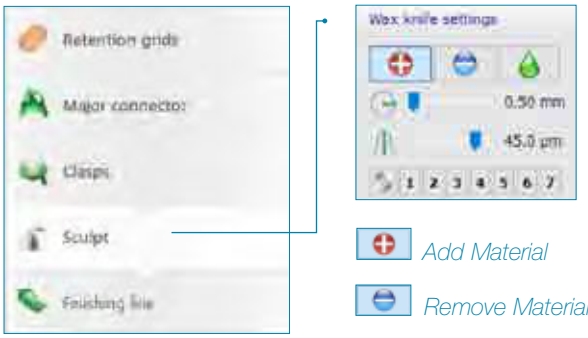
Plain



A metal plate which is normally adapted to the anatomy of the gum without using resin, although in certain cases resin may be used.

Designing Removable Denture Frame Reinforcements: **Designing the RPD**

2. Sculpt



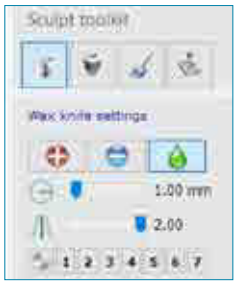
Add Material

Remove Material

Smooth areas

Designing Removable Partial Denture Reinforcements: **Finish**

1.



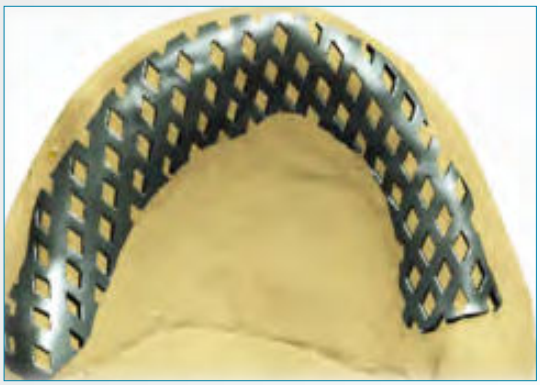
Add, remove or smooth the structure.

Add retentive parts - attachments.

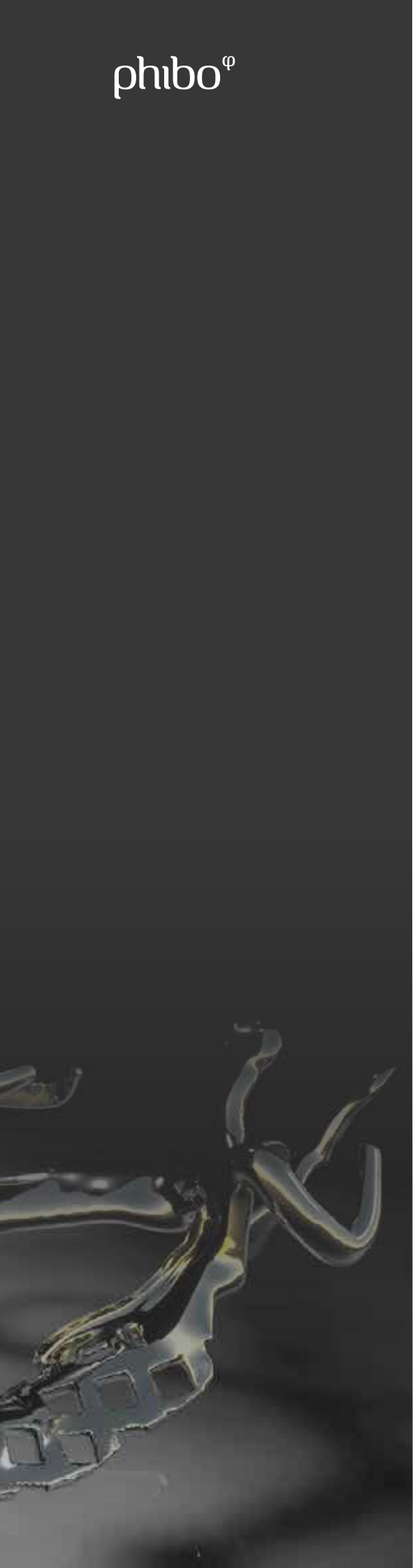
Designing Removable Partial Denture Reinforcements: **Saving**

1.

Design **finished and saved**.



