Conservation of value of KaVo handpieces in the dental practice.

Tips for prolonging the service life of rotating handpieces.
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Dear User,

We are delighted that you made your decision in favour of high quality KaVo handpieces and would like to give you some tips in this brochure to help you extend the service life of your KaVo handpieces.

This brochure provides you with information about the necessary care and the consequences of incorrect care with simple descriptions and visual representation.

KaVo takes complaints very seriously and investigations have revealed that many defects could be avoided with the correct reprocessing of the handpieces. More than 50% of the handpiece failures are caused by improper cleaning and care.

Dental handpieces are exposed to very high loads in the course of your daily routine. This includes:

- Speeds of up to 400,000 rpm, equivalent to 720 km/h at the outer diameter of the turbine rotor
- High cutting rates
- High performance and strong contract pressure

Wear and tear can also be generated by the following debris reaching the inside of the handpieces:

- Saliva and blood, dental substance, physiological saline solutions

Malfunctions can arise from:

- Incorrect operation and care, damage from dropping and impact

Cleaned and serviced well, your handpieces can still be a reliable tool after many years of use.

We hope you find the information in this brochure useful.
1. General

1.2 SYMBOLS AND GUIDELINES

For the handpieces to have a long service life, you need to comply with the labels on the handpieces.

Handpiece with important symbols.

Only KaVo medical devices marked with the thermal disinfection (1) or sterilisation symbol (2) may be reprocessed in the washer disinfector (RDG) or sterilised in the steam steriliser.

This brochure contains no information on hygiene regulations.

→ it is limited to information which supports the user in achieving a long service life and conserving the value of your handpieces

For information on hygiene regulations and occupational safety, please refer to:

German Robert Koch Institute, www.rki.de

• National guideline on hygiene and occupational safety

ROBERT KOCH INSTITUT

1.1 ORIGINAL KAVO SPARE PARTS

Non-original or forged spare parts cause damage to the product and associated risks.

Advantages of original KaVo spare parts:

• Optimum safety for patient and user
• Longevity based on service life tests and continuous improvements
• Warranty remains valid

If a user fails to use original KaVo spare parts, he or she works with a medical device that is no longer approved by KaVo:

• As a consequence, the spare parts manufacturer or the dentist becomes the manufacturer of the medical device
• Any warranty claims against KaVo are void
• There have been cases of accidents at dental practices due to forged spare parts
2. Conservation of value of the chucking system

2.1 ROTATING HANDPIECES WITH INTACT SHAFTS

If you use dental burs that have not been approved by KaVo, the handpiece may suffer substantial damage. Damage includes: Defects on the chucking system or defects on the bur shaft.

2.2 COMPLY WITH THE DIMENSIONS OF THE DENTAL TOOLS AND DIAMOND GRINDERS

For manufacturer information concerning the length, diameter, shaft shape and max speed, please refer to the corresponding instructions for use.

**NOTE**

Only use carbide cutters or diamond grinders that comply with EN ISO 1797-1 type 3, are made of steel or hard metal and meet the following criteria:

- Shaft diameter: 1.59 to 1.60 mm (0.0626 in to 0.0629 in)
- Overall length: max. 21 mm
- Shaft clamping length: at least 9 mm
- Blade diameter: max. 2 mm (0.0787 in)

Excerpt from Instructions for use. Non-compliance with information provided by the manufacturer voids any warranty claims against KaVo.

Consequences of non-compliance with manufacturer specifications:

- The dental bur retention force may be too low due to a worn-out shaft and the dental bur may be released during the treatment
- The shaft can spin freely in the chuck and destroys the chuck. The dental tool can fall out
- The ball bearings, gear wheels and chuck can be overloaded, e.g. by the dental tools being too long
- A shaft with recess/groove can jam in the clamping region of the handpiece.

Note on shaft clamping length:

The dental tool shaft must be smooth along the minimal shaft clamping length and must not show any recesses/grooves (see Instructions for use).

