

TS-5.1-500 Rotor



**Used in the Beckman Coulter
Allegra 25R and TJ-25 Centrifuges**



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.



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.



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.



Although rotor components and accessories made by other manufacturers may fit in the TS-5.1-500 rotor, their safety in this rotor cannot be ascertained by Beckman Coulter. Use of other manufacturers' components or accessories in the TS-5.1-500 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.



Hook all four buckets or microplate carriers, loaded or empty, to the rotor for every run. Make sure that filled containers are loaded symmetrically into the rotor and that opposing containers are filled to the same level with liquid of the same density.



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 ultracentrifuge.



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



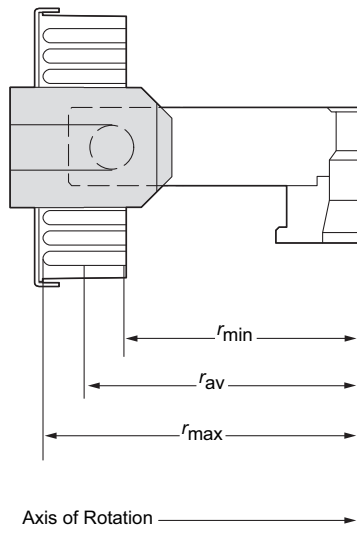
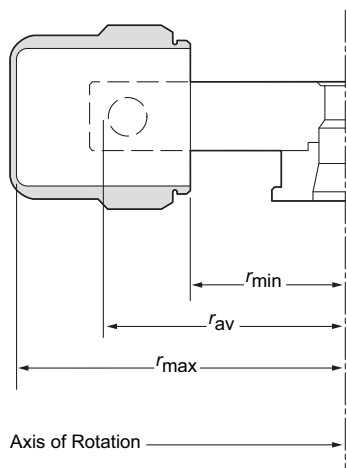
Never exceed the maximum rated speed of the rotor and labware in use. Refer to the section on RUN SPEEDS, and derate the run speed as appropriate.



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

TS-5.1-500 ROTOR

SPECIFICATIONS



Maximum speed (buckets)	5 100 rpm
Maximum speed (microplate carriers)	4 100 rpm
Critical speed range*	500 to 700 rpm
Density rating at maximum speed	1.2 g/mL
Relative Centrifugal Field [†] at maximum speed (buckets)	
At r_{max} (190.0 mm)	5 530 × <i>g</i>
At r_{av} (138.5 mm)	4 030 × <i>g</i>
At r_{min} (87.0 mm)	2 530 × <i>g</i>
Relative Centrifugal Field at maximum speed (microplate carriers)	
At r_{max} (160.0 mm)	3 010 × <i>g</i>
At r_{av} (136.5 mm)	2 570 × <i>g</i>
At r_{min} (113.0 mm)	2 130 × <i>g</i>
Conditions requiring speed reductions	see RUN SPEEDS
Maximum allowable imbalance of opposing loads	20 grams
Number of buckets or carriers	4
Available labware	see Tables 1 and 2
Nominal dimensions (largest bottle)	85 × 135 mm
Nominal capacity (largest bottle)	500 mL
Nominal rotor capacity	2 L
Approximate acceleration time to maximum	
speed (fully loaded)	59 sec
Approximate deceleration time from maximum	
speed (fully loaded)	47 sec
Weight of fully loaded rotor	9.7 kg (21.4 lb)
Rotor material	aluminum

* 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:

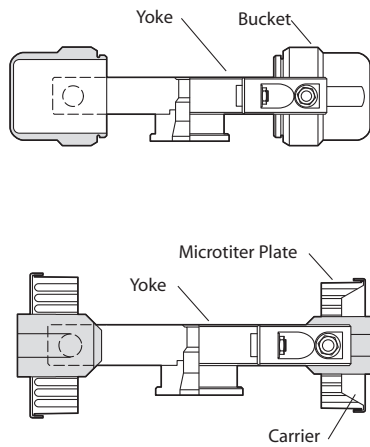
$$RCF = \frac{r\omega^2}{g}$$

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 an ISO 9001 or 13485 facility for use with the specified Beckman Coulter centrifuges.



