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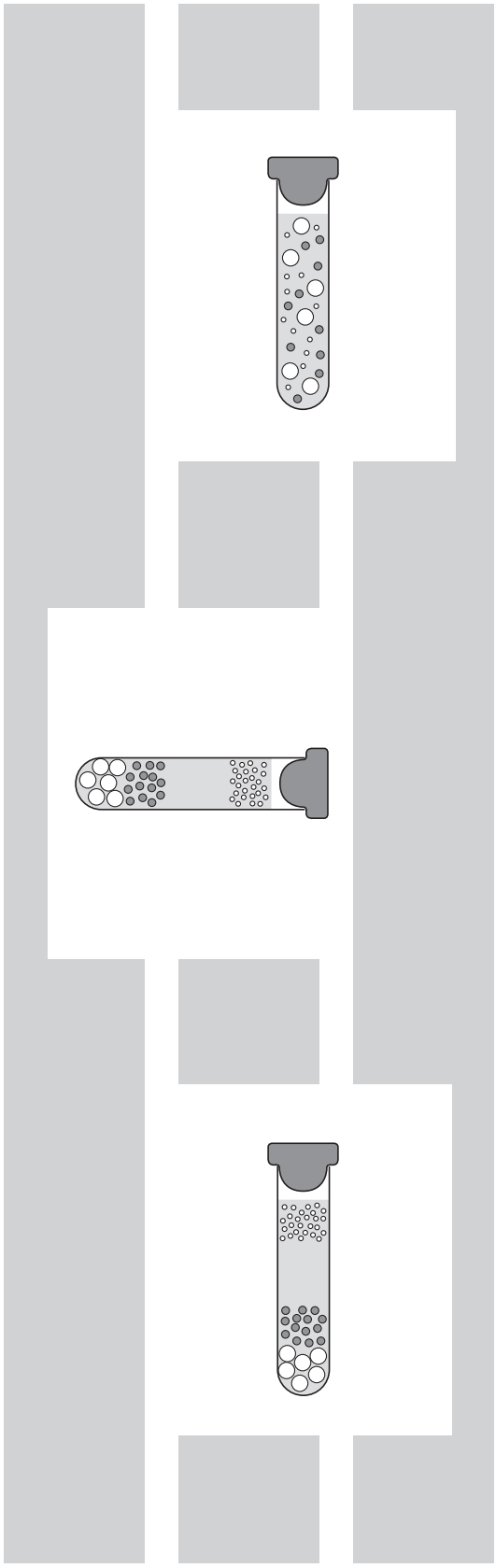
April 2014



# JS-7.5
# Swinging Bucket Rotor

## Used In Beckman Coulter J2, J6, and Avanti J Series Centrifuges

## Trademarks

## 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 of this publication, pay special attention to the 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 non-Beckman Coulter centrifuge 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. 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 JS-7.5 rotor, their safety in this rotor cannot be ascertained by Beckman Coulter. Use of other manufacturers' components or accessories in the JS-7.5 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.

Load all four buckets or multitube carriers, loaded or empty, into the rotor before every run. Make sure that filled containers are loaded symmetrically into the rotor and that opposing bottles or tubes are filled to the same level with liquid of the same density.

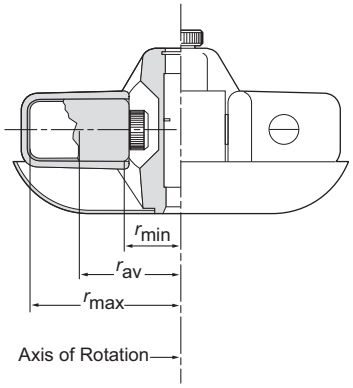
If disassembly reveals evidence of leakage, you should assume that some fluid escaped the rotor. Apply all appropriate safety and decontamination procedures to the centrifuge and accessories as required.

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.

# JS-7.5 SWINGING BUCKET ROTOR

## SPECIFICATIONS




| | |
|---|---|
| Maximum speed | 7 500 rpm |
| Critical speed range* | 600 to 800 rpm |
| Maximum solution density | 1.2 g/mL |
| Relative Centrifugal Field† at maximum speed | |
| using buckets ($r_{max}$ = 165 mm) | 10 400 × *g* |
| using 3 × 50-mL carriers ($r_{max}$ = 168 mm) | 10 580 × *g* |
| using 4 × 50-mL carriers ($r_{max}$ = 160 mm) | 10 080 × *g* |
| using 24 × 5-mL carriers ($r_{max}$ = 142 mm) | 8 950 × *g* |
| *k* factor at maximum speed (full tubes) | |
| in 250-mL buckets | 5 287 |
| in 3 × 50-mL multitube carriers | 4 140 |
| in 4 × 50-mL multitube carriers | 3 959 |
| in 24 × 5-mL multitube carriers | 2 818 |
| Number of buckets/carriers | 4 |
| Available tubes | see Tables 3 through 6 |
| Nominal bucket capacity | 200 mL |
| Nominal carrier capacity (4 × 50-mL carrier) | 800 mL |
| Nominal rotor capacity | 1 liter |
| Rotor weight, maximum sample mass | 10.9 kg (24 lb) |
| Approximate acceleration time to maximum speed | |
| (rotor fully loaded) in an Avanti J-25 centrifuge | 1 min |
| Approximate deceleration time from maximum speed | |
| (rotor fully loaded) in an Avanti J-25 centrifuge | 1 min |
| Approximate acceleration time to maximum speed | |
| (rotor fully loaded) in a J2 series centrifuge | 4 min |
| Approximate deceleration time from maximum speed | |
| (rotor fully loaded) in a J2 series centrifuge | 3 1/2 min |
| Rotor yoke material | aluminum, painted |
| Bucket and multitube carrier material | aluminum, anodized |
| Rotor entry code for | |
| microprocessor-controlled J2 and J6 series centrifuges | 7.5 |

* 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.

