NSK

Contra Angle Handpiece

Ti-Max Z45L

Z45L

OPERATION MANUAL

CE 0197 MADE IN JAPAN

OM-C0483E

1. User and Intended Use

User: Licensed dentists / oral surgeons
Intended Use: Ti-Max Z45L is powered by either an air-motor or electronic micromotor for use in general dentistry. The device is intended for cutting and grinding teeth, cavity preparations, tooth and crown preparations, finishing and trimming teeth and filling materials, and removal of crowns and filling materials.

2. Precautions for Handling and Operation

- Read these precautions carefully and use only as intended or instructed.
- Safety instructions are intended to avoid potential hazards that could result in personal injury or damage to the device. Safety instructions are classified as follows in accordance with the seriousness of the hazard.

Class	Degree of Hazard
⚠ WARNING	A hazard that could result in serious injury or damage to the device if the safety instructions are not followed.
⚠ CAUTION	A hazard that could result in light or moderate injury or damage to the device if the safety instructions are not followed.
NOTICE	General product specification information highlighted to avoid product malfunction and performance reduction.

⚠ WARNING

· Depressing the push button while the handpiece is rotating may result in OVERHEATING of the chuck mechanism. Special caution must be exercised during use to keep cheek tissue AWAY from the push button. Contact with the handpiece and the cheek tissue may cause the push button to be depressed and cause a burn injury to the patient.

⚠ CAUTION

· Read this Operation Manual before use to fully understand the product functions and file for future reference.
· Operate the product carefully to protect the patient against any danger.
· Users are responsible for the operational control, maintenance and continual inspection of this product.
· Do not attempt to disassemble the product or tamper with the mechanism except as recommend by NSK in this Operation Manual.
· Do not allow any impact to the product. Do not drop the product.
· Operators and all others in the area must wear eye protection and a mask when operating this handpiece.
· Supply coolant water while operating the handpiece. The handpiece may result in overheating which could cause a burn injury when the coolant water is not supplied.

· Entry of debris into the gear or inside the handpiece may result in overheating which could cause a burn injury.
· Always check the handpiece for vibration, noise and overheating before use. Do not use the handpiece and contact your Authorized NSK Dealer if the handpiece does not operate normally – including If you experience abnormal rotation, vibration, noise or overheating.
· Do not use strong acid water or sterilizing solutions to wipe, immerse or clean the product.
· The products are delivered in a non-sterile condition and must be sterilized prior to use. See "7-4 Sterilization" in this manual.
· Perform maintenance checks. See "6. Pre-treatment Check" in this manual.
· After long-term storage of the handpiece, check that the handpiece functions correctly before using on a patient. See "6. Pre-treatment Check" in this manual.
· To avoid clinical downtime, it is recommended that a spare be kept on hand in case of a breakdown during surgery.
· U.S. Federal law restricts this device to sale by or on the order of a licensed physician or a licensed dentist.
· The operation of the handpiece is permitted only on dental units which correspond to the standards IEC 60601-1 and IEC 60601-1-2.

3. Connection & Disconnection of the Handpiece and Motor

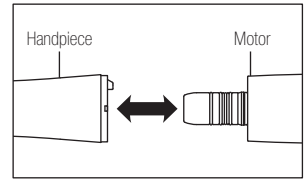

Fig. 1

3-1 Connection

1) Connect the handpiece directly to the motor and twist the handpiece until the handpiece is locked into the motor with a clicking sound.
2) Make sure the handpiece is firmly connected to the motor.

3-2 Disconnection

Hold the motor and the handpiece separately and pull them out straight.

⚠ CAUTION

· Disconnect the handpiece only after the motor has completely stopped rotating.
· Connect ONLY to E type motors (ISO 3964).

4. Insertion & Removal of the Bur

4-1 Insertion of the Bur

1) Insert the bur into the bur insertion hole on the head of the handpiece. (Fig. 2)
2) Insert the bur into the chuck while depressing the push button until the bur is secure, then release the button.
3) Check that the bur is secure by gently pulling and pushing the bur WITHOUT depressing the Push Button.

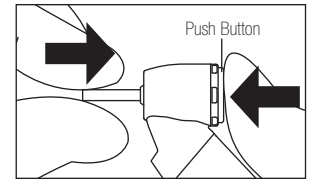

Fig. 2

4-2 Removal of the Bur

Remove the bur while depressing the Push Button.

NOTICE

Grip the handpiece while placing your tip of the thumb on the Push Button which makes it easier to depress the button.