The TS-5.1-500, rated for 5 100 rpm (using buckets: 4 100 rpm using microplate carriers), is a four-place swinging bucket rotor used in the Beckman Coulter Allegra 25R and TJ-25 benchtop centrifuges. The rotor buckets carry adapters that allow centrifugation of a wide range of tube and bottle sizes (from 1.5 mL reaction vials to 500-mL bottles). The rotor develops centrifugal forces that are suitable for rapidly sedimenting protein precipitates, large particles, cells, and cell debris.

The rotor yoke is made of aluminum and black-anodized for corrosion protection. Black-anodized aluminum buckets or microplates carriers can be run by placing them over pivot pins on the arms of the yoke; they swing out to horizontal position during centrifugation. A tie-down screw is used to secure the rotor to the drive shaft during centrifugation. Figure 1 shows the rotor and accessories.

Several types of labware can be run in the buckets, depending on your application, using modular disk adapters for tubes of various sizes. Transparent covers made of high-impact plastic are available as an aid toward containment. This rotor was tested¹ to demonstrate



Figure 1. The TS-5.1-500 Rotor and Accessories. Additional adapters are available for a variety of tube and bottle sizes.

¹ Validation of microbiological containment was done at an independent third-party testing facility (CAMR, Porton Down, UK, or USAMRIID, Ft. Detrick, MD, U.S.A.). Improper use or maintenance may affect seal integrity and thus containment.

containment of microbiological aerosols under normal operating conditions of the associated Beckman Coulter centrifuge, when used and maintained as instructed. Although the covers are not designed to contain aerosols that may result from tube breakage, they will contain most liquids and broken tube particles, reducing the need to clean the centrifuge chamber, and allowing you to take appropriate precautions before opening the covers in the event of tube breakage.

Each microplate carrier can hold up to two stacked (not to exceed 27.9 mm/1.10 in.) 96-well microplates or one deep-well plate.

The centrifuge identifies rotor speed during the run by means of a magnetic speed sensor system in the centrifuge rotor chamber and magnets imbedded in the rotor. The overspeed system ensures that the rotor does not exceed its permitted speed.

Refer to the Warranty at the back of this manual for warranty information.

PREPARATION AND USE

Specific information about the TS-5.1-500 rotor is given here. Information about the use and care of the centrifuge is contained in the centrifuge manual, which should be used together with this manual for complete rotor and centrifuge operation.

NOTE

Although rotor components and accessories made by other manufacturers may fit in the TS-5.1-500 rotor, their safety in this rotor cannot be ascertained by Beckman Coulter. Use of other manufacturers' components or accessories in the TS-5.1-500 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, buckets, and bucket covers (or microplate carriers) are clean and show no signs of corrosion or cracking. If any evidence of damage is present, do not centrifuge the rotor.
2. Check the chemical compatibilities of all materials used. Refer to *Chemical Resistances* (publication IN-175).
3. Verify that the tubes, bottles, and accessories being used are listed in Table 1 (buckets) or Table 2 (microplate carriers).

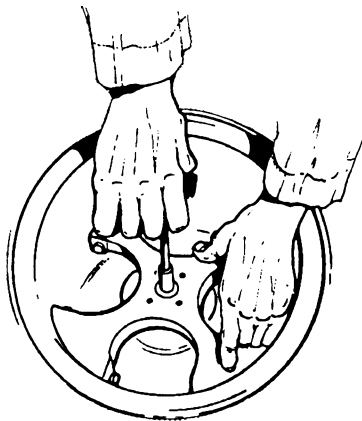
INSTALLING THE ROTOR YOKE

1. Before installing the yoke in the centrifuge, lightly lubricate the drive hole with a lubricant such as Anti-Seize (see instructions under MAINTENANCE).



CAUTION

Never drop the rotor yoke onto the centrifuge drive shaft. The drive shaft can be damaged if the rotor is forced sideways or dropped onto it.



2. Carefully lower the yoke straight down onto the centrifuge drive shaft. Be sure the yoke is properly seated on the shaft.
3. Fasten the tie-down screw (368245) onto the drive shaft. Use the T-handle rotor wrench (368246) to tighten the tie-down screw firmly on the shaft.



