GS6-TB-009A*
August 2000

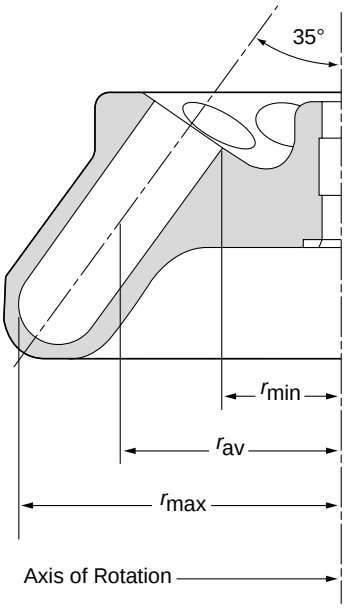
INSTRUCTIONS FOR USING THE GA-10 AND GA-24 FIXED ANGLE ROTORS

In Beckman Coulter GS-6 Series, Spinchron Series, and GP Series Centrifuges

Printed in the USA

GA-10 SPECIFICATIONS

Maximum speed	6400 rpm
Critical speed range*	400 to 1400 rpm
Density rating at maximum speed	1.2 g/mL
Relative Centrifugal Field† (see Table 1)	
at maximum speed (r_{max} = 123 mm)	5640 × *g*
Conditions requiring speed reduction	see RUN SPEEDS
Number of tube cavities	10
Available tubes and bottles	see Table 4
Maximum single-cavity load at	
rated speed (including tube and cap)	120 grams
Maximum tube length for full complement	
of tubes (31-mm diameter)	124 mm
Maximum rotor capacity	500 mL
Approximate acceleration and deceleration times‡	see Table 7
Weight of fully loaded rotor	6.4 kg (14 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:

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

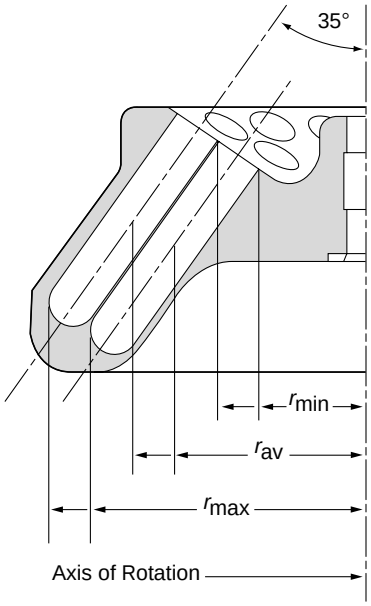
where r is the radius in millimeters, ω is the angular velocity in radians per second (2π RPM /60), and g is the standard acceleration of gravity (9807 mm/s^2). After substitution:

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

‡ The GA-10 rotor should always be run with the LOW brake setting to prevent sample mixing.

GA-24 SPECIFICATIONS

Maximum speed . . . . . 6400 rpm
Critical speed range* . . . . . 400 to 1400 rpm
Density rating at maximum speed . . . . . 1.2 g/mL
Relative Centrifugal Field† at maximum speed (see Table 1)
  outer row (r_{max} = 123 mm) . . . . . 5640 × *g*
  inner row (r_{max} = 108 mm) . . . . . 4950 × *g*
Conditions requiring speed reduction . . . . . see RUN SPEEDS
Number of tube cavities 24
Available tubes and bottles . . . . . see Table 4
Maximum single-cavity load at
  rated speed (including tube and cap) . . . . . 36 grams
Maximum tube length for full complement
  of tubes (19-mm diameter) . . . . . 124 mm
Maximum rotor capacity . . . . . 360 mL
Approximate acceleration and deceleration times‡ . . . . . see Table 7
Weight of fully loaded rotor . . . . . 6.4 kg (14 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/s^2). After substitution:

