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DOMINIQUE DUTSCHER SAS

Rotor S-2×Universal ID

Instructions for Use

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1 About this manual

1.1 Notes on this manual

This document describes the rotor and does not replace the operating manual for the device.

1. Before using the rotor, read these instructions for use.
2. Also read the operating manual for the device with which you are using the rotor.

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1.2 Warning notice structure

HAZARD LEVEL! Type of danger

Source of danger
Consequences of disregarding the danger

– Measures to avoid the danger

Symbol	Hazard level	Type of danger	Meaning
	DANGER	Personal injury	Will lead to severe injuries or death.
	WARNING	Personal injury	May lead to severe injury or death.
	CAUTION	Personal injury	May lead to minor or moderate injuries.
	NOTE	Material damage	May lead to material damage.

1.3 Graphics

Depiction	Meaning
1. 2.	Work steps
•	Bullet point
Text	Display text
Key	Name for port, button, status lamp, or key
	Important information
	Hint

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1.4 Other applicable documents

The following documents supplement the instructions for use:

- SpinPro 6 R operating manual
- SpinPro 7 R operating manual

2 Safety

2.1 Personal injury

2.1.1 Biological hazards

If you use unsuitable or damaged accessories for aerosol-tight centrifugation, dangerous aerosols may escape.

- Use only aerosol-tight accessories.
- Check the accessories for damage before each use.

2.1.2 Mechanical hazards

If you handle rotors incorrectly, the rotors may fall down and injure people.

- Hold rotors with both hands.
- Hold swing-bucket rotors at the rotor cross.

If rotors break, sharp-edged fragments can be created that can injure people.

- Wear cut-resistant gloves when collecting sharp-edged fragments.
- Avoid material damage to the rotors.

2.2 Material damage

2.2.1 Chemical hazards

Aggressive chemicals as well as aggressive cleaning agents and disinfectants can damage the material of the device, rotor and accessories. This may cause damage to the interior of the device during operation.

- Protect all components from aggressive chemicals.
- Clean and disinfect all components only with recommended cleaning agents and disinfectants.
- Clean the rotor, device and accessories immediately if they come into contact with aggressive chemicals.
- Check all components for material changes before each use.
- Take a damaged device out of operation.
- Replace a damaged rotor.
- Replace damaged accessories.

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2.2.2 Mechanical hazards

A damaged rotor or damaged accessories can be destroyed when used in the device.

- Check the rotor and accessories for visible damage and material changes before each use.
- Use only undamaged rotors and accessories.
- Use rotors and accessories only within their service life.

Incorrect handling of the buckets of swing-bucket rotors can cause the rotor cross and the buckets to fall and become damaged.

- Remove the buckets before removing the rotor.
- Insert the rotor without buckets.

2.2.3 Incorrect handling

Improperly attached rotors can damage the device, rotor and tubes.

- Insert the rotor as described in this manual.
- Tighten the rotor nut.
- Close the rotor lids and caps, if present, as described in this manual.
- Stop centrifugation immediately if you hear any unusual noises.

2.2.4 Loss of samples

Incorrect handling of buckets and tubes can lead to glass breakage and sample loss.

- Remove the buckets before removing the rotor.
- Insert the rotor without buckets.
- Insert the tubes with an adapter into the buckets.
- Use suitable tubes.

Incorrect handling of tubes can lead to sample loss.

- Observe the manufacturer's instructions for the tubes.
- Autoclave tubes according to the manufacturer’s instructions.
- For centrifugation, use only liquids with a maximum density of 1.2 g/mL.

2.3 Information on product liability

The owner of the device will be held liable for personal and material damage in the following cases:

- The device is used outside of its intended use
- The device is not used in accordance with the operating manual
- Manipulation of safety devices
- The device has spare parts installed that are not authorized by Eppendorf SE
- The device is used with accessories or consumables that are not recommended by Eppendorf SE
- Cleaning agents are used that are not recommended by Eppendorf SE
- Chemicals are used that are not recommended by Eppendorf SE
- Shipment not in original packing or in improper substitute packing

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- The device is maintained or repaired by persons not authorized by Eppendorf SE
- Unauthorized modifications

3 Delivery package

Quantity	Description
1	Rotor cross
2	Bucket
1	Pivot grease (20 mL)
1	Instructions for use

4 Product description

4.1 Features

The S-2×Universal ID rotor is a swing-bucket rotor with a capacity of up to 1000 mL per bucket.