NOTE

If the rotor yoke is left in the centrifuge between runs, before each run make sure it is properly seated on the drive shaft, and that the tie-down screw is tight.

LOADING THE BUCKETS OR CARRIERS

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



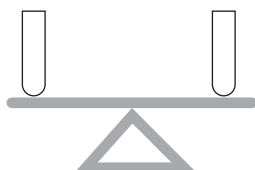
WARNING

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 other hazardous materials in this rotor without taking all 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.

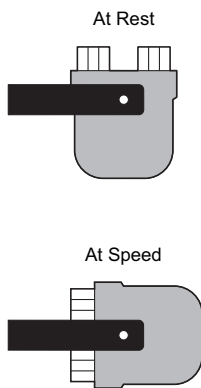
Symmetrical and Balanced Loading

To ensure optimal performance and stability, the rotor must be loaded symmetrically. Two factors affect symmetric loading:

- The buckets or carriers must be loaded symmetrically with respect to their pivotal axes.
- The rotor should be loaded symmetrically with respect to its center of rotation.



For best results, load opposing buckets or carriers with the same type of labware containing the same amounts of fluid of equal density. Additionally, opposing buckets or carriers and their contents should weigh approximately the same (within 20 grams). Do not exceed the rated maximum load for buckets (600 grams each) or carriers (345 grams each).



It is not necessary to completely fill all tubes or positions in buckets; however, partially filled buckets must be balanced with respect to the bucket pivotal axis (see Figure 2). In multitube adapters, each tube should be placed so that its weight is balanced by a tube in a diametrically opposite position across the pivotal axis in the same adapter. Adapters placed in opposing buckets should also be filled the same way.

In multiwell plate carriers, samples should be loaded into the wells symmetrically with respect to the pivotal axis of the carrier (the pivotal axis runs parallel to the crossbar), and opposing carriers should contain similar loads.

Using Buckets

You can load buckets before or after they are installed on the rotor yoke. In either case, we recommend filling the appropriate labware first and then loading the labware into the buckets to avoid tripping the imbalance detector.

1. Load the filled containers into the buckets (see page 11 for tube and bottle information).
2. Ensure that cover O-rings are lightly but evenly coated with silicone vacuum grease. Place covers on buckets. Screw covers to the right (clockwise) to tighten.

NOTE

If running buckets without covers, remove the O-rings from the buckets to prevent damage.

3. Attach each bucket to the yoke by aligning the grooves in the bucket sides with the pivot pins, then sliding the buckets down until the pivot pins are seated in the bucket pockets.

