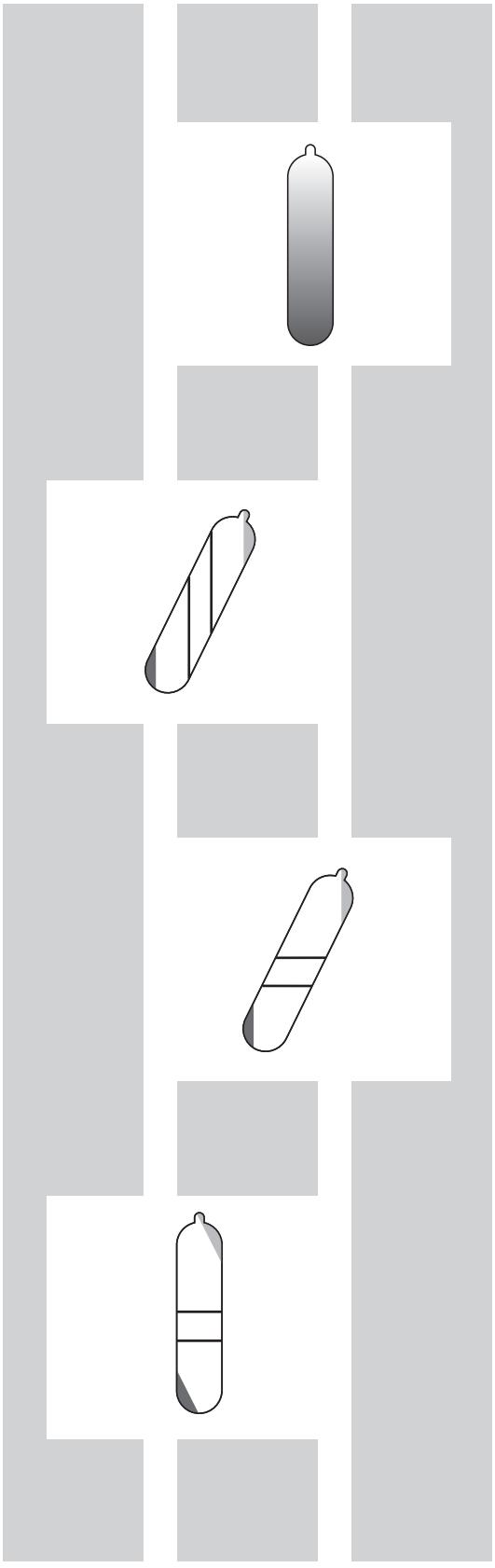
L5-TB-046DA
February 2014



Type 25 Rotor

Used In Beckman Coulter Class H, R, and S Preparative Ultracentrifuges

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 throughout this publication, pay special attention to the specific safety information presented. Observance of safety precautions will also help to avoid actions that could damage or adversely affect the performance of the rotor. This rotor was developed, manufactured, and tested for safety and reliability as part of a Beckman Coulter ultracentrifuge/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 ultracentrifuge 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 ultracentrifuge.

Although rotor components and accessories made by other manufacturers may fit in the Type 25 rotor, their safety in this rotor cannot be ascertained by Beckman Coulter. Use of other manufacturer' components or accessories in the Type 25 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.

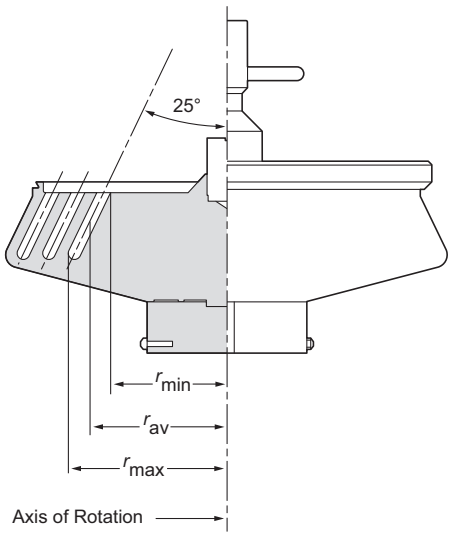
Place filled tubes in at least two opposing cavities. Make sure that filled containers are loaded symmetrically into the rotor and that opposing tubes are filled to the same level with liquid of the same density. Make sure that cavities in use have the proper floating spacers and/or spacers inserted (if applicable) before installing the rotor lid. Do not put spacers in cavities that do not contain tubes.