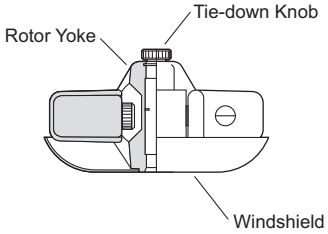
† Relative Centrifugal Field (RCF) is the ratio of the centrifugal acceleration at a specified radius and speed ($r\omega^2$) to the standard acceleration of gravity (*g*) according to the following formula:

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

where *r* is the radius in millimeters, $\omega$ is the angular velocity in radians per second (2 $\pi$RPM / 60), and *g* is the standard acceleration of gravity (9807 mm/s$^2$). After substitution:

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

# DESCRIPTION




*This rotor has been manufactured in a registered ISO 9001 or 13485 facility for use with the specified Beckman Coulter centrifuges.*

The JS-7.5 swinging bucket rotor (see Figure 1), rated for 7500 rpm, is designed to pellet cells and cell debris at moderate *g*-forces using round, conical, or flat-bottomed tubes or bottles in buckets or multitube carriers. The rotor will also run a variety of tubes in adapters. The JS-7.5 can also be used for density gradient separation, nucleic acid precipitations, and for RIA, where many small-volume samples are centrifuged.

The rotor is made of aluminum. The rotor yoke is painted; the buckets and multitube carriers are anodized for corrosion resistance. The tie-down knob secures the rotor to the centrifuge drive hub.

Pins in the rotor drive hole mate with grooves in the centrifuge drive hub (older model centrifuges), or with drive hub teeth (newer model centrifuges), to prevent the rotor from slipping during acceleration and deceleration.

The JS-7.5 rotor is warranted for 7 years (see the WARRANTY).


*Figure 1. The JS-7.5 Swinging Bucket Rotor and Accessories*

# PREPARATION AND USE

*Specific information about the JS-7.5 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 with this manual for complete rotor and accessory information.*

**NOTE**

Although rotor components and accessories made by other manufacturers may fit in the JS-7.5 rotor, their safety in this rotor cannot be ascertained by Beckman Coulter. Use of other manufacturers' components in the JS-7.5 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 at the front of this manual before using the rotor.*

1. Make sure that the rotor, buckets or carriers, and all tubes or bottles and accessories are clean and show no signs of corrosion or cracking.
2. Verify that the bottles or tubes being used are listed in Tables 3 through 6.
3. Check the chemical compatibilities of all materials used (refer to Appendix A in *Rotors and Tubes*, or to *Chemical Resistances*, publication IN-175).

## ROTOR PREPARATION

*For runs at other than room temperature, refrigerate or warm the rotor before the run for fast equilibration.*

### Tubes, Bottles, Buckets, and Multitube Carriers

1. When using tubes for the first time, check to make sure that their height does not interfere with the swing of the bucket or carrier to horizontal position. Place an empty tube or tubes in a bucket or carrier (in an adapter, if required), load the bucket or carrier into the rotor, and swing the bucket to a horizontal position. If the tops of the tubes touch the rotor body as the carrier swings, the tubes are too long and should not be used.

2. Place tubes or bottles that do not require adapters directly into the buckets or multitube carriers. Place tubes requiring adapters into the adapter and then place the adapter into the bucket or carrier. Arrange bottles or tubes in the buckets or carriers symmetrically and place similar buckets or carriers in opposite positions on the rotor yoke (see Figure 2). See pages 13 through 17 for information about tubes and bottles.

3. Place filled buckets or multitube carriers over the pivot pins[1] on the rotor yoke. Make sure that buckets or carriers are seated properly by gently swinging them on the pivot pins.

**CAUTION**

All four positions on the rotor yoke must contain a bucket or carrier during every run. *You can use four buckets, four carriers, or a combination of two buckets and two carriers of the same type, as long as you place like carriers opposite each other in the rotor.* Opposing loads must balance to within 10 grams.

- If you are running tubes with hinged caps, load them with the hinges facing the center of the carrier (see Figure 3). If the hinges extend over the edge of the carrier toward the rotor, they may contact the rotor yoke as the rotor swings to a horizontal position.

- The 250-mL buckets are sold in weight-matched sets of two, and each bucket's weight is marked on the top of the bucket. Keep matching sets of buckets together. Before each run, check that the buckets being used are of the same weight. Multitube carriers are not weight marked.

[1] U.S. Patent No. 5,681,258.