The rotor has the following specific features:

- Dishwasher-safe rotor cross
- Rotor identification by RFID

The following consumables can be used with the rotor:

- 1.5 mL and 2.0 mL reaction tubes
- 4 mL – 12 mL round-bottom tubes
- 15 mL – 50 mL conical tubes
- 175 mL – 1000 mL wide-neck bottles or conical tubes
- Deepwell plates
- Microplates
- PCR plates
- Slides
- Cell-culture plates
- 0.5 mL / 1.5 mL / 2.0 mL IsoRack tubes

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4.2 Product overview

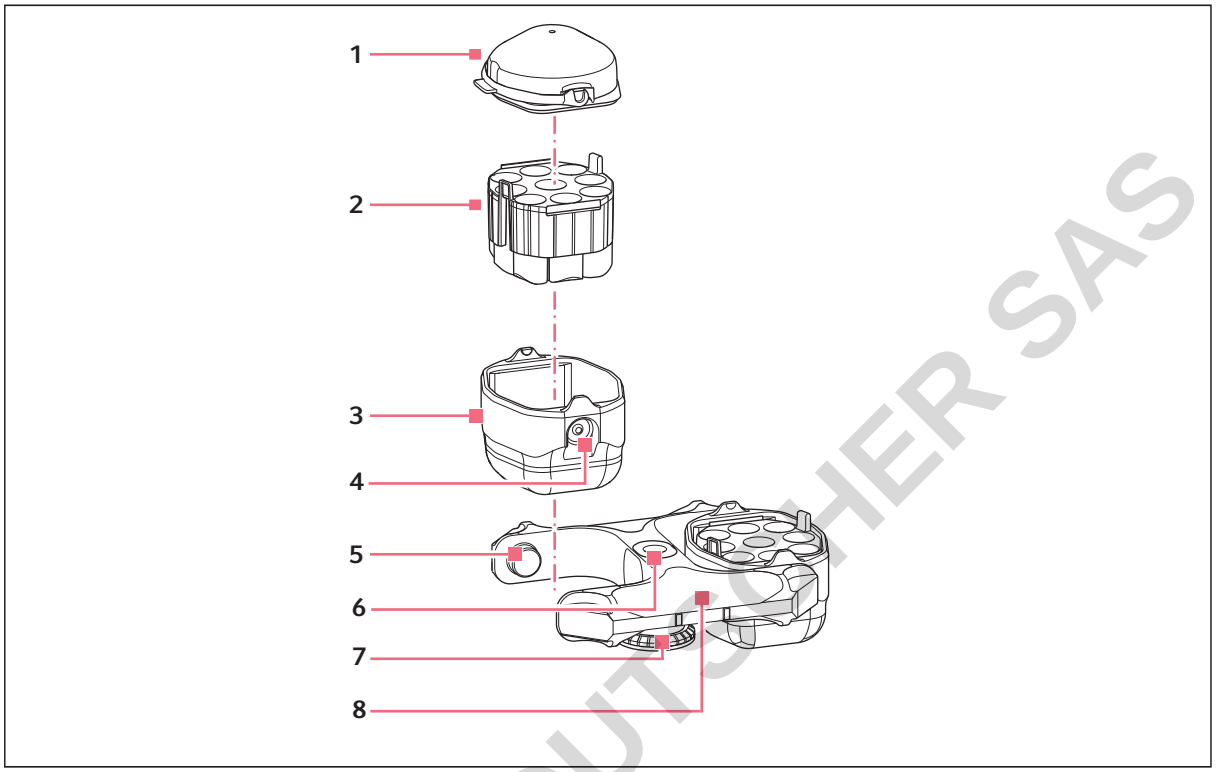


Fig. 4-1: Components of the rotor S-2×Universal

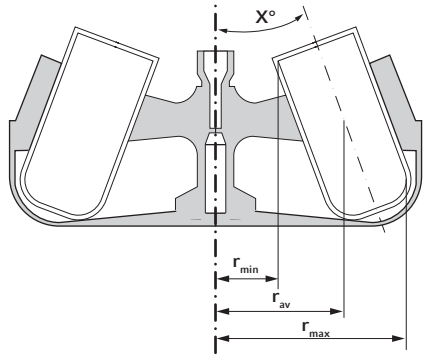
1	Bucket cap	5	Rotor pivot
2	Adapter	6	Rotor nut
3	Bucket	7	Rotor hub
4	Bucket groove	8	Rotor cross

5 Application

5.1 k-factor

The k-factor is a rotor-specific factor for determining the sedimentation efficiency and depends on the position of the reaction tube in the rotor. The k-factor takes into account the *g* force and the distance. The smaller the k-factor, the shorter the centrifugation time.

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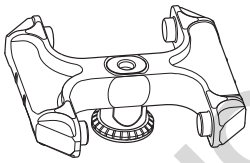
$$k = \frac{\ln\left(\frac{r_{max}}{r_{min}}\right)}{n^2} \times 2.533 \times 10^{11}$$

Fig. 5-1: Determination of the k-factor

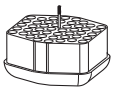
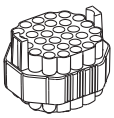
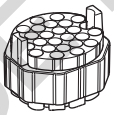
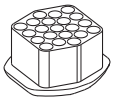
r_{max}	Maximum centrifugation radius	x^o	Rotation angle
r_{min}	Minimum centrifugation radius	n	Maximum rotation speed in rpm
r_{av}	Average centrifugation radius		

The k-factors can be found in the rotor tables.

