

DK2-53

User's Manual

Supported models: DWX-53DC

Thank you very much for purchasing this product.

- To ensure safe use with a full understanding of this machine's performance, please be sure to read through this manual completely.
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 - The contents of this operation manual and the specifications of this product are subject to change without notice.
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Before Use

Checking the Included Items

The following items are included with the kit. Make sure they are all present and accounted for.

 DK2-53-FX (15)	 DK2-53-TR (15)	 Dedicated milling burs*1	 Silicone stands (2)
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*1: ZRB-200D, ZPB-100D, ZPB-50D, ZPB-30D

MEMO

The DK2-53-FX, DK2-53-TR, and dedicated milling burs can be purchased separately.

Items to Prepare Yourself

• Items included with the machine

 Open edge adapter	 0.6 N·m torque screwdriver (1)
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MEMO

• Use the open edge adapter.

- Thanks to its heat-resistant specifications, the open edge adapter can be polymerized together with the resin, reducing the number of times this adapter needs to be attached and removed.
- The aperture is wider than that of the adapter included for the DWX-53DC, allowing for clean milling of the part under the front teeth.
- The adapter included for the DWX-53DC can also be used, but this will increase the number of steps that are required. For example, it may be necessary to remove the adapter before polymerization and attach the adapter before milling due to the resin type and the method used.

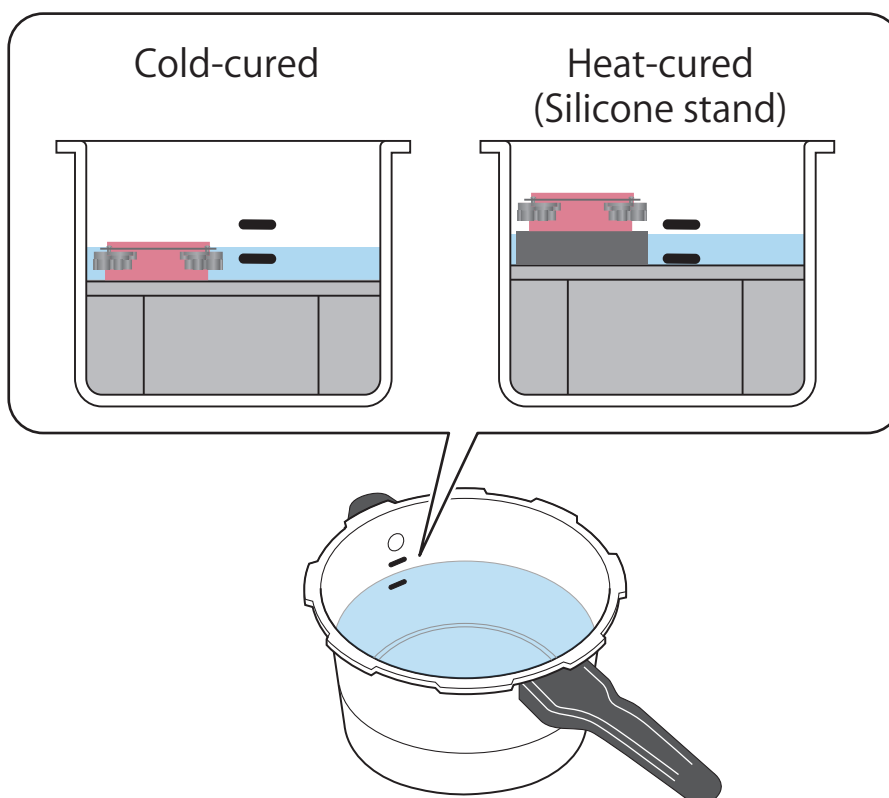
• Materials, equipment, etc.

- Cold-cured resin or Heat-cured resin
- Pressure pot
- Stand for adjusting the position of the polymerizing resin (This is used when adjusting the resin height during polymerization.)
- Spatula (This is used when mixing together the powder and the liquid.)
- Container (This is used when mixing together the powder and the liquid.)
- Lidded container (This is used when mixing together the heat-cured resin powder and the liquid.)
- Tissue paper (This is used to absorb the heat-cured resin's excess liquid layers.)
- Polyethylene sheet (This is used to keep fingers from coming into contact with the heat-cured resin's excess liquid layers.)