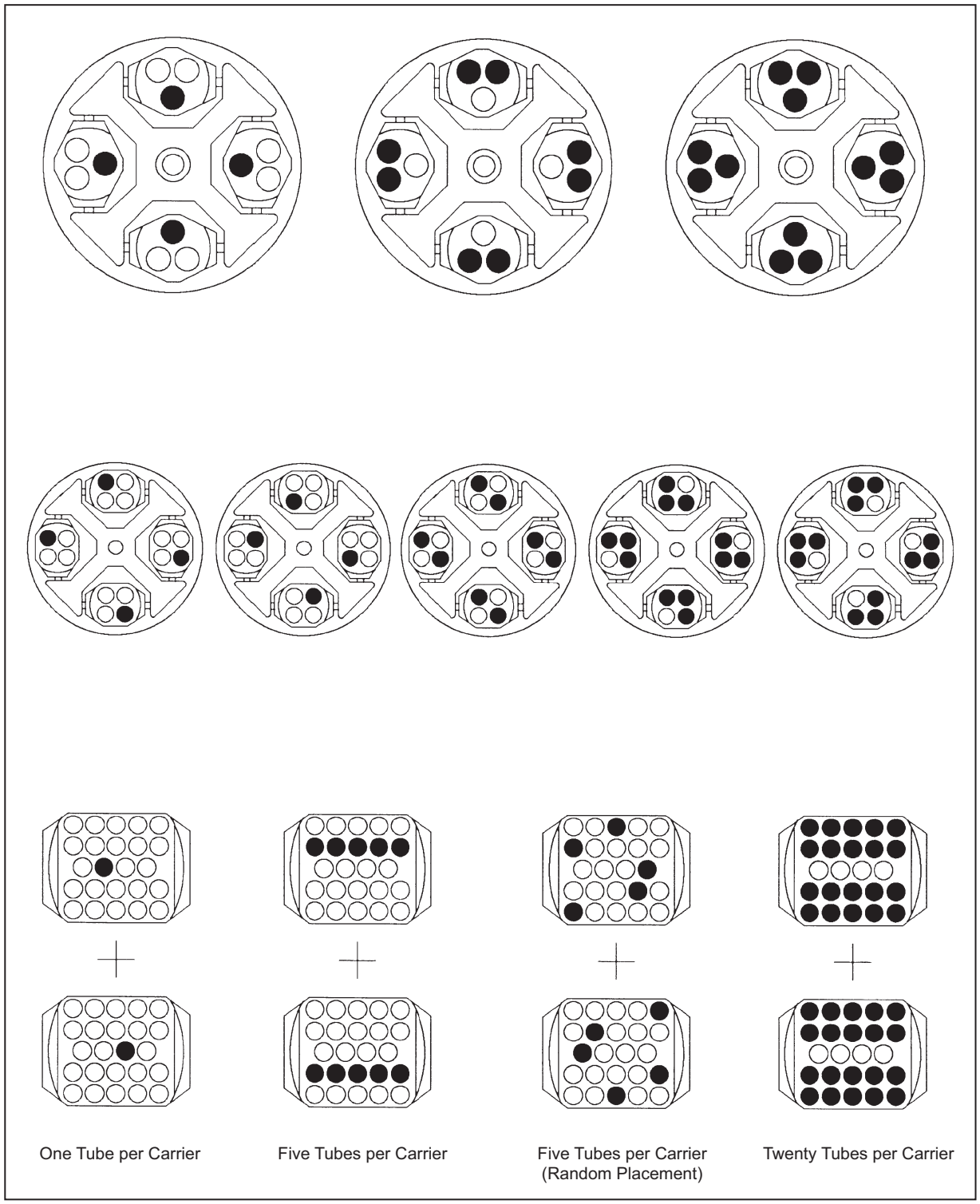



*Figure 2. Examples of Correctly Loaded Multitube Carriers. Contents of opposing carriers or buckets must be the same and each carrier or bucket must be balanced on its pivotal axis.*

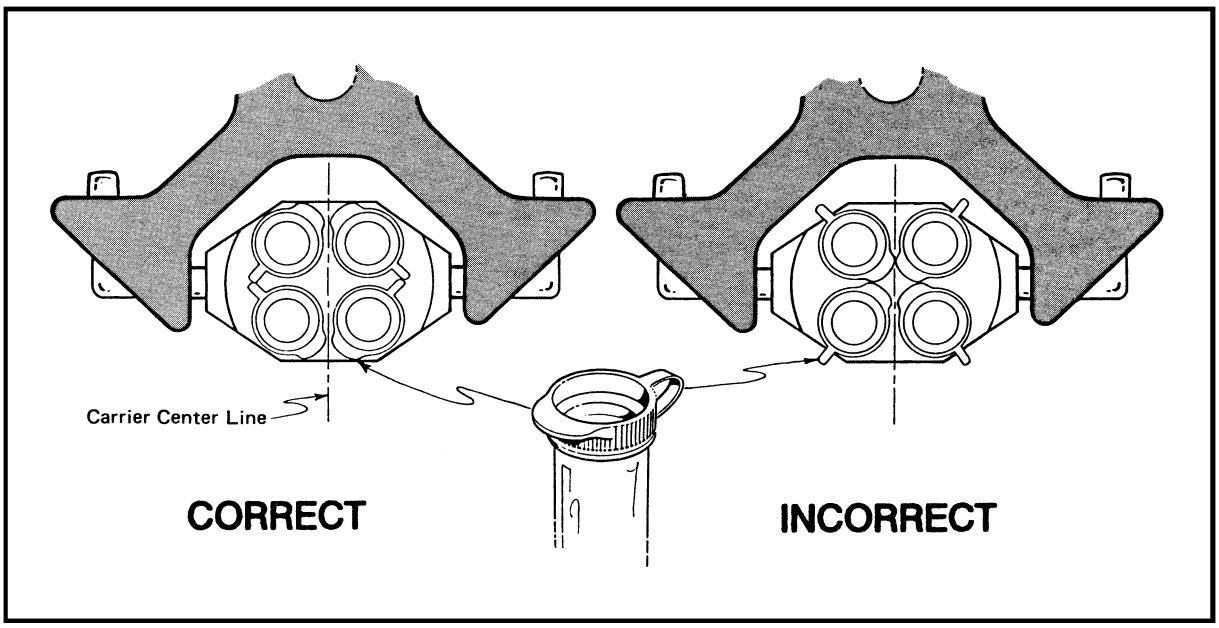
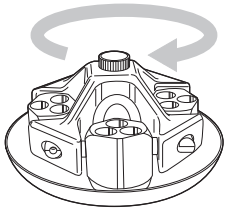



