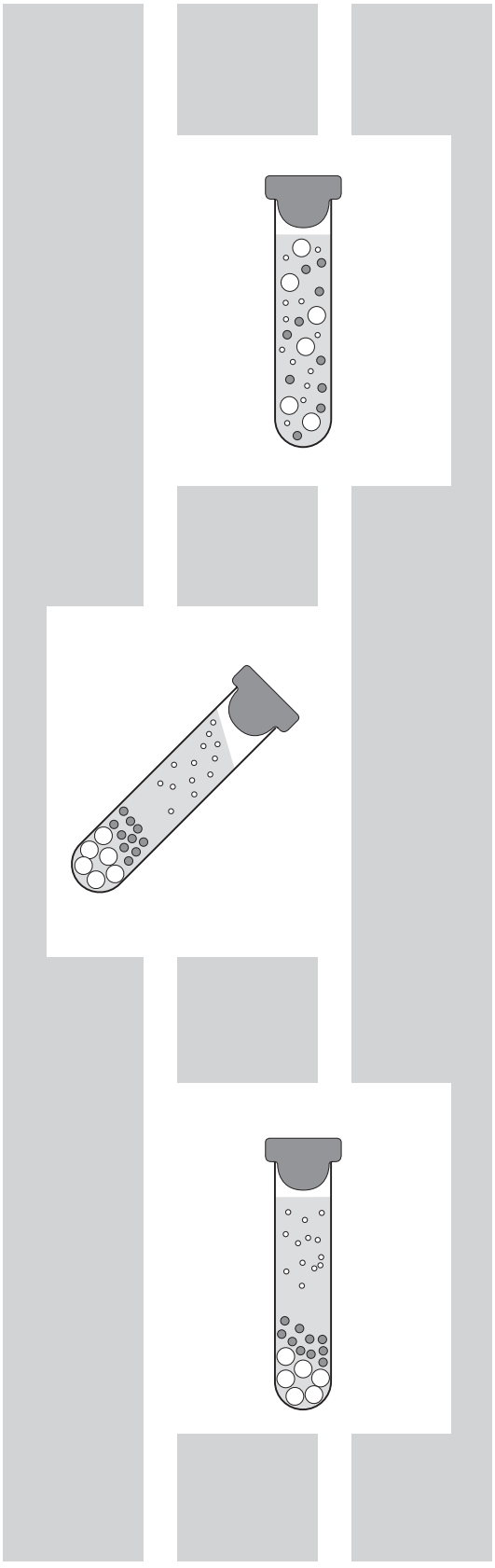
J-TB-070H
March 2007



JA-30.50 Ti
Fixed Angle Rotor

Used In Beckman Coulter J2 and Avanti® J Series Centrifuges

Printed in the U.S.A.

SAFETY NOTICE

This safety notice summarizes information basic to the safe use of the rotor described in this manual. The international symbol displayed above is a reminder to the user that all safety instructions should be read and understood before operation or maintenance of this equipment is attempted. When you see the symbol on other pages throughout this publication, pay special attention to the specific safety information presented. Observance of safety precautions will also help to avoid actions that could damage or adversely affect the performance of the 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 they are free of micro-organisms. Some of the most virulent—Hepatitis (B and C) and, HIV (I–V) viruses, 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. 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-30.50 Ti rotor, their safety in this rotor cannot be ascertained by Beckman Coulter. Use of other manufacturers' components or accessories in the JA-30.50 Ti rotor 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.

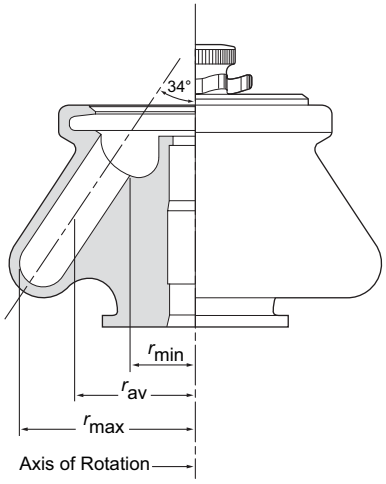
If disassembly reveals evidence of leakage, you should assume that some fluid escaped the rotor. Apply all appropriate safety and decontamination procedures to the centrifuge and accessories as required.