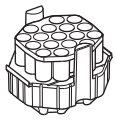
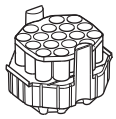
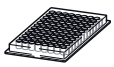
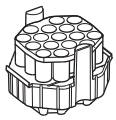
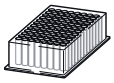
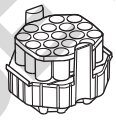
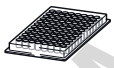
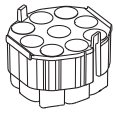
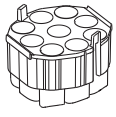
5.2 Rotor table

Rotor cross	Universal bucket	Aerosol-tight cap
		
Max. *g*-force	4302 × *g*	
Max. speed	4660 rpm	
Max. load per bucket (adapter, tube, contents, cap)	1510 *g*	

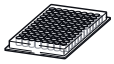
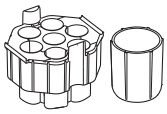
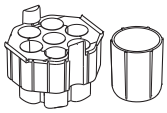
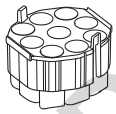
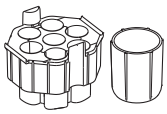
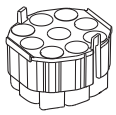
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Vessel	Tube Capacity Number per adapter/ rotor	Adapter Order no. (international)	Bottom shape Tube diameter Max. tube length with / without bucket cap	Max. *g*-force Max. radius	k-factor
	Round-bottom tube Ø 12 mm × 75 mm 5 mL 27/54	 5910 758 006	Round Ø 12 mm 107 mm / 112 mm	4211 × *g* 17.34 cm	4913
	Round-bottom tube 4 mL – 8 mL (Ø 13 mm × 75 mm – 100 mm) 30/60	 5910 755 007	Round Ø 13 mm 117 mm / 119 mm	4235 × *g* 17.44 cm	9193
	Round-bottom tube 7.5 mL– 12 mL (Ø 16 mm × 75 mm – 100 mm) 26/52	 5910 754 000	Round Ø 16 mm 118 mm / 120 mm	4235 × *g* 17.44 cm	7952
	Vessel 9 mL (Ø 17.5 mm × 100 mm) 21/42	 5910 762 003	Round Ø 17.5 mm 118 mm / 120 mm	4010 × *g* 16.52 cm	5690
	Reaction tube 1.5 mL / 2.0 mL 46/92	 5910 763 000	Flat Ø 11 mm 39 mm / 39 mm	4189 × *g* 17.25 cm	2360

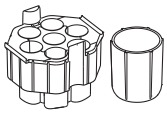
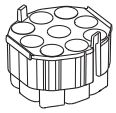
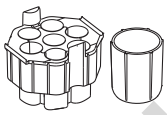
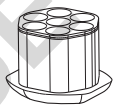
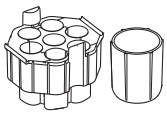
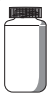
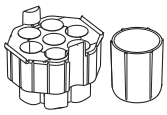
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Vessel	Tube Capacity Number per adapter/ rotor	Adapter Order no. (international)	Bottom shape Tube diameter Max. tube length with / without bucket cap	Max. *g*-force Max. radius	k-factor
	Reaction tube 5 mL 17/34	 5910 752 008 (without upper part)	Conical Ø 17 mm 122 mm / 124 mm	4291 × *g* 17.67 cm	—
	Conical tube 15 mL 17/32	 5910 752 008	Conical Ø 17 mm 122 mm / 124 mm	4291 × *g* 17.67 cm	10375
	Microplate 96/192 wells 1/2	 5910 752 008 (without upper part)	Flat 38 mm / 46 mm	3060 × *g* 12.60 cm	—
	Deepwell plate 96 wells 1/2	 5910 752 008 (without upper part)	Flat 38 mm / 46 mm	3060 × *g* 12.60 cm	—
	Microplate 96/192 wells 1/2	 5910 769 008	Flat 38 mm / 46 mm	2404 × *g* 9.90 cm	—
	Conical tube 25 mL 9/18	 5910 769 008  5820 733 004	Conical Ø 30 mm 91 mm / 91 mm	3674 × *g* 15.13 cm	5114

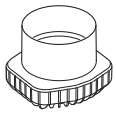
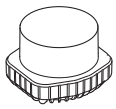
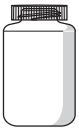
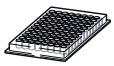
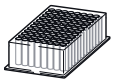
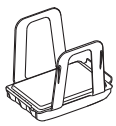
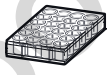
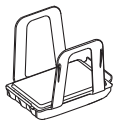
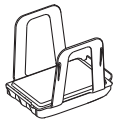
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Vessel	Tube Capacity Number per adapter/ rotor	Adapter Order no. (international)	Bottom shape Tube diameter Max. tube length with / without bucket cap	Max. *g*-force Max. radius	k-factor
	Microplate 96/192 wells 1/2	 5910 751 001	Flat 38 mm / 46 mm	2404 × *g* 9.90 cm	—
	Conical tube 25 mL 7/14	 5910 751 001  5820 733 004	Conical Ø 30 mm 91 mm / 91 mm	3643 × *g* 15.00 cm	5254
	Conical tube 25 mL 9/18	 5910 769 008  5820 734 000	Conical Ø 30 mm 78.5 mm / 78.5 mm	3493 × *g* 14.16 cm	5456
	Conical tube 25 mL 7/14	 5910 751 001  5820 734 000	Conical Ø 30 mm 78.5 mm / 78.5 mm	3405 × *g* 14.02 cm	5633
	Conical tube 50 mL 9/18	 5910 769 008	Conical Ø 29 mm 118 mm / 122 m m	4302 × *g* 17.63 cm	9171