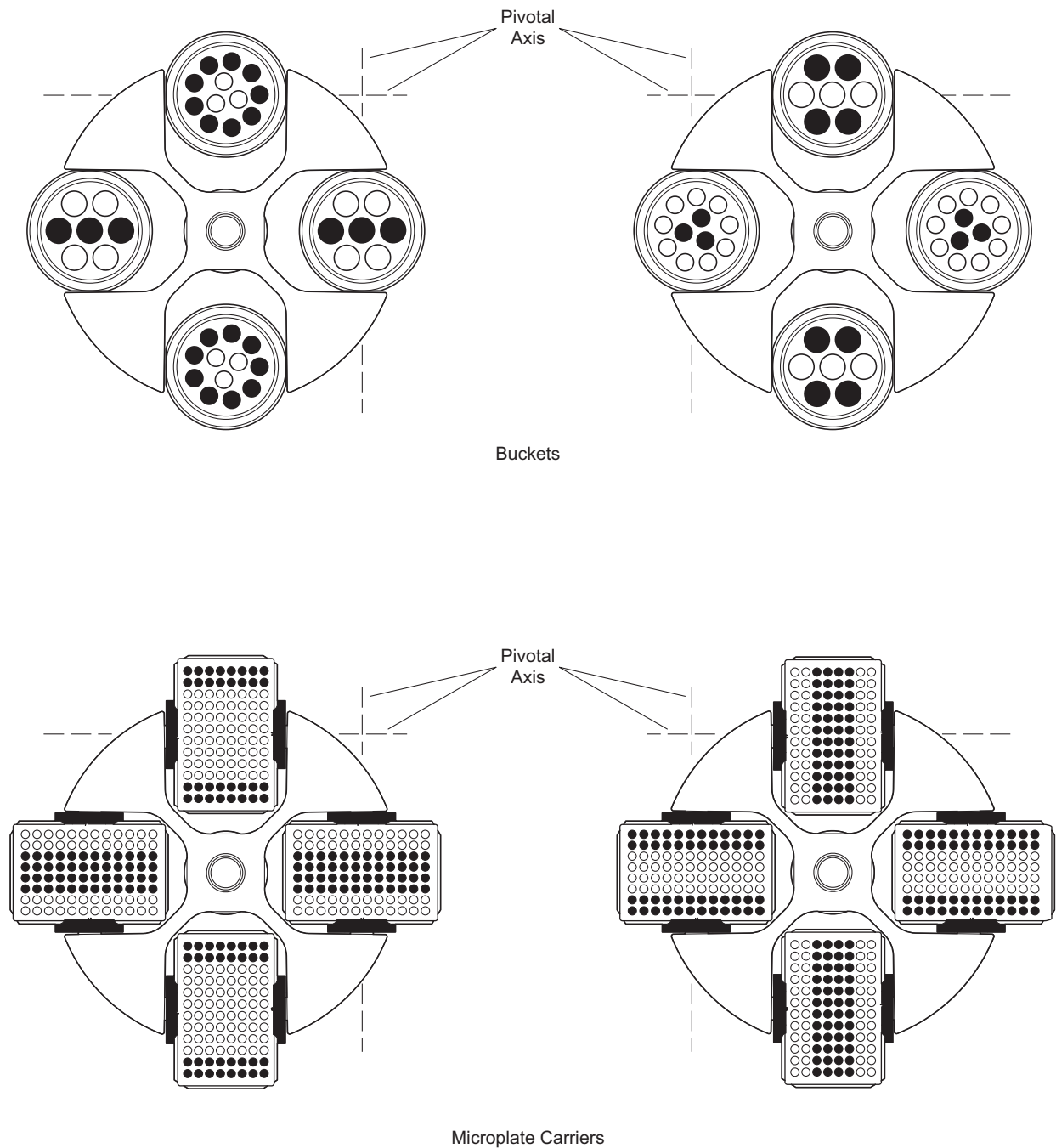


Figure 2. Symmetrical and Balanced Loading. All four positions must have a bucket or carrier attached for every run. Never run the rotor with only two positions filled.



CAUTION

Attach all four buckets (or two buckets and two carriers), loaded or empty, to the rotor yoke. If only two buckets are filled, place them in opposite positions on the yoke. All four positions must contain buckets (or carriers) during a run. Never run the rotor with only two positions filled. If two buckets and two carriers are run, position the buckets opposite each other.

4. Gently swing the buckets to ensure that they are properly seated on the pivot pins.

Using Microplate Carriers

If only two carriers are run, install them opposite each other in the rotor and run either two buckets or two additional carriers (they can be empty) to prevent rotor imbalance.

1. Insert the filled plate(s) into the carrier. If using more than one plate per carrier, place a 96-well cap strip (see Table 2) between the plates to prevent breakage during centrifugation.

 **NOTE**

A rubber support pad (362390) is available that can be placed beneath plates to prevent breakage during centrifugation.

2. Attach each carrier to the yoke by aligning the grooves in the sides with the pivot pins, then sliding the carriers down until the pivot pins are seated in the carrier pockets.



CAUTION

All four positions must contain buckets or carriers during a run. Never run the rotor with only two positions filled. If two buckets and two carriers are run, position the carriers opposite each other.

3. Gently swing the carriers to ensure that they are properly seated on the pivot pins.

OPERATION

1. Refer to the instrument instruction manual for centrifuge operation.
2. See RUN SPEEDS, page 12, for information about speed limitations.

REMOVAL AND SAMPLE RECOVERY



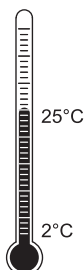
CAUTION

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

1. Remove the buckets or carriers from the centrifuge.
2. Remove the labware from the buckets or carriers.
3. If removing the rotor yoke, turn the T-handle wrench (368246) to the left (counterclockwise) to loosen the tie-down screw. Lift the yoke straight up and off the drive shaft.