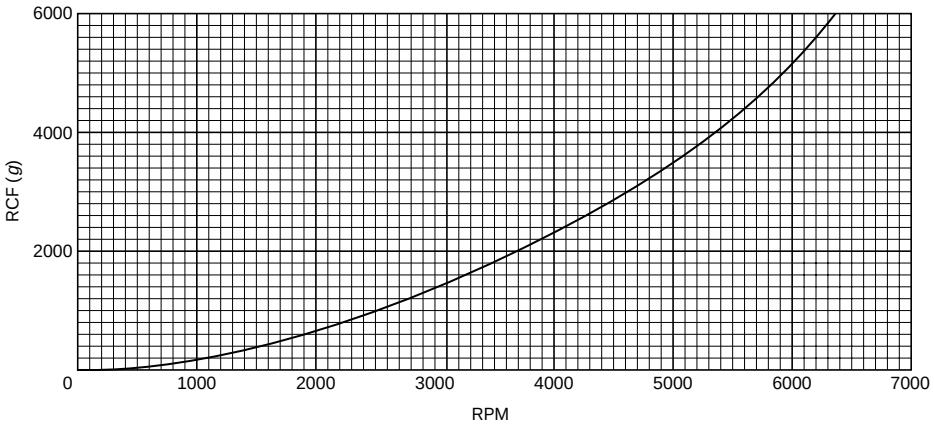
$$RCF = 1.12\, r \left(\frac{RPM}{1000}\right)^2$$

‡ The GA-24 rotor should always be run with the LOW brake setting to prevent sample mixing.

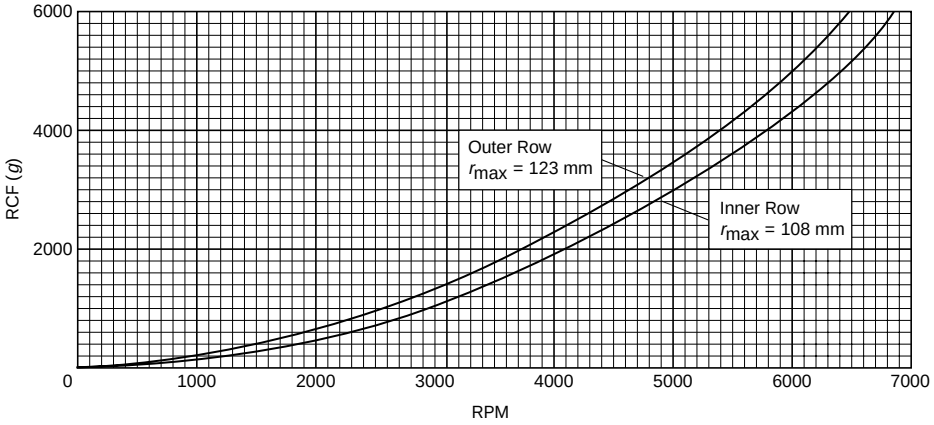
Table 1. Relative Centrifugal Fields for GA-10 and GA-24 Rotors.
Entries in the table are calculated from the formula
$RCF = 1.12\ r\ (RPM/1000)^2$
and then rounded to three significant digits.

Rotor Speed (rpm)	Relative Centrifugal Field (× *g*)	
	GA-24 Outer Row and GA-10 At r_{max} (123 mm)	GA-24 Inner Row At r_{max} (108 mm)
6400	5640	4950
6000	4960	4350
5500	4170	3660
5000	3440	3020
4500	2790	2450
4000	2200	1940
3500	1690	1480
3000	1240	1090
2500	861	753
2000	551	483
1500	309	272
1000	137	120

GA-10



GA-24



DESCRIPTION

These Beckman Coulter rotors have been manufactured in an NSAI-registered ISO 9001 or 9002 facility for use with the appropriately classified Beckman Coulter centrifuge.

The GA-10 and GA-24, rated for 6400 rpm, are fixed angle rotors designed to centrifuge up to 10 (GA-10) or 24 (GA-24) containers at a 35-degree angle to the axis of rotation. Used in Beckman Coulter GS-6, Spinchron, and GP series centrifuges, the rotors develop centrifugal forces that can efficiently pellet bacterial cells from large volumes, or particles from tissue homogenates. Short-column methods (such as partially filled tubes) may be used to purify a large quantity of virus in a step gradient. They are used for binding studies and to separate serum from whole blood.

The rotor body and lid are made of aluminum and are anodized for corrosion resistance—the rotor body is black and the lid is blue. The rotor lid is secured to the rotor by air pressure differential caused by the rotor as it spins. Grooves inside the rotor drive hole mate with drive pins on the centrifuge drive shaft to prevent the rotor from slipping during acceleration and deceleration.