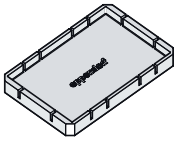
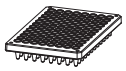
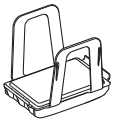
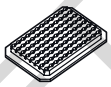
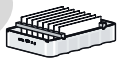
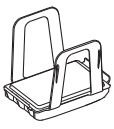
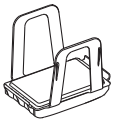
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Vessel	Tube Capacity Number per adapter/ rotor	Adapter Order no. (international)	Bottom shape Tube diameter Max. tube length with / without bucket cap	Max. *g*-force Max. radius	k-factor
	Conical tube 50 mL 7/14	 5910 751 001	Conical Ø 29 mm 118 mm / 122 mm	4281 × *g* 17.63 cm	9467
	Conical tube 50 mL 9/18	 5910 769 008	Conical Ø 29 mm 121 mm / 124 mm	4302 × *g* 17.63 cm	9171
	Conical tube 50 mL 7/14	 5910 751 001	Conical Ø 29 mm 121 mm / 124 mm	4281 × *g* 17.63 cm	9467
	Conical tube (skirted) 50 mL 7/14	 5910 764 006	Conical Ø 31 mm 121 mm / 124 mm	4121 × *g* 16.97 cm	9180
	Conical tube 175 – 225 mL 1/2	 5910 751 001	Conical Ø 62 mm – / 133 mm	3984 × *g* 16.41 cm	12537
	Wide-neck bottle 250 mL 1/2	 5910 751 001	Flat Ø 62 mm 121 mm / 124 mm	4104 × *g* 16.90 cm	10897

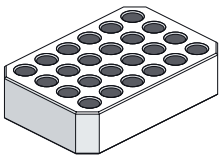
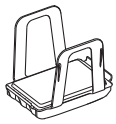
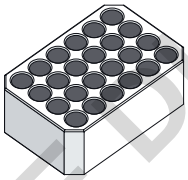
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Vessel	Tube Capacity Number per adapter/ rotor	Adapter Order no. (international)	Bottom shape Tube diameter Max. tube length with / without bucket cap	Max. *g*-force Max. radius	k-factor
	Conical tube 500 mL Corning 1/2	 5910 760 000	Conical Ø 96 mm – / 148 mm	4116 × *g* 16.90 cm	11921
	Wide-neck bottle 750 mL 1/2	 5910 757 000	Flat Ø 102 mm 135 mm / 139 mm	4225 × *g* 17.40 cm	14453
	Wide-neck bottle 1000 mL 1/2	 5910 756 003	Flat Ø 118 mm 133 mm / 138 mm	4240 × *g* 17.50 cm	11155
	Microplate 96/384 wells 5/10	 5910 753 004	Flat 66 mm / 80 mm	3740 × *g* 15.40 cm	—
	Deepwell plate 96 wells 1/2	 5910 753 004	Flat 66 mm / 80 mm	3740 × *g* 15.40 cm	—
	Cell-culture plate 1/2	 5910 753 004	Flat 66 mm / 80 mm	3740 × *g* 15.40 cm	—
	Kit 1/2	 5910 753 004	Flat 66 mm / 80 mm	3740 × *g* 15.40 cm	—

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Vessel	Tube Capacity Number per adapter/ rotor	Adapter Order no. (international)	Bottom shape Tube diameter Max. tube length with / without bucket cap	Max. *g*-force Max. radius	k-factor
	PCR plate 96/384 wells 1/2	 5910 753 004  5825 713 001	Flat 66 mm / 80 mm	3776 × *g* 15.55 cm	—
	PCR plate, semi-skirted 96 wells 1/2	 5910 753 004  5825 711 009	Conical 66 mm / 80 mm	3669 × *g* 15.11 cm	—
Slide	CombiSlide 12 slides 12/24	 5825 706 005  5910 753 004	Flat 66 mm / 80 mm	3689 × *g* 15.19 cm	—
Work rack	IsoRack	 5910 753 004	Open	3703 × *g*	—

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Vessel	Tube Capacity Number per adapter/ rotor	Adapter Order no. (international)	Bottom shape Tube diameter Max. tube length with / without bucket cap	Max. *g*-force Max. radius	k-factor
	24 × 0.5 mL Reaction tubes 1/2	 5825 708 008	Ø 6 mm 66 mm / 80 mm	 15.25 cm	
Work rack	IsoRack 24 × 1.5/2 mL Reaction tubes 1/2	 5910 753 004  5825 709 004	Open Ø 11 mm 66 mm / 80 mm	3567 × *g* 14.69 cm	—

5.3 Selecting the rotor and accessories

1. Select the rotor, adapters and tubes according to your application.
2. Use the buckets with aerosol-tight caps for aerosol-tight centrifugation.