TUBES, BOTTLES, AND ACCESSORIES

The TS-5.1-500 rotor uses labware listed in Tables 1 and 2. Be sure to use only those items listed.



Temperature Limits

- Beckman Coulter plastic tubes and bottles have been centrifuge tested for use at temperatures between 2 and 25°C. For centrifugation at other temperatures, pretest tubes under anticipated run conditions.

- If plastic containers are frozen before use, make sure that they are thawed to at least 2°C prior to centrifugation.

Labware

Use the tubes and bottles listed in Table 1 in the buckets. Refer to Table 2 for labware that can be centrifuged in microplate carriers.

RUN SPEEDS

The centrifugal force at a given radius in a rotor is a function of 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. The rcf at each speed is automatically calculated by the centrifuge software; if the rcf is entered, the centrifuge calculates the equivalent rpm (revolutions per minute). Run speeds must be reduced in the following circumstances:

- If the weight of the load *in a bucket* exceeds 600 grams, or if the solution density is more than 1.2 g/mL are centrifuged, reduce the maximum allowable run speed according to the following equation:

$$\text{reduced maximum speed} = (5\ 100\ \text{rpm}) \sqrt{\frac{600\ \text{grams}}{\text{heaviest load in grams}}}$$

- If the weight of the load in a *microplate carrier* exceeds 345 grams, reduce the maximum allowable run speed according to the following equation:

$$\text{reduced maximum speed} = (4\ 100\ \text{rpm}) \sqrt{\frac{345\ \text{grams}}{\text{heaviest load in grams}}}$$

Do not select rotational speeds in excess of 5 100 rpm when using buckets only, or 4 100 rpm using carriers only or two carriers and two buckets.

Table 1. Tubes and Bottles Used in the TS-5.1-500 Rotor Buckets

Tube/Bottle			Polypropylene Adapter	
Dimensions and Volume	Description	Part Number	Description	Part Number
85 × 135 mm 500 mL	polycarbonate bottle with screw cap	368454 (pkg/2)	none	—
85 × 135 mm 500 mL	polypropylene bottle with screw cap	368453 (pkg/2)	none	—
62 × 122 mm 250 mL	polycarbonate bottle with screw cap	356013 (pkg/6)	1-place adapter	392256 (pkg/2)
62 × 122 mm 250 mL	polypropylene bottle with screw cap	356011 (pkg/6)	1-place adapter	392256 (pkg/2)
56 × 122 mm 200 mL	bottle with screw cap	*	1-place adapter	392256 (pkg/2)
50 × 102 mm 125 mL	bottle with screw cap	*	1-place adapter	368458 (pkg/2)
45 × 102 mm 100 mL	bottle with screw cap	*	1-place adapter	368459 (pkg/2)
30 × 120 mm 50 mL	conical tube	*	4-place adapter	368461 (pkg/2)
29 × 104 mm 50 mL	round-bottom tube	*	4-place adapter	368477 (pkg/2)
28.5 × 100 mm 50 mL	conical tube with self-standing rim	*	4-place adapter	368460 (pkg/2)
26 × 100 mm 30 mL	tube with screw cap	†	5-place adapter	368462 (pkg/2)
24 × 100 mm 25 mL	glass tube	*	5-place adapter	368463 (pkg/2)
17 × 120 mm 15 mL	conical tube	*	9-place adapter	368464 (pkg/2)
17 × 107 mm 15 mL	tube with cap	*	10-place adapter	368466 (pkg/2)
17 × 115 mm 15 mL	tube with cap	*	12-place adapter	368465 (pkg/2)
16 × 76 mm 10 mL	thickwall polycarbonate tube	355630 (pkg/25)	12-place adapter	368468 (pkg/2)
16 × 76 mm 10 mL	thickwall polypropylene tube	355640 (pkg/25)	12-place adapter	368468 (pkg/2)
16 × 64 mm 10 mL	thickwall polycarbonate tube	355647 (pkg/25)	12-place adapter	368468 (pkg/2)

*Commercially available outside the United States. Observe manufacturers' recommendations for speed and temperature limitations; contact manufacturer for technical support.

