Instructions For Use

JA-14.50 Fixed-Angle Rotor

For Use in Beckman Coulter Avanti J Series

PN B32164AC
October 2016

Beckman Coulter, Inc.
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BECKMAN COULTER

JA-14.50 Fixed-Angle Rotor
PN B32164AC (October 2016)

Contact Us
If you have any questions, contact our Customer Support Center.

- Worldwide, find us via our website at www.beckmancoulter.com/customersupport/support.
- In the USA and Canada, call us at 1-800-369-0333.
- Outside of the USA and Canada, contact your local Beckman Coulter Representative."

Original Instructions

Revision History

For labeling updates, go to www.beckmancoulter.com and download the latest version of the manual or system help for your instrument.

Issue AC, 07/2016 — Updates were made to the following sections: *Safety Information for the JA-14.50 Rotor*, *Specifications*, *Description*, *Preparation and Use*, *Tubes*, *Replacement Rotor Parts*, *Supplies*.

Note: *Changes that are part of the most recent revision are indicated in text by a bar in the margin of the amended page.*

Safety Notice

Read all product manuals and consult with Beckman Coulter-trained personnel before attempting to use this equipment. Do not attempt to perform any procedure before carefully reading all instructions. Always follow product labeling and manufacturer's recommendations. If in doubt as to how to proceed in any situation, contact your Beckman Coulter Representative.

Alerts for Warning, Caution, and Note

⚠ WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION

CAUTION indicates a potentially hazardous situation, which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

NOTE NOTE is used to call attention to notable information that should be followed during installation, use, or servicing of this equipment.

Safety Information for the JA-14.50 Rotor

This rotor was developed, manufactured, and tested for safety and reliability as part of a Beckman Coulter centrifuge/rotor system. Its safety or reliability cannot be assured if used in a centrifuge not of Beckman Coulter's manufacture or in a Beckman Coulter centrifuge that has been modified without Beckman Coulter's approval.

Handle body fluids with care because they can transmit disease. No known test offers complete assurance that such fluids are free of micro-organisms. Some of the most virulent—Hepatitis (B and C) viruses, HIV (I-V), atypical mycobacteria, and certain systemic fungi—further emphasize the need for aerosol protection. Handle other infectious samples according to good laboratory procedures and methods to prevent spread of disease. Because spills may generate aerosols, observe proper safety precautions for aerosol containment. Do not run toxic, pathogenic, or radioactive materials in this rotor without taking appropriate safety precautions. Biosafe containment should be used when Risk Group II materials (as identified in the World Health Organization *Laboratory Biosafety Manual*) are handled; materials of a higher group require more than one level of protection.

The rotor and accessories are not designed for use with materials capable of developing flammable or explosive vapors, or a hazardous chemical reaction. Do not centrifuge such materials in nor handle or store them near the centrifuge.

Although rotor components and accessories made by other manufacturers may fit in the JA-14.50 rotor, their safety in this rotor cannot be ascertained by Beckman Coulter. Use of other manufacturers' components or accessories in the JA-14.50 rotor, excluding the tubes referenced in Table 1 and Table 3 may void the rotor warranty and should be prohibited by your laboratory safety officer. Only the components and accessories listed in this publication should be used in this rotor.

Do not run an empty rotor. Place filled tubes in at least two opposing cavities. Make sure that filled containers are loaded symmetrically into the rotor and that opposing tubes are filled to the same level with liquid of the same density.

If disassembly reveals evidence of leakage, and pathogenic or radioactive materials are involved, you should assume that some fluid escaped the rotor. Apply appropriate decontamination procedures to the centrifuge and accessories.

Never exceed the maximum rated speed of the rotor and labware in use. Refer to the section on *Run Speeds*, and derate the run speed as appropriate.

Do not use sharp tools on the rotor that could cause scratches in the rotor surface. Corrosion begins in scratches and may open fissures in the rotor with continued use.

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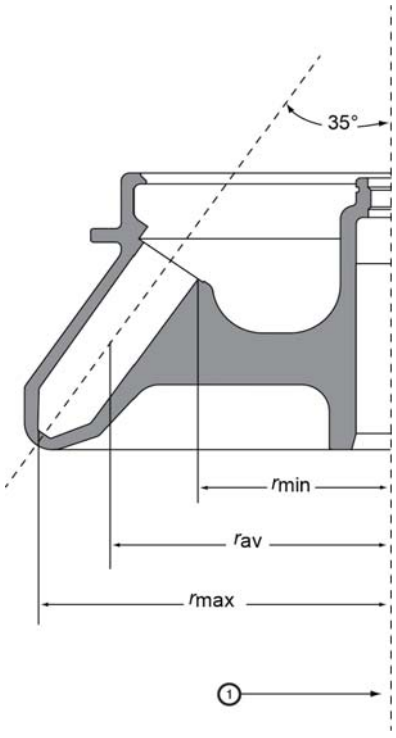
Specifications



1. Axis of Rotation

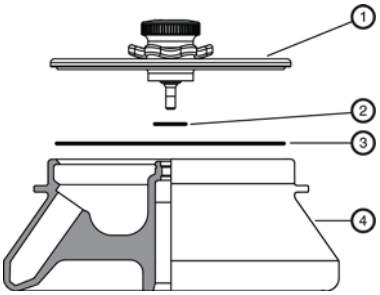
Maximum speed	14,000 RPM
Critical speed range[a]	400 to 1000 RPM
Density rating at maximum speed	1.2 g/mL
Relative Centrifugal Field[b] at maximum speed	
at r_{max} (160 mm)	35,000 × *g*
at r_{av} (124 mm)	27,100 × *g*
at r_{min} (87 mm)	19,100 × *g*
k factors at maximum speed	787
Conditions requiring speed reductions	see *Run Speeds*
Number of tube cavities	16
Available tubes see Table 1, Table 2, Table 3 and Table 4	
Nominal dimensions	30 × 115 mm
Nominal tube capacity	50 mL
Nominal rotor capacity	800 mL
Approximate acceleration time to maximum speed (rotor fully loaded)	4 ½ min
Approximate deceleration time from maximum speed (rotor fully loaded, max. break)	2 ½ min
Rotor weight, unloaded	10.5 kg (23 lbs 3 oz.)
Rotor material	aluminum

a. The critical speed range is the range of speeds over which the rotor shifts so as to rotate about its center of mass. Passing through the critical speed range is characterized by some vibration.

b. Relative Centrifugal Field (RCF) is the ratio of the centrifugal acceleration at a specified radius and speed ($r\omega^2$) to the standard acceleration of gravity (*g*) according to the following formula: $RCF = r\omega^2/g$ — where *r* is the radius in millimeters, ω is the angular velocity in radians per second (2π RPM /60), and *g* is the standard acceleration of gravity (9807 mm/s^2). After substitution: $RCF = 1.12r\,(RPM/1000)^2$

NOTE At 14,000 RPM and at an ambient temperature of 25°C or below, the minimum rotor temperature is 4°C. Above 38°C ambient, 4°C may not be achievable at 14,000 RPM.

