J-TB-046AB
January 2016

Instructions for Using the 4 × 50 mL Round-Bottom Multitube Carrier

in the JS-7.5 Swinging Bucket Rotor

Table 1 Specifications

Maximum Speed	7500 rpm
Relative Centrifugal Field[a] at maximum speed. At r_{max} (160 mm) At r_{av} (113 mm) At r_{min} (66 mm)	 10 080 × g 7119 × g 4158 × g
k factor (at r_{max})	3959
Carrier capacity	4 tubes
Tube capacity	50 mL
Rotor capacity	16 tubes/800 mL
Maximum solution density	1.2 g/mL
Maximum allowable imbalance of opposing loads[b]	10 grams
Maximum accel time	4 min
Maximum decel time	2 min
Overspeed protection	windage
Rotor material	anodized aluminum
Carrier weight (unloaded)	approx. 1.5 lb (692 ± 5.0 g)
Rotor Weight with 4 carriers installed	approx. 24 lb (10.9 kg)

a. 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 anglar velocity in radians per second (2π RPM/60), and g is the standard acceleration of gravity (9807 mm/s^2). After substitution:

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

b. Opposing loads include multitube carriers plus tubes and sample

Description

The 4 × 50 mL Round-Bottom Multitube Carrier is one of several containers used in the Beckman JS-7.5 Swinging Bucket Rotor. Each 4 × 50 mL carrier holds from one to four 50 mL tubes, and one carrier is placed in each of the four positions on the JS-7.5 rotor yoke, for a total rotor capacity of 800 mL of liquid. You may also run two 4 × 50 mL carriers and two 3 × 50 mL carriers for a total rotor capacity of 700 mL, or two 4 × 50 mL carriers and two 250 mL buckets, for a capacity of 900 mL.

Multitube carriers can be used for general-purpose pelleting (especially of cells), as well as nucleic acid precipitations and isolation of mononuclear cells using Ficoll-Paque.

A total of four carriers and/or buckets are required for a complete rotor assembly. The carriers are made of anodized aluminum and are sold in weight-matched sets of two.

Tubes, Bottles, and Adapters

Tubes and bottles that may be used in the 4 × 50 mL Multitube Carrier are listed in Table 2. Be sure to observe the maximum rotor speed limits and fill volumes shown. Adapters are required only when tubes smaller than 50 mL are used.

Table 2 Tubes, Bottles, and Adapters for the 4 x 50 mL Round-Bottom Multitube Carrier

Part Numbers	Description	Nominal Volume per Tube (mL)	Max. Fill[a] Volume per tube 9 mL (approx.)	Maximum Speed	Tube Size (mm)	PE Adapter(s) Required
357002	PC, screw-capped	50	50	7 500	29 x 104	none
357003	PA, screw-capped	50	50	7 500	-	none
357004	PC, snap-capped[b]	50	50	7 500	-	none
357005	PP, snap-capped[b]	50	50	7 500	-	none
357006	PC, uncapped	50	50	7 500	-	none
357007	PP, uncapped	50	50	7 500	-	none

Table 2 Tubes, Bottles, and Adapters for the 4 x 50 mL Round-Bottom Multitube Carrier *(Continued)*

Part Numbers	Description	Nominal Volume per Tube (mL)	Max. Fill[a] Volume per tube 9 mL (approx.)	Maximum Speed	Tube Size (mm)	PE Adapter(s) Required
335431	C	30	30	7 500	25 x 105	870331
335430	C	15	15	7 500	17 x 100	870329
335432	P	15	15	5 500	16 x 100	870329
[c]	Glass	30	30	[c]	25 x 105	870329
[c]	Glass	15	15	[c]	16 x 100	870331

PA = Polyallomer; PC = Polycarbonate; PE = Polyethylene; PP = Polypropylene; C = Corex (do not run below 4° C); P = Pyrex.

a. containers may be filled less than or equal to these volumes; above 20°C fill polypropylene tubes at least half full.
b. See *Loading Patterns* for instructions on positioning these tubes in the carrier.
c. Commercially available; observe manufacturer's special guidelines.

⚠ CAUTION

Do not use 50 mL glass tubes in the carrier. If a glass tube should break, the glass could damage the anodized carrier surface.

Because the strength of tubes can vary from lot to lot, and will depend on handling and usage, Beckman Coulter highly recommends that you pretest all tubes in the carrier (in the JS-7.5 rotor) using water samples to determine optimal operating conditions. The temperature range for all tubes used in this carrier is from 2 to 25°C.