† Commercially available. Observe manufacturers' recommendations for speed and temperature limitations, contact manufacturer for technical support.

Table 1. Tubes and Bottles Used in the TS-5.1-500 Rotor Buckets (continued)

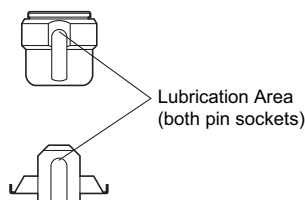
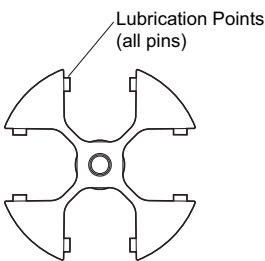
Tube/Bottle			Polypropylene Adapter	
Dimensions and Volume	Description	Part Number	Description	Part Number
16 × 81 mm 10 mL	polypropylene bottle	364695 (pkg/10)	12-place adapter	368468 (pkg/2)
12 × 75 mm 10 mL	glass tube	†	16-place adapter	368467 (pkg/2)
16 × 80 mm 10 mL	polycarbonate bottle with screw cap	355672 (pkg/25)	12-place adapter	368468 (pkg/2)
13 × 100 mm 7 mL	glass tube	†	16-place adapter	368469 (pkg/2)
11 × 38 mm 1.5 mL	polypropylene tube	357448 (pkg/500)	16-place adapter	368470 (pkg/2)
500 × 700 µL	reaction vials	†	24-place adapter	368471 (pkg/2)

* Commercially available outside the United States. Observe manufacturers' recommendations for speed and temperature limitations; contact manufacturer for technical support.

† Commercially available. Observe manufacturers' recommendations for speed and temperature limitations, contact manufacturer for technical support.

CARE AND MAINTENANCE

MAINTENANCE



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 yoke, buckets, and/or multiwell plate carriers, especially inside cavities, for rough spots or pitting, white powder deposits—frequently aluminum oxide—or heavy discoloration. If any of these signs are evident, do not run the rotor. Contact your Beckman Coulter representative for information about the Field Rotor Inspection Program and the rotor repair center.
- Before using the tie-down screw (368245), check it for damage such as distortion, splitting, or stripped threads. Replace it if it is damaged.
- Approximately once a week, and after cleaning and/or autoclaving, lubricate the rotor pins and pin sockets with a lubricant such as Spinkote (306812).

Table 2. Labware Used in the TS-5.1-500 Rotor Microplate Carriers

Description	Volume	Part Number	Accessory Description*	Part Number
multiwell polystyrene plate, 96-well, nonsterile	300 μ L/well	609844* (pkg/100)	rubber pad	362390 (pkg/4)
deep-well polystyrene plate, 96-well, nonsterile	1 mL/well	267001 (pkg/24)	cap strip, nonsterile [†]	267002 (pkg/12)
			cap strip, sterile [†]	267005 (pkg/12)
			aluminum foil lid [‡]	538619 (pkg/100)
deep-well polystyrene plate, 96-well, sterile	1 mL/well	267004 (pkg/24)	cap strip, nonsterile [†]	267002 (pkg/12)
			cap strip, sterile [†]	267005 (pkg/12)
			aluminum foil lid [‡]	538619 (pkg/12)
deep-well polypropylene plate, 96-well, nonsterile	1 mL/well	267006 (pkg/24)	cap strip, nonsterile [†]	267002 (pkg/12)
			cap strip, sterile [†]	267005 (pkg/12)
			aluminum foil lid [‡]	538619 (pkg/100)
deep-well polypropylene plate, 96-well, sterile	1 mL/well	267007 (pkg/24)	cap strip, nonsterile [†]	267002 (pkg/102)
			cap strip, sterile [†]	267005 (pkg/12)
			aluminum foil lid [‡]	538619 (pkg/100)
square-well polypropylene plate	2 mL/well	140504 (pkg/24)	aluminum foil lid [‡]	538619 (pkg/100)

* When stacking multiwell plates, place a cap strip (267002 or 267005) between each plate to prevent breakage during centrifugation.

[†] Caps are optional.

[‡] Requires 4-inch soft-rubber roller (538618) for installation.