Description



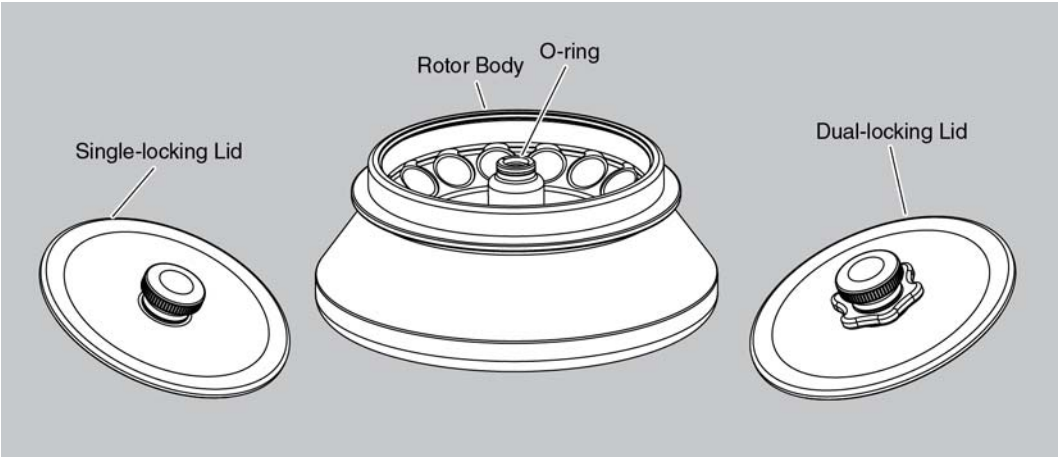
1. Dual-Locking Rotor Lid
2. Small O-ring
3. Large O-ring
4. Rotor Body

Beckman Coulter JA-14.50 rotors are manufactured in a facility that maintains certifications to both ISO 9001:2008 and ISO 13485:2003. They are for use with the specified Beckman Coulter centrifuges.

The JA-14.50 fixed-angle rotor is designed to hold up to sixteen 50-mL tubes at a 35-degree angle (see Figure 1). Used in Beckman Coulter Avanti J series centrifuges, the JA-14.50 rotor develops centrifugal forces that can efficiently pellet cells, bacteria, and food products; separate proteins, viruses, and subcellular fractions, and do phase separation and binding studies.

The JA-14.50 rotor with dual-locking lid was tested* to demonstrate containment of microbiological aerosols under normal operating conditions of the associated Beckman Coulter centrifuge, when used and maintained as instructed. The rotor is also available with a single-locking lid.

Figure 1 The JA-14.50 Fixed Angle Rotor

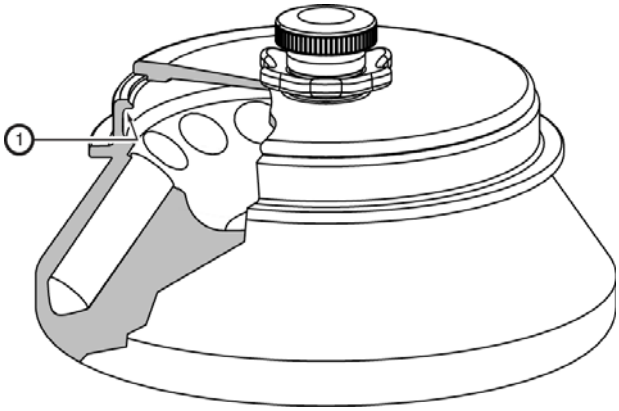


1. Single-Locking Lid
2. Rotor Body
3. O-Ring
4. Dual-Locking Lid

The JA-14.50 rotor has a patented fluid-containment annulus, located below the O-ring sealing surface (see Figure 2). The annulus helps to retain liquid that may escape from leaking or overfilled tubes, thereby minimizing the escape of liquid into the instrument chamber during centrifugation.

* Validation of microbiological containment was done at an independent third-party testing facility. Improper use or maintenance may affect seal integrity and thus containment.

Figure 2 Fluid-Containment Annulus



1. Annulus

The rotor and lid are made of anodized aluminum. Two O-rings, one in the rotor lid made of Buna-N rubber, and one in the rotor body made of ethylene propylene rubber, help to maintain atmospheric pressure inside the rotor during centrifugation when they are properly lubricated. Pins in the rotor drive hole mate with the centrifuge drive hub to prevent the rotor from slipping during acceleration and deceleration.

JA-14.50 rotors manufactured after October 2016 have a slightly tapered cell profile, which improves performance of most commercially available 50 mL conical tubes. However, some tubes and adapters that were compatible prior to October 2016 are no longer compatible. Please consult Tables 1-4 for compatible tubes and adapters.

NOTE JA14.50 rotors and lids manufactured after October 2016 include the letter "T" after the serial number (see Figure 8 and Figure 9).

See the Warranty at the back of this manual for warranty information.

Preparation and Use

Specific information about the JA-14.50 rotor is given here. Use the Rotors and Tubes for Beckman Coulter J Series Centrifuges *manual (publication JR-IM-10) and the centrifuge instruction manual along with this manual for complete rotor and accessory operation information.*

NOTE Although rotor components and accessories made by other manufacturers may fit in the JA-14.50 rotor, their safety in this rotor cannot be ascertained by Beckman Coulter. Use of other manufacturers' components or accessories in the JA-14.50 rotor, excluding the tubes referenced in Table 1 and Table 3, may void the rotor warranty and should be prohibited by your laboratory safety officer. Only the components and accessories listed in this publication should be used in this rotor.

Prerun Safety Checks

Read the Safety Notice section at the front of this manual before using the rotor.

1. Make sure that the rotor, lid, and all tubes or accessories are clean and show no signs of corrosion or cracking.

2. Verify that the tubes being used are listed in Table 1, Table 2, Table 3 and Table 4.

3. Refer to *Chemical Resistances* (publication IN-175), included in the *Rotors and Tubes* CD-ROM for the chemical compatibilities of all materials used.

Rotor Preparation

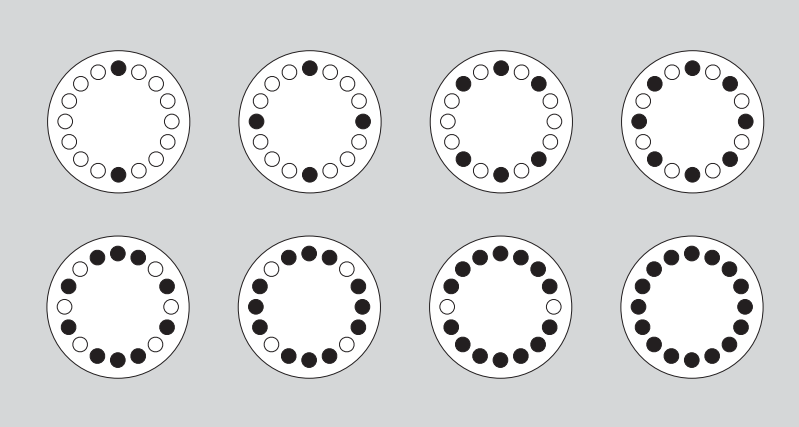
For runs at other than room temperature refrigerate or warm the rotor beforehand for fast equilibration.

1. Be sure that metal threads in the rotor are clean and lightly but evenly lubricated with Spinkote lubricant (306812).

   Also ensure that O-rings are lightly but evenly coated with silicone vacuum grease (335148).

2. Load the filled containers symmetrically into the rotor.
   - (Refer to *Tubes* for information about containers.)
   - If fewer than sixteen tubes are being run they must be arranged symmetrically in the rotor (see Figure 3).
   - Opposing tubes must be filled to the same level with liquid of the same density.

Figure 3 Typical Examples of Arranging Sixteen or Fewer Tubes in the Rotor



Operation

1. Precool the rotor in the centrifuge or in a refrigerator before use—especially before short runs—to ensure that the rotor reaches the set temperature.

   A suggested precooling cycle is a minimum of 30 minutes at 2000 RPM at the required temperature.

2. If fluid containment is required, *use capped tubes*.

   It is strongly recommended that all containers carrying physiological fluids be capped to prevent leakage.