- Vibrator (This is used to extract air bubbles from the container after the powder and the liquid have been mixed together.)
- Heat-resistant acrylic resin adhesive (This is used to affix the DK2-53-FX, the DK2-53-TR, and artificial teeth.)
- Brush/eye dropper (This is used to apply adhesive.)
- Artificial teeth

Advance Preparation

Add water to the pressure pot and prepare a stand that will position the DK2-53-FX (cold-cured) or the silicone stand (heat-cured) within the range indicated by the water level gradations.



Usage Method

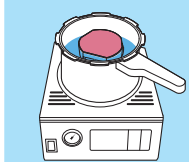
This section explains how to create dentures with this kit. Cold-cured resin or heat-cured resin may be used.

There are two workflows: the Denture Base workflow in which the resin is polymerized before the denture base is milled and the artificial teeth are affixed and the Removable Denture workflow in which the mold for the artificial teeth is milled and arranged and the resin is polymerized before the complete denture (full denture) is milled. The work procedure varies depending on the resin and method used.

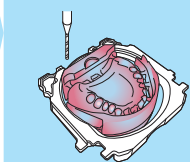
Cold-cured resin

• Denture Base Workflow (P. 5)

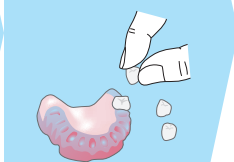
1. Create the denture resin. (P. 5)



2. Mill the denture resin. (P. 6)

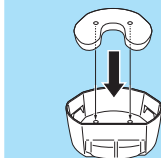


3. Affix the artificial teeth. (P. 7)

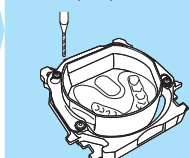


• Removable Denture Workflow (P. 8)

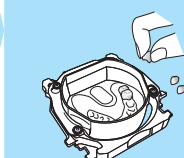
1. Affix the DK2-53-FX and the DK2-53-TR. (P. 8)



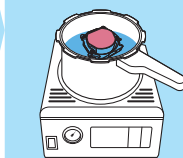
2. Mill the tooth mold (the female mold for the artificial teeth) into the TR. (P. 8)



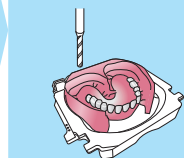
3. Arrange the artificial teeth on the TR. (P. 10)



4. Create the denture resin. (P. 10)



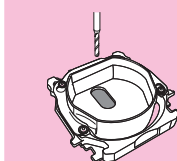
5. Mill the denture resin. (P. 11)



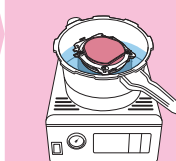
Heat-cured resin

• Denture Base Workflow (P. 12)

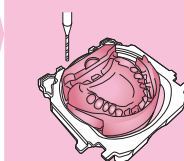
1. Drill a hole in the DK2-53-FX. (P. 12)



2. Create the denture resin. (P. 13)



3. Mill the denture resin. (P. 15)

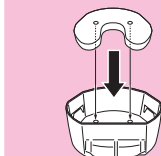


4. Affix the artificial teeth. (P. 15)

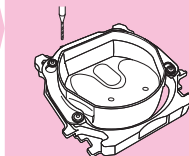


• Removable Denture Workflow (P. 16)

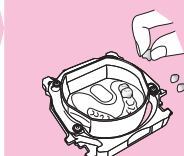
1. Affix the DK2-53-FX and the DK2-53-TR. (P. 16)



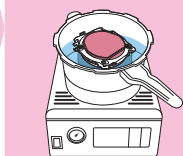
2. Drill holes in the FX and mill the tooth molds into the TR. (P. 16)



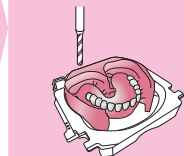
3. Arrange the artificial teeth on the TR. (P. 18)



4. Create the denture resin. (P. 18)



5. Mill the denture resin. (P. 20)



Cold-cured resin

Denture Base Workflow

In this method, polymerize the resin, and then mill the denture base and affix the artificial teeth.