⚠ CAUTION

· The bur must be inserted into the chuck as far as it will go.
· Remove the bur only after the handpiece has completely stopped rotating.
· Check that the bur shank is clean every time before the insertion of the bur
· Entry of debris into the chuck, via the bur shank, could cause bur rotation slip and also prevent the bur from being securely locked in the chuck.
· Do not rotate the handpiece without a bur in the chuck. The handpiece may overheat which could cause a burn injury.
· Always follow the instructions provided by the bur manufacturer.
· Do not exceed the bur speed recommended by the bur manufacturer.
· Do not use burs longer than 25mm.
· When using a bur with a length of 20-25mm, the working diameter must be as follows; within ø2mm for a diamond bur, ø1mm for a carbide bur. The use of a bur with a diameter that exceeds the specified values may result in a bur runout and cause the bur to bend or break.
· Do not apply excessive pressure when using this product. The use of excessive pressure may cause the bur bend or break.
· Do not use if the burs are bent, deformed, worn, rusted or broken. Use of the product with a bur that is bent, deformed, worn, rusted or broken may cause the bur to break or disengage from the chuck.
· Do not use if the burs are cracked on the edge or axis. Use of the product with a bur that is cracked may cause the bur to break or disengage

from the chuck.
· Do not use a bur that is not ISO certified.
· Do not use a bur that is modified or altered in any manner.

5. Switching coolant water type

It is possible to switch the type of coolant water flow which cools the drilling point.
Turn the switching valve with an attached wrench to switch the coolant water type.

- Align the mark ⬭ and ○ to set the water spray shape.
- Align the mark ⬬ and ○ to set the water jet shape.

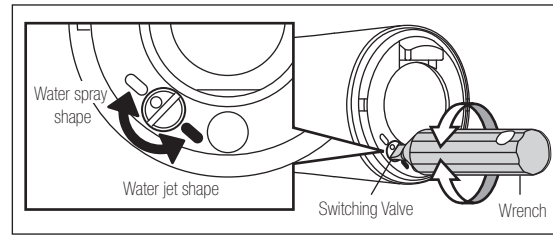

Fig. 3

⚠ CAUTION

· Make sure to turn the switching valve unti it stops.
· Before initiating treatment, assure the water is spraying correctly.
· If water is not being supplied correctly, recheck the switching valve.

6. Pre-treatment Check

Inspect the handpiece in accordance with the following procedure and confirm that there is no abnormality before use.

1) Insert a bur into the chuck and check the bur for looseness. If there is unacceptable looseness, do not use the handpiece and contact your Authorized NSK Dealer to repair the product.
2) Set the rotation speed within allowable level of the bur in accordance with the bur's instruction and operate the handpiece. Check if there is no abnormal vibration of the bur and/or the handpiece, and/or unusual noise. If you observe any problems, stop the handpiece and contact your Authorized NSK Dealer to repair the product.
3) Keep the handpiece running for one minute to observe for any problems described in 1) and 2). After one minute, stop running the handpiece and check if the surface of the handpiece is not heated. If you observe heating, do not use the handpiece and contact your Authorized NSK Dealer to repair the product.

4) Start using the handpiece if you did not observe any problems described in above.

Dispose the product in accordance with "12. Disposal of product" if the dealer cannot repair it.

7. Maintenance

After use for each patient, maintain the product as follows.

7-1 Cleaning (Handpiece)

1) Remove dirt and debris from the product with a brush. Do not use a wire brush.
2) Wipe the handpiece clean with alcohol-immersed cotton swab or cloth.


The surface of the handpiece can be washed and disinfected with a Thermo-Disinfector prior to Sterilization.
Refer to the Thermo-Disinfector manual.

⚠ CAUTION

· After washing with Thermo-Disinfector, dry the product until all internal moisture is thoroughly removed prior to lubrication. Any moisture remaining inside the product may reduce the effect of lubrication and may cause corrosion inside of the product.
· To clean the product never use any solvent such as benzine or thinner.
· Sterilize the handpiece every time after using the Thermo -Disinfector.

7-2 Cleaning (Optic)

Wipe the Glass Rod tip clean with an alcohol-immersed cotton swab. Remove all debris and oil. (Fig. 4)

⚠ CAUTION

Do not use a sharp tool to clean the Glass Rod. A sharp tool may damage the glass and reduce the light transmission.

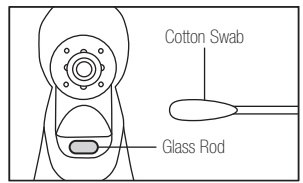

Fig. 4

7-3 Lubrication

■ NSK PANA SPRAY

Apply NSK PANA SPRAY every time after every cleaning and before sterilization.

1) Remove the bur from the handpiece.
2) Attach the Spray Nozzle to the NSK PANA SPRAY nozzle.
3) Insert the Spray Nozzle in rear of the handpiece. Hold the handpiece and spray for approximately 2-3 seconds. Apply lubricant until it is expelled from the handpiece head for at least 2 seconds. (Fig. 5)

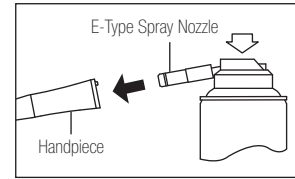

Fig. 5

⚠ CAUTION

· Repeat lubrication until the handpiece is clean and free of debris.
· When applying spray, hold the handpiece firmly to prevent the handpiece from slipping out of the hand due to the spray pressure.
· Hold the spray can upright.