3. Select the JA-14.50 rotor.

4. For additional operating information, see the following:
   - *Run Times* for using *k* factors to adjust run durations.
   - *Run Speeds* for information about speed limitations.

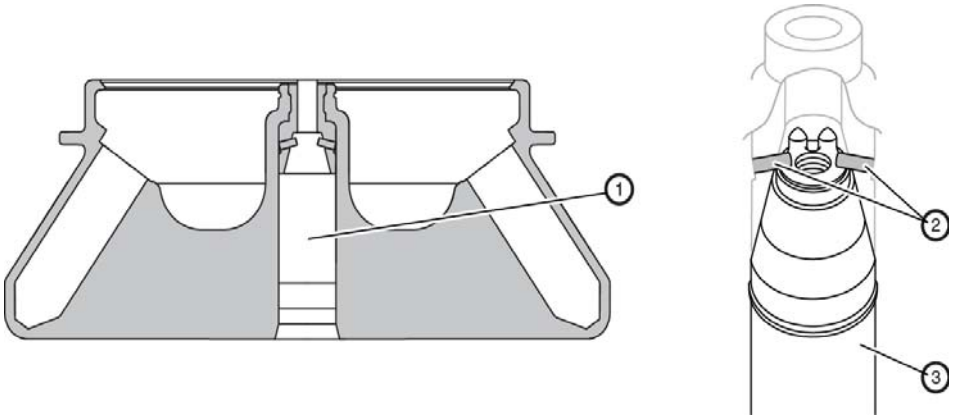
Installing the Rotor

Rotor Drive Pin Orientation

Two metal pins inside the rotor drive hole engage with teeth on the centrifuge drive hub to prevent the rotor from slipping during acceleration and deceleration (see Figure 4). When the rotor is properly installed, the pins sit either in the drive hub grooves or on top of the hub surface (Figure 5).

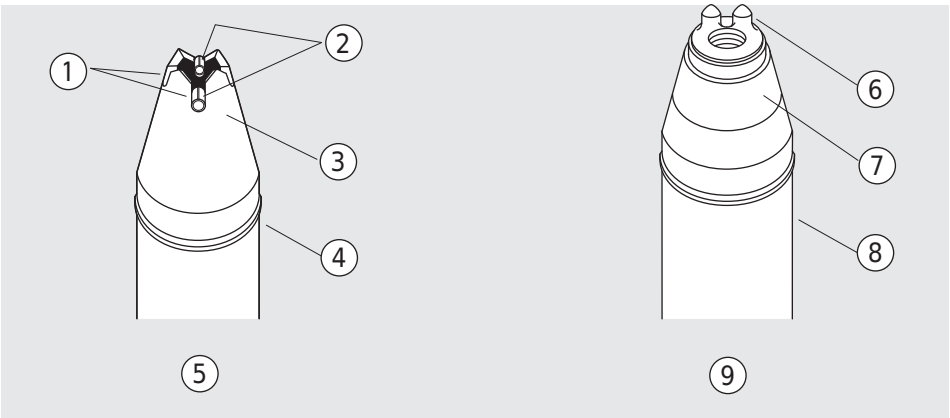
The rotor pins are positioned parallel to the Beckman Coulter name engraved at the center of the rotor body (see Figure 6). The markings on the lifting ring, located near the top periphery of the rotor, also are indicators of the drive pin position. Knowing the pin orientation before you install the rotor will help to ensure that you position the rotor properly on the hub, minimizing the chance of hub damage. Follow the steps below.

Figure 4 Rotor Drive Pin Location and Orientation



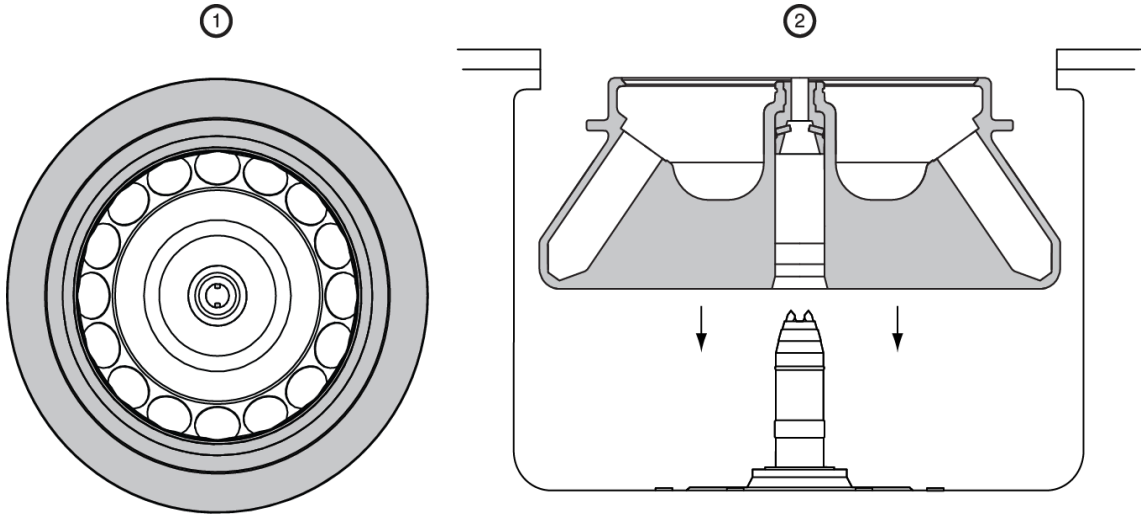
1. Rotor Drive Hole
2. Drive Pins
3. Avanti J Centrifuge Drive Spindle Hub

Figure 5 Centrifuge Drive Hub Configurations



1. Drive Hub Grooves (4)
2. Rotor Pins (2)
3. Drive Hub
4. Drive Spindle Assembly
5. Older Model Centrifuges
   Be sure the pins in the rotor drive hole are seated in the grooves of the drive spindle hub as shown
6. Teeth (2)
7. Drive Hub
8. Drive Spindle Assembly
9. Newer Model Centrifuges
   Be sure the pins in the rotor drive hole are not sitting on top of the teeth on the drive spindle hub

Figure 6 Installing the Rotor



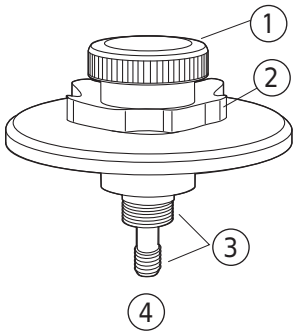
1. Top View

2. Side View

Rotor Lid Configurations

The rotor has two available lid configurations.

- The dual-locking lid (B19947) allows the lid to be attached to and removed from the rotor outside the centrifuge, so that tubes can be loaded and unloaded under a safety hood. The dual-locking lid consists of a daisy knob that attaches the lid to the rotor body, and a tie-down knob that attaches the rotor to the centrifuge drive hub.



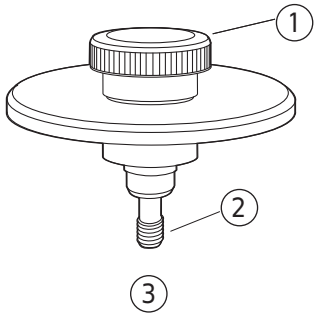
1. Tie-down Knob

2. Daisy Knob

3. Lubricate Threads

4. Dual-Locking Lid

- The single-locking lid (B19952) has a tie-down knob that secures the rotor to the centrifuge drive spindle. The rotor must be placed in the centrifuge before the lid is attached.