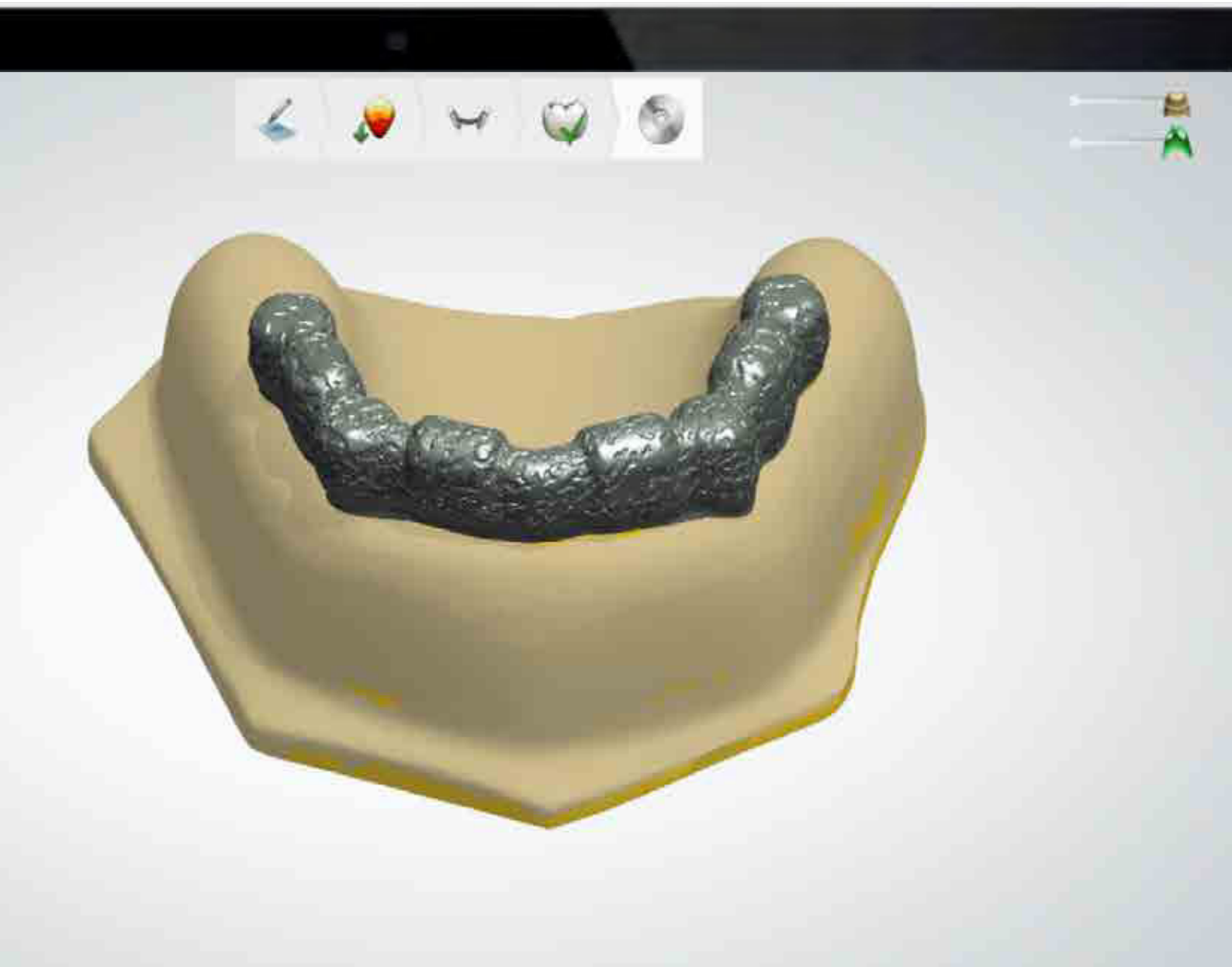
phibo



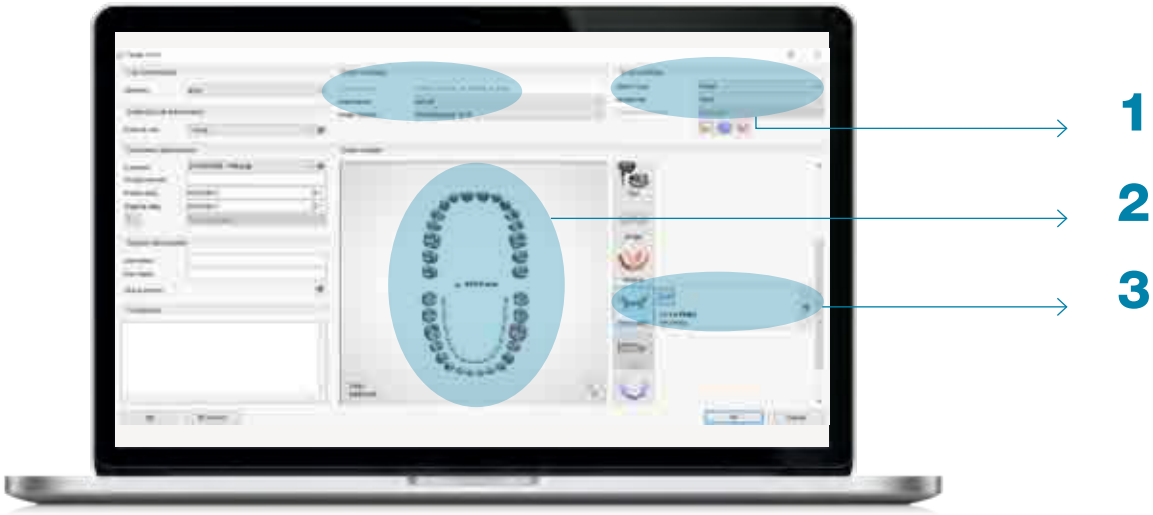

Back
Close
Save
Order elements
RPD frame 38-48
Lift indications
Design completed and saved.

Bar Superstructure

(Secondary Structure)



Bar Superstructure **Order form**



1.

Select:

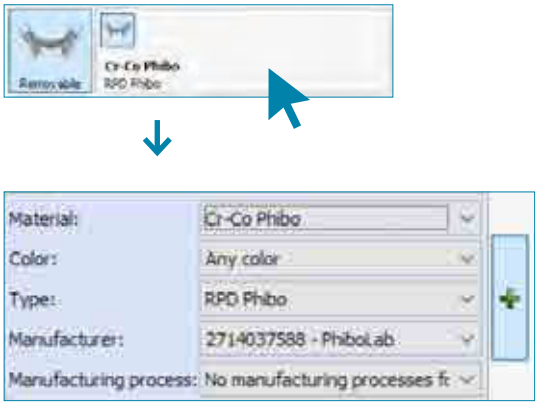
- Type of object: Model, to be scanned in the laboratory.
- Antagonist: Depends on the requirements of the work.
- Scanning of the surrounding area: This is automatically set to **Selected.**

2.

In the **Odontogram,** select any tooth in the arch where you are going to build the secondary structure and click: **Removable.**

Bar Superstructure **Order form**

3. Click on the (+) button to view the following options:



BUILD A SECONDARY SUPERSTRUCTURE FOR BARS.
In type, select Bar Superstructure.

Scan **primary structure.**

The model with the primary structure (Bar) must be entered into the scanner with the attachment retainers.

Important!
The indicator spray must not fall on the retainers to avoid extra thickness.