- The min. shaft clamping length of KaVo miniature turbines is 9 mm
- The min. shaft clamping length of KaVo standard turbines is 11 mm

Non-approved dental tool (shaft has recesses/grooves in the clamped area)
2. Conservation of value of the chucking system

2.3 SEPARATING CROWNS WITH CROSS-TOOTHED TOOL

Dental bur manufacturers offer crown materials specifically for different types of bur. For instance, they recommend a special bur made of hard metal for the crown made of metal or soft ceramics whereas for a zirconium crown, a diamond bur is recommended.

Stop the handpiece immediately if the tool hooks into the tooth!

If toothed tools are recommended, please chose cross-toothed tools because straight-toothed tools will more often become hooked into the tooth. Due to the abrupt hook, the chuck system of the instrument will become more stressed and the chuck and shaft could have a higher wear.

2.4 NEVER LEAVE THE DENTAL BUR IN THE CHUCK AFTER A TREATMENT

The chuck should bear no load during storage in order to prolong its service life. Storage of handpieces together with the dental bur is associated with a risk of injury or infection.

2.5 CLOSE THE TENSIONING RING OF THE HANDPIECE

Never start operating the straight handpiece while the chuck is open, because:

- Straight handpiece jams
- Chuck jams

2.6 NEVER PRESS THE PUSH-BUTTON DURING OPERATION OF THE DEVICE

Never press or wipe the push-button on the turbine, straight or contra-angle handpiece while the handpiece is rotating, because of:

- Excessive wear and tear on drive/rotor
- Damage to the push-button/chuck

Possible consequences of actuation during ongoing operation include:

- Malfunction of the push-button
- Chuck does not release or does do with difficulty
- Metallic abrasion products of the lid might get into the ball bearings
- Push-button can heat up excessively
Lubrication of ball bearing:
Insufficient lubrication of the ball bearings causes signs of excessive wear and tear possibly leading to defects. To prevent any secondary damage, have defective ball bearings replaced quickly.

Signs indicative of defective ball bearings include:
- Loud running noise
- Uneven run
- Handpiece jams completely
- Strong increase in temperature

Even missing lubrication once, in particular after internal cleaning, can lead to early damage to the ball bearing.

Never position the patient’s cheek close to the push-button. The friction between the push-button and the chucking system generates heat that may cause burn injuries to the mucosal membranes.
4. Conservation of value of the surgical handpieces

Surgical instruments need to be subjected to special treatment.

⚠️ After each use, clean the handpiece immediately under running lukewarm water to remove all external soiling.

If the handpiece can be taken apart, take it apart and clean the insides under running lukewarm water.

Consequences of failure to clean:

Insufficient cleaning of coagulated blood or crystallisation of saline solutions can lead to corrosion.

Before any sterilisation, make sure that no residual saline solution is present in the handpiece. This may lead to crystallisation effects and malfunction of the handpiece.

Clean surgical handpiece

Sooiling on surgical handpieces

5. Conservation of value in case of damage from dropping

5.1 PREVENTING DAMAGE WHEN THE HANDPIECE IS DROPPED

Check the handpiece by eye for any changes during the reprocessing process in order to protect both the handpiece and the patient.

Procedure for detecting damage from dropping the handpiece:

- Visual inspection for external damage reveals deformation
- Functional test reveals excessive running noise and/or excessive heating

If you are not sure about damage from dropping a handpiece, please contact your KaVo Service Centre to prevent possible secondary damage.
5. Conservation of value in case of damage from dropping

5.2 SNAP HANDPIECES ONTO THE COUPLING AUDIBLY

The handpiece must be audibly snapped into the motor/turbine coupling. If it fails to snap-in, it may drop to the floor and be damaged.

Attachment of a handpiece on a motor coupling

The handpiece must never be attached and/or taken off while the foot control is being pressed.