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3. Make sure that rotors and accessories meet the following requirements:
   - Maximum service life not exceeded
   - Undamaged
   - Not corroded
   - No material changes
   - Undamaged and clean lid sealing
4. Make sure that the tubes meet the following requirements:
   - Approved for this application by the manufacturer
   - Chemically resistant to the sample
   - Designed for the intended load
   - Undamaged, not deformed and not brittle

5.4 Inserting the rotor

The rotor is automatically detected at the start of a centrifugation run because it is equipped with RFID rotor detection. The device limits the speed of the detected rotor to its maximum speed. Using rotor detection, the rotor counts the number of cycles used. Rotor detection prevents a rotor from being used in a device that is not compatible with the rotor. The rotor also prevents use after the number of cycles has been exceeded.

Tool:
- Rotor key

Prerequisites:
- A usable rotor is available.

1. Place the rotor vertically on the motor shaft.
2. Tighten the rotor nut. To do this, turn the rotor key clockwise.

   The rotor is detected.

5.5 Removing the rotor

Tool:
- Rotor key

1. Loosen the rotor nut by turning the rotor key counterclockwise.
2. Lift the rotor vertically out of the device.

5.6 Loading the rotor

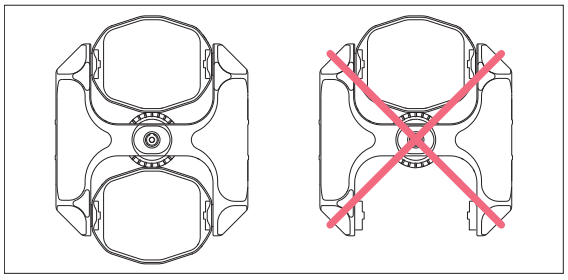
Inserting buckets

The weight class code is stamped in the groove on the bucket.

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Prerequisites:

- The grooves of the buckets are clean.
- The pivots of the rotor cross are greased.



1. Insert the adapters into the buckets.
2. Insert the buckets with the same code opposite each other into the rotor cross.

   All positions in the rotor cross are occupied.

Loading buckets

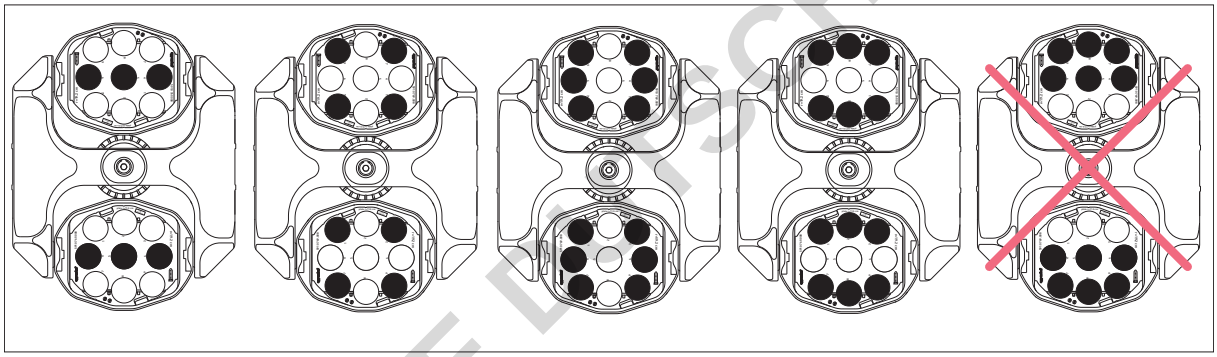


Fig. 5-2: Loading examples

NOTICE! Sample loss

Open tube lids can break off during centrifugation.

– Before centrifugation, make sure that the tube lids are closed correctly.

Prerequisites:

- The buckets are equipped with the appropriate adapters.
- The maximum load per bucket including adapter, cap, tube or plate is not exceeded.

1. Place tubes of the same type and weight correctly aligned and symmetrical into the buckets.
2. Make sure that the loaded buckets can swing out freely.

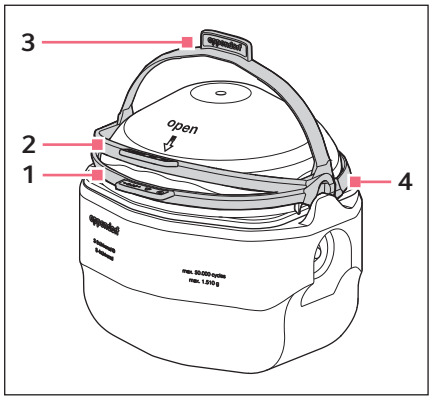
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Closing a bucket with a cap

NOTICE! Damage to the bucket cap

If the bucket cap is positioned incorrectly, the sealing clamp of the cap may break when sealing the bucket.

– Make sure the bucket cap is correctly positioned on the bucket.



1. Fold the sealing clamp of the cap into the **open** position (1).
2. Place the cap on the bucket and press the cap down so that the sealing clamp lifts slightly (2).
3. To seal the caps aerosol-tight, fold the sealing clamp beyond the latch into the **close** position (4) until it audibly clicks.