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

TUBES AND BOTTLES

The GA-10 can accommodate up to ten 50-mL tubes. Acceptable tube sizes and the adapters required to hold them in the cavities are listed in Table 2. Beckman Coulter tubes available for the use with the GA-10 rotor are described in Table 4.

The GA-24 can accommodate up to twenty-four 15-mL tubes in two rows of cavities—an outer row of sixteen and an inner row of eight. Acceptable tube sizes and the adapters required to hold them in the cavities are listed in Table 3. Beckman Coulter tubes available for use with the GA-24 rotor are described in Table 4.

Table 2. Acceptable Tube Sizes and Adapters for GA-10 Rotors

Nominal Tube Volume (mL)	Nominal Dimensions (mm)	r_{max} at Adapter or Cavity Bottom (mm)	RCF at Maximum Speed (× *g*)	Adapter Color	Adapter Part Number
1.5	11 × 38	58	2660	white	344497
1.8	11 × 39	57	2614	white	344497
15	16 × 100	118	5410	blue	870329
30	25 × 105	121	5550	blue	870331
50	29 × 104	123	5640*	—	none

*Maximum speed when 50-mL glass tubes are run is 1000 rpm.

Table 3. Acceptable Tube Sizes and Adapters for GA-24 Rotors

Nominal Tube Volume (mL)	Nominal Dimensions (mm)	r_{max} at Adapter or Cavity Bottom (mm)		RCF at Maximum Speed (× *g*)		Adapter Color	Adapter Part Number
		Outer Row	Inner Row	Outer Row	Inner Row		
7	13 × 100	119	104	5460	4770	orange	342642
10	16 × 100	119	104	5460	4770	purple	342641
15	16 × 100	123	108	5460	4950	—	none

Table 4. Beckman Coulter Tubes and Bottles for GA-10 and GA-24 Rotors

Tube				Adapter	Rotor
Dimensions (mm)	Volume (mL)	Description	Part Number		
Open-Top Tubes					
16 × 76	10	polyallomer	355640	342641	GA-24
16 × 76	10	polycarbonate	355630	342641	GA-24
16 × 76	10	stainless steel	301108	342641	GA-24
29 × 103	50	polypropylene	357007	none	GA-10
29 × 103	50	polycarbonate	357006	none	GA-10
Tubes with Snap-On Caps					
11 × 38	1.5	natural polyallomer	357448	344497	GA-10
11 × 38	1.5	natural polypropylene	356090	344497	GA-10
11 × 38	1.5	blue polypropylene	356091	344497	GA-10
11 × 38	1.5	green polypropylene	356092	344497	GA-10
11 × 38	1.5	yellow polypropylene	356093	344497	GA-10
11 × 38	1.5	orange polypropylene	356094	344497	GA-10
11 × 38	1.5	natural polypropylene (cap separate)	343169	344497	GA-10
11 × 39	1.8	white polyethylene	340196	344497	GA-10
29 × 103	50	polypropylene	357005	none	GA-10
29 × 103	50	polycarbonate	363664	none	GA-10

Continued —

Table 4. Beckman Coulter Tubes and Bottles for GA-10 and GA-24 Rotors (continued)

Tube				Adapter	Rotor
Dimensions (mm)	Volume (mL)	Description	Part Number		
Bottles					
16 × 80	10	polycarbonate (with cap)	355672	342327	GA-10
29 × 104	50	polycarbonate (with cap assembly)	357001	none	GA-10
29 × 104	50	polycarbonate (with screw cap)	357002	none	GA-10
29 × 104	50	polycarbonate (with cap assembly)	361693	none	GA-10
29 × 104	50	polyallomer (with screw cap)	357003	none	GA-10

PREPARATION AND USE

Specific information about the GA-10 and GA-24 rotors is given here. Information about the centrifuge is contained in the centrifuge operator's 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 these rotors, their safety in these rotors cannot be ascertained by Beckman Coulter. Use of other manufacturers' components or accessories in the GA-10 or GA-24 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.

PREPARATION AND LOADING

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

CAUTION

The centrifuge drive shaft can be bent or broken if the rotor is forced sideways or dropped onto it. Install the rotor by centering it over the shaft and carefully lowering it straight down.