*Figure 3. Proper Loading of Tubes with Hinged Caps*

### Installing the Rotor Yoke



1. Be sure that the metal threads in the rotor drive hole are clean and lightly lubricated with Spinkote lubricant (306812).
2. Lower the rotor yoke straight down onto the centrifuge drive hub.
3. Tighten the tie-down knob to secure the rotor to the centrifuge drive hub.

## OPERATION

- 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 bottles or tubes.* It is strongly recommended that all containers carrying physiological fluids be capped, and not overfilled, to prevent leakage.

- If you are using an Avanti J series centrifuge, select the JS-7.5 rotor. If you are using a microprocessor-controlled J2 or J6 series centrifuge, enter rotor code 7.5. Refer to your centrifuge instruction manual for additional information.

- During a run, buckets and carriers swing 90 degrees from their at-rest position. The pivotal axis of a bucket or carrier can be imagined as a line extending across the bucket or carrier from one pivot pin to the other. If a bucket or carrier is loaded so that its weight is unequally distributed on either side of its pivotal axis it will not hang vertically at rest and, more importantly, will not swing to a horizontal position during a run (see Figure 4). As a result extra stress will be placed on the bucket, carrier, tubes and/or bottles, increasing the possibility of breakage or rotor imbalance.

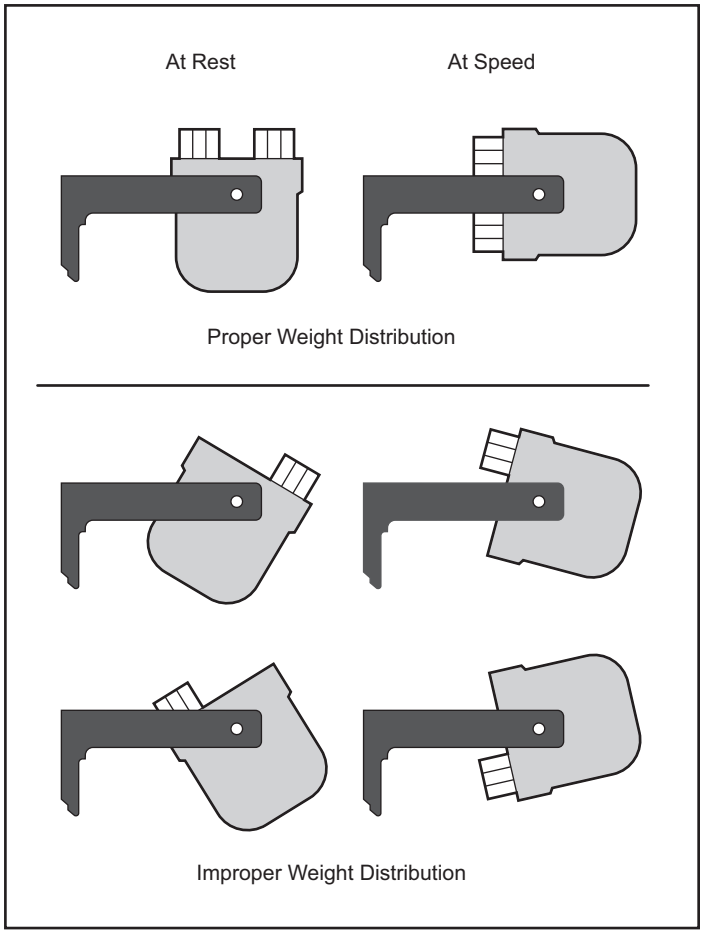
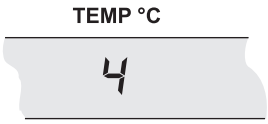



*Figure 4. Examples of the Effects on the Horizontal Swing of Buckets Caused by Proper and Improper Weight Distribution*

***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 JS-7.5 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 and J6 Series Centrifuges

Enter the required run temperature and the appropriate temperature compensation settings on the control panel following the instructions below. Table 1 provides compensation settings for centrifuge models J2-HS and J2-21. Table 2 provides compensation settings for the Model J2-HC. Temperature compensation values for other centrifuge models must be determined empirically. Table 1 values can be used as a starting point for testing.

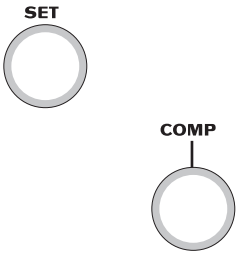
*Table 1. Temperature Compensation Settings for Centrifuge Models J2-HS and J2-21. Interpolate if intermediate values are required.*

| Rotor Speed (rpm) | Required Sample Temperature (°C) | | | | | | |
|---|---|---|---|---|---|---|---|
| | –20 | –10 | 2 | 5 | 10 | 20 | 40 |
| 7500 | –4 | –3 | +1 | +1 | +1 | +2 | +3 |
| 5000 | –2 | 0 | +3 | +3 | +3 | +3 | +4 |
| 2000 | 0 | +2 | +4 | +4 | +4 | +4 | +5 |

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

| Rotor Speed (rpm) | Required Sample Temperature (°C) | | | | | | |
|---|---|---|---|---|---|---|---|
| | –20 | –10 | 2 | 5 | 10 | 20 | 40 |
| 7500 | 0 | +2 | +3 | +3 | +4 | +4 | +4 |
| 5000 | 0 | +1 | +2 | +2 | +2 | +3 | +3 |
| 2000 | 0 | 0 | 0 | +1 | +1 | +2 | N |

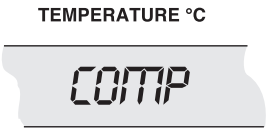
## Analog J2 and J6 Series Centrifuges




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

2. For models J2-HS, JS-21, and J2-HC, find the compensation value in Table 1 or 2 that corresponds to the required temperature and run speed. Set the COMP dial to that setting. Temperature compensation settings for other centrifuge models must be determined empirically.

## Microprocessor-Controlled J2 and J6 Series Centrifuges




Temperature compensation values for these centrifuge models must be determined empirically.

Enter rotor code 7.5, 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. Press [**COM ADJ**]. The word “COMP” flashes below the TEMPERATURE display and the display flashes.

3. 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.

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

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

**NOTE**

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

## 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. 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.*

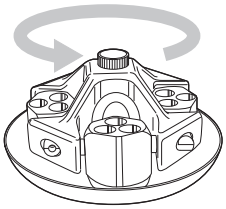
**NOTE**

Line voltage fluctuations can cause variations in acceleration and deceleration times.

## REMOVAL AND SAMPLE RECOVERY

**CAUTION**

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



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.
2. Use both hands to lift the rotor straight up off the drive hub.
3. Place the rotor on a counter or bench top under a safety hood (if required).

**NOTE**

Lubricating the centrifuge drive hub with Spinkote should prevent the rotor from sticking in J2 series centrifuges. In Avanti J series centrifuges, the drive hubs do not need lubrication because Delrin rings on the hubs prevent sticking.

## BOTTLES AND TUBES

The JS-7.5 rotor uses the bottles and tubes listed in Tables 3 through 6. Be sure to use only those items listed and observe the maximum fill volumes and speed limits shown. (Maximum fill volume is the maximum amount of fluid that can be centrifuged in the listed container.) To minimize the possibility of leakage from capped tubes or bottles, load tubes or bottles with sample, secure the caps, and precool the loaded, sealed labware to run temperature before beginning the run.

Refer to Appendix A in *Rotors and Tubes* for information on the chemical resistances of tube and accessory materials.

*Table 3. Available Bottles and Tubes for the JS-7.5 Rotor with 250-mL Buckets. Use only the items listed here and observe fill volumes and maximum run speeds.*

| Tube | | Part Number | Max. Fill Volume (mL) (approx) | Required Accessory | | | Max Speed |
|---|---|---|---|---|---|---|---|
| Dimensions and Volume | Description | | | Description | Part Number | Tubes per Adapter | |
| 62 × 136 mm 250 mL | polycarbonate, capped | 355673 | 250 | none | — | — | 7 500 |
| 62 × 120 mm 250 mL | polycarbonate, wide mouth | 356013 | 250 | none | — | — | 7 500 |
| 62 × 120 mm 250 mL | polypropylene, wide mouth | 356011 | 250 | none | — | — | 7 500 |
| 62 × 141 mm 230 mL | polycarbonate, conical | 356987 | 230 | adapter | 356983 | 1 | 7 500 |
| 62 × 141 mm 230 mL | polypropylene, conical | 356989 | 230 | adapter | 356983 | 1 | 7 500 |
| 29 × 104 mm 50 mL | polycarbonate, capped | 357000 | 45 | adapter | 356997 | 1 | 7 500 |
| 29 × 104 mm 50 mL | polycarbonate, snap-on cap | 363664 | 45 | adapter | 356997 | 1 | 7 500 |
| 29 × 104 mm 50 mL | polypropylene, snap-on cap | 357005 | 45 | adapter | 356997 | 1 | 7 500 |
| 29 × 104 mm 50 mL | polycarbonate, screw cap | 357002 | 45 | adapter | 356997 | 1 | 7 500 |
| 29 × 104 mm 50 mL | polypropylene, screw cap | 357003 | 45 | adapter | 356997 | 1 | 7 500 |
| 29 × 104 mm 50 mL | polypropylene, graduated | 357007 | 45 | adapter | 356966 | 1 | 7 500 |
| 30 × 115 mm 50 mL | conical tube | * | 50 | adapter | 356966 | 1 | 7 500 |
| 17 × 120 mm 15 mL | conical tube | * | 15 | adapter | 356964 | 4 | 7 500 |
| 14 × 55 mm 4 mL | polypropylene biovials | 366353 | 4 | adapter | 342098† | 9 | 7 500 |

* Conical tubes from a number of manufacturers may be used with this adapter. Because Beckman Coulter cannot test all manufacturers' tubes with respect to their ability to withstand the *g*-forces generated by this rotor, it is highly recommended that you pretest any other manufacturer's tubes in this adapter using water samples.