To transport the bucket closed, fold the sealing clamp into the carrying position (3).

6 Maintenance

6.1 Maintenance plan

Interval	Maintenance work
As required	*Chapter 6.2.2 "Replacing the sealing washer on caps" on page 21*
	Chapter 6.3.1 "Cleaning the rotor" on page 21
	Chapter 6.3.2 "Cleaning the rotor after breakage of glass vessels" on page 22
	Chapter 6.4.1 "Decontaminating the rotor" on page 23
	Chapter 6.4.2 "Autoclaving the rotor and accessories" on page 23
Before each use	*Chapter 6.2.1 "Checking the rotor and accessories" on page 21*

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6.2 Service

6.2.1 Checking the rotor and accessories

1. Check the rotors and accessories for damage.

   Take damaged rotors and damaged accessories out of operation.

2. Check the service life of the rotors and the accessories.

   Replace rotors and accessories that have exceeded their service life.

6.2.2 Replacing the sealing washer on caps

The cap will only be sealed aerosol-tight if the sealing washer is seated correctly.

Tool:

- Paper clip

Prerequisites:

- A new sealing washer is available.

1. Use the paper clip to pry the sealing washer from the groove.
2. Position the new sealing washer on the groove.
3. Press the sealing washer into the groove.
4. Check that the sealing washer does not protrude from the groove at any point.
5. Place the cap on the bucket and close the bucket.
6. Check that the bucket closes properly.

6.3 Cleaning

6.3.1 Cleaning the rotor

Do not grease the rotor hub.

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Material:

- Water
- Soap-based cleaning agent
- Cloth
- Pivot grease

Prerequisites:

- The rotor has been removed from the device.

1. Dampen the cloth with water and cleaning agent.
2. Clean the rotor, the buckets and the rotor accessories.
3. Rinse the rotor, the buckets and the accessories with water to remove any cleaning agent.
4. Allow the rotor, the buckets and the accessories to dry.
5. Lightly grease the rotor pivots with pivot grease.

You can clean the rotor cross in the dishwasher.

6.3.2 Cleaning the rotor after breakage of glass vessels

WARNING! Contamination

Biological substances leak from broken tubes. People who come into contact with these substances may suffer damage to their health.

– Wear your personal protective equipment.
– If necessary, carry out decontamination before cleaning.

When cleaning after breakage of glass vessels, pay particular attention to the adapters, buckets, caps and rubber parts such as seals. Tiny glass particles can become embedded in them.

Material:

- Water
- Soap-based cleaning agent
- Cloth

1. Remove all bits of broken tube.
2. Remove the rotor and accessories.
3. Rinse the rotor, buckets and accessories thoroughly with water to remove any bits of broken tube.
4. Clean the rotor, buckets and accessories with a damp cloth.
5. To avoid further damage, replace any damaged adapters, bucket caps or seals.

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6.4 Decontamination

6.4.1 Decontaminating the rotor

Decontamination with at least 70% ethanol is described here. If using an alternative disinfectant, follow the manufacturer's instructions.

Material:

- Disinfectant with at least 70 % ethanol
- Deionized water
- Cloth

Prerequisites:

- The rotor has been removed from the device.

1. Dampen the cloth with disinfectant.
2. Wipe the rotor cross, buckets and accessories with the cloth.
3. Wipe off the disinfectant with deionized water.
4. Clean the rotor, buckets and accessories.

6.4.2 Autoclaving the rotor and accessories

The following are autoclavable:

- Rotor cross
- Bucket with cap and sealing washer

Protective equipment:

- Laboratory protective clothing

1. Autoclave at 121 °C with steam for 20 min. Alternatively, autoclave at 134 °C with steam for 20 min.

7 Transport

7.1 Shipping the rotor

Use the original packing for transport. In the event that the original packing is no longer available, ensure that the rotor is adequately protected by replacement packing during storage and further transport. Eppendorf SE is not liable for damage caused by improper replacement packing.

WARNING! Contamination

If you store or ship a contaminated rotor, people may be contaminated and suffer damage to their health.

– Decontaminate the rotor before storage or shipping.

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Material:

- Packing

Prerequisites:

- The rotor has been decontaminated and cleaned.

1. Download the decontamination certificate for return shipments from the webpage www.eppendorf.com.
2. Complete the decontamination certificate.
3. Pack the rotor.
4. Attach the decontamination certificate to the outside of the packing in a way that is safe for transport.
5. Ship the rotor.

8 Disposal

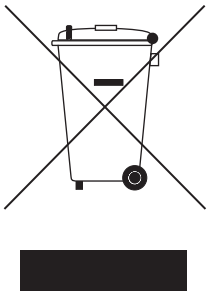
Electronics are installed in the associated rotor cross; the other accessories are free of electrical parts. This rotor cross contains only an RFID chip and no batteries and rechargeable batteries.

8.1 Legal regulations

EU countries

Electrical and electronic equipment must be disposed of in EU member states in accordance with Directive 2012/19/EU. This directive has been transposed into national law by all EU member states.