NOTE: A rubber support pad (362390) is available that can be placed beneath plates to prevent breakage during centrifugation.

Store the rotor in a dry environment (not in the centrifuge). Refer to *Chemical Resistances* (publication IN-175) for the chemical compatibilities of rotor and accessory materials. Your Beckman Coulter representative provides contact with the Field Rotor Inspection Program and the rotor repair center.

CLEANING

Wash 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.

NOTE

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



1. Wash the rotor yoke, buckets, bucket covers, and microplate carriers in a mild detergent, such as Beckman Solution 555 (339555), that won't damage the rotor. The Rotor Cleaning Kit (339558) contains two plastic-coated brushes and two quarts of Solution 555 for use with rotors and accessories. Dilute the detergent 10 to 1 with water.
2. Thoroughly rinse the cleaned rotor components with distilled water.
3. Air-dry the rotor components upside down. *Do not use acetone to dry the rotor.*

Before reinstalling the rotor yoke, lightly lubricate the drive hole with Anti-Seize (961660) to prevent the rotor from sticking, as follows:

1. Apply the lubricant onto a swab.
2. Draw the coated swab through a paper towel to remove excess lubricant.
3. Lightly coat the inside of the drive hole with the lubricant remaining on the swab.

DECONTAMINATION



If aluminum rotor components become contaminated with radioactive material, decontaminate them 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),² and Radiacwash.³

² In U.S.A., 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).

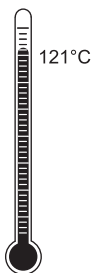
³ In U.S.A., contact Biodex Medical Systems (Shirley, NY); internationally, contact the U.S. office to find the dealer nearest you.

While Beckman Coulter has tested these materials and found that they do not damage components, no guarantee of decontamination is expressed or implied. Follow appropriate decontamination procedures as directed by your laboratory safety officer.



If the rotor or other components are contaminated with toxic or pathogenic materials, follow appropriate decontamination procedures as directed 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 covers from the buckets and place the rotor yoke, buckets, bucket covers, and/or microplate carriers in the autoclave upside down.
- Ethanol (70%)⁴ 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.

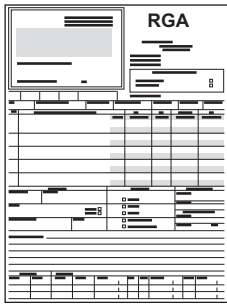
Refer to publication IN-192 (included with each box of tubes) for tube and bottle sterilization and disinfection procedures.

STORAGE

When it is not in use, store the rotor in a dry environment (not in the centrifuge).

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; worldwide offices are listed on the back cover of this manual) or see the Beckman Coulter *Benchtop Rotors, Tubes & Accessories* catalog (BR-9742, available at www.beckmancoulter.com) for detailed information on ordering rotors, tubes, and accessories. For your convenience, a partial list is given below.

REPLACEMENT ROTOR PARTS

TS-5.1-500 rotor assembly	368308
Bucket (set of 2)	368452
Bucket cover (set of 2)	368472
Bucket O-ring (pkg/8)	368455
Microplate carrier (set of 2)	368451
Tie-down screw	368245
T-handle rotor wrench	368246

OTHER

Tubes, bottles, and adapters	see Table 1
Microplate carrier labware	see Table 2
Support pad (for multiwell plates)	362390
Rubber roller, 4-in., for sealing foil microplate lids	538618
Spinkote lubricant (2 oz)	306812
Silicone vacuum grease (1 oz)	335148
Rotor Cleaning Kit	339558
Beckman Solution 555 (1 qt)	339555
Rotor cleaning brush	339379

BENCHTOP ROTOR WARRANTY

Subject to the conditions specified below and the warranty clause of the Beckman Coulter, Inc., terms and conditions in effect at the time of sale, Beckman Coulter 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 benchtop centrifuge rotor to the original buyer by Beckman Coulter 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.

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 operated in a Beckman Coulter centrifuge that has been improperly disassembled, repaired, or modified.
4. Thermoplastic rotors or components used in some benchtop centrifuges are warranted for one (1) year from date of purchase.

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.

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 NEITHER BECKMAN COULTER, INC. NOR ITS SUPPLIERS SHALL HAVE ANY 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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