Never exceed the maximum rated speed of the rotor and labware in use. Refer to the section on RUN SPEEDS.

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.

JA-30.50 Ti FIXED ANGLE ROTOR

SPECIFICATIONS



Maximum speed
- in Avanti J-30I centrifuges . . . . . 30 000 rpm
- in Avanti J-26XP series centrifuges . . . . . 26 000 rpm*
- in Avanti J-25 series centrifuges . . . . . 25 000 rpm*

Critical speed range† . . . . . 600 to 800 rpm
Maximum solution density . . . . . 1.2 g/mL
Relative Centrifugal Field‡ at maximum speed
- at r_{max} (108 mm) . . . . . 108 860 × *g*
- at r_{av} (74 mm) . . . . . 74 600 × *g*
- at r_{min} (40 mm) . . . . . 40 320 × *g*

k factor at maximum speed 280
Conditions requiring speed reduction . . . . . see RUN SPEEDS
Maximum allowable imbalance of opposing loads . . . . . 2 grams
Number of tube cavities (round-bottom) 8
Available bottles and tubes . . . . . see Table 3
Nominal tube dimensions . . . . . 25 × 104 mm
Nominal tube capacity . . . . . 50 mL
Nominal rotor capacity . . . . . 400 mL
Approximate acceleration time to maximum speed
(rotor fully loaded)
- in an Avanti® J-30 I centrifuge (to 30 000 rpm) . . . . . 5 1/4 min
- in a J2 series centrifuge (to 20 000 rpm) . . . . . 4 min

Approximate deceleration time from maximum speed
(rotor fully loaded, max. brake)
- in an Avanti® J-30 I centrifuge (from 30 000 rpm) . . . . . 3 1/2 min
- in a J2 series centrifuge (from 20 000 rpm) . . . . . 3 min

Rotor weight, empty . . . . . 11.2 kg (24.7 lb)
Rotor weight, maximum sample mass . . . . . 11.8 kg (26 lb)
Rotor material . . . . . titanium body, aluminum lid
Rotor entry code for microprocessor-controlled
J2 series centrifuges 30.5

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* At speeds above 20 000 rpm, the minimum temperature set point will be above 4°C.

† 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.

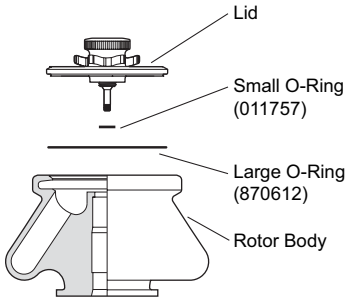
‡ Relative Centrifugal Field (RCF) is the ratio of the centrifugal acceleration at a specified radius and speed ($r\omega^2$) to the standard acceleration of gravity (g) according to the following formula:

$$RCF = \frac{r\omega^2}{g}$$

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/s²). After substitution:

$$RCF = 1.12\, r \left(\frac{RPM}{1000}\right)^2$$

DESCRIPTION



This rotor has been manufactured in a registered ISO 9001 or 9002 facility for use with the specified Beckman Coulter centrifuges.

The JA-30.50 Ti fixed angle rotor, rated for 30 000 rpm, is designed to hold up to eight 50-mL tubes at a 34-degree angle. Used in Beckman Coulter Avanti J and J2 series centrifuges, the JA-30.50 Ti rotor develops centrifugal forces that can efficiently pellet cells from large volumes, or cell particles from tissue homogenates. Short column methods (i.e., partially filled tubes) may also be used to purify large quantities of virus in a cushion gradient.

An available dual-locking lid mechanism allows the rotor to be loaded into and removed from the centrifuge with the lid in place. The rotor may be placed under a safety hood before the lid is attached or removed. If biosafety is not a concern, a single-locking lid mechanism is also available.

The JA-30.50 Ti rotor has a patented fluid-containment annulus, located below the O-ring sealing surface (see Figure 1). If tubes are overfilled or if leakage occurs during centrifugation, the annulus holds enough volume that all of the liquid is kept inside the rotor—even if all eight tubes leak at the same time. This feature helps to eliminate the escape of liquid into the centrifuge chamber.

