



Centrifuge and Rotor Maintenance & Cleaning Guide



Ingeniously Practical



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Introduction

A Centrifuge is one of the most common instruments used in the sample preparation process in almost every laboratory. The rotor is the heart of any centrifuge, which is why proper cleaning and maintenance are essential to maximize the lifetime of the centrifuge and the rotor itself.

Depending on the application, there are various numbers of rotors and accessories. Some laboratories use their centrifuge for more than 12 hours a day, which can be challenging to the rotor longevity. In order to prevent workplace accidents and ensure safety of the laboratory personnel handling centrifugation processes regular and proper rotor maintenance needs to be followed.

Please read this Guide and learn more about how to use and maintain centrifuge and rotors.



1. Cleaning

1.1 General information

- Before entering the lab, make sure to put on a lab coat. The coat should always be worn with the sleeves rolled down. Remember safety goggles and gloves.
- Turn the centrifuge off and disconnect it from the power supply before you begin any cleaning or disinfecting. Do not pour liquids into the housing interior.
- Do not spray disinfectant on the centrifuge.
- Thorough cleaning not only has its purpose in hygiene but also in avoiding corrosion due to pollution.
- In order to avoid damaging anodized parts such as rotors, reduction plates etc., only pH-neutral detergents with a pH-value of 6-8 should be used for cleaning. Alkaline cleaning agents (pH-value > 8) must not be used.
- After cleaning, please ensure all parts are dried thoroughly, either by hand or in a hot-air cabinet (max. temp. +50°C).
- It is necessary to coat anodized aluminum parts with anti-corrosion oil regularly in order to increase their lifespans and reduce corrosion predisposition.
- Due to humidity or not hermetically sealed samples, condensation may form. The condensation has to be removed from the rotor chamber with a soft cloth on a regular basis.
- Connect the unit to the power supply after the equipment is completely dry.
- Do not carry out disinfection with UV-, beta- and gamma-rays or any other high energy radiation.

IMPORTANT

The maintenance procedure has to be repeated every 10 to 15 runs, but at least once a week!

1.2 Centrifuges

- Open the lid before you turn off the centrifuge. Disconnect it from the power supply.
- Open the rotor nut by turning the rotor key counter clockwise.
- Remove the rotor.
- For cleaning and disinfection of the centrifuge and the rotor chamber use the above mentioned cleaner (only pH-neutral detergents with a pH-value of 6-8).



Picture 1

- Clean all accessible areas of the centrifuge and its accessories, including the power cord with a damp cloth.
- Wash the rubber seals and rotor chamber (see Picture 1) thoroughly with water.
- Rub the dry rubber seals with glycerol or talc to prevent these to becoming brittle. Other components of the unit, e.g. the lid lock, motor shaft and rotor must not be greased.
- Dry the motor shaft with a soft, dry and lint-free cloth.
- Inspect the centrifuge and accessories for damage.

IMPORTANT

Make sure that the centrifuge is switched off and disconnect the centrifuge from the power supply. Then remove any adherent dust from the ventilation slots in the centrifuge by using a soft brush. Do this at least every six months.

1.3 Rotors and accessories

- Clean and disinfect the rotors, rotor lids and adapters with the above mentioned cleaner (only pH-neutral detergents with a pH-value of 6-8).
- Use a bottle brush to clean and disinfect the rotor bores.
- Rinse the rotors, rotor lid and adapter with clear water. Particularly the drillings of angle rotors.
- For drying of the rotors and accessories set them on a towel. Place the angle rotors with bores down.
- Dry the rotor cone with a soft, dry and lint-free cloth and look for damage. Do not grease the rotor cone.

2. Autoclaving

Aluminum rotors

The recommend time and condition for autoclaving.

- Time, temperature and air pressure – 15-20 min at 121°C (1 bar)



PP-rotors, adapters, racks, caps and O-rings

The recommend time and condition for autoclaving.

- Time, temperature and air pressure – 15-20 min at 121°C (1 bar)



IMPORTANT

The sterilization time of 20 minutes must not be exceeded. Continuous sterilization will cause a reduction in the mechanical resistance of the plastic material. We recommend to replace the seals of aerosol-tight lids and caps after five autoclaving cycles.