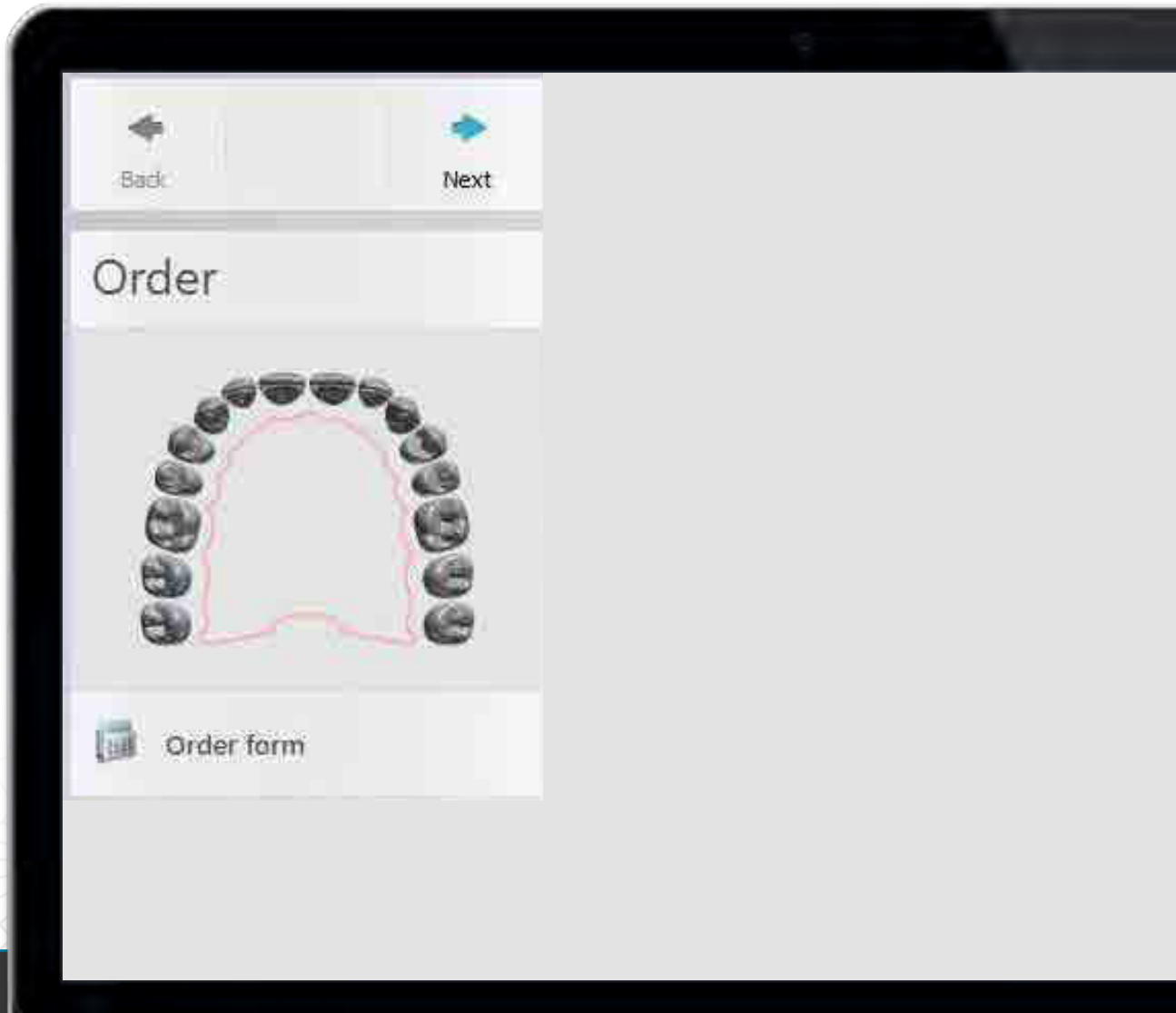
Bar Superstructure Design

Each section is explained from left to right; you can return to previous sections at any time, if necessary, without losing any information.

Bar Superstructure Design: **Order**

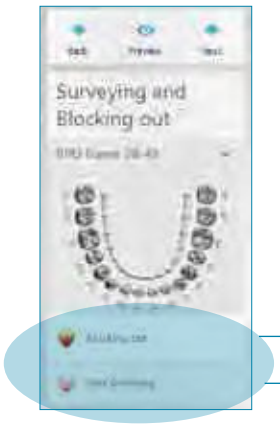
You can edit the order form.

Not all sections of the order can be edited. Depending on the edits, the system will ask if you wish to scan again.



Bar Superstructure Design:
Inspect & lock

1.



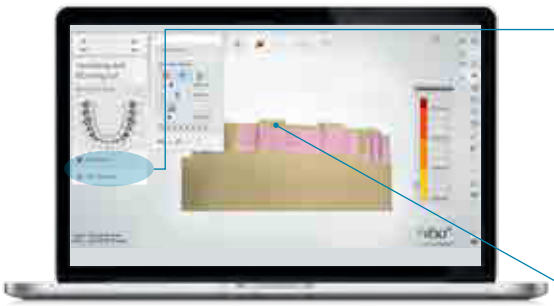
LOCKING:
Define the insertion.

TRIM WAX:
Remove or add wax to the denture in order to customise it as required.

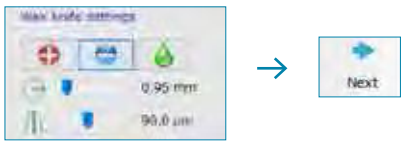
Wax colour.
Transparency option.

Bar Superstructure Design:
Inspect & lock

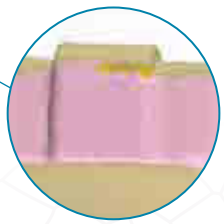
2. Once the insertion direction (view) for the secondary structure is set, click on:



3. Use the toolbox to add, remove and smooth the wax.

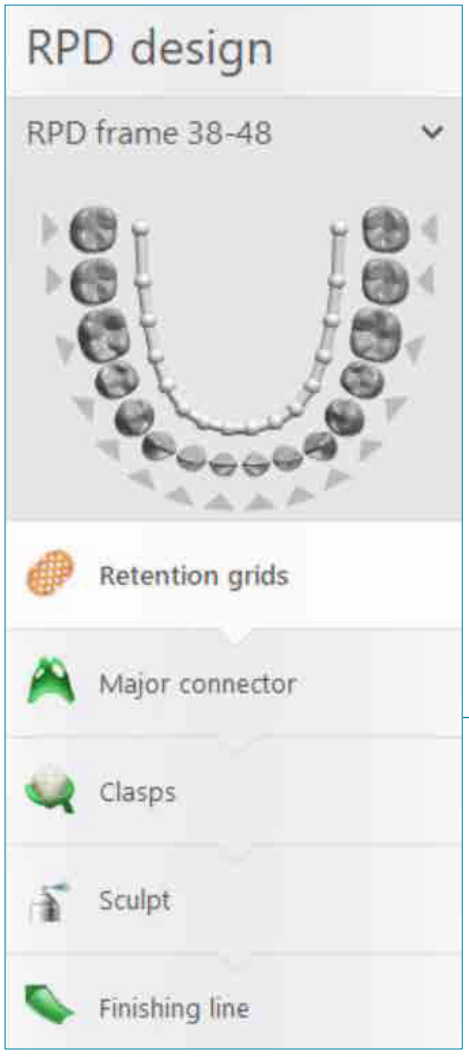


The Technician must decide which areas to add, remove or smooth.



Relieving a little below the mid-point is recommended to aid retention.

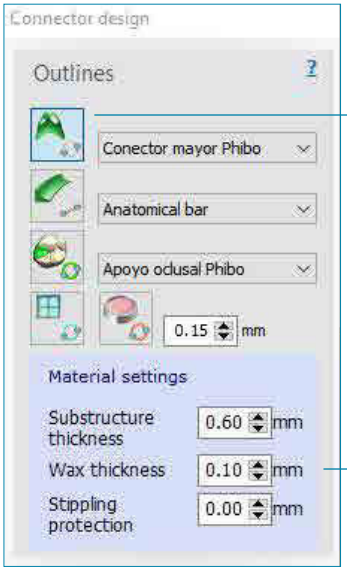
Bar Superstructure Design: **Designing the RPD**



1. Main connector. Create the framework of the attachments/jackets. Create the superstructure.

Bar Superstructure Design: **Designing the RPD**

1. Main connector

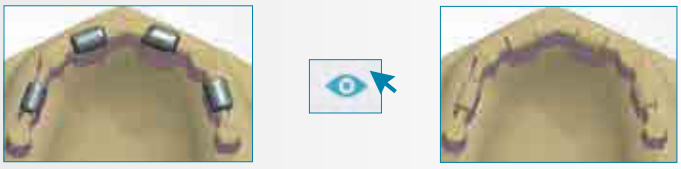


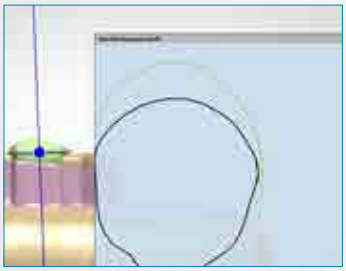
With the **main connector** option, create:

- Framework for the attachments/jackets.
- The Bar Superstructure.