■Chuck cleaning

Clean Push Button chuck once a week.

1) Mount the arrow-head spray nozzle tip into NSK PANA SPRAY nozzle.
2) Lubricate the chuck directly thorough the bur insertion hole. (Fig. 6)
3) Lubricate handpiece by using NSK PANA SPRAY (Fig. 5) or Care3 Plus.

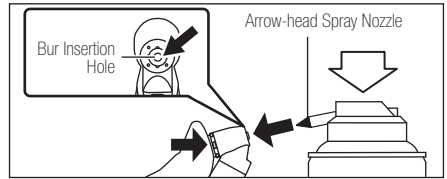

Fig. 6

⚠ CAUTION

If the chuck is not regularly cleaned, the chuck grip may be weakened and the bur may accidentally be released during operation.

■Care3 Plus

When using NSK Care3 Plus automatic handpiece cleaning and lubrication system, refer to the Care3 System instructions.

7-4 Sterilization

Sterilize the product by steam sterilization. Remove the bur after use for each patient and sterilize as described below.

1) Wrap the handpiece using a paper-plastic pouch for steam sterilization. Seal the pouch.
2) Sterilization is achieved under the following conditions.
   - Gravity displacement steam sterilizer; Exposure at 132 ºC for 15 minutes, Drying for 30 minutes/Exposure at 135 ºC for 10 minutes, Drying for 30 minutes
   - Dynamic air removal steam sterilizer: Exposure at 132 ºC for 4 minutes, Drying for 30 minutes/Exposure at 135 ºC for 3 minutes, Drying for 16 minutes
3) Store the handpiece in the paper-plastic pouch until immediately before use.

⚠ CAUTION

- Do not sterilize the product with other instruments even when it is in a pouch. This is to prevent possible discoloration and damage to the product from chemical residue on other instruments.
- Store the product in an environment as specified in the Specification Section with good ventilation and away from direct sunlight. The air must be free from dust, salt and sulphur.
- Immediately after use, the product must be cleaned, lubricated and sterilized. If blood remains on the external or internal surfaces, it may clot

and cause rust.
- Do not heat or cool the product too quickly. Rapid change in temperature may cause damage to the product.
- If temperature of the chamber exceeds 135 ºC , the product may not operate properly.
- Steam sterilization must be used for the product. All other sterilization method must not be used because the validity of other sterilization methods is not confirmed.
- Do not touch the product immediately after sterilization because it will be very hot.

NOTICE

NSK recommends Class B sterilizers as stated in EN 13060.

8. Periodical Maintenance Checks

Perform periodical maintenance checks every three months, referring to the check sheet below. If any abnormalities are found, contact your Authorized NSK Dealer.

Points to check	Details
Head cap is loose	Check that the Head Cap is firmly tightened.
Rotation	Rotate the handpiece and check for abnormalities such as abnormal rotation, vibration, noise, and overheating.
Coolant Water	Operate the handpiece and check that the coolant water is flowing through all spray ports.

9. Symbol

This product is Autoclavable up to Max.135°C.


The surface of the handpiece can be washed and disinfected with a Thermo-Disinfector prior to Sterilization.

Conforms to CE European Directive of “Medical equipment directive 93/42/EEC.”


Manufacturer.

Authorized representative in the European community.

℞ Only Caution: U.S. Federal law restricts this device to sale by or on the order of a licensed physician or a licensed dentist.

10. Warranty

NSK products are warranted against manufacturing errors and defects in materials. NSK reserves the right to analyze and determine the cause of any problem. Warranty is voided should the handpiece not be used correctly or for the intended purpose or has been tampered with by unqualified personnel or has had non NSK parts installed. Replacement parts are available for seven years beyond discontinuation of the model.

11. Spare Parts List

Model	Order Code	Remarks
Wrench	Z1129101	For switching coolant water type

12. Disposal of Product

Sterilize the product before disposal in order to prevent the risks of contamination to humans and the environment. Follow the local regulations and facility protocol with regard to disposal.

13. Specifications

Model	Z45L
Max. Rated Motor Speed	40,000 min^{-1}
Max. Rated Speed in Rotation (Handpiece)	168,000 min^{-1}
Gear Ratio	1:4.2 Increasing
Bur Type	ISO 1797-1 Type3 ø1.59-1.60mm FG Bur
Chuck Type	Push Button Type
Chucking Length	11.6mm
Max. Bur Length	25mm
Max. Working Part Diameter	ø2mm
Optic	Glass Rod
Coolant Water Type	Water Spray or Water Jet (switch-selectable)
Water Flow Rate	Min. 50ml/min (when the water pressure is 200 kPa)
Use Environment	Temperature: 10 - 40°C, Humidity:30 - 75%, Atmospheric Pressure:700 - 1,060hPa
Transportation and Store Environment	Temperature:-10 - 50°C, Humidity:10 - 85%, Atmospheric Pressure:500 - 1,060hPa

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