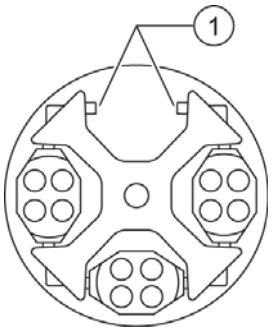
Installing The Carriers On The Rotor Yoke

Place carriers over the stainless steel pivot pins on the rotor yoke, as shown in Figure 1. Make sure they are seated properly by gently swinging them on the pivot pins. Note that the engraved surface of the carrier should face the outside. If you are running the 4 × 50 mL carriers with other carriers or buckets, place the containers opposite each other on the yoke (see Figure 2). Check the weight marked on the side of each bucket to make sure you are installing a matching set. *Always place identical carriers or buckets in opposing positions*.

⚠ CAUTION

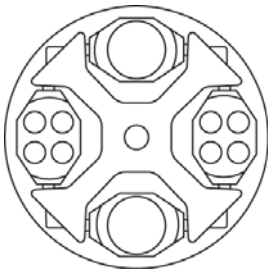
Risk of equipment damage. All four positions on the rotor yoke must contain either a carrier or a bucket during a run. Never run the rotor with only two positions filled.

Figure 1 Installing Multitube Carriers on the Rotor Yoke



1. Stainless Steel Pins

Figure 2 Two Multitube Carriers and Two 250 mL Buckets Loaded on Rotor Yoke



Loading the Carrier

Working with Physiological Fluids

⚠ WARNING

Risk of contamination. 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) viruses, HIV (I-V), atypical mycobacteria, and certain systemic fungi — further emphasize the need for aerosol protection.

Take appropriate safety precautions when handling toxic, pathogenic, or other hazardous materials.

When working with potentially hazardous materials, always fill or open containers in an appropriate hood or biological safety cabinet. Use capped tubes only; they are designed to provide

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

Ask your laboratory safety officer to advise you about the level of containment required for your application and about the proper decontamination or sterilization procedures to follow in the event that fluids should escape from containers.

Loading Patterns

Each carrier can run, one, two, three, or four tubes. For runs using fewer than four tubes, follow the symmetrical loading patterns shown in Figure 3, Figure 4, and Figure 5. When tubes are loaded correctly, opposing tubes can be connected by an imaginary straight line through the center of the rotor yoke. Be sure that opposing loads — carriers plus tubes and sample — balance to within 10 grams of each other. Tubes may be loaded into the carrier before or after the carrier is loaded in the rotor.

Be sure to cap tubes, if appropriate. Tubes with hinged caps must be loaded with the tab toward the center, as shown in Figure 6.

Figure 3 *Loading 1 tube per carrier (possible opposing carrier configurations)*

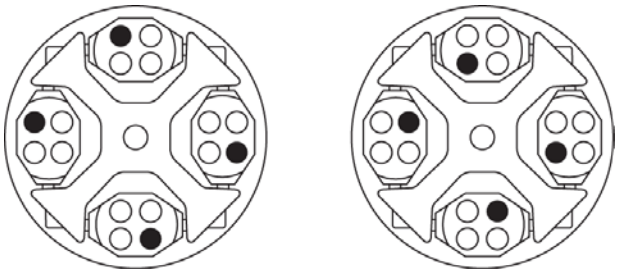


Figure 4 *Loading 2 tubes per carrier (possible opposing carrier configurations)*

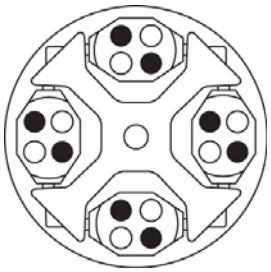


Figure 5 *Loading 3 tubes per carrier (possible opposing carrier configurations)*

