

**A BLACK RING Inside
the chamber is
NOT NORMAL !**

**YOUR SAMPLES
MAY SUFFER.**

SPILLAGE HURTS EVERYONE
avoid it since you
can!

CLEAN &/OR LUBRICATE YOUR O-RINGS
FAILURE TO DO SO MAY MEAN LOSS OF SAMPLE AND USE
OF THE ROTOR AND ASSOCIATED CENTRIFUGE !!!!!!!



DON'T LET THIS HAPPEN TO
Y O U



Date: February 15, 2007

Subject: Centrifuge Mechanical Safety – Centrifuge/Rotor System

Dear Beckman Coulter Customer:

You should know that Beckman Coulter rotors are designed, tested and approved for use on Beckman Coulter centrifugation instruments. Before releasing a rotor for sale it is tested with the appropriate Beckman Coulter instrument. Information on operating limits and controls for each Beckman Coulter rotor are encoded on the rotor and read by the Beckman Coulter instrument. In this way we are confident that the rotor and instrument when operated together are safe and reliable.

Rotors not sold by Beckman Coulter are not tested by Beckman Coulter so we have no information as to how a particular rotor will perform on a Beckman Coulter instrument or whether such a rotor will be safe on the Beckman Coulter instrument. For this reason we recommend against the use of non-Beckman Coulter rotors. We also inform our instrument customers that because of these unknowns any damage that might be caused by the non-Beckman Coulter rotor is not covered by the warranty on the Beckman Coulter instrument.

Additionally, Beckman Coulter rotors are not tested on non-Beckman Coulter instruments. Because we have not tested this combination, we have no information as to how a Beckman Coulter rotor will perform in a non-Beckman Coulter instrument or whether such an instrument will be safe when using the Beckman Coulter rotor. For this reason we recommend against the use of non-Beckman Coulter instruments. We also inform our rotor customers that because of these unknowns any damage that might be caused by the non-Beckman Coulter instrument is not covered by the warranty on the Beckman Coulter rotor.

Beckman Coulter provides rotor safety information in our Rotor Safety publication number: IN-197C. Please consult this publication which is available in the following languages; English, German, Italian, Spanish, French, Chinese, Japanese.

Sincerely,

A handwritten signature in cursive script that reads 'Margie Rogers'.

Margie Rogers
Centrifugation Business Manager
Beckman Coulter

10 Basic Commandments of Safe Centrifuge Usage

1. Be absolutely sure that the rotor is “tied down” to the centrifuge before starting a run!!!!
2. Always balance your load! Use an accurate balance!
3. Listen to the centrifuge as it gets up to speed and abort the run if you hear anything abnormal.
4. Inspect your tubes or bottles for any sign of cracks or deformities.
5. Rotors and containers are rated for their maximum speed and G force. Never exceed!
6. Know the proper fill level for your containers.
7. Always use a cart to transport rotors.
8. Know your personal lifting capabilities and get help if necessary.
9. Clean the rotors as per manufacturers recommendations and frequently inspect them.
10. Maintain your equipment properly and ask for help if you are not absolutely sure.

Beckman Coulter: 800-742-2345, Kendro Sorvall: 800-522-7746

Courtesy of: **ronjohnstone.com** The source of the only safe one liter bottles and caps for Composite Rotors

Centrifuge Rotor Safety

Centrifuges, like automobiles, are both devices that we tend to use in an almost automatic manner and frequently take for granted because we are so familiar with their use.

Big mistake!

The centrifuge itself usually poses no great danger to the user as the actual rotating mechanism has little mass. The rotor, however, sometimes has a great deal of mass and must therefore be frequently inspected and always respected by prudent users.

Two web sites will give you an idea of the terrible things that can happen if a metal rotor gets out of control, go to: www.ehs.cornell.edu, then search "centrifuge," then click on "Centrifuge Explosion Damages Laboratory," and, also go to: <http://web.mit.edu/charliew/www/centrifuge.html>

Physics defines mass as the quantity of matter in a body as measured by its inertia. Very pragmatically: the heavier an object is and the faster it is moving, the more dangerous it is.

In the case of practical centrifugation, another factor must be taken into account: the structural failure characteristics of the rotor. What makes metal rotors dangerous is their propensity to catastrophically fail, i.e., have a significant portion of the rotor separate from the main body while at speed.

