

<b>Frederick National Laboratory for Cancer Research</b> <small>sponsored by the National Cancer Institute</small>	HPV Serology Laboratory Standard Operating Procedure	
Use and Maintenance of the Eppendorf Centrifuge		
<b>Document ID: HSL_EQ_020</b>	Version 1.0	Page 1 of 10

Released by/Date Effective:

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**1. PURPOSE**

- 1.1. The purpose of this procedure is to describe the use and maintenance of an Eppendorf centrifuge.

**2. SCOPE**

- 2.1. This procedure applies to the HPV Serology Laboratory located at the Advanced Technology Research Facility, Room C2007.

**3. REFERENCES**

- 3.1. Eppendorf Centrifuge 5430 R User manual
- 3.2. HSL\_EQ\_020.01: Eppendorf Centrifuge Use and Maintenance Form
- 3.3. HSL\_GL\_001: Waste Disposal at the Advanced Technology Research Facility
- 3.4. HSL\_GL\_002: Equipment Qualification and Calibration in the HPV Serology Laboratory
- 3.5. HSL\_GL\_003: Good Documentation Practices for the HPV Serology Laboratory
- 3.6. HSL\_GL\_006: Reagent Preparation for the HPV Serology Laboratory
- 3.7. HSL\_GL\_007: Reagent and Chemical Expiry in the HPV Serology Laboratory
- 3.8. HSL\_GL\_008: Laboratory Flow and Gowning Procedures for the HPV Serology Laboratory
- 3.9. HSL\_GL\_009: HPV Serology Laboratory BSL-2 Procedures
- 3.10. HSL\_GL\_010: Control and Request of Documents in the HPV Serology Laboratory

**4. RESPONSIBILITIES**

- 4.1. The Research Associate, hereafter referred to as analyst, is responsible for reviewing and following this procedure.
- 4.2. The Scientific Manager or designee is responsible for training personnel in this procedure and reviewing associated documentation.
- 4.3. The Quality Assurance Specialist is responsible for quality oversight and approval of this procedure.

**5. REAGENTS, CHEMICALS AND EQUIPMENT**

- 5.1. Eppendorf Centrifuge 5430 R

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- 5.2. Rotors
- 5.3. A-2-MTP Microplate Bucket (Fisher Scientific, Cat # 05-401-517 or equivalent)
- 5.4. Cavicide (Warehouse, Cat # 79300360)
- 5.5. Ster-ahol (VWR, Cat # 14003-358 or equivalent)
- 5.6. Wypalls paper towel (Warehouse, Cat # 79300335 or equivalent)
- 5.7. Clorox Bleach, Concentrated (Warehouse, Cat # 68100251 or equivalent)

## 6. HEALTH AND SAFETY CONSIDERATIONS

- 6.1. Proper safety precautions should be taken while working in a laboratory setting. This includes, but is not limited to, proper protective equipment such as lab coats, safety glasses, closed-toe shoes, and non-latex gloves.
- 6.2. Refer to the respective SDS when working with any chemicals.
- 6.3. Refer to "HSL\_GL\_001: Waste Disposal at the Advanced Technology Research Facility" regarding waste disposal processes at the ATRF.

## 7. DEFINITIONS AND ICONS

Term	Definition
FME	Facilities, Maintenance and Engineering
HPV	Human Papillomavirus
HSL	HPV Serology Laboratory
RCF	Relative Centrifugal Force
RPM	Revolutions per minute
SDS	Safety Data Sheets
SOP	Standard Operating Procedure
Type I Water	Ultrapure/Reagent Grade/Critical applications
Type II water	Pure/Analytical Grade, used for standard applications

## 8. OPERATION

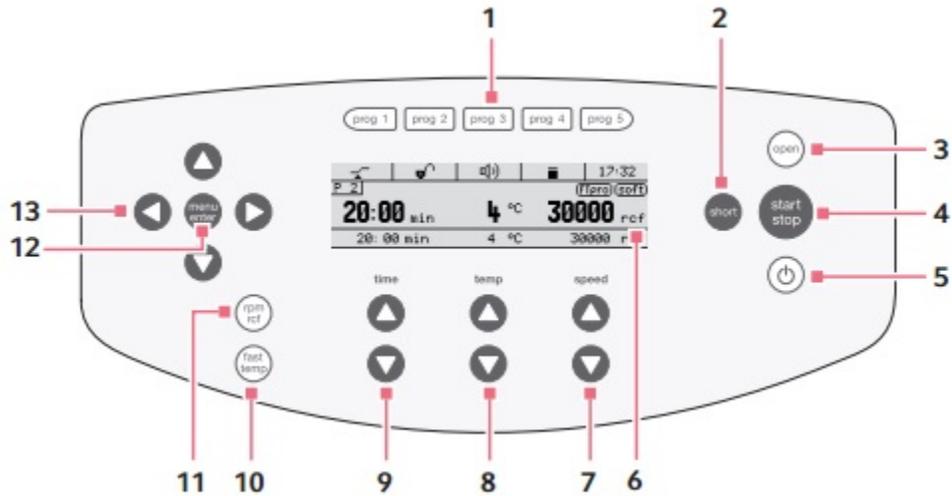
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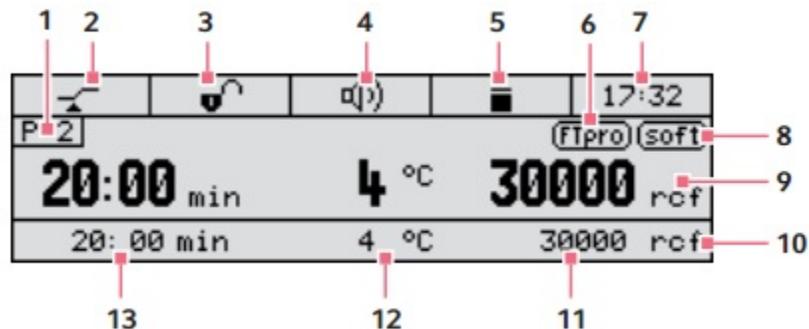
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8.1. Operating Controls:



1 - Select Program	8 – Adjust the Temperature
2 – Short Spin Centrifuge	9 – Adjust the Centrifuging Duration
3 – Release Lid	10 – Start Temperature Control Cycle Fast Temp
4- Start and Stop Centrifuge	11 – Switch the Display Centrifuging Speed (rpm/rcf)
5 - Activate or Deactivate Standby Mode	12 – Call and Select the Menu Parameters
6 - Display	13 – Navigating the Menu
7 – Set Speed of Centrifugation	

8.2. Centrifuge Display:



1 – Program Number (if enabled)	8 – Soft Ramp
2 – Status of the function at set rpm	9 – Standard Display
3 – Status of the key lock	10 – Extended Display (if enabled)
4 – