

Ref: Date Review date:

STANDARD OPERATING PROCEDURE

1. SOP for the Beckman Avanti J-25 centrifuge.	
2. Description: The loading, unloading, operation and care of the Beckman Avanti J-25 Centrifuge.	
3. Authorisation eg <i>List of Authorised Users and details of procedures and personnel that provide authorisation;</i>	
<ul style="list-style-type: none"> ◆ <i>Authorisation provided by:</i> ◆ <i>Custodian of equipment:</i> ◆ <i>Training required for task:</i> ◆ <i>Supervision required for task:</i> ◆ <i>Responsibility for Review of this SOP:</i> 	<p>Dr Amanda Boyce Dr Amanda Boyce On-site training in the procedure. Familiar with this SOP and have completed a risk assessment for the material/task being used in conjunction with the centrifuge. None once trained. Dr Amanda Boyce</p>
4. Resources eg. <i>is there anything you need in advance before commencing ie.....</i>	
<ul style="list-style-type: none"> ◆ <i>Equipment</i> ◆ <i>Substances</i> ◆ <i>PPE (see section 6)</i> 	<p>Centrifuge tubes that are appropriate for the chemical nature and density of the samples. A suitable rotor for the centrifuge tubes. Spinkote and vacuum grease. Eye protection; Covered shoes.</p>
5. Instructions.	
Environment	<ul style="list-style-type: none"> ◆ The centrifuge is located in a room with limited activities. This makes for a more controlled environment.
Preparation	<ul style="list-style-type: none"> ◆ Tubes are matched by weight or by volume where all tubes have the same contents of the same density. ◆ A suitable number of tubes are required that can be evenly distributed around the rotor for a balanced run. If necessary, an extra tube of the same weight should be prepared. ◆ Ensure the centrifuge tubes are properly capped / sealed to prevent spills / splashes of the contents.
Step by Step Instructions	<ol style="list-style-type: none"> 1. Turn on the electrical power to the centrifuge. 2. Select the appropriate rotor for the job and inspect for any damage. Do not use if the rotor is damaged in any way. 3. Check the O-rings (x2) on the rotor lid. Apply vacuum grease if required. This ensures proper sealing. 4. Place small amount of Spinkote on the spindle for easy release of the rotor and a little to the thread of the rotor lid for easy release of the lid. 5. Locate the rotor correctly on the spindle. 6. Select the required temperature and allow the centrifuge to adjust to the required temperature. 7. If centrifuge is being refrigerated to bring to the required temperature, keep the lid closed to prevent the formation of condensation on the inside of the centrifuge. 8. Check that the total mass of the load (of centrifuge tubes and contents) does not exceed the maximum allowable for the rotor. 9. Load the centrifuge tubes into the rotor. 10. Securely fit the lid to the rotor. 11. Close the lid to the centrifuge. 12. Select appropriate rotor ID. Incorrect ID selection may lead to running the rotor at wrong speed (i.e. above maximum) 13. Set the required parameters for the centrifuge run (i.e. speed and duration). These parameters are dependent upon the rotor, the centrifuge tubes being used and the nature of the material being centrifuged (i.e. the density of the sample) and the total mass of the load. 14. Wait next to the centrifuge until it has reached the desired speed and has not stopped due to it being unbalanced. 15. Wait until the centrifuge run has been completed and the lock to the centrifuge lid is unlocked. 16. Unscrew the rotor lid and remove the samples. 17. Remove the rotor and place upside-down to allow it to dry.

Clean up and Waste Disposal	<ul style="list-style-type: none"> ◆ Cleaning rotors - Do not use caustic cleaning agents. Only use mild detergents (i.e. Beckman rotor detergent) with water. ◆ More specific clean-up procedures must be developed with the protocols for the particular chemical or biological nature of the specific samples being centrifuged.
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Optional This procedure is rated LOW (AS 4360) when carried out to the above instructions and incorporating the appropriate control measures. Refer to Risk Assessment

6. Key Hazards Refer to Risk Assessment	Risks from Hazard	Control Measure including PPE Ref the Hierarchy of Controls
◆ Electrical	◆ Risk of electrocution	◆ Make sure the electrical cable has a testing tag (that has passed inspection). Make sure there is no damage to the electrical cable.
◆ Lifting hazard / manual handling of rotor.	◆ Muscle strains/neck/shoulder injury from incorrect lifting. Uncontrolled falling object/rotor if not handled properly.	◆ Training in lifting and handling of the rotors
◆ Biological/chemical hazard from broken tube and broken seal on rotor lid	<ul style="list-style-type: none"> ◆ The tube content is released from the rotor to the inside of the centrifuge. ◆ Splashed and spillages from samples ◆ Failure of tubes from chemical incompatibility 	<ul style="list-style-type: none"> ◆ Check the O-rings before each run. Apply grease if required. A quarterly maintenance inspection. ◆ Ensure that the tubes are sealed properly. ◆ Select the appropriate centrifuge tube made from a compatible material.
◆ Unbalanced rotor.	◆ The unbalanced rotor becomes unstable and could come off spindle or shatter, causing serious injury or death	◆ Ensure the tubes to be centrifuged are matched in pairs or evenly distributed around the rotor. Tubes are to be filled to the same level with the same density fluid or are to be weight matched. Beckman has additional features to prevent operation of unbalanced rotor but should not be relied upon as the sole mechanism for preventing an unbalanced run
◆ Operating a rotor at higher than its maximum speed	◆ Risk of the rotor shattering causing failure of the centrifuge and/or serious injury or death	◆ Ensure correct selection of rotor ID. Double check the required speed against the rotor chart (Showing RPM/g and maximal speed).
◆ Damaged rotor	◆ A damaged rotor may not be capable of operating at the rated speed and may become unbalanced or shatter	◆ Quarterly inspection of rotors. Inspect rotor before use. Do not use if rotor is damaged.
◆ Obstructions in front of the centrifuge	◆ Over-reach with the heavy rotor when loading (1). Trip hazard causing a fall	◆ Ensure clear and unobstructed access to the centrifuge for ease of loading/unloading.

7. Emergency Procedures and Shut down.
 There are procedures built into the centrifuge to prevent some of the hazard from occurring i.e. if the correct rotor is selected it will not allow the rotor to be spun over its maximum speed and if the rotor is unbalanced, the centrifuge will stop itself. If the centrifuge is vibrating a little too much and it has not stopped automatically, there is a red STOP button. Press that, wait until it has stopped spinning and redistribute the tubes to make sure the rotor is completely balanced.

8. Legislative References

AS 2243.6-1990: Safety in laboratories - mechanical aspects.

9. Definitions.

Laboratory centrifuge: An apparatus used in the laboratory for separating substances of different density or particle size, when suspended in a fluid, by spinning them about an axis in a suitable container.

Rotor: Primary component of a centrifuge which holds the material to be subjected to centrifugal force (in some form of tube or container) and which is rotated by the drive system.