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

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

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

TYPE 25 ROTOR



SPECIFICATIONS

Maximum speed	25 000 rpm		
Density rating at maximum speed	1.2 g/mL		
Relative Centrifugal Field* at maximum speed			
	1st Row	**2nd Row**	**3rd Row**
At r_{max}	(100.4 mm)	(116.3 mm)	(132.1 mm)
	70 300 × *g*	81 400 × *g*	92 500 × *g*
At r_{av}	(91.1 mm)	(106.9 mm)	(122.8 mm)
	63 800 × *g*	74 800 × *g*	86 000 × *g*
At r_{min}	(81.7 mm)	(97.5 mm)	(113.4 mm)
	57 200 × *g*	68 300 × *g*	79 400 × *g*
k factors at maximum speed (full tubes)	84	71	62
Conditions requiring speed reductions	see RUN SPEEDS		
Number of tube cavities	100		
Available tubes	see Table 1		
Nominal tube dimensions	8 × 51 mm		
Nominal tube capacity	1 mL		
Nominal rotor capacity	100 mL		
Approximate acceleration time to maximum speed (fully loaded)	9 1/2 min		
Approximate deceleration time from maximum speed (fully loaded)	10 min		
Weight of fully loaded rotor	12 kg (26 lb)		
Rotor and lid material	aluminum		

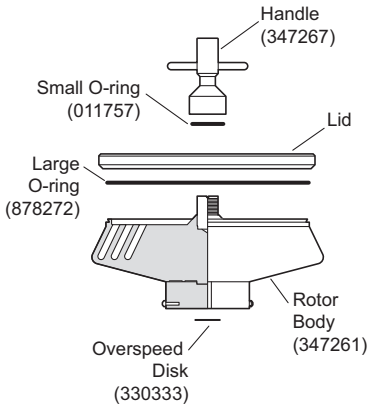
* Relative Centrifugal Field (RCF) is the ratio of the centrifugal acceleration at a specified radius and speed ($r\omega^2$) to the standard acceleration of gravity (g) according to the following formula:

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

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/s^2). After substitution:

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

DESCRIPTION



This rotor has been manufactured in an NSAI-registered ISO 9001 or 13485 facility for use with the appropriately classified Beckman Coulter ultracentrifuges.

The Type 25, rated for 25 000 rpm, is a fixed angle rotor designed to centrifuge up to 100 tubes at a 25-degree angle to the axis of rotation. Used in Beckman Coulter Class H, R, and S preparative ultracentrifuges, the rotor develops centrifugal forces for the differential separation of particles such as lipoproteins. Approximately 100 mL of gradient and sample can be centrifuged per run.

The rotor and lid are made of aluminum and are black anodized for corrosion resistance. The lid handle is made of clear-anodized aluminum. O-rings made of Buna N rubber in the rotor handle and rotor body maintain atmospheric pressure inside the rotor during centrifugation, if they are properly lubricated.

Because of the weight of the rotor, drive pins are not required.

For overspeed protection, a photoelectric detector in Beckman Coulter ultracentrifuges monitors the overspeed disk on the rotor bottom and shuts down the run if speeds exceeding 25 000 rpm are detected.

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

PREPARATION AND USE

Specific information about the Type 25 rotor is given here. Information common to this and other rotors is contained in the manual Rotors and Tubes for Preparative Ultracentrifuges *(publication LR-IM), which should be used together with this manual for complete rotor and accessory operation. Publication LR-IM is included in the literature package shipped with this rotor manual.*

NOTE

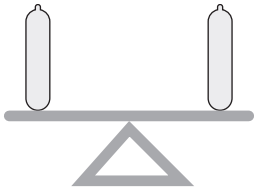
Although rotor components and accessories made by other manufacturers may fit in the Type 25 rotor, their safety in this rotor cannot be ascertained by Beckman Coulter. Use of other manufacturers' components or accessories in the Type 25 rotor may void the rotor warranty and should be prohibited by your laboratory safety officer. Only the components and accessories listed in this publication should be used in this rotor.

PRERUN SAFETY CHECKS

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

1. Make sure that the rotor and lid are clean and show no signs of corrosion or cracking.
2. Make sure that the rotor is equipped with the correct overspeed disk (330333). If the disk is missing or damaged, replace it according to the instructions in *Rotors and Tubes.*
3. Check the chemical compatibilities of all materials used (refer to Appendix A in *Rotors and Tubes*).
4. Verify that only the tubes and accessories listed in Table 1 are being used.