6. Conservation of value during reprocessing

6.1 DISINFECTION

The handpiece must never be immersed in a disinfection/ultrasonic bath, because:

- The ball bearings might be destroyed
- Other technical defects on the handpiece may occur

Improper use: Handpiece/coupling was immersed in a disinfection bath

Never use chloride-containing disinfectants:

- Use agents released by the manufacturer exclusively
- Unsuitable disinfectants can lead to corrosion

Agent attacked the surface

Handpiece that has been cleaned with chloride-containing disinfectant
In general, wipe disinfection is recommended. If excessive amounts of disinfectant or a non-approved disinfectant is sprayed onto the handpiece or the motor/turbine coupling, malfunctions may occur.

If the disinfectant flows into the handpiece or into the motor/turbine coupling, defects on the coupling may occur.

6.2 THERMODISINFECTION

Please make sure to use only the chemicals recommended by the manufacturer of the device. Replace the water filters of the washer disinfecter regularly as the machine would otherwise rinse with water containing particles.

The handpieces must be dry when you take them out of the washer disinfector, dry them subsequently if necessary, otherwise corrosion may occur.

7.1 AUTOMATED CARE USING THE QUATTROcare PLUS

In general, automated care of rotating dental handpieces using the KaVo QUATTROcare PLUS is preferred over manual care. The handpieces are lubricated and serviced professionally and correctly with the proper amount of QUATTROcare Spray.

After lubrication, excessive oil is purged from the handpiece with compressed air.

The purchase of a QUATTROcare PLUS from KaVo minimises servicing errors, which reduces follow-up costs related to repairs.

QUATTROcare PLUS: All O-rings of the service couplings on the QUATTROcare PLUS must be in perfect working order. Otherwise, the handpiece will not be lubricated properly.

If strong soiling has occurred, repeat the cleaning/lubricating process and run the handpiece in between. The oil foam expands by more than 300 times its volume. This collects and rinses out soil particles and residues.
7. Care

7.2 MANUAL CARE WITH KAVO SPRAY

7.2.1 Handpieces

This services the inside of the handpieces. For this purpose, spray into the handpiece for at least 1 second. If the spray time is too short, the service life may decrease.

A sufficient duration of the spray puff is indicated by oil foam exiting from the chuck and lid.

For proper care, keep the can upright.

If the can is nearly empty, you need to check by eye if the handpiece has been lubricated sufficiently, since often only propellant gas exits from the spray head in this condition.

If the oil does not exit as a clear liquid after servicing, cleaning and/or lubricating need to be repeated.

7.2.2 Motors

KaVo electrical motors must not be lubricated, since they feature inherent permanent lubrication. Exceptions to this rule are air-driven motors.

7.3 CARE INSTRUCTIONS FOR THE QUATTROCARE PLUS AND KAVO SPRAY

- Internal cleaning with a KaVo CLEANspray is no substitute for lubrication with oil
- Use original KaVo sprays exclusively. The oil from KaVo is specifically matched to the materials used by KaVo
- Use matching spray heads for the products and applications exclusively. There are different spray heads available for turbines and contra-angle handpieces. These seal the rear of the handpieces during the spray process
- During service with the QUATTROCare PLUS, make sure not to damage the O-rings on the QUATTROCare PLUS. Otherwise, the oil leaks on the side and does not get into the handpiece

Service procedure:

- Remove the rotating instrument (dental bur/cutter) from the handpiece.
- Lubricate the chuck at least 1x per week
- If possible, service handpieces and heads separately (see instructions for use of the handpiece)
- Lubricate the handpieces and heads AFTER each disinfection and BEFORE each sterilisation
- During the servicing, hold the handpiece between the bag and cellulose of the KaVo Cleanpac. This allows leaking oil and/or soiling on the head/handpiece to be detected
8. Conservation of value during storage

Storage of the handpieces after servicing:

Always use a handpiece stand (ordering number: 0.411.9902) for storage to enable excessive residual oil to leak out. Otherwise, the handpiece may get too hot when operated again, which may lead to further damage to the ball bearings.

- Use of the handpiece stand allows the residual oil to leak out

- Inappropriate storage

- Do not attach the handpieces to the corresponding couplings right after the servicing process.