When this happens:

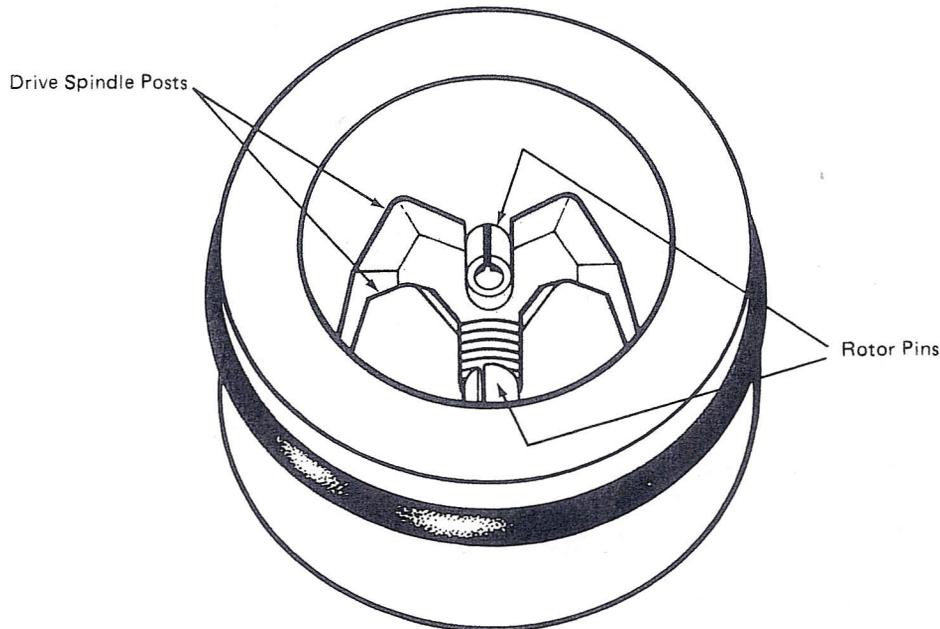
- The separated piece of the rotor is thrown into the side of the centrifuge at very high speed. At a nominal speed of 13,000 rpm, the lineal outside surface speed of a popular 250 ml. metal rotor is about 474 miles per hour.
- The centrifuge immediately will go into a violent state of imbalance, hopefully shutting down power to the drive motor to prevent further damage.
- The main body of the rotor may strike the side wall of the centrifuge and perhaps the broken off piece of the rotor-causing everything to come to an instant stop – which usually breaks off the centrifuge tower. Frequently, the refrigeration coils are punctured.
- The bottles/tubes containing your samples will usually have broken and the liquid will now be free of containment.

No sane person would ever want to be in the same room with a centrifuge during a catastrophic rotor failure.

What can you do to protect yourself and the laboratory?

1. Properly maintain your centrifuge. Find a reliable, local centrifuge service company and contract with them to perform periodic, preventative maintenance on your centrifuges. We have found that the "National Independent Service Association," (www.tritech.com, then click on "NISA") is an excellent source of honest, reliable, service people throughout the country. Morrow Service, Inc. is proud to be a charter member of this organization.
2. Inspect your rotors frequently. Examine them on a clean bench with a strong light available to illuminate the cavities. A fiber optic microscope illuminator is ideal, but a small, focusing flashlight such as a "Maglite" may be adequate. Look for any signs of pitting or corrosion in the cavities, any damage to the drive system such as bent or broken pins, breaks in the protective surface coating, breaks in the surface or between cavities, and don't forget the lid and any sealing O-rings. Make note of any findings in a log book and track any changes between inspections. If in doubt as to the safety of a rotor, ask your service organization for their opinion or you can send the rotor to us for a free inspection. Please remember that you can only visually inspect the surface and most of the corrosion may be hidden from view.
3. Seal the breaks in the surface. Any slight breaks in the protective surface coating should be sealed to prevent corrosion. Minute quantities of an epoxy sealant should not affect the balance, but be careful! Serious corrosion should not be hidden from safety inspectors.
4. Train your operators in the most acceptable ways to safely carry and handle the rotor. A metal rotor is heavy and can easily cause back strain. Remove one from the cold room and you will soon have a wet, heavy object that can easily slip from your hands, possibly causing loss of sample and physical damage to the operator and the lab. In the UK, you must obtain written permission to utilize a rotor that weighs more than 10 kg. as it is obviously difficult to handle and will cause strain.
5. Clean your rotors. Institute a policy of frequent rotor cleanings to keep the surfaces free of corrosive substances. In the case of a sample spill, clean the rotor and the centrifuge immediately. Please consult the instruction manual for your particular rotor and centrifuge for the permissible cleaning techniques. We will be glad to train your staff in this important step.
6. Train your operators to always properly tie down the rotor before spinning. Omission of this simple step is the greatest cause of major rotor problems.
7. Inspect each bottle/tube before using. Failure of a bottle/tube will cause an immediate imbalance condition as well as sample loss and subsequent mess.
8. Read your rotor instruction manual for interesting points such as: Aluminum rotors should never be subjected to autoclaving as it may cause metal fatigue. All metal rotors, even low speed ones, are assigned a design life and that life should not be safely exceeded. As ultraspeed rotors are run near the yield point where elastic deformation of the metal occurs, only a specific number of runs, usually 1000, can be safely made before a mandatory speed reduction of 10% must be instituted. The rotor can be then run for an additional 1000 cycles before discarding it.