1. Create the framework for the jackets/attachments with the option: MAJOR CONNECTOR.

Important!
Create the framework with minimum thickness: 0.10mm.
(Keep the other values the same as in the image).

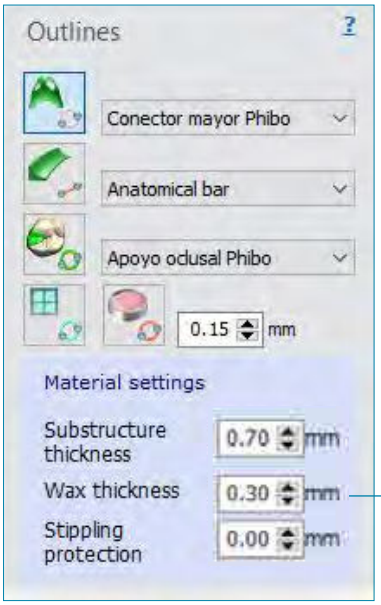




Transversal cut view of the jacket framework.

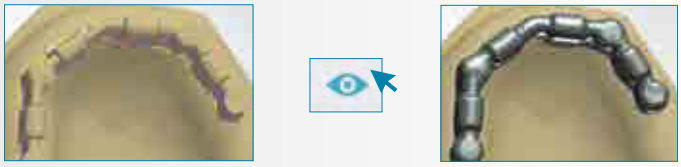
Bar Superstructure Design: **Designing the RPD**

1.1. Main connector



2. Create the Secondary Structure with the option: MAJOR CONNECTOR

Important!
Create the framework with minimum thickness: between 0.30mm and 0.60mm.
(Keep the other values the same as in the image).



Transversal cut view of the superstructure (secondary) on the bar and the jackets.

Bar Superstructure Design: **Finish**

1. Once the Superstructure is completed, move directly to Finish where you have the option to Sculpt Design RPD

Add, remove or smooth material.

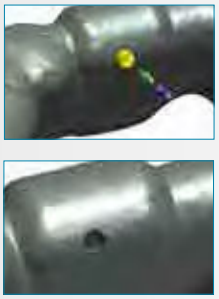
In **attachments**, you can create different retentions.

(A)

(B)

Important! Don't forget to click to apply the attachments

(A)



(B)

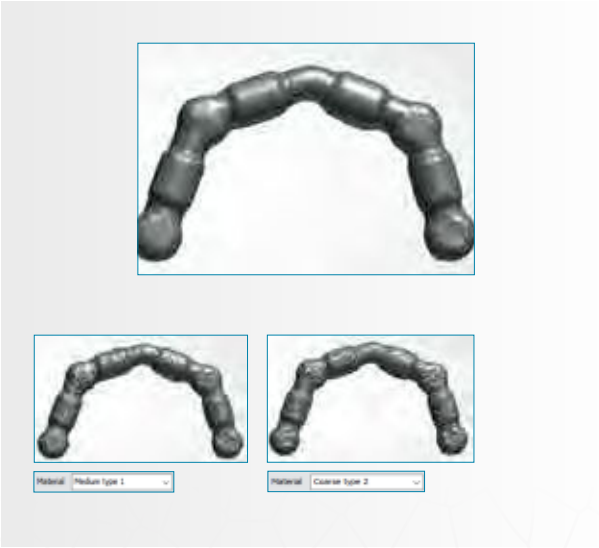
Bar Superstructure Design: **Finish**

2.

Select the area where the stippled wax will be applied when moving to the <Pre-Production> stage.

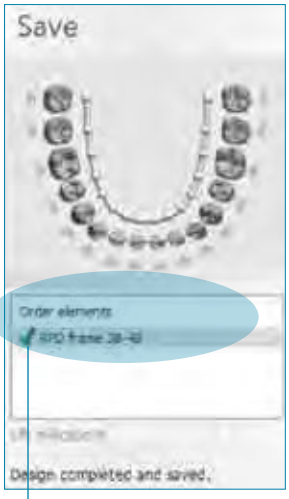
Pre-Production:

Select the type of Stippled Wax to apply in the Material dropdown menu and click on Preview



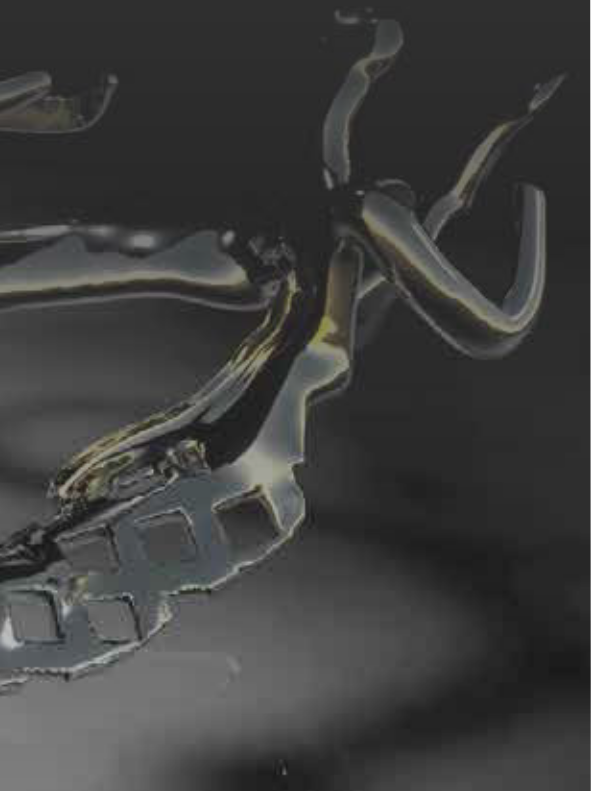
Bar Superstructure Design: **Saving**

1.