- Never plug the serviced instrument onto the motor/turbine coupling and never store it in the instrument holder. The oil leaks into the hose and may lead to a defect on the coupling.

9. Troubleshooting

9.1 REMOVAL OF CLOGGING

9.1.1 Handpieces

The spray channels may become clogged due to the water being hard. If an insufficient amount of spray water exits at the spray openings, please check if the spray channels are soiled and clean them according to need.

If the amount of water is too low, the tooth and the pulp may be damaged by overheating.

Short-term remedy:

Clean the spray nozzles using the dedicated nozzle needles provided by the manufacturer. Do not use a root canal needle to puncture the spray nozzles, otherwise, the spray channels may be damaged.

Caution: Never place the handpiece in a descaling agent or spray it with a descaling agent, as this may lead to corrosion.

- Spray nozzle from KaVo

- Use of the endo file

Long-term remedy:

Cleaning of the spray nozzles by a certified repair workshop.
9. Troubleshooting

9.1.2 Cannula of the 3-function or multifunctional handpiece

Materials from the dental practice can soil and clog the cannula, for example, impression materials or caustic chemicals.

Removal of soiling:

• Use short nozzle needles exclusively

• Long nozzle needles may damage the inside hoses. The spray air can then no longer be guaranteed to be dry

9.2 REPLACING THE WATER FILTER

If the water quality is poor, the water filter (if any) can become dirty.

Consequences of a dirty water filter:

• Die Sprayqualität und die Wassermenge lässt nach

![Removal of the clogging with a shorter nozzle needle](image1)

![Short nozzle needle](image2)

![Long nozzle needle](image3)

![Replacing a water filter](image4)

![New functional water filter (for material number, see Chapter 10)](image5)
9. Troubleshooting

9.3 REPLACING THE O-RINGS
If the motor coupling, turbine coupling or the cannula of the 3-function and/or multifunctional handpiece is leaking, the O-rings need to be replaced:

• O-rings can become porous or swell up
• O-rings might be pulled off inadvertently during wipe disinfection

Consequences of defective O-rings on the motor coupling:
• The water does not get where it is needed. This leads to damage to ball bearings, inside of the motor, spray air and cooling air

Consequences of defective O-rings on the turbine coupling:
• The water gets into the ball bearings of the turbine rotor and, via the return air duct, into the treatment centre

Consequences of defective O-rings on the cannula of the 3-function or multifunctional handpiece:
• Moist spray air is produced
• Particles from porous O-rings clog the media channels
• No flow or reduced flow rate

Procedure for replacement of the O-rings:
• Compress the O-rings between the fingers such that the O-ring lifts off slightly
• Pull off the O-rings toward the front
• Always replace all O-rings
• Do not use any sharp/hard tools

Servicing the O-rings:
• Use recommended oils exclusively since the O-rings may otherwise decompose or swell up with other chemicals
• Do not use Vaseline

The following tips prolong the durability of O-rings:
• Attach and remove the handpiece/cannula in a straight line and with a slight twisting motion onto/from the motor/turbine coupling
• Lubricate the O-rings exclusively with a cotton swab moistened with KaVo Oil
• Only the pneumatic motors may be subjected to lubrication. All other motors have inherent permanent lubrication.
9. Troubleshooting

9.4 REPLACING THE LED LAMP

Inserting the new LED, make sure that the contacts in the coupling are not damaged. The LED must be inserted with the pins in the correct orientation for the LED to work properly. If the LED fails to light up after installation, reinstall it after turning it 180°.