Electrical and electronic equipment placed on the market after August 13, 2005 must be specially marked. According to the European standard DIN EN 50419, the following symbol can be used for this marking:



Batteries and rechargeable batteries must be disposed of in EU member states in accordance with Directive 2006/66/EC. This directive has been transposed into national law by all EU member states.

Non-EU countries

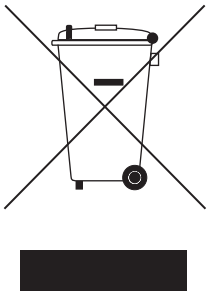
Non-EU countries have country-specific standards for the disposal of waste electrical and electronic equipment and the disposal of batteries and rechargeable batteries.

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Notes on disposal of electrical and electronic equipment in the United Kingdom

In the United Kingdom, the disposal of electrical and electronic equipment is governed by national regulations which are based on national legislation from 2013, The Waste Electrical and Electronic Equipment Regulations 2013 (as amended), which apply to these devices.

According to these regulations, any electrical and electronic equipment that was put on the market after August 13, 2005 in the business-to-business sector – which applies to this product – must no longer be disposed of with household waste. They are marked with the following symbol to indicate this:



As the disposal regulations may differ from one country to another, please contact your supplier for more information.

8.2 Preparing for disposal

Preparing disposal according to legal regulations

For information on the legal regulations that apply in your country, contact your local authority and your Eppendorf partner.

1. Check which legal regulations apply to disposal in your country.
2. Choose a certified waste disposal company or contact your Eppendorf partner.
3. Decontaminate and clean the rotor before disposal.
4. If decontamination is not possible, dispose of the rotor as hazardous waste.

Creating a decontamination certificate

Prerequisites:

- The rotor has been decontaminated and cleaned.

1. Download a decontamination certificate from the webpage www.eppendorf.com.
2. Complete the decontamination certificate.

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9 Technical data

9.1 Application parameters

Device	Maximum *g*-force	Maximum speed
SpinPro 6 R	4300 × *g*	4660 rpm
SpinPro 7 R	4300 × *g*	4660 rpm

9.2 Service life of rotors

As soon as the maximum number of cycles is reached, the rotor must be replaced.

Eppendorf SE specifies the maximum service life of rotors and accessories in cycles.

Each centrifugation run in which the rotor is accelerated and then decelerated is counted as a cycle, regardless of the speed and duration of the centrifugation run.

The specified service life applies if the following conditions are met:

- Proper use
- Recommended cleaning and service
- Damage-free condition

Components and accessories	**Service life from first use**
Rotor cross	100000 cycles
Bucket	50000 cycles
Bucket cap with replaceable seal	50000 cycles

Components and accessories	**Number of autoclaving cycles**	**Time / temperature**
Cap with seal	50 autoclaving cycles	20 min / 134 °C
	100 autoclaving cycles	20 min / 121 °C
Bucket	50 autoclaving cycles	20 min / 134 °C
	100 autoclaving cycles	20 min / 121 °C
Rotor cross	50 autoclaving cycles	20 min / 134 °C
	100 autoclaving cycles	20 min / 121 °C

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10 Ordering information

Description	Order no.
Caps for Rotor S-4xUniversal, aerosol-tight 2 pcs.	5910 750 005
Sealings for aerosol-tight caps Rotor S-4xUniversal-Large, universal buckets 5 pcs.	5920 754 009

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Appendix

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Overview of the chemical resistance of the rotor cross, bucket, bucket cap and seal

A **Assessment criteria** **30**
B **Acids and lyes** **31**
C **Organic solvents** **32**
D **Cleaning and decontamination agents** **33**
E **Other solutions** **35**

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A Assessment criteria

Marking	Resistance	Explanations
■■■	Resistant	Chemical can be used.
■■	Partially resistant	Chemical can cause discoloration of the surface.
■	Not resistant	Chemical can cause severe discoloration or damage to the surface. The chemical must only be used with great caution.
N/A	–	Chemical has not been tested.

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B Acids and lyes

Designation	Concentration	Rotor cross	Bucket	Bucket cap	Seal
Ammonia solution	2 %	■■■	■■	■■■	■■■
Ammonia solution	25 %	■■■	■	■■■	■■■
Acetic acid	12 %	■■■	■■	■■■	■■■
Acetic acid	96 %	■■■	■	■■■	■■■
Sodium hydroxide	4 %	■■■	■	■■■	■■■
Sodium hydroxide	20 %	■■■	■	■■■	■■■
Perchloric acid	10 %	■■■	■	■■■	■■■
Nitric acid	6.3 %	■■■	■	■■■	■■■
Hydrochloric acid	3.6 %	■■■	■	■■■	■■■
Hydrochloric acid	32 %	■	■	■■■	■■■
Sulfuric acid	16 %	■■■	■	■■■	■■■
Sulfuric acid	96 %	■	■	N/A	■■■
Trichloroacetic acid	10 %	■■■	■■	■	■■