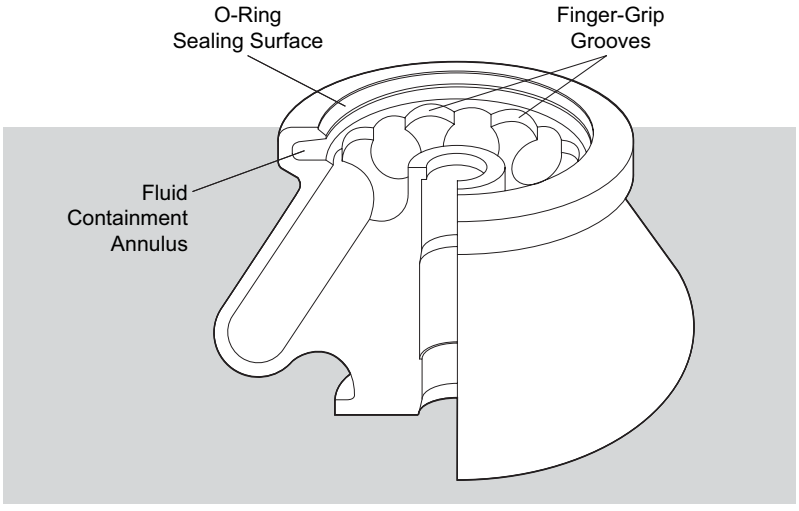


Figure 1. Fluid-Containment Annulus

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

For warranty information, see the WARRANTY at the back of this manual.

PREPARATION AND USE

Specific information about the JA-30.50 Ti rotor is given here. Information common to this and other rotors is contained in the manual Rotors and Tubes for J Series Centrifuges *(publication JR-IM), which should be used together with this manual for complete rotor and accessory information.*

NOTE

Although rotor components and accessories made by other manufacturers may fit in the JA-30.50 Ti rotor, their safety in this rotor cannot be ascertained by Beckman Coulter. Use of other manufacturers' components or accessories in the JA-30.50 Ti rotor 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

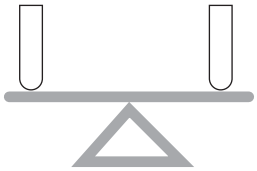
Read the Safety Notice page at the front of this manual before using the rotor.

1. Make sure that the rotor and lid are clean and show no signs of corrosion or cracking.
2. Check the chemical compatibilities of all materials used. (Refer to Appendix A in *Rotors and Tubes*.)
3. Verify that the tubes being used are listed in Table 3.

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 AND BOTTLES on page 11 for information about containers.) If fewer than eight tubes are being run, they must be arranged symmetrically in the rotor (see Figure 2). Opposing tubes must be filled to the same level with liquid of the same density.

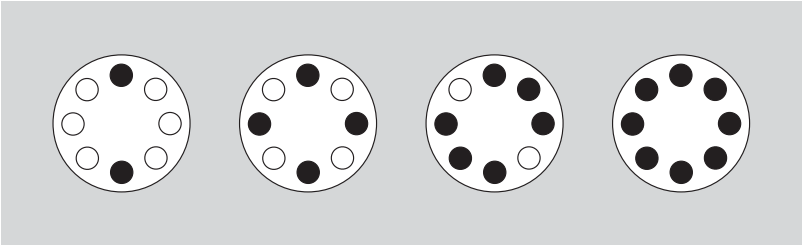


Figure 2. Typical Examples of Arranging Tubes in the Rotor. Two, four, six, or eight tubes can be centrifuged per run, if they are arranged in the rotor as shown.

NOTE

Do not run an empty rotor. Place filled tubes in at least two opposing cavities.

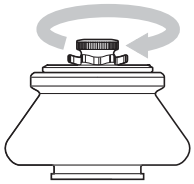
OPERATION

- For low temperature runs, 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.

- If fluid containment is required, *use capped tubes or bottles.* It is strongly recommended that all containers carrying physiological fluids be capped to prevent leakage.
- If you are using an Avanti J series centrifuge, select the JA-30.50 Ti rotor. If you are using a microprocessor-controlled J2 series centrifuge, be sure to enter rotor code **30.5**. Refer to your centrifuge instruction manual for additional information.