† Adapter 342098 can be double-stacked to increase rotor capacity.

*Table 4. Tube Specifications for the JS-7.5 Rotor with 3 ×50-mL Conical Multitube Carrier*

| Part Number | Material Description | Nominal Volume per Tube (mL) | Nominal Tube Dimensions (mm) | Operating Temperature Range (°C) |
|---|---|---|---|---|
| * | plastic, conical (with screw cap) | 50 | 29 × 103 | 2 to 40 |

*Commercially available; observe manufacturer's speed guidelines.

## Buckets, Multitube Carriers, and Accessories

Four different carriers are available for use with the JS-7.5 rotor. The 250-mL bucket holds 250-mL bottles or, with adapters, a variety of smaller tubes (see Table 3).

*Table 5. Available Tubes for the JS-7.5 Rotor with 4 ×50-mL Round-Bottom Multitube Carrier*

| Tube | | Part Number | Max Fill Volume (mL) (approx) | Required Adapter | Max. Speed (rpm) |
|---|---|---|---|---|---|
| Dimensions and Volume | Description | | | | |
| 29 × 104 mm 50 mL | polycarbonate, screw cap | 357002 | 50 | none | 7 500 |
| 29 × 104 mm 50 mL | polypropylene, screw cap | 357003 | 50 | none | 7 500 |
| 29 × 104 mm 50 mL | polycarbonate, snap-on cap* | 363664 | 50 | none | 7 500 |
| 29 × 104 mm 50 mL | polypropylene, snap-on cap* | 357005 | 50 | none | 7 500 |
| 29 × 104 mm 50 mL | polycarbonate, uncapped | 363647 | 50 | none | 7 500 |
| 29 × 104 mm 50 mL | polypropylene, uncapped | 357007 | 50 | none | 7 500 |
| 25 × 105 mm 30 mL | glass | † | 30 | 870331 | † |
| 16 × 100 mm 15 mL | glass | † | 15 | 870329 | † |

* See Figure 3 for instructions on positioning these tubes in the carrier.

† Commercially available; observe manufacturer's speed guidelines.

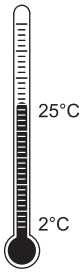
*Table 6. Available Tubes for the JS-7.5 Rotor with 24 × 5-mL Round-Bottom Multitube Carrier*

| Tube | | Max Fill Volume (mL) (approx) | Maximum Speed |
|---|---|---|---|
| Dimensions and Volume | Description | | |
| 12 × 75 mm 5 mL | polypropylene* | 5 | 7 500 |
| 12 × 75 mm 5 mL | polystyrene* | 5 | 5 000 |
| 12 × 75 mm 5 mL | glass borosilicate† | 5 | 6 000 |

*Manufactured by Falcon.

†Manufactured by Baxter.

Three different multitube carriers are also available. The 3 × 50-mL carrier holds from one to three conical 50-mL tubes (see Table 4), providing a total capacity of 600 mL. The 4 × 50-mL carrier holds from one to four round-bottom 50-mL tubes (see Table 5), providing a total capacity of 800 mL. The 24 × 5-mL carrier holds from one to twenty-four 5-mL tubes (see Table 6), providing a total rotor capacity of 480 mL. No adapters are needed with the multitube carriers; however, adapters can be used with the 4 × 50-mL multitube carrier (see Table 5).




## 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 before centrifugation.

### Thickwall Tubes

Thickwall 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; be sure to note the fill volumes and run speeds shown in Tables 3 through 6.

### Polycarbonate and Polypropylene Tubes

Capped polycarbonate or polypropylene tubes may be centrifuged completely or partially filled (not less than half full). Again, all opposing containers for a run must be filled to the same level.

## RUN TIMES


The *k* factor is a measure of a rotor's pelleting efficiency. Beckman Coulter has calculated the *k* factor for all of its rotors, at maximum speed with full bottles or 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*).

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

For centrifugation below maximum speed, estimate the run time required by adjusting the *k* factor as follows:

$$k_{adj} = k \left( \frac{7500}{\text{actual run speed}} \right)^2 \quad (4)$$

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* (Beckman publication DS-719).

## RUN SPEEDS

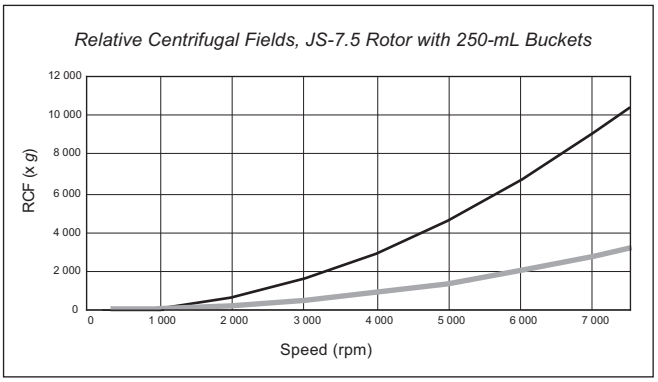

The centrifugal force at a given radius in a rotor is a function of run speed. Comparisons of forces between different rotors are made by comparing the rotors' relative centrifugal fields (RCF). When rotational speed is adjusted so that identical samples are subjected to the same RCF in two different rotors, the samples are subjected to the same force (see Table 7). The RCF at a number of rotor speeds is provided in Table 7.