1. Tie-down Knob
2. Lubricate Threads
3. Single-Locking Lid

Rotor Installation

1 To prevent the rotor from sticking to the centrifuge drive hub, apply a thin coat of Spinkote lubricant to the rotor drive pins and to the lid knob threads.

2 Lightly coat the large and small O-rings with silicone vacuum grease.

3 *Dual-locking lid only.* Place filled tubes into the rotor, then place the lid on the rotor and turn the daisy knob to the right (clockwise) until secure.

Do not overtighten.

4 Turn the rotor until the Beckman Coulter name or the engraved drive pin alignment indicators are either horizontal or perpendicular to the drive hub pins or teeth (see Figure 4).

Or, rotate the drive spindle to align the hub pins or teeth with the rotor drive pins.

5 Carefully lower the rotor straight down onto the centrifuge drive spindle hub.

Do not drop the rotor onto the spindle hub.

6 Slowly turn the rotor around the drive spindle to make sure that it is properly seated.

In rare cases, the rotor pins can rest on top of the spindle hub pins or teeth, which prevents the rotor from being secured to the drive spindle.

Turning the rotor after installing it will move the pins into proper position.

7 Secure the rotor to the centrifuge drive spindle as follows:

a. *Dual-locking lid*: press the lid knob down and turn it to the right (clockwise) until secure, no more than two full turns.

Do not overtighten.

b. *Single-locking lid*: place filled tubes into the rotor, then place the lid on the rotor.

Press the lid knob down and turn it to the right (clockwise) until secure.

Do not overtighten.

⚠ CAUTION

If the rotor is left in the centrifuge between runs, make sure that the rotor is seated on the drive hub and that the tie-down knob is tight before each run.

Run Procedure

When the rotor is properly loaded and installed in the centrifuge, you are ready to perform the run. Refer to the applicable centrifuge instruction manual for operating instructions.

⚠ WARNING

Operator error or tube failure may generate aerosols. Toxic, pathogenic, or other hazardous materials must not be run in this rotor unless all appropriate safety precautions are taken. Also see the *Safety Notice* at the beginning of this manual.

⚠ CAUTION

Make sure that the rotor is properly seated on and securely fastened to the drive hub before each run.

Removal and Sample Recovery

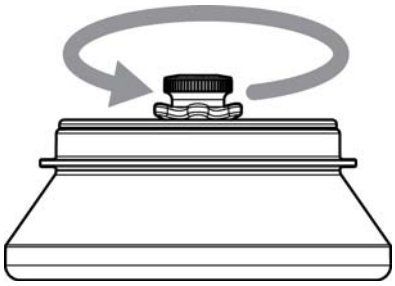
⚠ CAUTION

If disassembly reveals evidence of leakage, you should assume that some fluid escaped the rotor. Apply all appropriate safety and decontamination procedures to the centrifuge and accessories.

Dual-Locking Lid

1 Place one hand on the rotor to keep it from turning.

Grasp the round lid knob with your other hand and turn the knob to the left (counterclockwise) until the stem disengages from the drive hub threads.



2 Hold the knob or place your hands on the rotor and lift the rotor straight up off the drive hub.

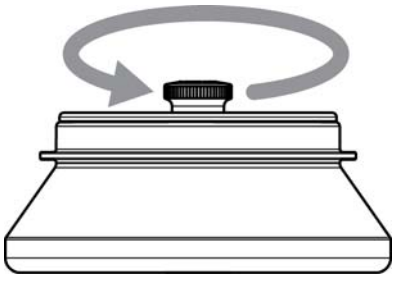
3 Place the rotor on a counter or bench top under a safety hood.

4 Grasp the daisy knob and turn it to the left (counterclockwise) until it disengages.

5 Remove the lid and set it aside.

Single-Locking Lid

1 Unscrew the lid knob.



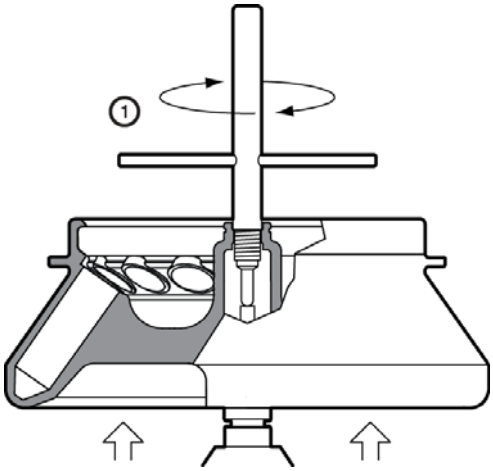
2 Remove the lid and set it aside.

3 Lift the rotor straight up off the drive hub to avoid bending or damaging the hub.

If the Rotor Sticks to the Drive Hub

If the rotor sticks to the centrifuge drive hub, use the removal tool (360998) to release it as follows (see Figure 7.

Figure 7 Using the Rotor Removal Tool



1. Rotor Removal Tool (360998)

NOTE This procedure requires you to remove the rotor lid while the rotor is in the centrifuge. If you are using the dual-locking lid, the biosafe seal provided by this mechanism will be broken when the lid is removed. Consult your laboratory safety officer for the proper safety procedures to follow in this case.

1 Remove the lid.

2 Screw the removal tool into the threaded opening.

As the tool tightens down it will push against the drive hub, forcing the rotor up and off the hub.

3 Lift the rotor up and out of the centrifuge by the removal tool handle or by holding the rotor with your hands.

4 Unscrew the removal tool and remove it from the rotor.

NOTE Never run the rotor with the removal tool in place.

Lubricate the centrifuge drive hub with a light coat of Spinkote to prevent further sticking.

Tubes

Tubes for JA-14.50 rotors manufactured prior to October 2016 are listed in Table 1 and Table 2. Tubes for JA-14.50 rotors manufactured after October 2016 are listed in Table 3 and Table 4. Be sure to use only those items listed, and to observe the maximum speed limits and fill volumes shown. (Maximum fill volume is the maximum amount that can be centrifuged in the container listed.)

NOTE JA-14.50 rotors and lids manufactured after October 2016 include the letter "T" after the serial number (Figure 8 and Figure 9).

Figure 8 Rotor Serial Number with T

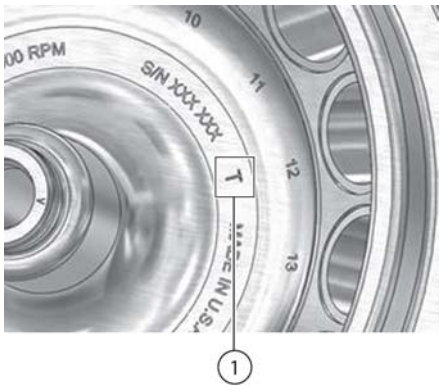
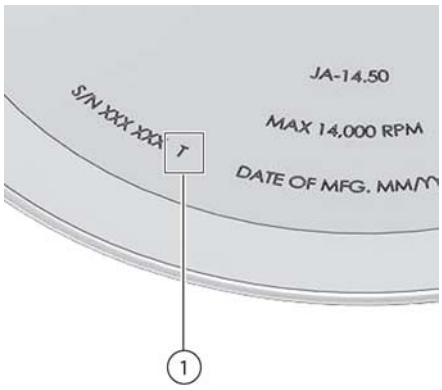


Figure 9 Rotor Lid Serial Number with T



1.T– designates the rotor and lid were manufactured after October 2016

Refer to *Chemical Resistances* (publication IN-175) for information on the chemical compatibilities of tube and accessory materials.