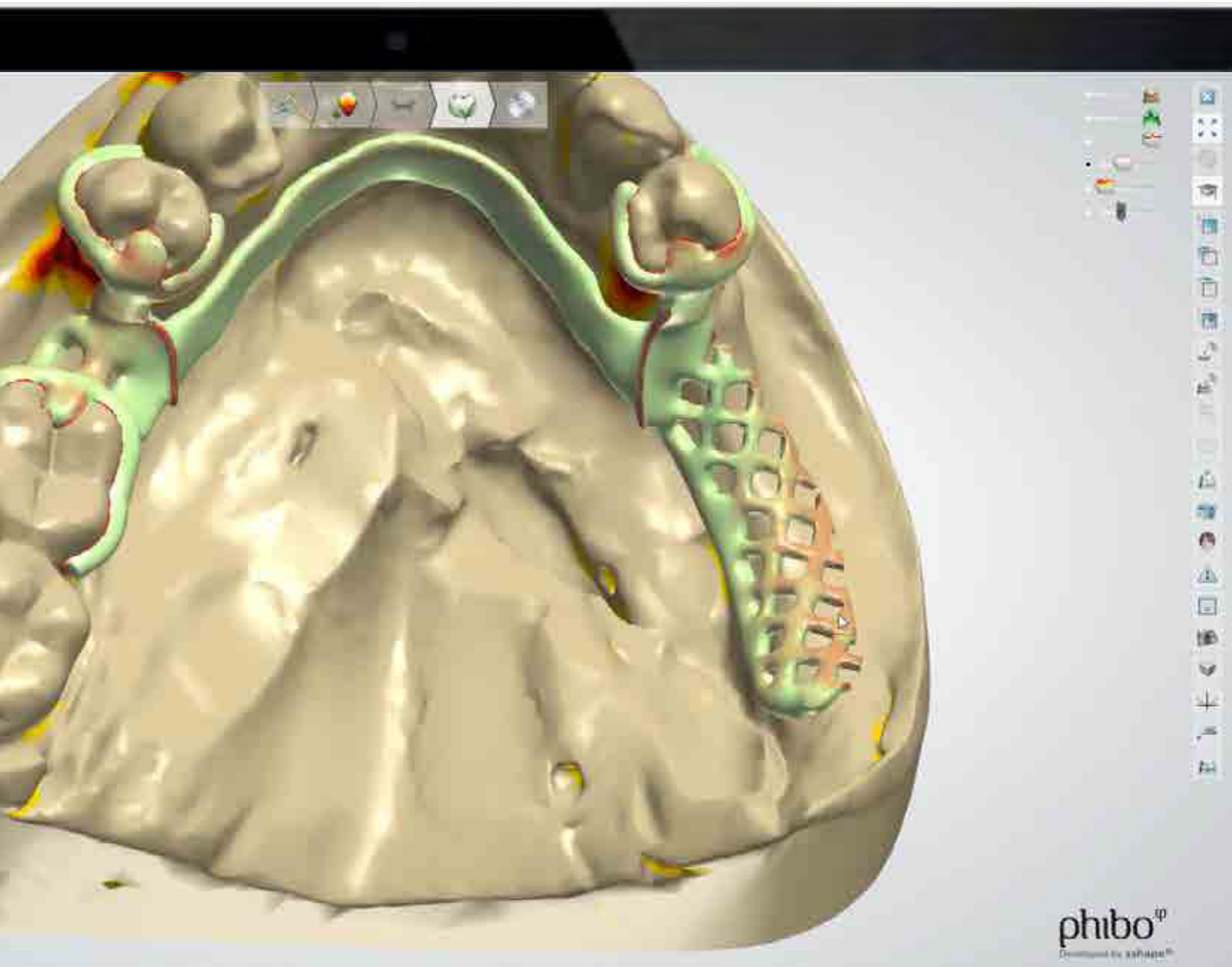
Design **Completed and Saved.**

phibo




Back
Next
Surveying and Blocking out
RPD frame 38-48
Blocking out
Wax trimming
Sculpt toolkit
Wax knife settings
0.95 mm
90.0 µm
0.00 mm

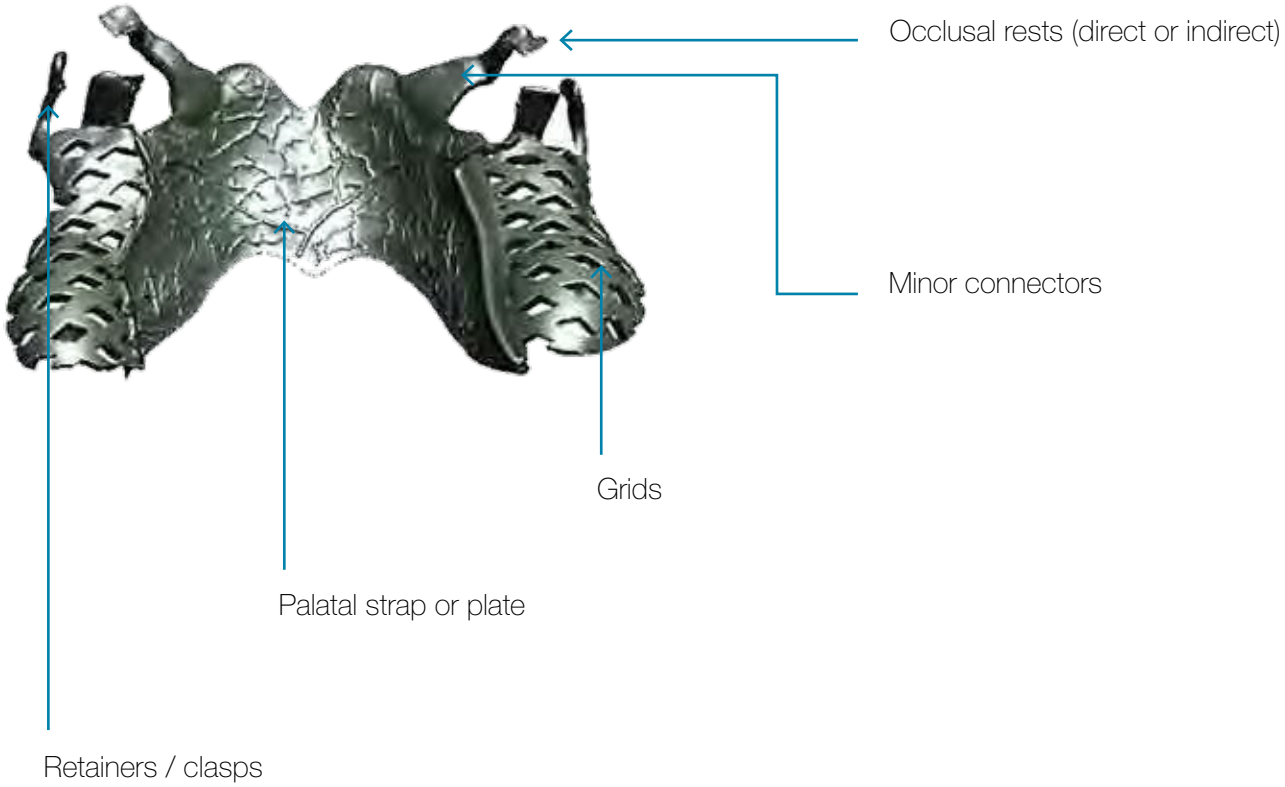
Introduction to Removable Partial Dentures