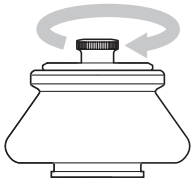
INSTALLING THE ROTOR

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 lid 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. Carefully lower the rotor straight down onto the centrifuge drive spindle hub. Do not drop the rotor onto the spindle hub.
5. Slowly turn the rotor around the drive spindle to make sure that it is properly seated.
6. Secure the rotor to the centrifuge drive spindle as follows:

   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.

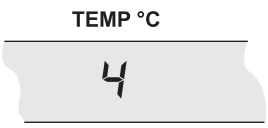


   Single-locking lid: place filled tubes into the rotor, then place the lid on the rotor. Press the lid knob down and turn it to the right (clockwise) until secure. do not overtighten.

WARNING

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.

TEMPERATURE



To ensure that the JA-30.50 Ti rotor reaches the required temperature during the run, follow the appropriate instructions below for the centrifuge model being used.

Avanti J Series Centrifuges

Enter the run temperature according to the instructions in your centrifuge instruction manual. No additional input is required.

J2 Series Centrifuges

Enter the required run temperature *and* the appropriate temperature compensation units (see Tables 1 and 2) on the centrifuge control panel as follows.

Table 1. Temperature Compensation Settings for Analog and Microprocessor-Controlled Centrifuges (Models J2-HS, J2-MI, and J2-MC). Interpolate if intermediate values are required.

Rotor Speed (rpm)	Required Sample Temperature (°C)						
	–20	–10	2	5	10	20	40
20 000	N	N	–6	–6	–6	–4	–9
18 000	N	–6	–4	–6	–5	–4	–8
15 000	–3	–5	–3	–5	–5	–3	–7
10 000	–2	–2	–2	–1	–2	–2	–6

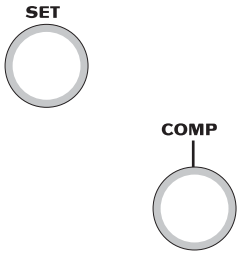
An “N” indicates that the rotor cannot achieve the required temperature at this speed.

Table 2. Temperature Compensation Settings for the Model J2-HC Analog Centrifuge. Interpolate if intermediate values are required.

Rotor Speed (rpm)	Required Sample Temperature (°C)						
	–20	–10	2	5	10	20	40
18 000	N	–5	–5	–5	–3	–3	–3
15 000	–4	–3	–4	–3	–3	–3	–1
10 000	–3	–2	–1	–2	–1	0	1

An “N” indicates that the rotor cannot achieve the required temperature at this speed.

Analog J2 Series Centrifuges (Models J2-HS and J2-HC)

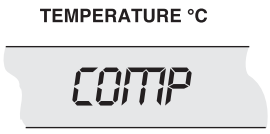


1. Turn the SET knob on the centrifuge control panel to the required sample temperature.

2. Find the compensation value in Table 1 for Model J2-HS or Table 2 for Model J2-HC that corresponds to the required temperature and run speed. Set the COMP dial to that setting. (Interpolate if intermediate values are required.)

Microprocessor-Controlled J2 Series Centrifuges (Models J2-MI and J2-MC)

Enter rotor code **30.5**, then follow the steps below.



1. Press the [**TEMP**] key on the centrifuge control panel and then use the keypad to enter the sample temperature.

2. Find the compensation value in Table 1 that corresponds with the set temperature and run speed.

3. Press [**COMP ADJ**]. The word “COMP” flashes below the TEMPERATURE display and the display flashes.

4. Use the keypad to enter the required compensation value. Press the [**±.**] key to enter a minus sign; pressing it again will remove the minus sign.

5. Check the temperature display. (If the entry is incorrect, press [**CE**] and reenter the digits.)

6. When the entry is correct, press [**ENTER/RECALL**].

NOTE

To clear a COMP ADJ entry, press [**COMP ADJ**], [**0**], and [**ENTER/RECALL**].

REMOVAL AND SAMPLE RECOVERY

CAUTION

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

Dual-locking Lid

1. Place one hand on the rotor to keep it from turning. Grasp the tie-down knob with your other hand and turn it to the left (counter-clockwise) until the stem disengages from the drive hub threads.