Tubes for JA-14.50 Rotors Manufactured before October 2016

⚠ CAUTION

The tubes listed in Table 1 should be used one time only. Tube damage and sample leakage will result from repeated use.

Do not use glass tubes in this rotor.

Table 1 Adapters to support tubes from other manufacturers for the JA-14.50 Rotor[a] manufactured before October 2016

Type and Volume	Tube Description	Required Adapter	Effective r_{max} (mm)	Effective r_{min} (mm)	Max Speed/RCF/ *k* Factor
conical 50 mL	Polypropylene conical tube with cap[bcdef]	N/A	159.7	98.8	g
conical 15 mL	Polypropylene conical tube with cap[bcef]	B40156 (Qty 2 ea. B30033)	156.2	92.2	g

Table 1 Adapters to support tubes from other manufacturers for the JA-14.50 Rotor[a] manufactured before October 2016

Type and Volume	Tube Description	Required Adapter	Effective r_{max} (mm)	Effective r_{min} (mm)	Max Speed/RCF/ *k* Factor
conical 5 mL	Polypropylene conical tube with tethered cap[h]	B40158 (Qty 2 ea. B30035)	125.1	95.7	g
conical 50 mL	Spin filtration device[ij]	N/A	159.7	98.8	g
conical 15 mL	Spin filtration device[ij]	B40156 (Qty 2 ea. B30033)	156.2	92.2	g

a. Use only the items listed here and observe fill volumes and maximum run speeds.
b. Manufactured by Greiner.
c. Manufactured by BD Falcon.
d. Manufactured by VWR.
e. Manufactured by Corning.
f. Manufactured by NUNC.
g. Use manufactures' recommendations for tube and bottle RCF limits. The corresponding RPM and k factor can be calculated using the equations on pages 1 and 15, respectively.
h. Manufactured by Eppendorf.
i. Manufactured by Pall.
j. Manufactured by Millipore.

Table 2 Available Beckman Coulter Bottles and Tubes for the JA-14.50 Rotor[a] manufactured prior to October 2016

Nominal Dimensions and Volume	Tube Description	Part Number	Nominal Volume (mL)	Required Adapter P/N	Tubes per Adapter	Max Speed/RCF/ *k* Factor
29 × 104 mm 50 mL	Polycarbonate Round Bottom bottles with cap assemblies	361693	40	B40155 (Qty 2 ea B30032)	1	14,000 RPM 34,520 × *g* 563
29 × 104 mm 50 mL	Polypropylene Round Bottom bottles with cap assemblies	361694	40	B40155 (Qty 2 ea B30032)	1	14,000 RPM 34,520 × *g* 563
29 × 104 mm 50 mL	Polycarbonate Round Bottom bottles with screw caps	357002	40	B40155 (Qty 2 ea B30032)	1	14,000 RPM 34,520 × *g* 563
29 × 104 mm 50 mL	Polypropylene Round Bottom bottles with screw caps	357003	40	B40155 (Qty 2 ea B30032)	1	14,000 RPM 34,520 × *g* 563
29 × 104 mm 50 mL	Polycarbonate Round Bottom tubes with snap-on caps	363664	36.5	B40155 (Qty 2 ea B30032)	1	14,000 RPM 34,520 × *g* 563

Table 2 Available Beckman Coulter Bottles and Tubes for the JA-14.50 Rotor[a] manufactured prior to October

Nominal Dimensions and Volume	Tube Description	Part Number	Nominal Volume (mL)	Required Adapter P/N	Tubes per Adapter	Max Speed/RCF/ *k* Factor
29 × 104 mm 50 mL	Polypropylene Round Bottom tubes with snap-on caps	357005	36.5	B40155 (Qty 2 ea B30032)	1	14,000 RPM 34,520 × *g* 563
29 × 104 mm 50 mL	Polycarbonate Round Bottom open-top tubes	363647	35	B40155 (Qty 2 ea B30032)	1	14,000 RPM 34,520 × *g* 563
29 × 104 mm 50 mL	Polypropylene Round Bottom open-top tubes	357007	35	B40155 (Qty 2 ea B30032)	1	14,000 RPM 34,520 × *g* 563
18 × 100 mm 15 mL	Polycarbonate Round Bottom open-top tube	342080	15	B40157 (Qty 2 ea B30034)	1	14,000 RPM 33,400 × *g* 665
18 × 100 mm 15 mL	Polypropylene Round Bottom open-top tube	342081	15	B40157 (Qty 2 ea B30034)	1	14,000 RPM 33,400 × *g* 665
18 × 100 mm 15 mL	Polyethylene Round Bottom open-top tube	342082	15	B40157 (Qty 2 ea B30034)	1	14,00 RPM 33,400 × *g* 665
16 × 80 mm 10 mL	Polycarbonate Round Bottom bottle with cap assembly	355672	10	361703 & B40155 (Qty 2 ea B30032)	1	14,000 RPM 30,900 × *g* 445
11 × 38 mm 1.5 mL	Polypropylene microfuge tube	357448	1.5	361705 &B40155 (Qty 2 ea B30032)	3	14,000 RPM 27,000 × *g* 449
11 × 38 mm 1.5 mL	Polypropylene microfuge tube	356090	1.5	361705 & B40155 (Qty 2 ea B30032)	3	14,000 RPM 27,000 × *g* 449

a. Use only the items listed here and observe fill volumes and maximum run speeds.

Tubes for JA-14.50 Rotors Manufactured after October 2016

NOTE JA-14.50 rotors and lids manufactured after October 2016 include the letter "T" after the serial number (see Figure 8 and Figure 9).

⚠ CAUTION

The tubes listed in Table 3 should be used one time only. Tube damage and sample leakage will result from repeated use.

Do not use glass tubes in this rotor.

Table 3 Adapters to support tubes from other manufacturers for the JA-14.50 Rotor[a] manufactured after October 2016

Type and Volume	Tube Description	Required Adapter	Effective r_{max} (mm)	Effective r_{min} (mm)	Max Speed/RCF/ *k* Factor
conical 50 mL	Polypropylene conical tube with cap[bcdef]	N/A	159.7	98.8	g
conical 15 mL	Polypropylene conical tube with cap[bcef]	B89429 (Qty 2 ea B19962)	156.2	92.2	g
conical 5 mL	Polypropylene conical tube with tethered cap[h]	B89431 (Qty 2 ea B19964)	125.1	95.7	g
conical 50 mL	Spin filtration device[ij]	N/A	159.7	98.8	g
conical 15 mL	Spin filtration device[ij]	B89429 (Qty 2 ea. B19962)	156.2	92.2	g

a. Use only the items listed here and observe fill volumes and maximum run speeds.
b. Manufactured by Greiner.
c. Manufactured by BD Falcon.
d. Manufactured by VWR.
e. Manufactured by Corning.
f. Manufactured by NUNC.
g. Use manufactures' recommendations for tube and bottle RCF limits. The corresponding RPM and k factor can be calculated using the equations on pages 1 and 15, respectively.
h. Manufactured by Eppendorf.
i. Manufactured by Pall.
j. Manufactured by Millipore.

Table 4 Available Beckman Coulter Bottles and Tubes for the JA-14.50 Rotor[a] manufactured after October 2016

Nominal Dimensions and Volume	Tube Description	Part Number	Nominal Volume (mL)	Required Adapter P/N	Tubes per Adapter	Max Speed/RCF/ *k* Factor
18 × 100 mm 15 mL	Polycarbonate Round Bottom open-top tube	342080	15	B89430 (Qty 2 ea B19963)	1	14,000 RPM 33,400 × *g* 665
18 × 100 mm 15 mL	Polypropylene Round Bottom open-top tube	342081	15	B89430 (Qty 2 ea B19963)	1	14,000 RPM 33,400 × *g* 665
18 × 100 mm 15 mL	Polyethylene Round Bottom open-top tube	342082	15	B89430 (Qty 2 ea B19963)	1	14,000 RPM 33,400 × *g* 665

a. Use only the items listed here and observe fill volumes and maximum run speeds.