Definition of **Removable Partial Dentures**

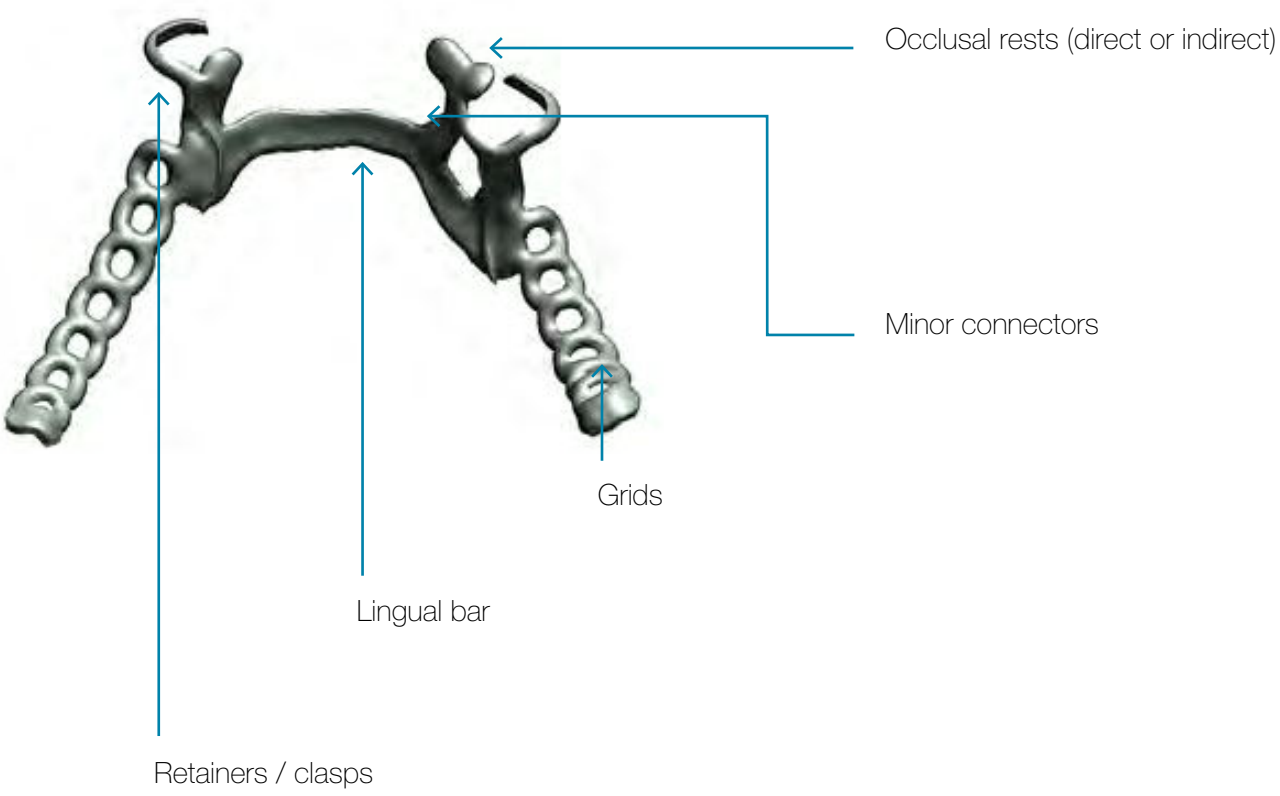
A removable partial denture is a tissue-supported denture, which consists of a metal structure (exoskeleton) containing resin and acrylic teeth, held in place by metal clasps attached to existing teeth.

Upper Jaw Removable Partial Denture

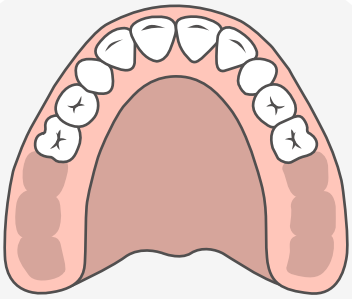


Definition of **Removable Partial Dentures**

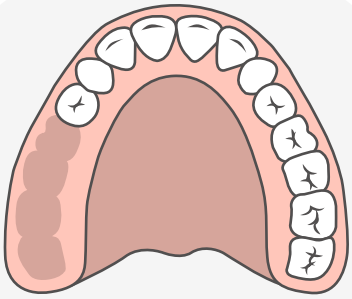
Lower Jaw Removable Partial Denture



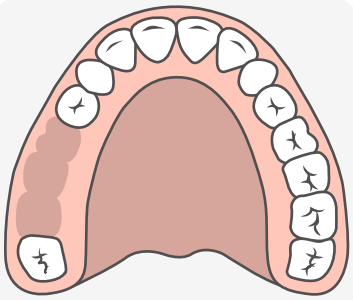
The **Kennedy** Classification



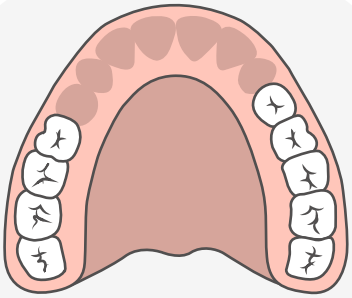
Kennedy Class I
Posterior edentulous areas on both arches



Kennedy Class II
Posterior edentulous area on one arch



Kennedy Class III
Edentulous areas between anterior and posterior natural teeth



Kennedy Class IV
Edentulous area anterior to both arches (crosses the midline)

**There are variations to the different Kennedy classifications.*

Parts of a Removable Partial Denture

1. **RESTS.** These transfer functional forces to the dental pieces, thus preventing the denture from moving to soft tissue.

- Occlusal.
- Cingulum.
- Incisal.

2. **RETAINERS.** These retain, stabilise and prevent the denture from moving.

Parts of a retainer:

Retentive arm: This normally goes on the buccal surface of a natural tooth. It consists of three parts:

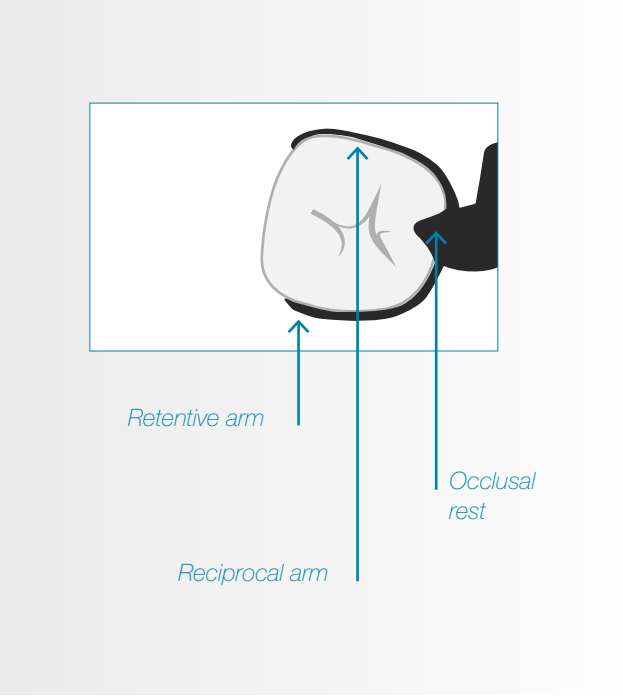
A rigid part: Located on the expulsive part of the tooth.