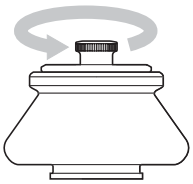
2. Hold the tie-down knob or place your hands on the rotor and lift the rotor straight up off the drive hub.

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

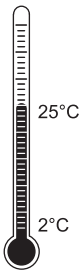


1. Unscrew the tie-down knob.
2. Remove the lid and set it aside.
3. Lift the rotor straight up off the drive hub.

TUBES AND BOTTLES

The JA-30.50 Ti rotor uses the tubes and bottles listed in Table 3. 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.) Refer to Appendix A in *Rotors and Tubes* for information on the chemical resistances of tube, bottle, and accessory materials.

Temperature Limits



- Plastic containers have been tested for use at temperatures between 2 and 25°C. For centrifugation at other temperatures, pretest containers 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.

Thickwall Tubes

Thickwall polyallomer, polypropylene, and polycarbonate tubes can be run partially filled (at least half filled) with or without caps, but all opposing tubes for a run must be filled to the same level with liquid of the same density. Do not overfill capless tubes.

Table 3. Available Tubes and Bottles for the JA-30.50 Ti Rotor.
Use only the items listed here and observe fill volumes and maximum run speeds.

Tube or Bottle				Required Accessory		Max Speed*/ RCF/ *k* Factor
Dimensions and Volume	Description	Part Number	Max. Fill Volume (mL)	Description	Part Number	
29 × 104 mm 50 mL	polycarbonate bottle w/cap assy (pkg/6)	357000	40	none	—	30 000 rpm 108 800 × *g* 280
29 × 104 mm 50 mL	polyallomer bottle w/cap assembly (pkg/6)	357001	40	none	—	30 000 rpm† 108 800 × *g* 280
29 × 104 mm 50 mL	thickwall polycarbonate, no cap (pkg/25)	363647	35	none	—	30 000 rpm† 108 800 × *g* 280
29 × 104 mm 50 mL	thickwall polypropylene,‡ no cap (pkg/25)	357007	35	none	—	30 000 rpm 108 800 × *g* 280
29 × 104 mm 50 mL	polycarbonate bottle, screw cap (pkg/25)	357002	40	none	—	25 000 rpm 75 600 × *g* 403
29 × 104 mm 50 mL	polyallomer bottle, screw cap (pkg/25)	357003	40	none	—	25 000 rpm 75 600 × *g* 403
29 × 104 mm 50 mL	thickwall polycarbonate, snap-on cap (pkg/25)	363664	36.5	none	—	25 000 rpm 75 600 × *g* 403
29 × 104 mm 50 mL	thickwall polypropylene, snap-on cap (pkg/25)	357005	36.5	none	—	25 000 rpm 75 600 × *g* 403
16 × 80 mm 10 mL	polycarbonate bottle, screw cap (pkg/25)	355672	10	adapter	361703 (Ultem)⌗	30 000 rpm 91 000 × *g* 244
11 × 38 mm 1.5 mL	polyallomer tube, snap-on cap, natural (pkg/500)	357448	1.3	adapter	361705 (Ultem)⌗	30 000 rpm 73 400 × *g* 126
11 × 38 mm 1.5 mL	polypropylene tube, snap-on cap, natural (pkg/500)	356090	1.3	adapter	361705	30 000 rpm 73 400 × *g* 126
25 × 104 mm 50 mL	glass tube	**	**	adapter	870331 (rubber)	10 000 rpm 12 100 × *g* 494

* Maximum speeds listed are guidelines only. These speeds have been achieved in reliability tests at Beckman Coulter, but because of variances in user methodologies, no guarantee of performance is expressed or implied.

† At 2°C; at 25°C, maximum speed must be limited to 26 000 rpm for tube 357001 and to 29 000 rpm for tube 363647.

‡ Above 20°C fill polypropylene tubes at least half full. Containers may be filled less than or equal to the maximum fill volumes provided in this table.

** Observe manufacturer's maximum speed and fill guidelines.

⌗ Ultem is a registered trademark of GE Plastics.

