

## STANDARD OPERATING PROCEDURE

### Operating Centrifuges

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2030 SRTC, 5-4403  
Nov 30, 2018

Minimum Personal Protective Equipment Required: Skin and body protection (long pants, lab coat, closed toed shoes, appropriate gloves)

Risks: Centrifuges can harm users due to the high speed in which they operate. Mechanical failure of the rotor can result in injury or even death. Sample container breakage can generate aerosols that are harmful to inhale.

The majority of centrifuge accidents result from user error.

Special Handling:

- ✓ Proper selection, use and maintenance of rotors is critical to safe operation
- ✓ Centrifuge rotors must be properly balanced
- ✓ Rotors and inserts must be cleaned after each use

Protocol/Procedure:

1. If you need to run samples at 4°C
  - a. Set the temperature, close the door, and allow the centrifuge to reach the desired temperature.
  - b. Place a post-it note on top that says your name, date, and that you need to keep the centrifuge at 4°C.
  - c. Keep the door closed the entire time it is set at 4°C.
  - d. Once you have completed all runs, you must reset the temperature to room temperature
2. Select the appropriate rotor and/or adaptors for the centrifuge and tubes you are using and note the maximum speed.
  - a. We have two floor model centrifuges. One is a Sorvall RC 5C Plus and the other is a Beckman Coulter Avanti J-20 XP.
    - i. Rotors for the Sorvall RC 5C plus:
      1. SLA-600TC: maximum speed 12,500 rpm (25,656 RCF)
      2. SA-600: maximum speed 16,5000 (39,412 RCF)
      3. SLA-3000: maximum speed 11,000 rpm (20,449 RCF)
    - ii. Rotors for the Beckman Coulter Avanti J-20 XP
      1. JA 25.50: maximum speed 25,000 rpm (75,600 RCF)
      2. JLA 16.250: maximum speed 16,000 rpm (38,400 RCF)

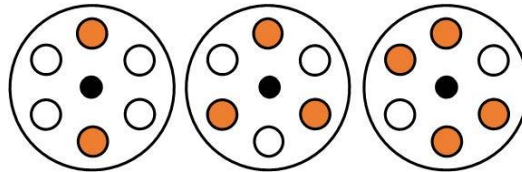
- b. We have one large benchtop centrifuge: a Sorvall Legend
  - i. There are two sets of buckets for the Legend:
    1. 75006441 K: maximum speed 4600 rpm; maximum load 800 g
    2. 75006449 Q: maximum speed 4600 rpm; maximum load 500 g
3. Inspect the rotor (or buckets) for signs of corrosion or cracking. If found, do not use the rotor and inform the lab manager of the issue.
4. For **RC5C Plus** and **Avanti J-20 XP**, install the rotor and make sure it is properly seated on the drive shaft. There are drive pins on the drive shaft and on the rotor. When properly seated, these pins engage and prevent the rotor from slipping.
5. Make sure your tubes are balanced before loading them into the rotor!

There is a two-pan balance in room 2040 across from the Nanopure that should be used to confirm tubes are balanced. If inserts will be used, include them when weighing your tubes.
6. For the **Legend**, place your samples in the buckets and place the buckets on two-pan balance to and adjust as needed to get them balanced. There is a large weight difference between the various buckets and inserts even when empty, so they must be weighed along with the samples.

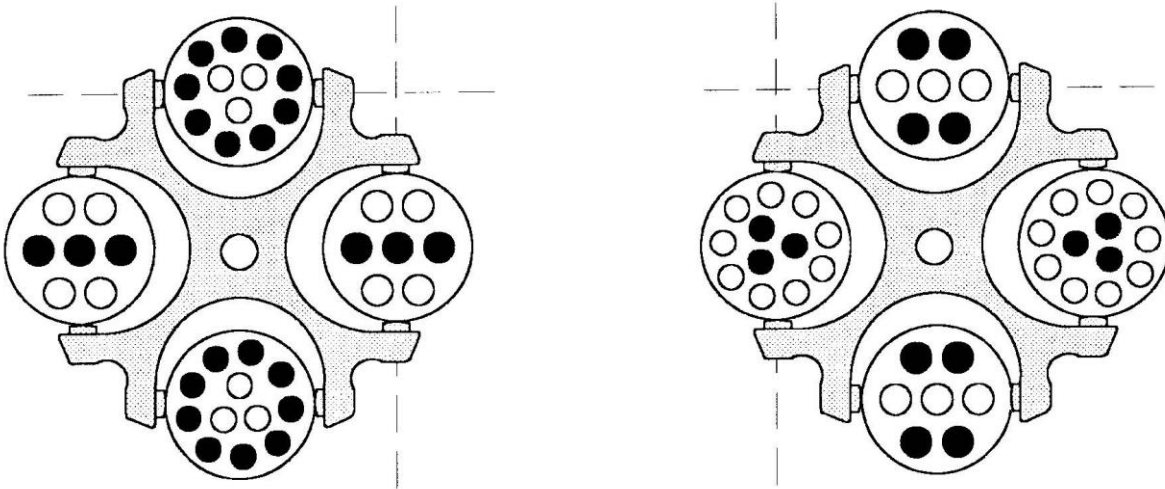
When placing buckets onto rotor, make sure balanced pairs are placed across from each other.

### Examples of balanced rotors

Balanced 6-Position Rotor



## Swinging Bucket Rotor



7. Make sure rotor lids are tightly sealed. [The **RC5C** has two knobs: first turn the big knob to tighten, then turn the small knob. Both should be tight.] Lift on the rotor to make sure it cannot be removed.
8. Close the door.
9. Set run speed and time, never exceed a rotor's maximum speed. Set Rotor ID if necessary (printed on the top of the rotors). Press Start.
10. **DO NOT** leave the area until the centrifuge has reached the running speed. If there is excessive vibration, shaking, or noise, press **STOP** immediately. Make sure the rotor is properly seated and balanced. If a problem persists alert the lab manager and stop using the centrifuge.
11. Make sure the rotor has come to a complete stop before opening the door.
12. Remove the rotor from the centrifuge. Remove any adaptors from the rotor. Check the adaptors and rotor cups for evidence of spills or leaks. The rotors can be cleaned with a damp paper towel and then dried.
13. Wipe down the rotor with 70% ethanol and return to rotor shelf.
14. Wipe the interior of the centrifuge down with a paper towel and 70% ethanol. Do a final wipe down with DI water.
15. **If the centrifuge was run at 4 °C, reset the temperature to room temperature and keep the door open and allow the centrifuge to return to room temperature.** The centrifuge will not automatically return to room temperature. Make sure to use a paper towel to dry the interior chamber. Condensation will form as it returns to room temperature and if left can cause corrosion.