ROTOR INSTALLATION AND REMOVAL in Beckman J2 Series Centrifuges



1. Lightly lubricate the centrifuge drive spindle with Spinkote™.
2. Apply a thin coat of silicone vacuum grease to the lid O-rings.
3. Lower the rotor *straight down* onto the centrifuge drive spindle.

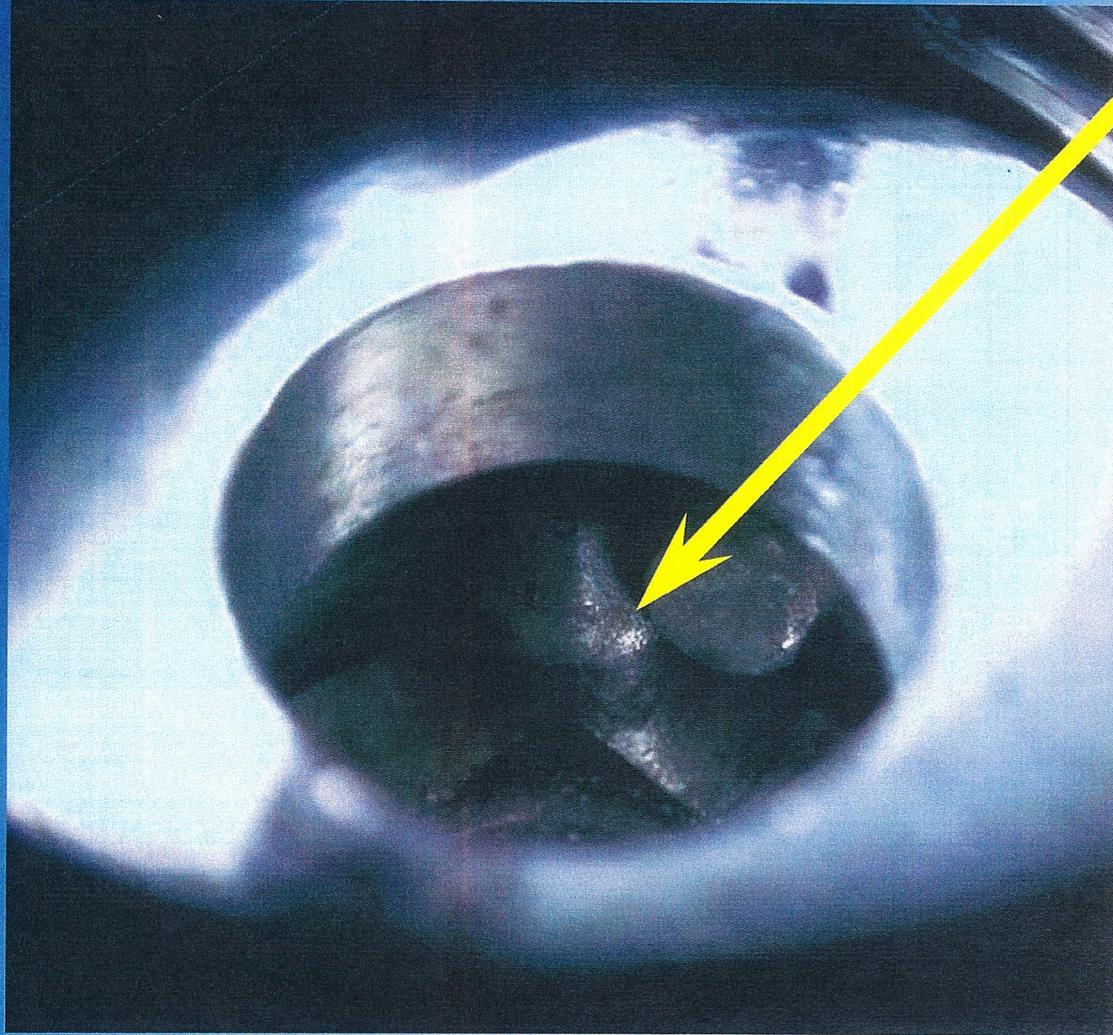
CAUTION

Be certain the rotor drive pins are engaged in the grooves of the drive spindle. (See the figure above).