Before autoclaving the PP-rotor, adapter or bucket thoroughly clean them to avoid the burning of dirty residue. You can disregard the consequences of some chemical residues to plastic materials at ambient temperatures. But, at the high temperatures during autoclaving those residues may corrode and destroy the plastic. The objects must be thoroughly rinsed with distilled water after the cleaning but before the autoclaving. Residues of any cleaning liquids may cause fissures, whitening and stains.

3. Gas sterilization

Adapters, buckets and rotors may be gas sterilized with Ethylenoxyd. Make sure to air out the items after the sterilization and before using them again.

IMPORTANT

Because the temperature may rise during the sterilization, rotors, adapters and buckets must not be closed and must be totally unscrewed.

4. Chemical sterilization

Rotors, adapters and buckets may be treated with the usual liquid disinfectants.

IMPORTANT

Before applying any other cleaning or decontamination method than recommended by the manufacturer, contact the manufacturer to ensure that it will not damage the centrifuge or the rotor.

5. Grease – Vaseline for Rotors

- After each cleaning (see picture 2) and autoclaving process, or if swing out rotors do not swing freely, apply a thin layer of Vaseline (OHAUS pn: 30314586) to the rotor bolts (see picture 3).



Picture 2



Picture 3

- Ensure that the rotor cross pivots and the bucket grooves are free from contamination.
- After each run apply a thin layer of Vaseline to the lid thread on fixed-angle rotors (see picture 4 and 5) to prevent any damage. This prevents a twisting of the sealing during opening/closing. To ensure tightness, take care that the lid is tightly closed.



Picture 4



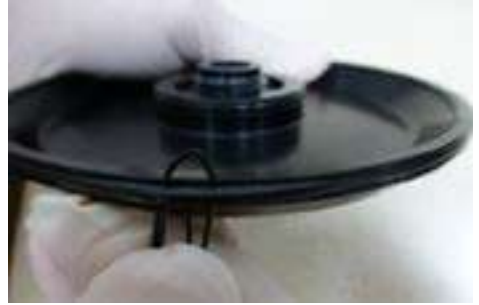
Picture 5



Vaseline (OHAUS pn: 30314586)

6. Replace the seal

- Use a blunt lever to lift the rubber seal from the nut. For this purpose use e.g. the round side of a paper clip (see picture 6). Take care and make sure that the seal will not become damaged.
- Check the seal to make sure it is intact. Do not use any damaged, discolored or dirty seals.
- Insert the seal in one location along the groove and use your fingers and spread it along the outer edge of the lid until the seal is fully seated in the groove.
- Place the lid on the rotor and close the lid.
- Remove the lid and check that the seal is seated correctly.
- If the seal is too long or too short, remove the seal from the groove and reinsert it.



Picture 6

IMPORTANT

Faulty sealing can be caused when the gasket is handled incorrectly. Uniformly insert the seal. Do not pull the seal length ways!

7. Glass breakage

With high g-values, the rate of glass tube breakage increases. Glass splinters have to be removed immediately from rotor, buckets, adapters and the rotor chamber itself. Fine glass splinters will scratch and therefore damage the protective surface coating of a rotor. If glass splinters remain in the rotor chamber, fine metal dust will build up due to air circulation. This very fine, black metal dust will significantly pollute the rotor chamber, the rotor, the buckets and the samples.

If necessary, replace the adapters, tubes and accessories to avoid further damage. Check the rotor bores regularly for residues and damage.

IMPORTANT

Please check the relevant specifications of the centrifuges tubes with the manufacturer.

8. Aggressive Chemicals

- Rotors are high-quality components that withstand extremely heavy loads. To ensure this stability it must be considered that aggressive chemicals can impair the stability of the rotor.
- Avoid the use of aggressive chemicals including strong or weak alkali, strong acids, solutions with mercury, copper and other heavy metal ions, halogenated hydrocarbons, concentrated saline solutions and phenol.
- If the rotor, rotor lids and /or caps are contaminated with aggressive chemicals, immediately clean it using a neutral cleaning agent and then rinse it thoroughly with water. This applies to the rotor bores in particular.
- Rotor lids and caps made of PC and PP should be regularly checked of damage.
- Replace rotor lids or caps which show cracks or milky stains immediately.