ROTOR PREPARATION



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

1. Be sure that metal threads in the rotor are clean and lightly but evenly lubricated with Spinkote lubricant (306812). Also ensure that O-rings are lightly but evenly coated with silicone vacuum grease.

2. Load the filled and sealed tubes symmetrically into the rotor (see page 8 for tube information). When centrifuging fewer than 100 tubes, load the outer row of cavities first (44 tubes), then the middle row (32 tubes), and then the innermost row (24 tubes). (Exception: to load an odd number of tubes, evenly space three tubes in the innermost row, and then load the remaining even number of tubes symmetrically.) *Opposing tubes must be filled to the same level with liquid of the same density.*

3. Complete loading by placing spacers, if required, over the tubes if applicable.

NOTE

Place filled tubes in at least two opposing cavities. Make sure that cavities in use also have the proper spacers inserted before installing the rotor lid. Do not put spacers in cavities that do not contain tubes.

4. Put the lid in place and tighten as firmly as possible by hand.

OPERATION

1. Carefully place the rotor on the drive hub.

2. Refer to the instrument instruction manual for ultracentrifuge operation.

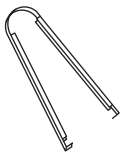
3. For additional operating information, see the following:

   - RUN TIMES, page 9, for using *k* factors to adjust run durations
   - RUN SPEEDS, page 10, 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.



Quick-Seal Tube Removal Tool (361668)

1. Remove the rotor from the centrifuge by lifting it straight up and off the drive hub.
2. Remove the rotor lid.
3. Use the removal tool (361668) to remove the spacers and tubes.

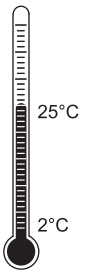
TUBES

The Type 25 rotor uses only the tubes and accessories listed in Table 1; be sure to use only those items. Refer to *Rotors and Tubes* for information on the chemical resistances of tube and accessory materials.

Table 1. Available Tubes for the Type 25 Rotor

Tube			Required Accessory		Maximum Speed
Dimensions and Volume	Description	Part Number	Description	Part Number	
8 × 51 mm 1 mL	Quick-Seal polypropylene	345831 (pkg/50)	Noryl* spacer	345824 (pkg/8)	25 000 rpm
8 × 51 mm 1 mL	thickwall polycarbonate	355657 (pkg/1)	none	—	25 000 rpm

*Noryl is a registered trademark of GE Plastics.



Temperature Limits

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

Quick-Seal Tubes

Quick-Seal tubes must be sealed prior to centrifugation. These tubes are heat sealed and do not need caps; however, spacers are required on top of the tubes when they are loaded into the rotor.

- Fill Quick-Seal tubes leaving a *small* bubble of air at the base of the neck. Do not leave a large air space—too much air can cause excessive tube deformation.
- Refer to *Rotors and Tubes* for detailed information on the use and care of Quick-Seal tubes.

Thickwall Tubes

Thickwall polycarbonate tubes can be run partially filled (at least half filled) 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.

RUN TIMES

The *k* factor of the rotor is a measure of the rotor's pelleting efficiency. (Beckman Coulter has calculated the *k* factors for all of its preparative rotors at maximum rated speed and using full tubes.) The *k* factor is calculated from the 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 ($\omega = 0.105 \times$ 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*).

$$t = \frac{k}{s} \tag{3}$$

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

$$k_{adj} = k\left(\frac{25\,000}{\text{actual run speed}}\right)^2 \tag{4}$$

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

$$\frac{t_a}{t_b} = \frac{k_a}{k_b} \tag{5}$$

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

RUN SPEEDS

The centrifugal force at a given radius in a rotor is a function of 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 a number of rotor speeds is provided in Table 2.

If nonprecipitating solutions more dense than 1.2 g/mL are centrifuged, the maximum allowable run speed must be reduced according to the following equation:

Table 2. Relative Centrifugal Fields for the Type 25 Rotor. Entries in this table are calculated from the formula $RCF = 1.12r\,(RPM/1000)^2$ and then rounded to three significant digits.