Polycarbonate and Polyallomer Bottles

Capped polycarbonate and polyallomer bottles may be centrifuged completely filled, or partially filled (not less than half full). Containers placed in opposing positions in the rotor must be filled to the same level.

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:

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

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:

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

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).

$$t = \frac{k}{s} \quad (3)$$

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

$$k_{adj} = k \left(\frac{30\,000}{\text{actual run speed}} \right)^2 \quad (4)$$

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,

$$\frac{t_a}{t_b} = \frac{k_a}{k_b} \quad (5)$$

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

For more information on *k* factors, see *Use of* k *Factor for Estimating Run Times from Previously Established Run Conditions (*publication DS-719).

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 4).

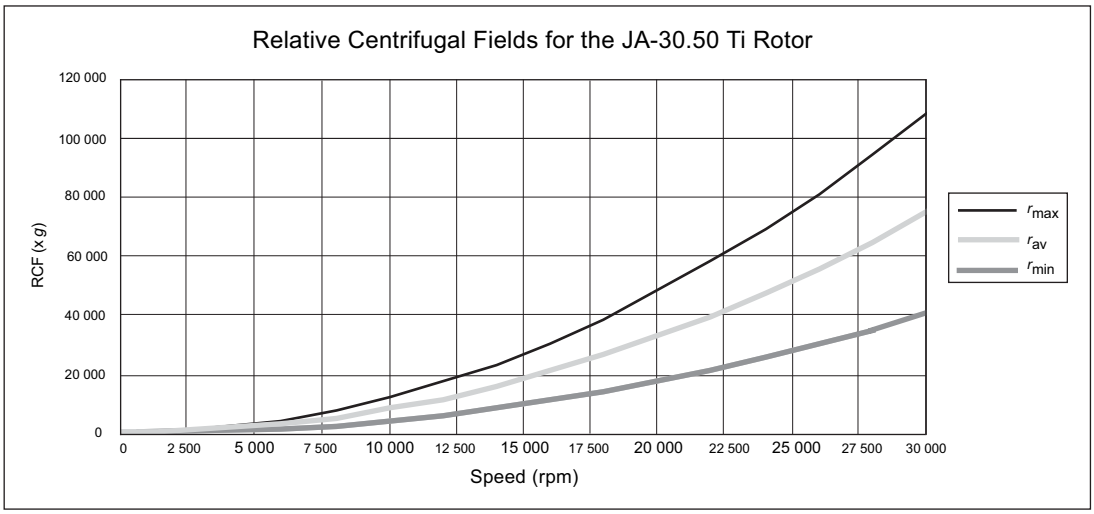
Do not select run speeds in excess of 30 000 rpm. When solutions more dense than 1.2 g/mL are centrifuged in this rotor, use equation (6) to calculate the reduced maximum allowable rotor speed.

$$\text{reduced maximum speed} = (30\,000) \sqrt{\frac{1.2 \text{ g/mL}}{\text{density of tube contents}}} \quad (6)$$

Table 4. Relative Centrifugal Fields for the JA-30.50 Ti Rotor.
Entries in this table are calculated from the formula
$RCF = 1.12\ r\ (RPM/1000)^2$
and then rounded to three significant digits.

Rotor Speed (rpm)	Relative Centrifugal Field (× *g*)		
	At r_{max} (108 mm)	At r_{av} (74 mm)	At r_{min} (40 mm)
30 000	108 860*	74 600	40 300
28 000	94 800	65 000	35 100
26 000	81 800	56 000	30 300
24 000	69 700	47 700	25 800
22 000	58 500	40 100	21 700
20 000	48 400	33 200	17 900
18 000	39 200	26 900	14 500
16 000	31 000	21 200	11 500
14 000	23 700	16 200	8 780
12 000	17 400	11 900	6 450
10 000	12 100	8 290	4 480
8 000	7 740	5 300	2 870
6 000	4 360	2 980	1 610
4 000	1 940	1 330	717
2 000	484	331	179

* 108 860 is the calculated r_{max} value (with no rounding applied).