1. The rotor is marked with four dots (at 3, 6, 9, and 12 o'clock positions) indicating the direction of the grooves. Align the dots in the rotor top with the centrifuge drive pins. Install the rotor into the centrifuge by centering it over the drive shaft and lowering it straight down. Make sure that the grooves in the rotor drive cavity are seated on the centrifuge drive pins; if the rotor is not correctly seated the lid can not be secured to the rotor.

NOTE

Do not use adapters in which glass tubes have previously broken; pieces of glass will be embedded in the rubber and will damage or break subsequently used containers.

2. Load the filled containers symmetrically into the rotor. If fewer than the maximum number of tubes or bottles (or multi-tube adapters) are being run, they must be arranged symmetrically in the rotor. Opposing containers must be filled to the same level with liquid of the same density.

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

4. When the rotor is seated, ensure that the rotor tie-down nut O-ring is in place and in good condition, then place the tie-down nut on the centrifuge drive shaft. Tighten it firmly by inserting the torquing bar (356036) through the cross-drilled hole in the tie-down nut and turning the nut clockwise until it is tight. If the rotor is left in the centrifuge between runs, tighten the tie-down nut before each run.

WARNING

Do not substitute a metal object for the plastic tie-down nut supplied with this rotor. If a tie-down nut comes off the shaft during centrifugation, the plastic nut furnished will break apart in the chamber, causing minimal damage to the instrument. A loose metal object could substantially damage the rotor, chamber, and lid, and could potentially escape the chamber into the laboratory, causing personal injury or property damage.

CAUTION

Failure to securely tighten the tie-down nut may allow the tie-down nut and the lid assembly to come off. This could cause severe damage to the rotor and the centrifuge.

OPERATION

Refer to the instrument instruction manual for centrifuge operation. Table 5 indicates approximate acceleration and deceleration times for these rotors in both 60-Hz and 50-Hz instruments. To avoid sample mixing caused by rapid deceleration, always run GA-10 and GA-24 rotors with the centrifuge set for LOW brake.

NOTE

For low-temperature runs, precool the centrifuge and rotor (without samples) at 0°C for 30 minutes at 2000 rpm.

CAUTION

Make sure the tie-down nut is tight before each run.

Table 5. Approximate Acceleration and Deceleration Times for the GA-10 and GA-24 Rotors

Instrument	Acceleration (seconds)		Deceleration* (seconds)	
	Empty	Loaded	Empty	Loaded
60-Hz Nonrefrigerated Centrifuge	65	70	55	60
60-Hz Refrigerated Centrifuge	65	70	55	60
50-Hz Nonrefrigerated Centrifuge	80	85	55	60
50-Hz Refrigerated Centrifuge	80	85	55	60

*LOW brake setting.

NOTE

Line voltage fluctuations can cause variations in acceleration and deceleration times. Values in Table 5 were achieved with line voltage ratings at 120 volts for 60-Hz instruments and 220 volts for 50-Hz instruments.

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 1.

Maximum allowable runs speed for these rotors must be reduced in any of the following circumstances.

- When any single-cavity load exceeds the rated maximum (including the weight of the tube and cap), or if the solution density is greater than 1.2 g/mL, use the applicable square-root reduction formula to determine the allowable rotor speed:

  GA-10:

$$\text{speed} = 6400 \text{ rpm } \sqrt{\frac{120 \text{ grams}}{\text{heaviest load in grams*}}} \quad (1)$$

GA-24:

$$\text{speed} = 6400 \text{ rpm} \sqrt{\frac{36 \text{ grams}}{\text{heaviest load in grams*}}} \qquad (2)$$

*Heaviest single-cavity load (including tube and cap)

- When 50-mL glass tubes are run in the GA-10, reduce rotor speed to 1000 rpm to avoid breakage (no adapters are used with these tubes).
- When certain glass tubes made by other manufacturers are used, reduce rotor speed to prevent tube breakage. Tables 6 and 7 indicate recommended *g*-force limits to minimize breakage *and are intended as guides only.* Because the strength of other manufacturers' glass and plastic tubes can vary from lot to lot, and will depend on handling and usage, *Beckman Coulter highly recommends that you pretest these tubes in the appropriate labware in these rotors using water samples to determine optimal operating conditions*.