1. Create the denture resin.

- 1 Mix the cold-cured resin powder and the liquid together well.

After mixing, use a vibrator to extract the air bubbles.



- 2 Pour the mixture into the DK2-53-FX (hereinafter referred to as the FX).

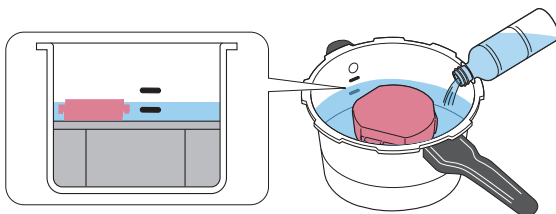


- 3 Wait for the surface of the mixture to dry.

- 4 Place the FX in the pressure pot.

- 5 Check the pressure pot's water level.

Adjust the amount of water if it is not at the level indicated on the pressure pot.



- 6 Set the pressure, temperature, and time on the pressure pot to polymerize the resin.

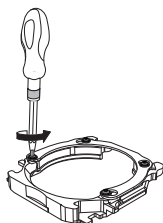
Set the values that are required in order for the cold-cured resin being used to polymerize.

- 7 After polymerization, cool the resin at room temperature.

2. Mill the denture resin.

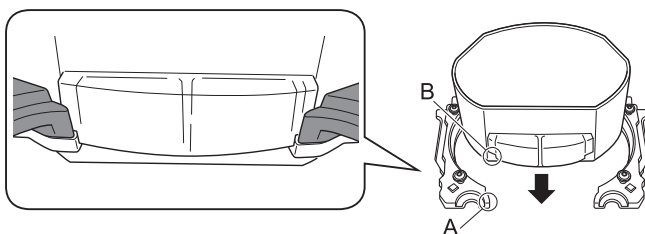
1 Remove the adapter cap from the open edge adapter.

Use a torque screwdriver to loosen the adapter cap screws by turning them approximately four times each, and then remove the adapter cap.

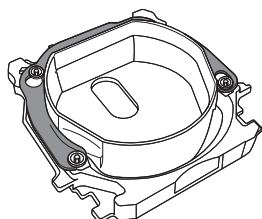


2 Attach the adapter base to the FX.

Align the edge of the open edge adapter (A) with the edge of the FX (B).



3 Attach the adapter cap.

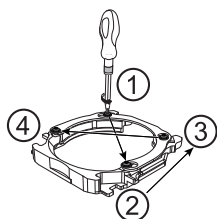


4 Tighten the cap screws (in four locations).

Tighten the screws until this state is reached.

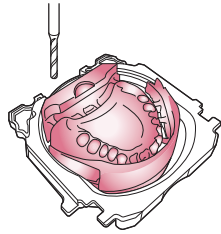
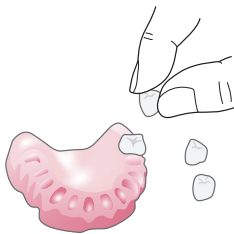
Important

To fix the part in place evenly, tighten the cap screws in order across the diagonals.



5 Mill the denture.

Attach the FX to the machine, and then use the CAM data to mill the denture resin together with the FX.

**3. Affix the artificial teeth.****1 Remove the open edge adapter.****2 Use heat-resistant acrylic resin adhesive, cold-cured resin, or something similar to affix the artificial teeth.**

Removable Denture Workflow

Mill the tooth mold (the female mold for the artificial teeth), arrange the artificial teeth, polymerize the resin, and then mill the complete denture (full denture).

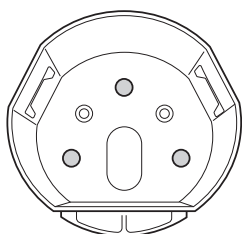
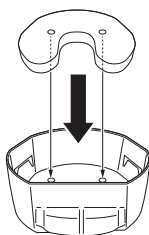
1. Affix the DK2-53-FX and the DK2-53-TR.