Temperature Limits

- Plastic tubes have been centrifuge tested for use at temperatures between 2 and 25°C. For centrifugation at other temperatures, pretest tubes under anticipated run conditions.
- If plastic containers are frozen before use, make sure that they are thawed to at least 2°C prior to centrifugation.

The JA-14.50 rotor generates *g*-forces higher than the tube manufacturers' recommended maximums (see Table 1, Table 2, Table 3, and Table 4). Running tubes above the recommended maximum *g*-forces will cause white striations known as crazing (see Figure 10). Moderate crazing will not affect run results or cause tube leakage. However, repeated tube usage and/or long run times will eventually lead to tube failure. To minimize the possibility of tube failure, observe the following conditions.

- Do not use tubes more than once.
- Discard crazed tubes.
- Refer to Table 5 to find the *g*-forces produced at various speeds in the rotor, and limit run speed to the speed that produces the maximum recommended *g*-force for the tube in use.

Figure 10 Examples of Tubes with Minimum and Moderate Crazing

Run Times

The *k* factor of the rotor is a measure of the rotor's pelleting efficiency. Beckman Coulter has calculated the *k* factors for all of its rotors, at maximum speed with full tubes, using the following formula:

$$k = \frac{\ln(r_{max}/r_{min})}{\omega^2} \times \frac{10^{13}}{3600} \quad \textbf{EQ 1}$$

where ω is the angular velocity of the rotor in radians per second ($\omega = 0.105 \times \text{RPM}$), r_{max} is the maximum radius, and r_{min} is the minimum radius.

After substitution:

$$k = \frac{(2.533 \times 10^{11}) \ln(r_{max}/r_{min})}{(\text{RPM})^2} \quad \textbf{EQ 2}$$

In the JA-14.50 rotor, the *k* factor is 787 for full 50-mL tubes at maximum speed.* For containers that nominally hold less than 50 mL, the *k* factors will be different. Calculate the *k* factors for these containers using EQ 2.

Use the *k* factor in the following equation to estimate the run time *t* (in hours) required to pellet particles of known sedimentation coefficient *s* (in Svedberg units, *S*).

$$t = \frac{k}{s} \quad \textbf{EQ 3}$$

For example, at 14,000 RPM *E. coli* (*s* = 3600 *S*) will pellet in

$$t = \frac{787}{3600} \approx 13 \text{ min} \quad \textbf{EQ 4}$$

* Based on sedimentation in water at 20°C.

Run times can be estimated for centrifugation at less than maximum speed by adjusting the *k* factor as follows:

$$k_{adj} = k_{rated} \left(\frac{14,000}{\text{actual run speed}} \right)^2 \quad \textbf{EQ 5}$$

Run times can also be estimated from data established in prior experiments using a different rotor if the *k* factor of the previous rotor is known. For any two rotors, a and b,

$$\frac{t_a}{t_b} = \frac{k_a}{k_b} \quad \textbf{EQ 6}$$

where the *k* factors have been adjusted for the actual run speed used.

Run Speeds

The centrifugal force at a given radius in a rotor is a function of run speed. Comparisons of forces between different rotors are made by comparing the rotors' relative centrifugal fields (RCF). When rotational speed is selected so that identical samples are subjected to the same RCF in two different rotors, the samples are subjected to the same force (see Table 5).

Do not select rotational speeds higher than the maximums you have determined to be appropriate for your protocols (in no case above 14,000 RPM). When solutions more dense than 1.2 g/mL are centrifuged in this rotor, use EQ 7 to calculate the reduced maximum allowable rotor speed.

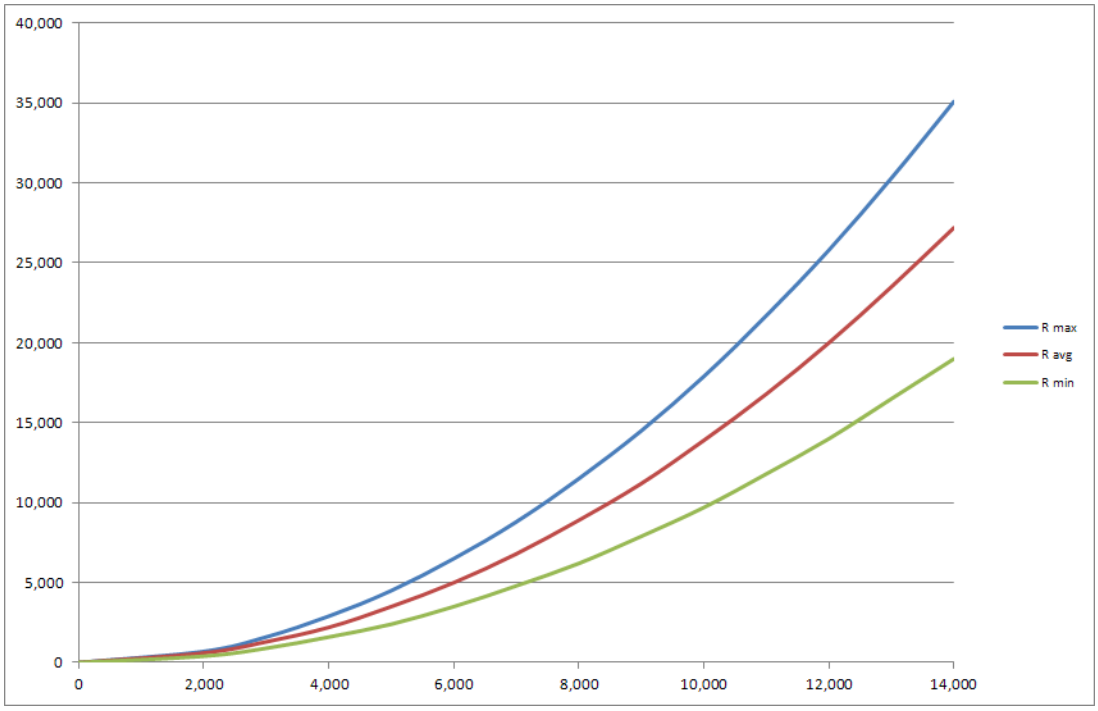
$$\text{reduced maximum speed} = (14{,}000\ \text{RPM}) \sqrt{\frac{1.2\ \text{g/mL}}{\text{density of tube contents}}} \qquad \textbf{EQ 7}$$

Table 5 Relative Centrifugal Fields for the JA-14.50 Rotor[a]

Rotor Speed (RPM)	Relative Centrifugal Field (× *g*)		
	At r_{max} (160 mm)	At r_{av} (124 mm)	At r_{min} (87 mm)
14,000 13,000 12,000 11,000	35,000 30,300 25,800 21,700	27,200 23,500 20,000 16,800	19,000 16,500 14,000 11,800
10,000 9000 8000	17,900 14,500 11,500	13,900 11,200 8900	9700 7900 6200
7000 6000 5000	8800 6500 4500	6800 5000 3500	4800 3500 2400
4000 3000 2000 0	2900 1600 700 0	2200 1300 600 0	1600 900 400 0

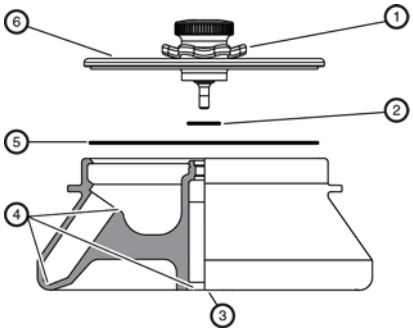
a. Entries in this table are calculated from the formula RCF = $1.12r\,(\text{RPM}/1000)^2$ and then rounded to three significant digits.