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 rotor lid and unload the containers.
2. If removing the rotor, use the torquing bar to release the tie-down screw, then lift the rotor straight up and off the drive shaft.

Table 6. Recommended g*-Force Limits to Minimize Breakage of Certain Glass Tubes and Bottles Made by Other Manufacturers in the GA-10 Rotor*

Tube Description	Volume (mL)	Dimensions (mm)	Safe *g* Force (RCF)	Safe Speed (RPM)
B-D SST (RB, SB)	10*	16 × 100	3000	4650
B-D Vac (RB, plain)	10*	16 × 100	max	6400
Kimax 45049 (RB)	10	16 × 100	max	6400
Kimax 45200 (LT, G, SC)	10	17 × 116	1000	2600
Pyrex 9820 (RB)	10	16 × 100	max	6400
Pyrex 8140 (LT, G)	12	17 × 117	1000	2600
B-D SST (RB, SB)	15*	16 × 130	2700	4400
B-D Vac (RB, plain)	15*	16 × 130	2900	4600
Corex 8060A (LT)	15	17 × 120	1000	2600
Corex 8080A (LT, G)	15*	17 × 120	1000	2600
Corex 8442 (RB)	15	16 × 115	max	6400
Corvac (RB, SB)	15*	16 × 131	max	6400
Kimax (LT, G)	15	17 × 118	1000	2600
Pyrex 8500 (ST)	15	17 × 110	2700	4400
Pyrex 8080 (LT, G)	15*	17 × 120	1000	2600
Pyrex 8320 (ST)	40	29 × 116	2500	4200
Kimax 45212 (ST)	50*	29 × 118	1000†	2600
Pyrex 8280 (ST)	50*	29 × 115	2500	4200

* Most common usage.

† Speed must be reduced to 1000 rpm when some 40- and 50-mL glass tubes are used in the GA-10 rotor because no adapters are used.

Code: B-D = Becton-Dickinson
G = graduated
SB = silicone gel barrier
Vac = Vacutainer (B-D)
Dispo = disposable
LT = long taper
SC = screw capped
FB = flat bottom
RB = round bottom
ST = short taper

The following are registered trademarks:
Corvac – Sherwood Medical Industries, Inc; Pyrex and Corex – Corning Glass Works;
Kimax – Kimble (Division of Owens-Illinois); SST and Vacutainer – Becton, Dickinson and Company.

Table 7. Recommended g*-Force Limits to Minimize Breakage of Certain Glass Tubes and Bottles Made by Other Manufacturers in the GA-24 Rotor*

Tube Description	Volume (mL)	Dimensions (mm)	Safe *g* Force (RCF)	Safe Speed (RPM)
Pyrex, Kimax, B-D, or Dispo (RB or FB)	3 or less	10 × 75	max	6400
Pyrex (LT)	3	11 × 75	max	6400
B-D Vac (RB, plain)	5*	12 × 75	max	6400
Kimax (RB)	5	12 × 75	max	6400
Pyrex 9820 (RB)	5*	12 × 75	max	6400
B-D SST(RB, SB)	7*	12 × 100	max	6400
B-D Vac (RB, plain)	7*	13 × 100	max	6400
B-D SST (RB, SB)	10*	16 × 100	3000	4650
B-D Vac (RB, plain)	10*	16 × 100	max	6400
Kimax 45059 (RB)	10	16 × 100	max	6400
Kimax 45200 (LT, G, SC)	10	17 × 116	900	2600
Pyrex (RB)	10	16 × 100	max	6400
Pyrex 8140 (LT, G)	12	17 × 117	900	2600
B-D SST (RB, SB)	15*	16 × 130	900	2600
B-D Vac (RB, plain)	15*	16 × 130	900	2600
Corex 8060A (LT)	15	17 × 120	900	2600
Corex 8080A (LT, G)	15*	17 × 120	900	2600
Corex 8442 (RB)	15	16 × 115	max	6400
Corvac (RB, SB)	15*	16 × 131	max	6400
Kimax (LT, G)	15	17 × 118	900	2600
Pyrex 8500 (ST)	15	17 × 110	900	2600
Pyrex 8080 (LT, G)	15*	17 × 120	900	2600

*Most common usage.