<table>
<thead>
<tr>
<th>Product name</th>
<th>Material number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water filter (GENTLEforce, GENTLEsince, GENTLEmini)</td>
<td>1.000.4823</td>
</tr>
<tr>
<td>Water filter (COMFORTdrive, MASTERmatic, GENTLEpower, MASTERtorque, EXPERTtorque, EXPERTmatic)</td>
<td>1.002.0271</td>
</tr>
<tr>
<td>Wrench for water filter</td>
<td>1.002.0321</td>
</tr>
<tr>
<td>O-ring (MULTIflex coupling black), 10 pcs.</td>
<td>1.004.2776</td>
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<tr>
<td>O-ring (MULTIflex coupling white), 10 pcs.</td>
<td>1.004.2775</td>
</tr>
<tr>
<td>O-Ring Set (3-F cannula), 5 pcs.</td>
<td>1.010.7027</td>
</tr>
<tr>
<td>O-ring (INTRAmatic motor), 10 pcs.</td>
<td>0.200.6120</td>
</tr>
<tr>
<td>Multi LED (handpieces)</td>
<td>1.007.5372</td>
</tr>
<tr>
<td>Mini LED (INTRA LUX S600 LED)</td>
<td>1.007.8474</td>
</tr>
<tr>
<td>High-pressure lamp (for MULTIflex LUX couplings, pneumatic and electric motors)</td>
<td>1.002.2928</td>
</tr>
<tr>
<td>Nozzle needle (spray tubing, INTRA, INTRAmatic)</td>
<td>0.410.0931</td>
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<tr>
<td>Nozzle needle (3-F cannula)</td>
<td>1.004.4986</td>
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<tr>
<td>Nozzle needle (handpieces)</td>
<td>0.410.0921</td>
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<tr>
<td>Spray repair kit (INTRA, INTRA LUX)</td>
<td>0.410.0610</td>
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<tr>
<td>INTRA handpiece stand 2151</td>
<td>0.411.9501</td>
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<tr>
<td>Insert for handpiece stand (MULTIflex)</td>
<td>0.411.9902</td>
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<tr>
<td>Insert for handpiece stand (COMFORTdrive)</td>
<td>1.006.0525</td>
</tr>
<tr>
<td>Cellulose pad (for handpiece stand)</td>
<td>0.411.9862</td>
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### 10. Care agents and spare parts

<table>
<thead>
<tr>
<th>Product name</th>
<th>Material number</th>
</tr>
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<tbody>
<tr>
<td>KaVo Spray 2112A (box of 6 cans)</td>
<td>0.411.9640</td>
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<tr>
<td>Spray head (INTRA) for straight and contra-angle handpieces, heads, chucks</td>
<td>0.411.9911</td>
</tr>
<tr>
<td>Spray head (COMFORTdrive)</td>
<td>1.005.3154</td>
</tr>
<tr>
<td>Spray head (MULTiflex) for turbines, SONICflex, INTRAflex</td>
<td>0.411.9921</td>
</tr>
<tr>
<td>Pack of Cleanpac, 10 pcs.</td>
<td>0.411.9691</td>
</tr>
<tr>
<td>QUATTROcare PLUS 2124A care unit</td>
<td>1.008.3805</td>
</tr>
<tr>
<td>QUATTROcare PLUS Spray 2140P (box of 6 cans)</td>
<td>1.005.4525</td>
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<tr>
<td>Surgery service coupling</td>
<td>1.009.9489</td>
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<tr>
<td>INTRA service coupling</td>
<td>1.009.6143</td>
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<tr>
<td>INTRA heads service coupling</td>
<td>0.411.7941</td>
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<tr>
<td>MULTiflex service coupling</td>
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<tr>
<td>COMFORTdrive service coupling</td>
<td>1.005.1707</td>
</tr>
<tr>
<td>Service coupling for chuck (for automated chuck servicing)</td>
<td>0.411.7603</td>
</tr>
<tr>
<td>Chuck servicing set (for manual servicing with QUATTROcare spray can)</td>
<td>1.003.1253</td>
</tr>
</tbody>
</table>

We are working continuously to increase the satisfaction of our customers even further and hope that the information compiled in this brochure helps you prolong the service life of your rotating handpieces.

If you are aware of typical servicing errors from your everyday routine or if you see any need for more detailed explanation of any topic, please get in contact with Andreas.Thanner@kavo.com or Service.Instruments@kavo.com.

Thank you very much!