Rotor Speed (rpm)	Relative Centrifugal Field (× *g*)			*k* Factor*
	At r_{max}	At r_{av}	At r_{min}	
1st row	(100.4 mm)	(91.1 mm)	(81.7 mm)	
5 000	2 810	2 550	2 290	2 090
10 000	11 200	10 200	9 150	523
15 000	25 300	23 000	20 600	232
20 000	45 000	40 800	36 600	131
23 000	59 500	54 000	48 400	99
25 000	70 300‘	63 800	57 200	84
2nd row	(116.3 mm)	(106.9 mm)	(97.5 mm)	
5 000	3 260	2 990	2 730	1 780
10 000	13 000	12 000	10 900	445
15 000	29 300	26 900	24 600	198
20 000	52 100	47 900	43 700	111
23 000	68 900	63 300	57 800	84
25 000	81 400	74 800	68 300	71
3rd row	(132.1 mm)	(122.8 mm)	(113.4 mm)	
5 000	3 700	3 440	3 180	1 550
10 000	14 800	13 800	12 700	387
15 000	33 300	30 900	28 600	172
20 000	59 200	55 000	50 800	97
23 000	78 300	72 800	67 200	73
25 000	92 500	86 000	79 400	62

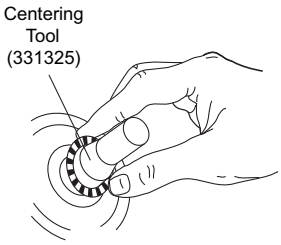
*Calculated for all Beckman Coulter preparative rotors as a measure of the rotor’s relative efficiency in pelleting sample in water at 20°C.

$$\text{reduced maximum speed} = (25\,000\ \text{rpm})\sqrt{\frac{1.2\ \text{g/mL}}{\rho}} \qquad (6)$$

where ρ is the density of the tube contents. This speed reduction will protect the rotor from excessive stresses due to the added tube load. *Note, however, that the use of this formula may still produce maximum speed figures that are higher than the limitations imposed by the use of certain tubes or adapters.* In such cases, use the lower of the two figures.

CARE AND MAINTENANCE

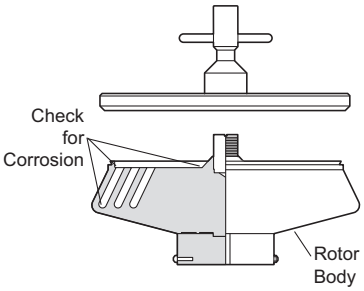
MAINTENANCE



NOTE

Do not use sharp tools on the rotor. Scratches in the anodized surface could lead to corrosion.

- Periodically inspect the rotor, especially inside cavities, for rough spots or pitting, white powder deposits—frequently aluminum oxide—or heavy discoloration. If any of these signs are evident, do not run the rotor. Contact your Beckman Coulter representative for information about the Field Rotor Inspection Program and the rotor repair center.
- Regularly inspect the overspeed disk. If it is scratched, damaged, or missing, replace it. Replacement instructions are in *Rotors and Tubes*.
- Regularly lubricate the metal threads in the rotor and handle with a thin, even coat of Spinkote lubricant. Failure to keep these threads lubricated can result in damaged threads.
- Regularly apply silicone vacuum grease to the O-rings. Replace O-rings about twice a year or whenever worn or damaged.



Refer to Appendix A in *Rotors and Tubes* for the chemical resistances of rotor and accessory materials. Your Beckman Coulter representative provides contact with the Field Rotor Inspection Program and the rotor repair center.

CLEANING

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

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

1. Remove the O-rings before washing.
2. Wash the rotor and lid in a mild detergent, such as Beckman Solution 555, that won't damage the rotor. The Rotor Cleaning Kit

contains two plastic-coated brushes and two quarts of Solution 555 (339555) for use with rotors and accessories. Dilute the detergent 10 to 1 with water.

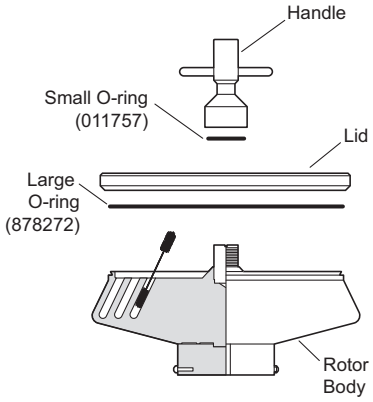
NOTE

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

3. Rinse the cleaned rotor and components with distilled water.

4. Air-dry the rotor and lid upside down. *Do not use acetone to dry the rotor.*

5. Apply a thin, even coat of silicone vacuum grease (335148) to the O-rings before replacing them.



Clean metal threads every 6 months, or as necessary. Use a brush and concentrated Solution 555. Rinse and dry thoroughly, then lubricate lightly but evenly with Spinkote to coat all threads.