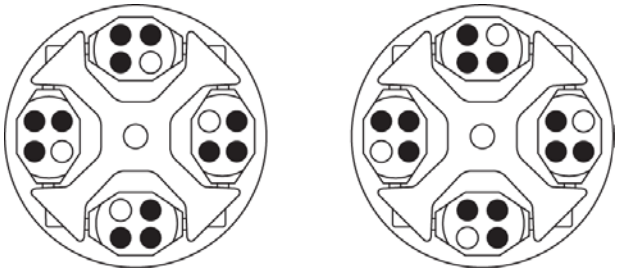
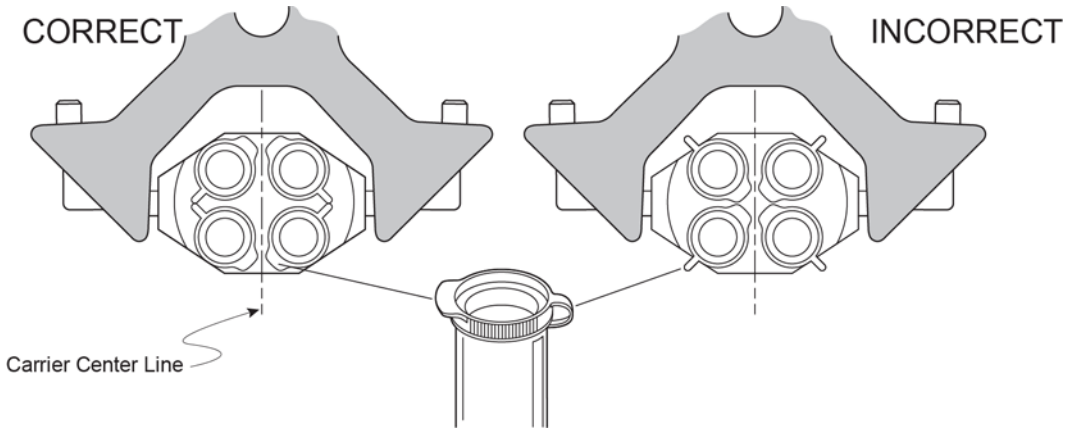


Figure 6 Proper Loading of Tubes with Hinged Caps



Operation

For complete rotor operating instructions, consult *Instructions for Using the JS-7.5 Swinging Bucket Rotor in Beckman J2-21 and J-6 Series Centrifuges* (J-TB-007). Consult the appropriate instrument instruction manual for centrifuge operation.

Care and Maintenance

Maintenance

Handle the carriers carefully. Do not use sharp tools on carriers since corrosion begins in scratches and may open fissures in the metal with increased use. Follow the instructions below for cleaning and sterilizing the carriers.

Periodically inspect the carriers, especially inside the cavities, for rough spots, pitting, white powder deposits — frequently aluminum oxide — or heavy discoloration. If any of these signs are evident, do not use the carrier. Show it to your Beckman Coulter Field Service representative, who provides contact with both the Field Rotor Inspection Program and with a rotor repair program.

Cleaning

Under normal use, the carriers should be cleaned at least once a week. Using a mild detergent such as Solution 555, diluted 5 or 10 to 1 with water, wipe them with a soft brush or cloth or immerse them in detergent solution and then rinse in distilled water. Place the carriers upside down on an open rack and allow to air-dry. The Rotor Cleaning Kit (see the *Supply List*) contains two quarts of Solution 555 and brushes that will not scratch the carriers.

Clean carriers immediately after use if you have run salt solutions or other corrosive materials, or if spillage has occurred. Do not allow corrosive solutions to dry on the carriers.

NOTE Do not wash the carriers in a dishwasher. Do not use acetone to dry the carriers.

Decontamination

If the anodized aluminum carrier 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: RAD-CON,* and Radiacwash.†

Beckman Coulter does not warrant the performance of these products with respect to their effect on the carriers or their ability to decontaminate them.

If the carriers are contaminated with toxic or pathogenic materials, follow appropriate decontamination procedures as outlined by your laboratory safety officer.

Sterilization and Disinfection

The carriers can be autoclaved at 121°C for up to an hour; place them in the autoclave upside down. Ethanol (70%)‡ may also be used.

While Beckman Coulter, Inc. 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 regarding proper methods to use.

Returning a Carrier

Before returning a carrier for any reason, prior permission (a Returned Goods Authorization form) must be obtained from Beckman Coulter, Inc.

This RGA form may be obtained from Beckman Coulter, Inc. It should contain the following information:

- six-digit part number and date of manufacturer (both are engraved on carrier)
- 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 carrier at the factory, and
- name and phone number of the person to be notified about repair costs, etc.

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* Nuclear Associates, Carle Place, New York 11514

† Atomic Products Corp., Center Moriches, New York 11934

‡ Flammability hazard. Do not use in or near operating centrifuges.

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.

4 × 50 mL Round-Bottom Multitube Carriers (set of 2) 362214
3 ×50 mL Conical Multitube Carriers (set of 2) 362213
250-mL Buckets (set of 2) 362216
JS-7.5 Rotor (without carriers or buckets) 362212
Rotor Cleaning Kit 339558
Solution 555 339555
Tubes, Bottles, and Accessories ..... See Table 2

Special J2-21 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 J2-21 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.
4. Rotor bucket sets purchased concurrently with or subsequent to the purchase of a swinging bucket rotor are warranted only for term coextensive with that of the rotor for which the bucket sets were purchased.

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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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.

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