1 Apply heat-resistant acrylic resin adhesive to the DK2-53-FX (hereinafter referred to as the FX).

Measure approximately 0.5 ml of heat-resistant acrylic adhesive with an eye dropper, and then drip this adhesive onto one of the three locations indicated in the figure so this location has adhesive with a diameter of approximately 5 mm (0.20 in.). Repeat for the other two locations.

Important

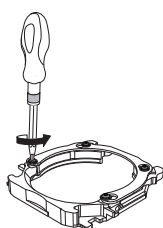
- To prevent tray deformation, do not apply too much adhesive.
- The surface on which adhesive is applied will have small air bubbles, but this is not a problem during milling.

**2** Attach the DK2-53-TR (hereinafter referred to as the TR) by aligning its recessed parts with the protrusions on the FX.

2. Mill the tooth mold (the female mold for the artificial teeth) into the TR.

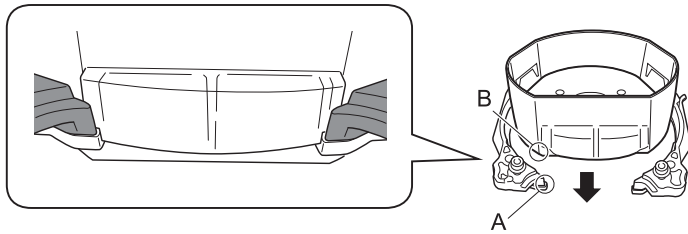
1 Remove the adapter cap from the open edge adapter.

Use a torque screwdriver to loosen the adapter cap screws by turning them approximately four times each, and then remove the adapter cap.

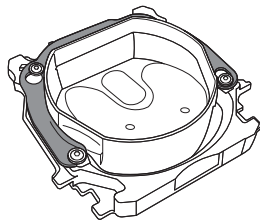


2 Attach the adapter base to the FX.

Align the edge of the open edge adapter (A) with the edge of the FX (B).



3 Attach the adapter cap.

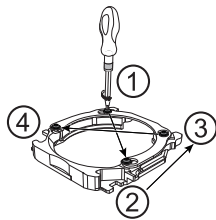


4 Tighten the screws (in four locations).

Tighten the screws until this state is reached.

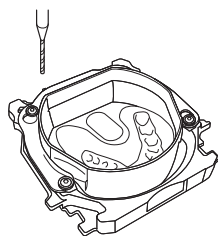
Important

To fix the part in place evenly, tighten the cap screws in order across the diagonals.



5 Mill the tooth mold (the female mold for the artificial teeth) into the TR.

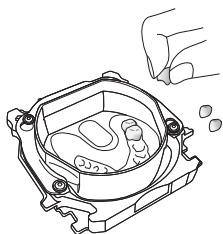
Attach the TR to the machine, and then use the CAM data to mill the tooth mold to use in fitting the TR with artificial teeth.



6 If you are using the adapter, loosen the cap screws, and then remove the adapter cap and the adapter from the FX.

3. Arrange the artificial teeth on the TR.

- 1 Apply one to two drops of heat-resistant acrylic resin adhesive to the TR's tooth mold.
- 2 Check the shape of the tooth mold and the orientation of the artificial teeth.
- 3 Push the artificial teeth onto the TR's tooth mold.



- 4 Check that the artificial teeth have been attached to the tooth mold without any gaps.

Important

The artificial teeth have an orientation that matches the tooth mold. Attach teeth with the proper orientation.

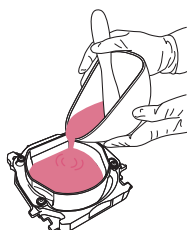
4. Create the denture resin.

- 1 Mix the cold-cured resin powder and the liquid together well.

After mixing, use a vibrator to extract the air bubbles.



- 2 Pour the mixture into the FX where the artificial teeth have been set.