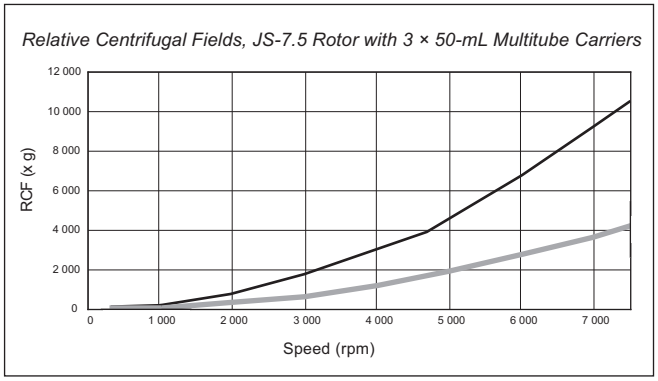
*Do not select rotational speeds higher than the maximums you have determined to be appropriate for your protocols (in no case above 7500 rpm or above the limit shown in Tables 3 through 6).* When solutions more dense than 1.2 g/mL are centrifuged in this rotor, use equation (6) to calculate the reduced maximum allowable speed.

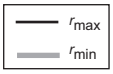
$$\text{reduced maximum speed} = (7500 \text{ rpm}) \sqrt{\frac{1.2 \text{ g/mL}}{\text{density of tube contents}}} \quad (6)$$

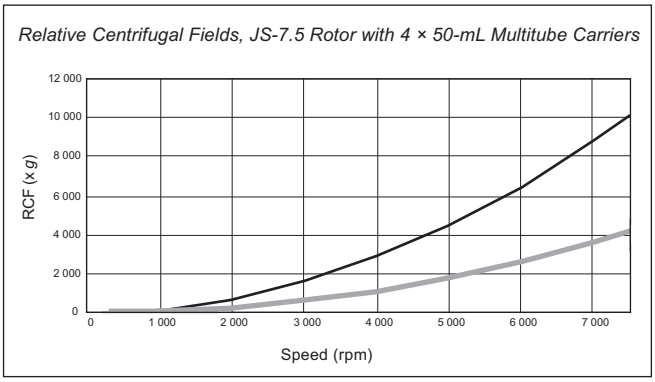
*Table 7. Relative Centrifugal Fields for the JS-7.5 Rotor.*
*Entries in this table are calculated from the formula*
*$RCF = 1.12r\,(RPM/1000)^2$ and are then rounded to three significant digits.*

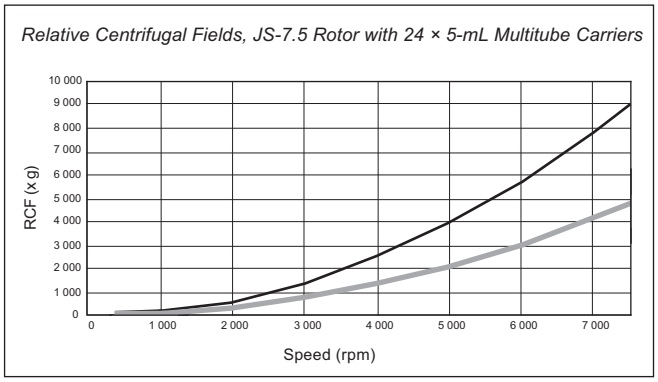
| Rotor Speed (rpm) | Relative Centrifugal Field (× *g*) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | In 250-mL Buckets | | In 3 × 50-mL Multitube Carriers | | In 4 × 50-mL Multitube Carriers | | In 24 × 5-mL Multitube Carriers | |
| | At $r_{max}$ (165 mm) | At $r_{min}$ (51 mm) | At $r_{max}$ (168 mm) | At $r_{min}$ (67 mm) | At $r_{max}$ (160 mm) | At $r_{min}$ (66 mm) | At $r_{max}$ (142 mm) | At $r_{min}$ (76 mm) |
| 7 500 | 10 400 | 3 210 | 10 580 | 4 220 | 10 080 | 4 160 | 8 950 | 4 790 |
| 7 000 | 9 060 | 2 800 | 9 220 | 3 680 | 8 780 | 3 620 | 7 790 | 4 170 |
| 6 000 | 6 650 | 2 060 | 6 770 | 2 700 | 6 450 | 2 660 | 5 730 | 3 060 |
| 5 000 | 4 620 | 1 430 | 4 700 | 1 880 | 4 480 | 1 850 | 3 980 | 2 130 |
| 4 000 | 2 960 | 913 | 3 010 | 1 200 | 2 870 | 1 180 | 2 540 | 1 360 |
| 3 000 | 1 660 | 514 | 1 690 | 675 | 1 610 | 665 | 1 430 | 766 |
| 2 000 | 739 | 228 | 753 | 300 | 717 | 296 | 636 | 340 |
| 1 000 | 184 | 57 | 188 | 75 | 179 | 74 | 159 | 85 |



# CARE AND MAINTENANCE

## INSPECTION

- Periodically (at least monthly) inspect the rotor components for rough spots or pitting, white powder deposits—frequently aluminum oxide—or heavy discoloration. If any of these signs are evident, do not use the rotor. Contact your Beckman Coulter representative for information about the Field Rotor Inspection Program (FRIP) and the rotor repair center.
- 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. If the drive pins appear damaged, contact Beckman Coulter Field Service.