9. Life time of rotors, buckets, accessories

Rotors and rotor lids made of aluminum and stainless steel have an operating time of **maximum 7 years** from first use. Transparent rotor lids and caps made of PC and PP as well as rotors, tube racks and adapters of PP have a maximum operating time of **up to 3 years** from first use.

Proper use damage-free condition, recommended care.

- Please check before each run, if the accessories have damage. Replace any damaged accessories.
- Rotors, rotor lids, buckets, adapters or caps that show any signs of corrosion or mechanical damage cannot be used any longer.
- Do not use any accessories which are past their lifetime.
- Take care when inserting buckets and rotors, ensure that they do not become scratched.
- Protect the equipment from damage.

10. Additional information for aerosol-tight rotors, lids and buckets

The aerosol tightness of rotors, rotor lids, buckets and caps has been tested and certified by the „TÜV Nord CERT GmbH, Certification Body Consumer Products, Essen (Germany)“ in accordance with Annex AA of IEC 61010-2-020.

IMPORTANT

Autoclaving, mechanical stresses and contamination by chemicals or other aggressive solvents can impair the aerosol-tightness of the rotors and buckets.

- Check the integrity of the seals of the aerosol-tight rotor lids or caps before each use.
- Use only aerosol-tight rotor lids or caps if the seals are undamaged and clean.
- Replace the seals of aerosol-tight lids and caps after five autoclaving cycles.
- Never store aerosol-tight rotors or buckets closed.

11. Installation of the rotor

- Clean the drive shaft as well as the collet with a clean, grease-free piece of cloth.
- Place the rotor into the drive shaft. (Picture 7).
- Take care that the rotor is fully inserted onto the motor shaft.
- Hold the rotor with one hand and secure the rotor to the shaft by turning the fixing nut clockwise. Tighten the fixing nut with enclosed Allen key (Pictures 8 and 9).
- We provide a tool for rotors without nuts, the tool will be included with the rotor.



Picture 7

Please check before each run if the rotor nut is tightened and that rotor lids, caps and inserted carriers are closed correctly. If unusual noises occur when the centrifuge starts the rotor, the rotor lid or cap may not be properly secured. Please stop centrifugation immediately by pressing the STOP key.



Picture 8
Nut for Rotor



Picture 9
Tool for rotor
without nut



Picture 10
Snap-on lid



Picture 11
Screw-on lid

12. Loading Rotors

12.1 Loading Angle rotors

- Rotors must be loaded symmetrically and with equal weight (Picture 13).
- The adapter may only be loaded with the appropriate vessels.
- The weight differences between the filled vessels should be kept as low as possible. Therefore we recommend weighing them with a balance. This reduces the wear of the drive and the acoustic operating noise.



Picture 12
Wrong



Picture 13
Correct

12.2 Loading Swing out rotors

- Loading of the buckets / vessels must be made in accordance to Picture 15.
- It is allowed to operate e.g. a 4-place-rotor with 2 loaded buckets only. But the loaded buckets must be opposite to each other. Make sure that the unloaded buckets are also inside the rotor (see below).
- In principle swing out rotors may not be taken into operation until all buckets or racks are put into the rotor.
- The bolts of the rotor must be greased with the “High TEF oil”.
- The sample tubes have to be filled evenly by eye and put into the drillings or tube racks.
- The weight difference of the loaded buckets should not exceed approx.1.0 g.



Picture 14
Wrong



Picture 15
Correct



OHAUS Corporation

Headquartered in Parsippany, New Jersey, OHAUS Corporation is a global leader in manufacturing an extensive line of weighing products, laboratory equipment and analytical instruments that meet and surpass the weighing and measurement needs of a broad range of industries, including laboratory, industrial, educational, food preparation and retail markets. An ISO 9001:2015 manufacturer, OHAUS develops products that are precise, reliable, affordable and backed by industry-leading customer support.

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