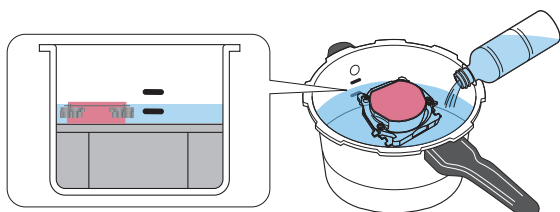


- 3 Wait for the surface of the mixture to dry.

- 4 Place the FX in the pressure pot.

- 5 Check the pressure pot's water level.

Adjust the amount of water if it is not at the level indicated on the pressure pot.



- 6** Set the pressure, temperature, and time on the pressure pot to polymerize the resin.

Set the values that are required in order for the cold-cured resin being used to polymerize.

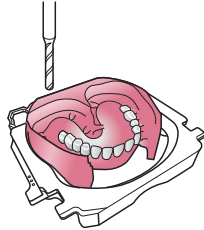
- 7** After polymerization, cool the resin at room temperature.

5. Mill the denture resin.

- 1** If you are using the adapter, attach the adapter to the FX that has undergone polymerization.

- 2** Mill the complete denture (full denture).

Attach the FX to the machine, and then use the CAM data to mill the denture resin together with the FX.



- 3** Loosen the cap screws, and then remove the adapter cap and the open edge adapter from the FX.

Heat-cured resin

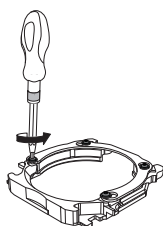
Denture Base Workflow

In this method, polymerize the resin, and then mill the denture base and affix the artificial teeth.

1. Drill a hole in the DK2-53-FX.

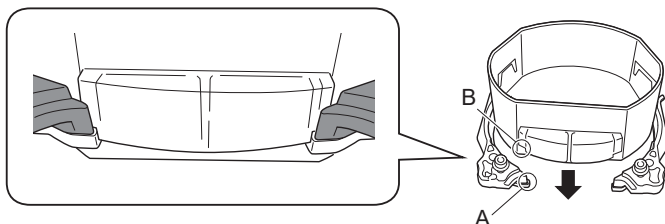
1 Remove the open edge adapter cap.

Use a torque screwdriver to loosen the adapter cap screws by turning them approximately four times each, and then remove the adapter cap.

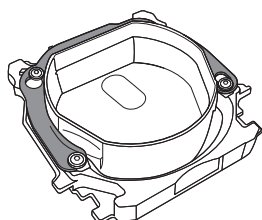


2 Attach the adapter base to the DK2-53-FX (hereinafter referred to as the FX).

Align the edge of the open edge adapter (A) with the edge of the FX (B).



3 Attach the adapter cap.

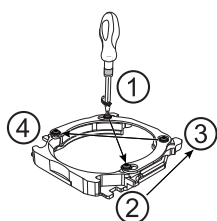


4 Tighten the cap screws (in four locations).

Tighten the screws until this state is reached.

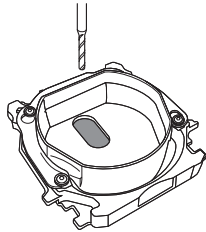
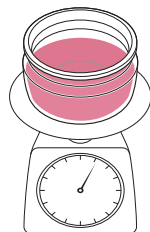
Important

To fix the part in place evenly, tighten the cap screws in order across the diagonals.



5 Drill a hole in the FX.

Attach the FX to the machine and cut off the part indicated in the figure.

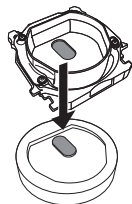
**6 If you are using the adapter, loosen the cap screws, and then remove the adapter cap and the adapter from the FX.****2. Create the denture resin.****1 Insert into the lidded container all the measured heat-cured resin liquid.****2 Insert 80% of the measured heat-cured resin powder so it fits below the liquid surface.****3 Insert the remaining 20% of the powder to cover the liquid surface.****4 Close the lid and mix the components together.****5 Wait 2 to 3 minutes until the mixture becomes porridge-like. If the room temperature is low, you may have to wait a little longer.**

6 Fix the FX onto the protrusion in the silicone stand.

Align the hole drilled in step 1. with the protrusion on the silicone stand.