Figure 11 Relative Centrifugal Fields Chart for the JA-14.50 Rotor



Care and Maintenance

Maintenance



1. Daisy Knob
2. Small O-ring (961696)
3. Rotor Body
4. Check for Corrosion
5. Large O-ring (885501)
6. Dual Locking Lid (B19947)

NOTE Do not use sharp tools on the rotor that could cause scratches in the rotor surface. Corrosion begins in scratches and may open fissures in the rotor with continued use.

1 Periodically (at least monthly) inspect the rotor, especially inside cavities, for rough spots or pitting, white powder deposits (frequently aluminum oxide), or heavy discoloration.

If any of these signs are evident, do not run the rotor.

Contact your Beckman Coulter representative for information about the Field Rotor Inspection Program and the rotor repair center.

2 Before using the rotor, inspect the rotor drive pins to ensure that they are not damaged.

Damaged drive pins can prevent the rotor from seating properly on the centrifuge drive hub (Avanti J series centrifuges only).

To inspect the drive pins, turn the rotor upside down and look into the drive hole in the center of the rotor.

3 Regularly lubricate the metal threads in the rotor with a thin, even coat of Spinkote lubricant.

Failure to keep these threads lubricated can result in damaged threads.

If the drive pins appear damaged, contact Beckman Coulter Field Service.*

4 Regularly apply silicone vacuum grease to the O-rings.

Replace O-rings about twice a year or whenever worn or damaged.

5 Refer to *Chemical Resistances* (publication IN-175) for the chemical compatibilities of rotor and accessory materials.

Your Beckman Coulter representative provides contact with the Field Rotor Inspection Program and the rotor repair center.

Cleaning

Wash the rotor and rotor components immediately if salts or other corrosive materials are used or if spillage has occurred. Do not allow corrosive materials to dry on the rotor.

Under normal use, wash the rotor frequently (at least weekly) to prevent buildup of residues.

1 Remove the O-rings before washing.

2 Wash the rotor and lid in a mild detergent, such as Solution 555 (339555), that won't damage the rotor.

Dilute the detergent with water (10 parts water to 1 part detergent).

* Call 1-800-742-2345 (U.S.A. or Canada); outside the U.S, contact your local Beckman Coulter office or visit us on the web at www.beckmancoulter.com.

The Rotor Cleaning Kit (339558) contains two plastic-coated brushes and two quarts of Solution 555 for use with rotors and accessories.

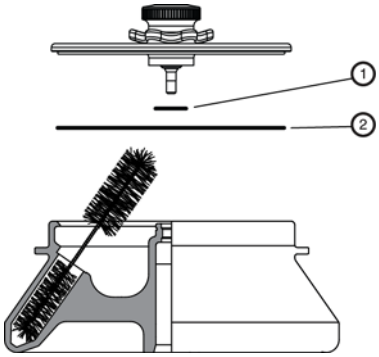
NOTE Do not wash rotor components in a dishwasher. Do not soak in detergent solution for long periods, such as overnight.

3 Thoroughly rinse the cleaned rotor and components with distilled water.

4 Air-dry the rotor and lid upside down.

Do not use acetone to dry the rotor.

5 Apply a thin, even coat of silicone vacuum grease to both lid O-rings before replacing them in the lid.



1. Small O-ring
2. Large O-ring

6 Clean metal threads every 6 months, or as necessary.

Use a brush and concentrated Solution 555.

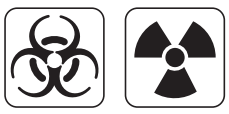
Rinse and dry thoroughly, then lubricate lightly but evenly with Spinkote to coat all threads.

7 Periodically remove the O-rings and wipe clean as necessary.

a. Clean the O-ring grooves with a cotton-tipped swab.

b. Reapply a light film of silicone vacuum grease.

Decontamination



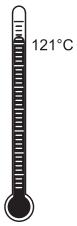
If the rotor (and/or accessories) becomes contaminated with radioactive material, it should be decontaminated using a solution that will not damage the anodized surfaces. Beckman Coulter has tested a number of solutions and found two that do not harm anodized aluminum: RadCon Surface Spray or IsoClean Solution (for soaking),* and Radiacwash.†

NOTE IsoClean can cause fading of colored anodized surfaces. Use it only when necessary and remove it promptly from surfaces.

While Beckman Coulter has tested these methods and found that they do not damage components, no guarantee of decontamination is expressed or implied. Consult your laboratory safety officer regarding the proper decontamination methods to use.

If the rotor or other components are contaminated with toxic or pathogenic materials, follow all appropriate safety and decontamination procedures as outlined by your laboratory safety officer.

Sterilization and Disinfection



- The rotor and all rotor components can be autoclaved at 121°C for up to an hour. Remove the lid from the rotor and place the rotor and lid in the autoclave upside down.
- Ethanol (70%) or hydrogen peroxide (6%) may be used on all rotor components, including those made of plastic. Bleach (sodium hypochlorite) may be used, but may cause discoloration of anodized surfaces. Use the minimum immersion time for each solution, per laboratory standards.

⚠ CAUTION

Ethanol is a flammability hazard. Do not use it in or near operating centrifuges.

While Beckman Coulter has tested these methods and found that they do not damage the rotor or components, no guarantee of sterility or disinfection is expressed or implied. When sterilization or disinfection is a concern, consult your laboratory safety officer regarding proper methods to use.

Refer to publication IN-192 (included with each box of tubes) for tube sterilization and disinfection procedures.

Storage

When it is not in use, store the rotor in a dry environment (not in the instrument) with the lid removed to allow air circulation so moisture will not collect in the tube cavities.

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* In U.S., contact Nuclear Associates (New York); in Eastern Europe and Commonweath States, contact Victoreen GmbH (Munich); in South Pacific, contact Gammasonics Pty. Ltd. (Australia); in Japan, contact Toyo Medic Co. Ltd. (Tokyo).

† In U.S., contact Biodex Medical Systems (Shirley, New York); internationally, contact the U.S. office to find the dealer closest to you.

Returning a Rotor

Before returning a rotor or accessory for any reason, prior permission must be obtained from Beckman Coulter, Inc. A return authorization form may be obtained from your local Beckman Coulter sales office. The form should contain the following information:

- rotor type and serial number
- history of use (approximate frequency of use)
- reason for the return
- original purchase order number, billing number, and shipping number, if possible
- name and email address of the person to be notified upon receipt of the rotor or accessory at the factory
- name and email address of the person to be notified about repair costs, etc.

To protect our personnel, it is the customer's responsibility to ensure that all parts are free from pathogens and/or radioactivity. Sterilization and decontamination must be done before returning the parts. Smaller items (such as tubes, bottles, etc.) should be enclosed in a sealed plastic bag.

All parts must be accompanied by a note, plainly visible on the outside of the box or bag, stating that they are safe to handle and that they are not contaminated with pathogens or radioactivity. ***Failure to attach this notification will result in return or disposal of the items without review of the reported problem.***

Use the address label printed on the return form when mailing the rotor and/or accessories.

Customers located outside the United States should contact their local Beckman Coulter office.