Code: B-D = Becton-Dickinson; Dispo = disposable; FB = flat bottom
G = graduated; LT = long taper; RB = round bottom
SB = silicone gel barrier; SC = screw capped; ST = short taper
Vac = Vacutainer (B-D)

The following are registered trademarks:
Corvac – Sherwood Medical Industries, Inc; Pyrex and Corex – Corning Glass Works;
Kimax – Kimble (Division of Owens-Illinois); SST and Vacutainer – Becton, Dickinson and Company.

CARE AND MAINTENANCE

MAINTENANCE

NOTE

Do not use sharp tools on the rotor, as the surface can be scratched. Corrosion begins in scratches and may open fissures in the metal with increased use.

- Periodically (at least monthly) 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 check the condition of the O-ring (927571) in the tie-down nut (356035); if it is worn or damaged, replace it.
- Before using the tie-down nut, check it for damage such as distortion or splitting; replace it if it is damaged. If no damage is apparent, lightly coat the O-ring in the base of the nut with silicone vacuum grease (355148). Do *not* use any type of lubricant or grease on the threads of the tie-down nut or the threads of the drive shaft.

Store the rotor in a dry environment (not in the centrifuge) with the lid removed. 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 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 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™ (339555), that won't damage the rotor. 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.
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.*

Before reinstalling the rotor, *lightly* lubricate the drive hole of the rotor with Anti-Seize[1] to prevent the rotor from sticking, as follows:

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

NOTE

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

While Beckman Coulter has tested these methods and found that they do not damage components, no guarantee of decontamination is expressed or implied. Consult your laboratory safety officer regarding the proper decontamination methods to use.

If the rotor or accessories are contaminated with toxic or pathogenic solutions, follow appropriate decontamination procedures. Check the chemical resistances list in *Chemical Resistances* to be sure the decontamination method will not damage any part of the rotor.

[1] A registered trademark of Permatex.

[2] In the United States, 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 the United States, contact Biodex Medical Systems (Shirley, New York); internationally, contact the U.S. office to find the dealer closest to 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 and lid 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 in each box of tubes or bottles, for tube and bottle sterilization and disinfection procedures.

TUBE BREAKAGE

If a glass tube breaks, remove the glass very carefully. If all the glass particles are not contained in the rotor, thoroughly clean the interior of the centrifuge chamber bowl and the underside of the gasket (including the groove where it contacts the bowl), the rotor and lid, and the adapters in use, if any.

WARNING

Be careful when examining or cleaning the gasket and chamber as glass particles may be imbedded in their surfaces.

If all the glass is not removed from the chamber and gasket, subsequent runs will cause the remaining glass fragments to be pulled into the chamber where they will abrade the surface of the bowl. The procedure for removing glass particles from the centrifuge chamber and gasket is in your centrifuge manual. Carefully remove any glass particles from adapters in which tubes have broken. Scrub them with a brush to be sure they are clean.

[4] 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, 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 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 to:

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

Attention: Returned Goods

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

SUPPLY LIST

NOTE

To obtain copies of referenced publications, Contact Beckman Coulter, Inc., Technical Publications Department, 1050 Page Mill Road, Palo Alto, CA 94304, U.S.A. (phone 650 859-1753; fax 650 859-1375).

Contact Beckman Coulter Sales (1-800-742-2345 in the United States; worldwide offices are listed on the back cover of this manual) for detailed information on ordering parts and supplies. For your convenience, a partial list is given below.

	GA-10	GA-24
REPLACEMENT ROTOR PARTS		
Rotor assembly	349826	349827
Tie-down nut	356035	356035
O-ring (Buna N rubber)	927571	927571
Lid assembly	355816	355816
O-ring (Buna N rubber)	012780	012780
SUPPLIES		
Adapters	see Table 2	see Table 3
Tubes and bottles	see Table 4	see Table 4
Torquing bar	356036	356036
Rotor Cleaning Kit	339558	339558
Beckman Solution 555 (1 qt)	339555	339555
Silicone vacuum grease (1 oz)	335148	335148
Anti-Seize (1 1/2 oz)	961660	961660

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.

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 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.

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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