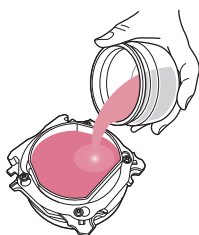
Supplemental

Applying vegetable oil to the protrusion on the silicone stand makes it easier to remove the resin after polymerization.

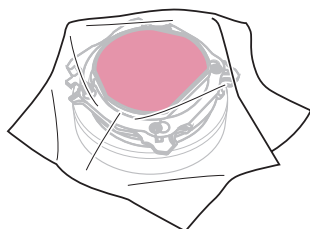


7 Pour the mixture into the FX.

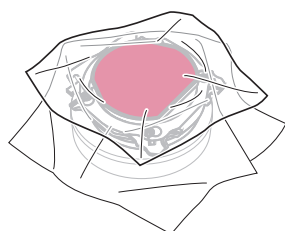
Flatten the surface of the mixture with a spatula.



8 Cover the mixture with a piece of tissue paper.



9 Place a polyethylene sheet on the tissue paper.



10 Lightly press down on the polyethylene sheet and the tissue paper to absorb the liquid layer from the surface of the mixture.

Important

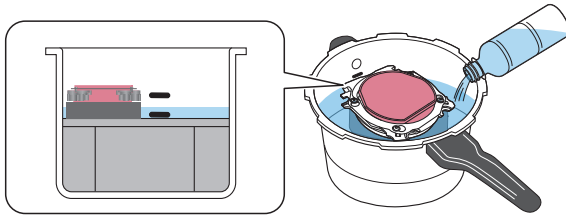
A liquid layer remaining on the surface may cause air bubbles to form there after polymerization.

11 Remove the polyethylene sheet and the tissue paper.

12 Place the silicone stand and the FX in the pressure pot.

13 Check the pressure pot's water level and temperature.

- Add water until approximately half the silicone stand is submerged.
- Heat the water until its temperature is between 20° C and 30° C (68° F and 86° F).



14 Apply pressure for approximately 60 minutes.

- After applying pressure, open the lid and check that there is no liquid on the resin surface.
- This time is merely a guideline. Set the time required for the heat-cured resin being used to turn rubbery.

15 Perform the pre-polymerization.

Gradually increase the water temperature to 65° C (149° F), and then perform pressurized and heated polymerization at 65° C (149° F) for 90 to 120 minutes.

Important

The pre-polymerization time is merely a guideline. If cracks or air bubbles remain in the heat-cured resin being used, increase this time until there are no cracks or air bubbles.

16 Perform the polymerization.

Perform pressurized and heated polymerization at 80° C (176° F) for 40 minutes.

Important

Heat-cured resin polymerizes at high temperatures. Handle it carefully after polymerization to avoid burns.

17 Remove the FX from the silicone stand, and then leave the FX at room temperature for approximately 30 minutes.

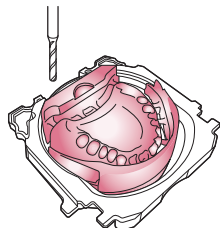
18 Cool the FX for approximately 15 minutes with cold water.

3. Mill the denture resin.

1 If you are using the adapter, attach the adapter to the FX that has undergone polymerization.

2 Mill the denture base.

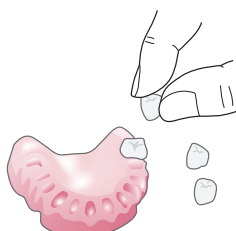
Attach the FX to the machine, and then use the CAM data to mill the denture resin together with the FX.



4. Affix the artificial teeth.

1 Remove the open edge adapter.

2 Use heat-resistant acrylic resin adhesive, cold-cured resin, or something similar to affix the artificial teeth.



Removable Denture Workflow

Mill the tooth mold (the female mold for the artificial teeth), arrange the artificial teeth, polymerize the resin, and then mill the complete denture (full denture).