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C Organic solvents

Designation	Concentration	Rotor cross	Bucket	Bucket cap	Seal
Acetone	≥ 99.8 %	■■■	■■■	■■■	■■■
Acetonitrile	≥ 99.9 %	■■■	■■	■■■	■■■
Petroleum ether	—	■■■	■■■	■■■	■■■
Trichlorome-thane (chloro-form)	—	■■■	■■■	■	■■■
Dichlorome-thane (meth-ylene chloride)	≥ 99.5 %	■■■	■■	■	■■
Diethyl ether	≥ 99.5 %	■■■	■■	■■■	■■■
DMSO	10 %	■■■	■■	■■	■■
DMSO	50 %	■■■	■■	■■■	■■■
DMSO	100 %	■■■	■■	■■■	■■■
Acetic acid ethyl ester	≥ 99.5 %	■■■	■■	■■■	■■■
Ethanol(dena-tured)	≥ 96 %	■■■	■■■	■■■	■■■
Formaldehyde	37 %	■■■	■■■	■■■	■■■
Isoamyl alcohol	≥ 98.5 %	■■■	■■■	■■■	■■■
Isopropanol	≥ 99.5 %	■■■	■■■	■■■	■■■
Methanol	≥ 99.98 %	■■■	■■	■■■	■■■

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D Cleaning and decontamination agents

Designation	Concentration	Rotor cross	Bucket	Bucket cap	Seal
Biocidal ZF	—	■■■	N/A	■■■	■■■
CaviCide	—	■■■	N/A	N/A	N/A
ClearKlens Bi-Spore, VH26	Mix 1 + 48 + 1	■■■	N/A	N/A	N/A
ClearKlens Cleansinald (SC), VH9	0.5 %	■■■	N/A	N/A	N/A
ClearKlens Tego 2000 (SC), VH25	1 %	■■■	N/A	N/A	N/A
COUNT-OFF Liquid Concentrat	2 %	■■■	N/A	■■■	■■■
COUNT-OFF Surface Cleaner	—	■■■	■	■■	■■
Dismozon plus (peroxide-based)	4 %	■■■	■■■	■■■	■■■
Descoton Forte	5 %	■■■	N/A	N/A	N/A
DNA *AWAY*	—	■■■	■■	■■■	■■■
DNA-ExitusPlus	—	■■■	N/A	■■■	■
Ethanol	70 %	■■■	N/A	N/A	N/A
Formaldehyde	6 %	■■■	N/A	■■■	■■■
Helipur (phenol-based)	6 %	■■■	■■■	■■	N/A
Hexaquart S (QAV -based[(1)])	5 %	■■■	■■	■■■	■■■
Incidin Plus	3 %	■■■	N/A	N/A	N/A
Isopropanol	70 %	■■■	N/A	N/A	N/A
Klercide Low Residue Quat Concentrate	01:49	■■■	N/A	N/A	N/A
Klercide Sporicidal Low Residue Peroxide	—	■■■	N/A	N/A	N/A

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Designation	Concentration	Rotor cross	Bucket	Bucket cap	Seal
Korsolex basic (aldehyde-based)	5 %	■■■	■■■	■■■	■■■
Medichem ID Kombi	3 %	■■■	N/A	N/A	N/A
Meliseptol (alcohol-based)	—	■■■	■■■	■■■	■■■
Sodium hypo-chlorite	6 %	■■■	N/A	■■■	■■■
Sodium hypo-chlorite	10 %	■■■	■	■■■	■■■
Rheosept	—	■■■	N/A	N/A	N/A
RNase AWAY	—	■■■	■■	■■■	■■■
RNase-Exitus-Plus	—	■■■	N/A	■■■	■
Sekusept Plus	2 %	■■■	N/A	N/A	N/A
Spor-Klenz	—	■■■	N/A	N/A	N/A
Hydrogen per-oxide	6 %	■■■	N/A	N/A	N/A
Hydrogen per-oxide	35 %	■■■	■	■■■	■■

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E Other solutions

Designation	Concentration	Rotor cross	Bucket	Bucket cap	Seal
Cesium chloride	1.86 g/mL	■■■	■■■	■■■	■■■
EDTA (pH 8)	0.5 mol/L	■■■	■■■	■■■	■■■
Ficoll (Polysaccharide)	1.077 g/mL	■■■	■■■	■■■	■■■
Formamide	50 %	■■■	N/A	N/A	N/A
Glutaraldehyde	25 %	■■■	■■	■■■	■■■
Glycerol	50 %	■■■	■■■	■■■	■■■
Guanidinium thiocyanate	4 mol/L	■■■	■■	■■■	■■■
Mineral oil	—	■■■	■■■	■■■	■
Sodium acetate (pH 5.2)	2 mol/L	■■■	■■■	■■■	■■■
Paraffin oil	—	■■■	N/A	N/A	N/A
SDS	1 %	■■■	■■	■■■	■■■
TRIS buffer pH 7.5	1 mol/L	■■■	■■■	■■■	■■■
Triton X-100	1 %	■■■	■■■	■■■	■■■
Tween 20	1 %	■■■	■■■	■■■	■■■
Water	—	■■■	■■■	■■■	■■■
Copper(II) sulfate	1 %	■■■	N/A	N/A	N/A
Guanidine hydrochloride	6 mol/L	■■■	N/A	N/A	N/A

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