Periodically remove the O-rings and wipe clean as necessary. Clean the O-ring grooves with a cotton-tipped swab. Reapply a light film of silicone vacuum grease.

DECONTAMINATION

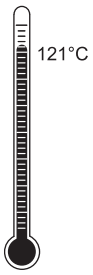
If the rotor (and/or accessories) becomes contaminated with radioactive material, decontaminate it using a solution which will not damage the anodized surfaces. Beckman Coulter has tested a number of solutions and found two which do not harm anodized aluminum: RadCon Surface Spray or IsoClean solution (for soaking),[1] and Radiacwash.[2]

If the rotor or other components are contaminated with toxic or pathogenic materials, follow appropriate decontamination procedures as outlined by your laboratory safety officer. Check Appendix A in *Rotors and Tubes* to be sure the decontamination method will not damage any part of the rotor.

[1] 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).

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

STERILIZATION AND DISINFECTION



- The rotor and all rotor components can be autoclaved at 121°C for up to an hour. Remove the lid from the rotor and place the rotor, lid, and spacers in the autoclave upside down.
- Ethanol (70%)[3] or hydrogen peroxide (6%) may be used on all rotor components, including those made of plastic. Bleach (sodium hypochlorite) may be used, but may cause discoloration of anodized surfaces. Use the minimum immersion time for each solution, per laboratory standards.

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

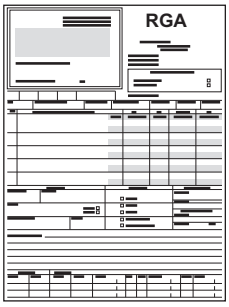
Refer to publication IN-192 for tube sterilization procedures. *Quick-Seal tubes are disposable and should be discarded after a single use.*

STORAGE

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

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

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 may be obtained from your local Beckman Coulter sales office, and should contain the following information:

- 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,
- 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 all parts are free from pathogens and/or radioactivity. Sterilization and decontamination must be done before returning the parts. Smaller items (such as tubes, bottles, etc.) should be enclosed in a sealed plastic bag.

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

Use the address label printed on the 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 *Ultracentrifuge Rotors, Tubes & Accessories* catalog (BR-8101, available at www.beckmancoulter.com) for detailed information on ordering parts and supplies. For your convenience, a partial list is given below.

REPLACEMENT ROTOR PARTS

Type 25 rotor assembly	347261
Rotor lid	347266
Rotor handle	347267
O-ring (rotor body)	878272
O-ring (handle)	011757
Overspeed disk (25 000 rpm)	330333

OTHER

Tubes and spacers	see Table 1
Quick-Seal Cordless Tube Topper kit, 60 Hz	358312
Quick-Seal Cordless Tube Topper kit, 50 Hz (Europe)	358313
Quick-Seal Cordless Tube Topper kit, 50 Hz (Great Britain)	358314
Quick-Seal Cordless Tube Topper kit, 50 Hz (Australia)	358315
Quick-Seal Cordless Tube Topper kit, 50 Hz (Canada)	367803
Tube Topper rack (8-mm dia. tubes)	349661
Quick-Seal tube removal tool	361668
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
Centering tool (for replacing overspeed disk)	331325

ULTRACENTRIFUGE ROTOR WARRANTY

All Beckman Coulter ultracentrifuge Fixed Angle, Vertical Tube, Near Vertical Tube, Swinging Bucket, and Airfuge rotors are warranted against defects in materials or workmanship for the time periods indicated below, subject to the Warranty Conditions stated below.

Preparative Ultracentrifuge Rotors . . . . . 5 years — No Proration

Analytical Ultracentrifuge Rotors. . . . . 5 years — No Proration

ML and TL Series Ultracentrifuge Rotors . . . . . 5 years — No Proration

Airfuge Ultracentrifuge Rotors. . . . . 1 year — No Proration

For Zonal, Continuous Flow, Component Test, and Rock Core ultracentrifuge rotors, see separate warranty.

Warranty Conditions (as applicable)

1) This warranty is valid for the time periods indicated above from the date of shipment to the original Buyer by Beckman Coulter or an authorized Beckman Coulter representative.