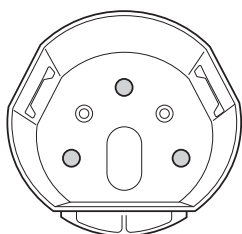
1. Affix the DK2-53-FX and the DK2-53-TR.

1 Apply heat-resistant acrylic resin adhesive to the DK2-53-FX (hereinafter referred to as the FX).

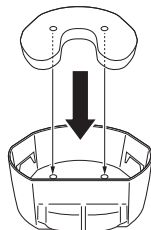
Measure approximately 0.5 ml of heat-resistant acrylic adhesive with an eye dropper, and then drip this adhesive onto one of the three locations indicated in the figure so this location has adhesive with a diameter of approximately 5 mm (0.20 in.). Repeat for the other two locations.

Important

- To prevent tray deformation, do not apply too much adhesive.
- The surface on which adhesive is applied will have small air bubbles, but this is not a problem during milling.



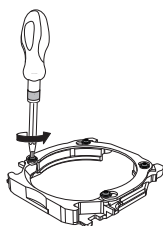
2 Attach the DK2-53-TR (hereinafter referred to as the TR) by aligning its recessed parts with the protrusions on the FX.



2. Drill holes in the FX and mill the tooth molds into the TR.

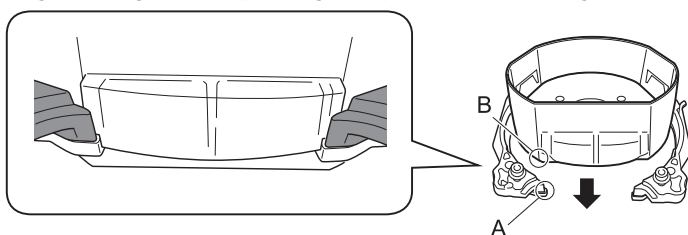
1 Remove the adapter cap.

Use a torque screwdriver to loosen the adapter cap screws by turning them approximately four times each, and then remove the adapter cap.

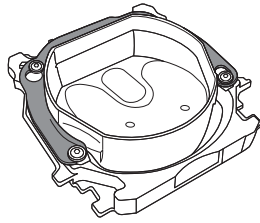


2 Attach the adapter base to the FX.

Align the edge of the open edge adapter (A) with the edge of the FX (B).



- 3 Attach the adapter cap.

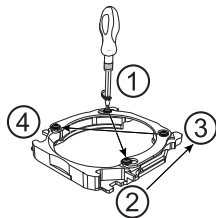


- 4 Tighten the cap screws (in four locations).

Tighten the screws until this state is reached.

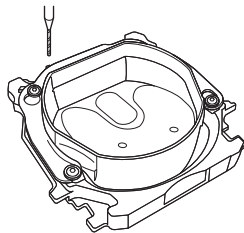
Important

To fix the part in place evenly, tighten the cap screws in order across the diagonals.



- 5 Drill holes in the FX and mill the tooth molds into the TR.

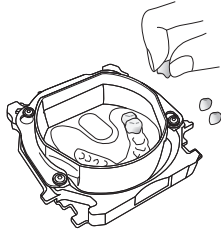
Attach the FX and TR to the machine, and then use the CAM data to mill the tooth mold to use in fitting the TR with artificial teeth. Also drill holes in the FX.



- 6 Remove the FX and TR from the machine.

3. Arrange the artificial teeth on the TR.

- 1 Apply one to two drops of heat-resistant acrylic resin adhesive to the TR's tooth mold.
- 2 Check the shape of the tooth mold and the orientation of the artificial teeth.
- 3 Push the artificial teeth onto the TR's tooth mold.



- 4 Check that the artificial teeth have been attached to the tooth mold without any gaps.

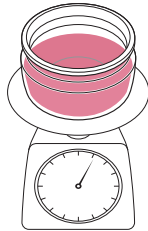
Important

The artificial teeth have an orientation that matches the **tooth mold**. Attach teeth with the proper orientation.

- 5 If you are using the adapter, loosen the cap screws, and then remove the adapter cap and the adapter from the FX.

4. Create the denture resin.

- 1 Insert into the lidded container all the measured heat-cured resin liquid.