Supply List

See the *High Performance, High Speed, High Capacity Rotors, Tubes & Accessories* catalog (BR-8102) available at www.beckmancoulter.com for detailed information on ordering parts and supplies; or call Beckman Coulter Customer Service at 1-800-742-2345 (U.S.A. or Canada). For your convenience, a partial list is given below.

Replacement Rotor Parts

Description	Part Number
JA-14.50 rotor assembly, biosafe (with dual-locking lid)	B88554
JA-14.50 rotor assembly (with single-locking lid)	B88555
Dual-locking lid	B19947
Single-locking lid	B19952
Lid (large) O-ring (Buna-N rubber)	885501
Rotor body (small) O-ring (ethylene propylene rubber)	961696

Supplies

NOTE For MSDS information, go to the Beckman Coulter website at www.beckmancoulter.com.

Description	Part Number
Tubes and adapters	see Table 1, Table 2, Table 3, and Table 4
Rotor removal tool	360998
Rotor Cleaning Kit	339558
Silicone vacuum grease (1 oz)	335148
Solution 555 (1 qt)	339555
Spinkote lubricant (2 oz)	306812

Beckman Coulter, Inc.
J Series Rotor Warranty

Subject to the conditions specified below and the warranty clause of the Beckman Coulter, Inc., terms and conditions of sale in effect at the time of sale, Beckman Coulter, Inc. agrees to correct either by repair, or, at its election, by replacement, any defects of material or workmanship which develop within seven (7) years after delivery of a J series rotor to the original buyer by Beckman Coulter, Inc. or by an authorized representative, provided that investigation and factory inspection by Beckman Coulter, Inc. discloses that such defect developed under normal and proper use. Should a Beckman Coulter centrifuge be damaged due to a failure of a rotor covered by this warranty, Beckman Coulter will supply free of charge all centrifuge parts required for repair.

Replacement

Any product claimed to be defective must, if requested by Beckman Coulter, Inc., be returned to the factory, transportation charges prepaid, and will be returned to Buyer with the transportation charges collect unless the product is found to be defective, in which case Beckman Coulter, Inc. will pay all transportation charges.

A defective rotor will be replaced by Beckman Coulter, Inc. at its then current list price less a credit based upon the age of the rotor (years since date of purchase). The Buyer shall not receive credit until the claimed defective rotor is returned to Beckman Coulter's Indianapolis, Indiana facility or delivered to a Beckman Field Service representative.

The replacement price (cost to Buyer) for the respective rotor shall be calculated as follows:

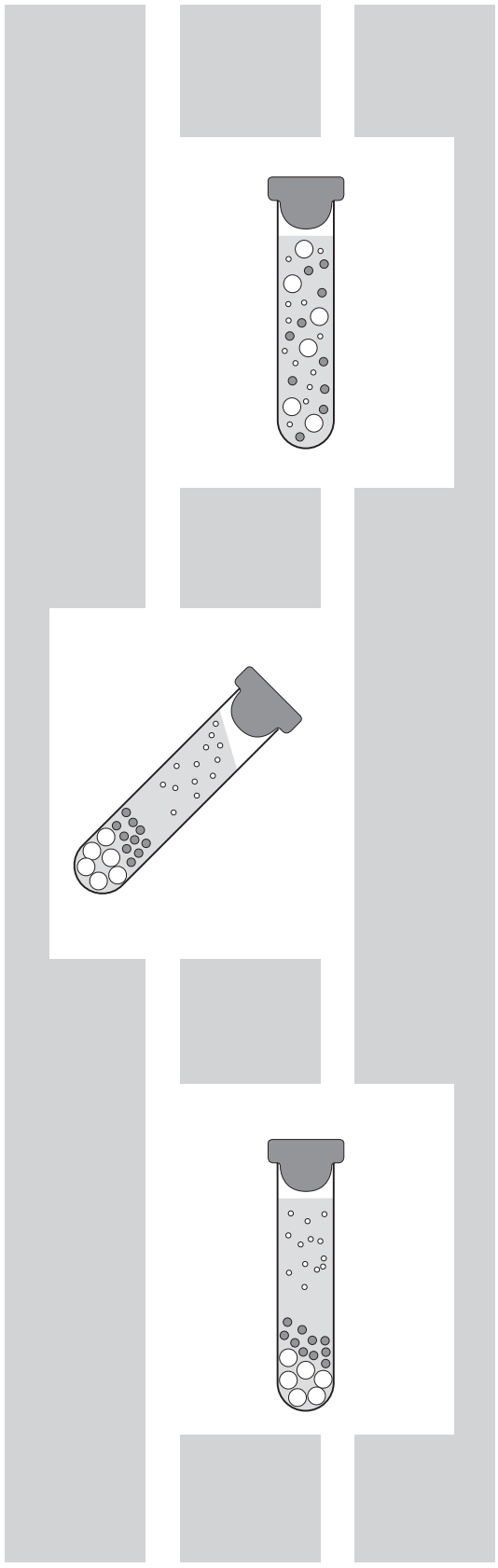
$$\text{Replacement price} = \text{Current rotor list price} \times \frac{\text{years}}{7}$$

Conditions

1. Except as otherwise specifically provided herein, this warranty covers the rotor only and Beckman Coulter, Inc. shall not be liable for damage to accessories or ancillary supplies including but not limited to (i) tubes, (ii) tube caps, (iii) tube adapters, or (iv) tube contents.
2. This warranty is void if the rotor has been subjected to customer misuse such as operation or maintenance contrary to the instructions in the Beckman Coulter rotor or centrifuge manual.
3. This warranty is void if the rotor is operated with a rotor drive unit or in a centrifuge unmatched to the rotor characteristics, or is operated in a Beckman Coulter centrifuge that has been improperly disassembled, repaired, or modified.

Disclaimer

IT IS EXPRESSLY AGREED THAT THE ABOVE WARRANTY SHALL BE IN LIEU OF ALL WARRANTIES OF FITNESS AND OF THE WARRANTY OF MERCHANTABILITY AND THAT BECKMAN COULTER, INC. SHALL HAVE NO LIABILITY FOR SPECIAL OR CONSEQUENTIAL DAMAGES OF ANY KIND WHATSOEVER ARISING OUT OF THE MANUFACTURE, USE, SALE, HANDLING, REPAIR, MAINTENANCE, OR REPLACEMENT OF THE PRODUCT.



Related Documents

Rotors and Tubes for Beckman Coulter J2, J6,and Avanti J Series Centrifuges
PN JR-IM-10

- Rotors
- Tubes, Bottles, and Accessories
- Using Tubes and Accessories
- Using Fixed-Angle Rotors
- Using Swinging-Bucket Rotors
- Using Vertical-Tube and Rack Type Rotors
- Care and Maintenance
- Chemical Resistances
- Temperature Compensation Tables
- Gradient Materials
- Blood Component Separation

Available in electronic pdf or CD-ROM by request.

Rotors and Tubes CD-ROM (369668)

- Rotors and Tubes for Tabletop Preparative Ultracentrifuges
- Rotors and Tubes for J2, J6, Avanti J Series Centrifuges
- Rotors and Tubes for Preparative Ultracentrifuges
- Rotor Safety Bulletin
- Chemical Resistances for Beckman Coulter Centrifugation Products

Included with shipment of instrument.

Additional References

- Chemical Resistances for Beckman Coulter Centrifugation Products (IN-175)
- Beckman Coulter High Performance, High Speed, High Capacity Rotors, Tubes & accessories catalog (BR-8102)
- Use and Care of Centrifuge Tubes and Bottles (IN-192)

Available in hard copy or electronic pdf by request.

www.beckmancoulter.com

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