4. Set the lid on the rotor, press down on the knob, and screw the lid on tight (requires at least three full turns of the knob).
5. To remove a rotor from the centrifuge, unscrew the lid and lift the rotor straight up off the drive. If the rotor is stuck on the spindle, use the T-bar removal tool referred to in the rotor instruction bulletin.

JUC-0794-1.5-DT

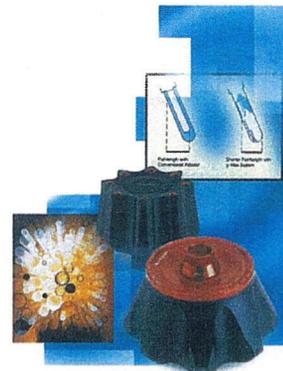
Avanti J Rotor Installation



**Improper
Seating – pin not
in the groove.**

Proper Seating

**Make sure the
rotor pins
are seated in the
groove.**



Dear Beckman Centrifuge User,

Beckman is frequently asked for recommendations by users in order to determine the safe, useful life of their rotors. Rotor life is ultimately a function of condition and cycles or runs. To determine the recommended life of a rotor that appears free of visible defects, refer to the chart below. If you do not have a known accurate count of the rotor cycles, then the "Retire After Years" column should be used in order to provide an adequate margin of safety against catastrophic failure. Beckman liability for a rotor failure used under normal and recommended conditions is limited to the warranty period listed below. Additional rotor coverage may be purchased in conjunction with a Total Service Agreement. This additional coverage requires an annual inspection and shall never exceed the "Retire After Years" age. Use of any Beckman rotor outside of these guidelines is always at the total risk and liability of the user.

Beckman Rotor Life			
	Warranty Years	Retire After Years	Retire After Runs
Ultracentrifuge Rotor			
Swinging Bucket.	5	10	2400
Aluminum Fixed Angle	5	10	2400
Zonal & Continuous Flow	5 yrs.or 2000 runs	10	2000
Component Test & Rock Core	5 yrs.or 2000 runs	10	2000
Titanium F/A,VT&NVT	5	12	6000
VC-53 Composite	6	12	7200
VAC-50 Aluminum Composite	5	12	3000
Analytical, Aluminum	5	10	2400
Analytical, Titanium	5	12	6000
TL and Max Series	5	12	NA
Airfuge Rotors	1	10	NA
J Series Rotors			
Avanti J Series	7	15	50,000
J 2/6 Series Rotors	7	15	50,000
JLA-10.500 canister	7	7	NA
* Canisters have retirement date engraved on them			
Tabletop Rotors			
Metal rotors except GH-3.7	7	10	NA
Plastic Microfuge Rotors	1	10	NA
GH-3.7 Rotor	7	7	NA

Thank You,

Beckman - Coulter



Dear Beckman Coulter Centrifuge User,

The following Beckman Coulter rotor needs to be returned to the factory for inspection and possible repair. To accomplish this, you must have a Return Goods Authorization (RGA). An RGA can be obtained by calling Victoria Townsend in our service department at 1-800-463-7828, Ext. 262164. Be prepared to supply your name, address, etc. as well as the rotor type and serial number, along with the type of instrument and serial number of the instrument that the rotor is normally used in. The RGA will be mailed to you and will include a shipping label, customs documents, and the documents to be packed with the rotor. When you get the RGA, pack the rotor carefully. Double boxing is recommended unless you have the original box in which the rotor was shipped. You must certify that the rotor is radiologically and biologically safe to handle. For swinging bucket rotors you must include the buckets. Do not include the rotor stand, bucket rack or any adapters. Typical rotor repair time takes about 4 weeks. Rotor repairs covered by warranty will be completed at no charge. You will be required to provide a purchase order to pay for repairs not covered by warranty.

In the interest of safety, Beckman will not repair rotors past the "retire after" age unless an accurate total of runs and hours can be provided. This "retire after" age varies with the type of rotor, but is typically 10-15 years.

Model _____ Serial # _____

Problem _____

Model _____ Serial # _____

Problem _____

Thank You,