- 2 Insert 80% of the measured heat-cured resin powder so it fits below the liquid surface.



- 3 Insert the remaining 20% of the powder to cover the liquid surface.

- 4 Close the lid and mix the components together.



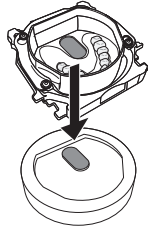
- 5 Wait 2 to 3 minutes until the mixture becomes porridge-like. If the room temperature is low, you may have to wait a little longer.

6 Fix the FX onto the protrusion in the silicone stand.

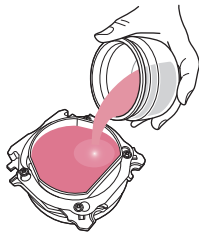
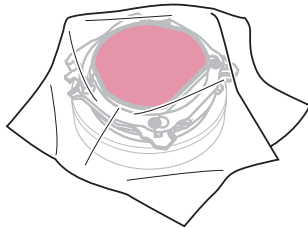
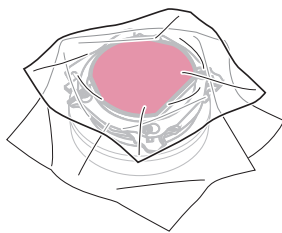
Align the hole drilled in step 1. with the protrusion on the silicone stand.

Supplemental

Applying vegetable oil to the protrusion on the silicone stand makes it easier to remove the resin after polymerization.

**7** Pour the mixture into the FX.

Flatten the surface of the mixture with a spatula.

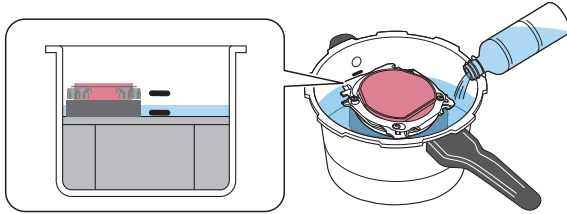
**8** Cover the mixture with a piece of tissue paper.**9** Place a polyethylene sheet on the tissue paper.**10** Lightly press down on the polyethylene sheet and the tissue paper to absorb the liquid layer from the surface of the mixture.**Important**

A liquid layer remaining on the surface may cause air bubbles to form there after polymerization.

11 Remove the polyethylene sheet and the tissue paper.**12** Place the silicone stand and the FX in the pressure pot.

13 Check the pressure pot's water level and temperature.

- Add water until approximately half the silicone stand is submerged.
- Heat the water until its temperature is between 20° C and 30° C (68° F and 86° F).



14 Apply pressure for approximately 60 minutes.

- After applying pressure, open the lid and check that there is no liquid on the resin surface.
- This time is merely a guideline. Set the time required for the heat-cured resin being used to turn rubbery.

15 Perform the pre-polymerization.

Gradually increase the water temperature to 65° C (149° F), and then perform pressurized and heated polymerization at 65° C (149° F) for 90 to 120 minutes.

Important

The pre-polymerization time is merely a guideline. If cracks or air bubbles remain in the heat-cured resin being used, increase this time until there are no cracks or air bubbles.

16 Perform the polymerization.

Perform pressurized and heated polymerization at 80° C (176° F) for 40 minutes.

Important

Heat-cured resin polymerizes at high temperatures. Handle it carefully after polymerization to avoid burns.

17 Remove the FX from the silicone stand, and then leave the FX at room temperature for approximately 30 minutes.

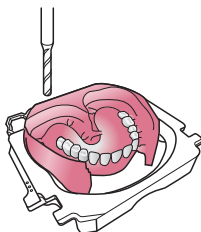
18 Cool the FX for approximately 15 minutes with cold water.

5. Mill the denture resin.

1 If you are using the adapter, attach the adapter to the FX that has undergone polymerization.

2 Mill the complete denture (full denture).

Attach the FX to the machine, and then use the CAM data to mill the denture resin together with the FX.



3 Loosen the cap screws, and then remove the adapter cap and the open edge adapter from the FX.