2) This warranty extends only to the original Buyer and may not be assigned or extended to a third person without written consent of Beckman Coulter.

3) This warranty covers the Beckman Coulter Centrifuge Systems only (including but not limited to the centrifuge, rotor, and accessories) and Beckman Coulter shall not be liable for damage to or loss of the user's sample, non-Beckman Coulter tubes, adapters, or other rotor contents.

4) This warranty is void if the Beckman Coulter Centrifuge System is determined by Beckman Coulter to have been operated or maintained in a manner contrary to the instructions in the operator's manual(s) for the Beckman Coulter Centrifuge System components in use. This includes but is not limited to operator misuse, abuse, or negligence regarding indicated maintenance procedures, centrifuge and rotor classification requirements, proper speed reduction for the high density of certain fluids, tubes, and tube caps, speed reduction for precipitating gradient materials, and speed reduction for high-temperature operation.

5) Rotor bucket sets purchased concurrently with or subsequent to the purchase of a Swinging Bucket Rotor are warranted only for a term co-extensive with that of the rotor for which the bucket sets are purchased.

6) This warranty does not cover the failure of a Beckman Coulter rotor in a centrifuge not of Beckman Coulter manufacture, or if the rotor is used in a Beckman Coulter centrifuge that has been modified without the written permission of Beckman Coulter, or is used with carriers, buckets, belts, or other devices not of Beckman Coulter manufacture.

7) Rotor parts subject to wear, including but not limited to rotor O-rings, VTi, NVT™, TLV, MLN, and TLN rotor tube cavity plugs and gaskets, tubing, tools, optical overspeed disks, bearings, seals, and lubrication are excluded from this warranty and should be frequently inspected and replaced if they become worn or damaged.

8) Keeping a rotor log is not mandatory, but may be desirable for maintenance of good laboratory practices.

Repair and Replacement Policies

1) If a Beckman Coulter rotor is determined by Beckman Coulter to be defective, Beckman Coulter will repair or replace it, subject to the Warranty Conditions. A replacement rotor will be warranted for the time remaining on the original rotor's warranty.

2) If a Beckman Coulter centrifuge is damaged due to a failure of a rotor covered by this warranty, Beckman Coulter will supply free of charge (i) all centrifuge parts required for repair (except the drive unit, which will be replaced at the then current price less a credit determined by the total number of revolutions or years completed, provided that such a unit was manufactured or rebuilt by Beckman Coulter), and (ii) if the centrifuge is currently covered by a Beckman Coulter warranty or Full Service Agreement, all labor necessary for repair of the centrifuge.

3) If a Beckman Coulter rotor covered by this warranty is damaged due to a malfunction of a Beckman Coulter ultracentrifuge covered by an Ultracentrifuge System Service Agreement, Beckman Coulter will repair or replace the rotor free of charge.

4) If a Beckman Coulter rotor covered by this warranty is damaged due to a failure of a Beckman Coulter tube, bottle, tube cap, spacer, or adapter, covered under the Conditions of this Warranty, Beckman Coulter will repair or replace the rotor and repair the instrument as per the conditions in policy point (2) above, and the replacement policy.

5) Damage to a Beckman Coulter rotor or instrument due to the failure or malfunction of a non-Beckman Coulter tube, bottle, tube cap, spacer, or adapter is not covered under this warranty, although Beckman Coulter will assist in seeking compensation under the manufacturer's warranty.

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 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.

Factory Rotor Inspection Service

Beckman Coulter, Inc., will provide free mechanical and metallurgical inspection in Indianapolis, Indiana, USA, of any Beckman Coulter rotor at the request of the user. (Shipping charges to Beckman Coulter are the responsibility of the user.) Rotors will be inspected in the user's laboratory if the centrifuge in which they are used is covered by an appropriate Beckman Coulter Service Agreement. Contact your local Beckman Coulter office for details of service coverage or cost.

Before shipping, contact the nearest Beckman Coulter Sales and Service office and request a Returned Goods Authorization (RGA) form and packaging instructions. Please include the complete rotor assembly, with buckets, lid, handle, tube cavity caps, etc. A SIGNED STATEMENT THAT THE ROTOR AND ACCESSORIES ARE NON-RADIOACTIVE, NON-PATHOGENIC, NON-TOXIC, AND OTHERWISE SAFE TO SHIP AND HANDLE IS REQUIRED.

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