Semi-rigid: Parallel to the dental equator.

Flexible: Located on the retentive area of the natural tooth.

Reciprocal arm: Its purpose is to neutralise the forces generated by the retentive arm. It has a greater volume in order to provide stability and rigidity.

Occlusal rest: This rests on the occlusal side of the tooth and prevents the denture from moving in the direction of the gum.



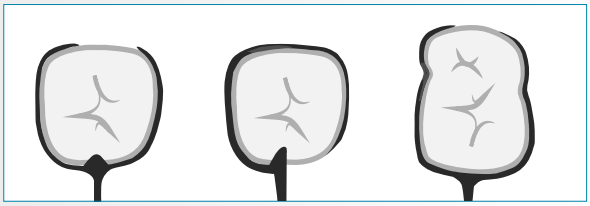
Parts of a Removable Partial Denture

Classification of retainers

according to whether they are supra- or infra-equatorial (direct or indirect).

Supra-Equatorial or Direct Retainers

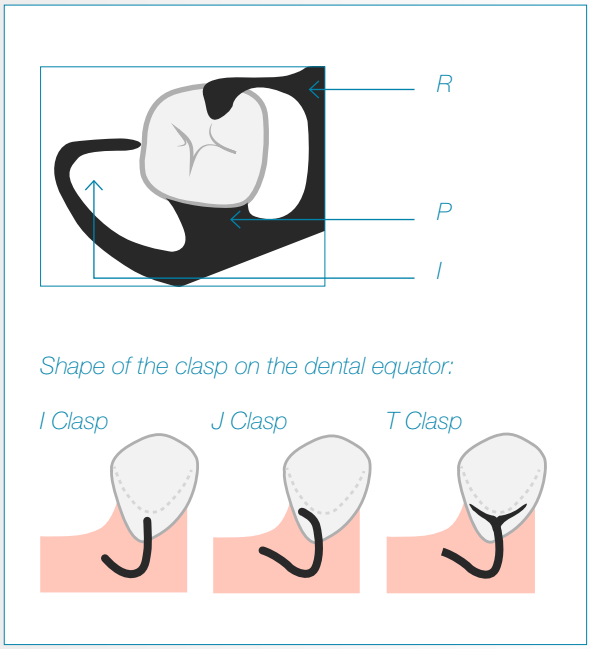
These originate above the dental equator and begin at a minor connector. These involve the retentive part being located under the equator.
Examples: Acker. Circumferential, twin, universal, etc.



Infra-Equatorial or Indirect Retainers

These originate under the dental equator and begin at the grid or major connector. They are located on the retentive part.
Examples: Roach or RP(I)s.

R= Rest.
P= Proximal plate.
I= I bar retainer. The letter 'I' is replaced by the shape of the clasp on the dental equator. (I, Y, T, V L, etc.)

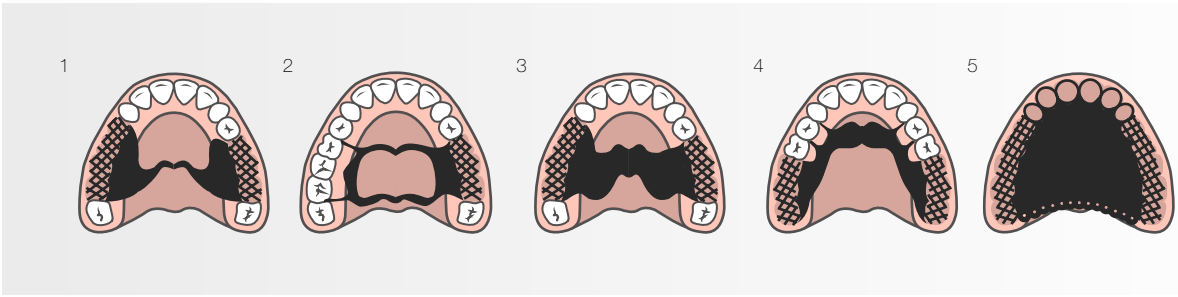


Parts of a Removable Partial Denture

3. **MAJOR CONNECTORS.** Their purpose is to join all the parts of the structure of the denture, providing stability and support. It should not be in retentive areas and it is recommended that it should be between 3-5 mm.

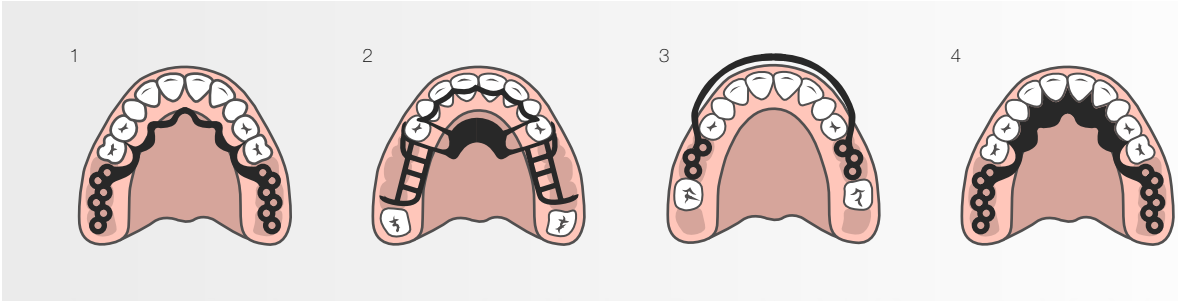
Upper Jaw Major Connectors

- Simple palatal strap (1)
- Double palatal strap (2)
- Transverse palatal strap (3).
- Palatal strap with metalwork (4).
- Transverse palatal plate (5).



Lower Major Connectors

- Lingual bar (1).
- Double lingual bar (2).
- Labial bar (vestibular) (3).
- Lingual plate (4).