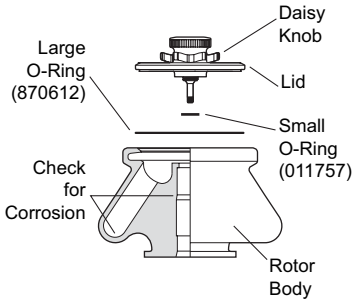


CARE AND MAINTENANCE

MAINTENANCE

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.



- Periodically (at least monthly) inspect the rotor, especially inside cavities, for rough spots or pitting, 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.
- 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.
- Regularly apply silicone vacuum grease to the O-rings. Replace O-rings about twice a year or whenever worn or damaged.

Refer to Appendix A in *Rotors and Tubes* for 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.

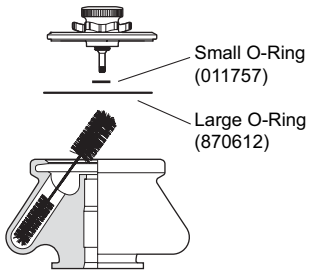
Under normal use, wash the rotor frequently (at least weekly) to prevent buildup of residues.

1. Remove the O-rings before washing.
2. Wash the rotor and lid in a mild detergent, such as Beckman Solution 555™, that won't damage the rotor. The Rotor Cleaning Kit (339558) contains two special plastic-coated brushes and two quarts of Solution 555 for use with rotors and accessories. Dilute the detergent 10 to 1 with water.

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.

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.

Periodically remove the O-rings and wipe clean as necessary. Clean the O-ring grooves with a cotton-tipped swab. 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),[1] and Radiacwash.[2]

NOTE

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

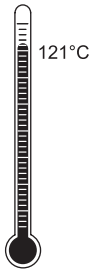
[1] In U.S., contact Nuclear Associates (New York); in Eastern Europe and Commonwealth States, contact Victoreen GmbH (Munich); in South Pacific, contact Gammasonics Pty. Ltd. (Australia); in Japan, contact Toyo Medic Co. Ltd. (Tokyo).

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

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, lid, and spacers in the autoclave upside down.

- Ethanol (70%)[3] 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.

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.

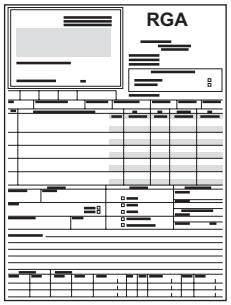
Refer to publication IN-192, included in each box of tubes or bottles, for tube and bottle sterilization and disinfection procedures.

STORAGE

When the rotor is not in use, store it 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.

[3] Flammability hazard. Do not use in or near operating centrifuges.

RETURNING A ROTOR



Before returning a rotor or accessory for any reason, prior permission (a Returned Goods Authorization form) must be obtained from Beckman Coulter, Inc. This RGA form, which may be obtained from your local Beckman Coulter sales office, should contain the following information:

- rotor 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 phone number of the person to be notified upon receipt of the rotor or accessory at the factory, and
- name and phone number of the person to be notified about repair costs, etc.

To protect our personnel, it is the customer's responsibility to ensure that the 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 RGA form when mailing the rotor and/or accessories to:

Beckman Coulter, Inc.
1050 Page Mill Road
Palo Alto, CA 94304

Attention: Returned Goods

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

SUPPLY LIST

For detailed information on ordering parts and supplies, call Beckman Coulter Sales (1-800-742-2345 in the United States) or your local Beckman Coulter office, or see the Beckman Coulter *High Performance, High Speed, High Capacity Rotors, Tubes & Accessories* catalog (BR-8102, available at www.beckmancoulter.com). For your convenience, a partial list is given below.

REPLACEMENT ROTOR PARTS

Rotor assembly, dual-locking lid	363420
Rotor assembly, single-locking lid	363421
Lid assembly, dual-locking	363424
Lid assembly, single-locking	363430
Tie-down assembly, single-locking lid	363431
Tie-down assembly, dual-locking lid	363426
Large lid O-ring	870612
Small lid O-ring	011757

SUPPLIES

Tubes, bottles, and adapters	see Table 3
Rotor Cleaning Kit	339558
Rotor removal tool	346965
Silicone vacuum grease (1 oz)	335148
Beckman Solution 555 (1 qt)	339555
Spinkote lubricant (2 oz)	306812

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 Palo Alto, California, 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.

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