## MAINTENANCE

- Routinely apply a light coat of Spinkote lubricant to the centrifuge drive hub (J2 and J6 series centrifuges only) and to the rotor drive hole to prevent the rotor from sticking. Lubricate the lid knob threads before each use.
- Do not use sharp tools on the rotor, as they can scratch the anodized surface. Corrosion begins in scratches and may open fissures in the metal with continued use.
- The four polyethylene stabilizing feet (816952) on the bottom of the rotor can be replaced if they become worn or damaged. Part number 816952 consists of one foot only; to replace all four feet, order four. The original screws can be reused if they are in good condition. If the screws need to be replaced, use four standard $^{10}/_{32}$-in. $\times$ $^{5}/_{8}$-in. screws.

Refer to Appendix A in *Rotors and Tubes* for the chemical resistances of rotor and tube 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. If the rotor is left in the centrifuge for long periods of time, remove the rotor from the centrifuge at least once a month for cleaning and lubrication.

1. Wash all rotor components, using a mild detergent such as Beckman Solution 555 (339555). The Rotor Cleaning Kit (339558) contains two 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 the rotor components or accessories in a dishwasher. Do not soak components in detergent solution for long periods of time, such as overnight.

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

3. Air-dry the rotor upside down. *Do not use acetone to dry the rotor.*

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.

## DECONTAMINATION

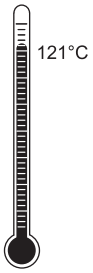
If the rotor (and/or accessories) becomes contaminated with radioactive material, decontaminate it using a solution that will not damage the anodized surfaces. Beckman Coulter has tested a number of solutions and found several that do not harm anodized aluminum: RadCon Surface Spray or IsoClean Solution (for soaking),[2] and Radiacwash.[3]

[2] In U.S.A., contact Nuclear Associated (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).
[3] In U.S.A., contact Biodex Medical Systems (Shirley, NY); internationally, contact the U.S. office to find the dealer nearest you.

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.

If the rotor or other components are contaminated with toxic or pathogenic materials, follow appropriate decontamination procedures as outlined by your laboratory safety officer. Refer to *Rotors and Tubes* to evaluate your rotor's ability to withstand a given chemical solution.

## STERILIZATION AND DISINFECTION




- The rotor and all rotor components can be autoclaved at 121°C for up to one hour. Place the rotor in the autoclave upside down, with the lid removed.
- Ethanol (70%)[4] may be used on all rotor components. Refer to Appendix A in *Rotors and Tubes* for other chemical resistances of tubes, bottles, and accessories.

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

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

## TUBE BREAKAGE

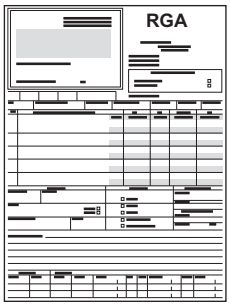
If a glass bottle or tube breaks, remove the glass very carefully from the rotor and/or adapter. Imbedded glass particles that remain in the rotor cavities or adapters can cause tube failure during subsequent runs. Clean the rotor thoroughly *immediately* following a bottle or tube breakage.

## STORAGE

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

[4] 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.

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

# SUPPLY LIST

**NOTE**

Publications referenced in this manual can be obtained by calling Beckman Coulter at 1-800-742-2345 in the United States, or by contacting your local Beckman Coulter office.

Contact 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.beckman-coulter.com) for detailed information on ordering parts and supplies. For your convenience, a partial list is given below.

## REPLACEMENT ROTOR PARTS

| | |
|---|---|
| JS-7.5 rotor assembly | 336380 |
| JS-7.5 rotor (yoke only) | 362212 |
| Polyethylene rotor foot (1) | 816952 |
| 250-mL buckets (set of 2) | 362216 |
| 3 × 50-mL conical multitube carriers (set of 2) | 362213 |
| 4 × 50-mL round-bottom multitube carriers (set of 2) | 362214 |
| 24 × 5-mL round-bottom multitube carriers (set of 2) | 362215 |
| Retaining ring for rotor knob shaft | 885367 |
| Tie-down kit | 364920 |

## SUPPLIES

| | |
|---|---|
| Bottles, tubes, and adapters | see Tables 3 through 6 |
| Rotor Cleaning Kit | 339558 |
| Silicone vacuum grease (1 oz) | 335148 |
| Solution 555 (1 qt) | 339555 |
| Spinkote lubricant (2 oz) | 306812 |

# J SERIES SWINGING BUCKET 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 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 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 will pay all transportation charges.

A defective rotor will be replaced by Beckman Coulter 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 Coulter 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 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.

4. Each bucket or carrier, whether purchased with a rotor assembly or purchased separately, is covered by this warranty for seven (7) years from the date of purchase, and will be replaced or repaired during such period according to the terms and conditions of this warranty. The date of manufacture marked on the bucket may be earlier than the date of purchase, and the expiration date marked on the bucket, which is seven (7) years after the date of purchase, may be correspondingly offset.

5. Buckets or carriers should not be used after the expiration date marked on the bucket or carrier. If at the time of purchase the marked expiration date is less than 7 years from the date of purchase, the expiration date becomes the date of purchase plus seven (7) years. Use of a bucket or carrier after such expiration date voids Beckman Coulter's warranty obligations with respect to any rotor and/or centrifuge in which such a bucket is used.

## 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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