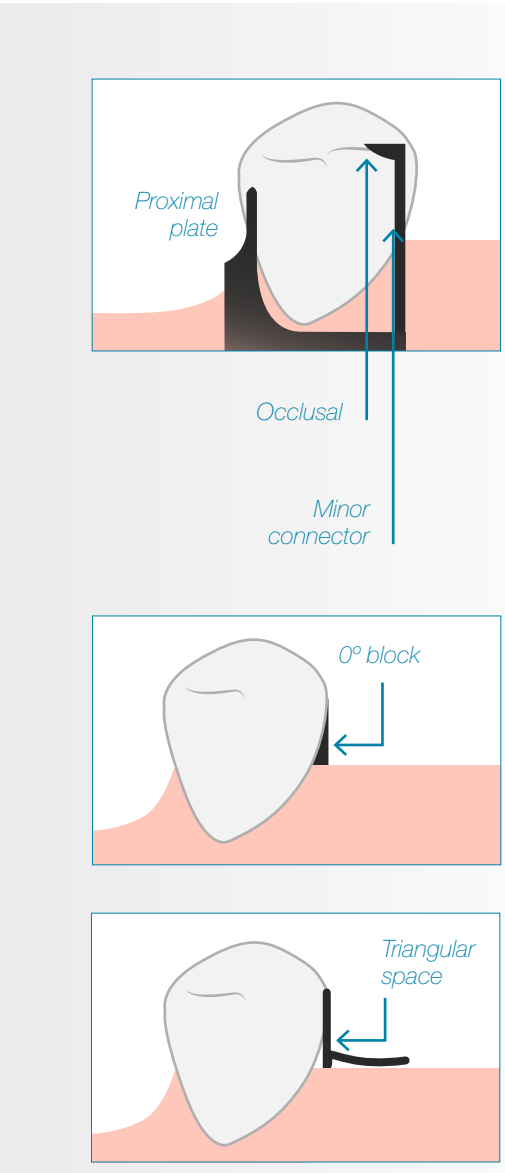


Parts of a Removable Partial Denture

4. MINOR CONNECTORS

These join the major connector to the other parts of the framework. They distribute the occlusal force to the abutment teeth and the structure itself.
They are located in the interdental spaces with certain ones being left out.

Minimum distance between two connectors less than 5mm.

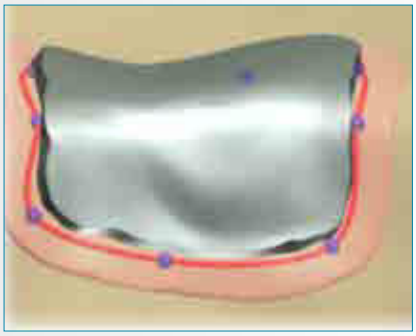


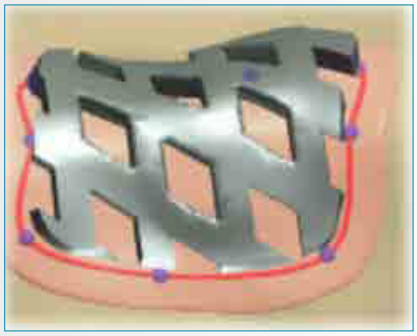
Parts of a Removable Partial Denture

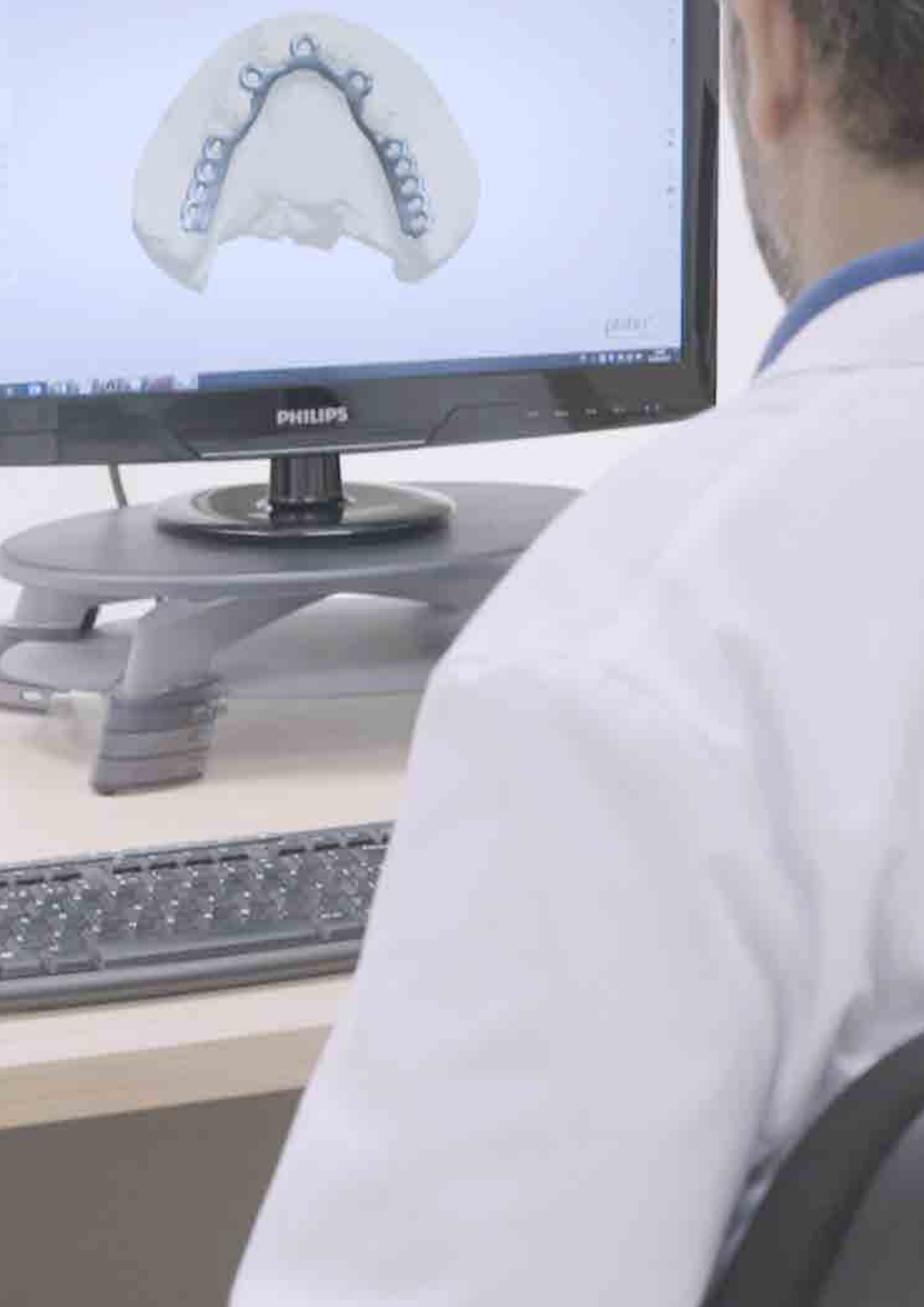
5. BASE-GRIDS

The metal bases are in direct contact with the soft tissue, thus helping retain the acrylic teeth and providing stability to the denture.

The grids are covered in resin, thus helping to keep the acrylic teeth in place and providing stability to the denture.






PHILIPS

Phibo® HQ
Pol. Ind. Mas d'en Cisa
Gato Pérez, 3-9
08181 Sentmenat, Spain
Tel.: +34 937 151 958
Fax: +34 937 153 997

phibo.com

store.phibo.com

phibo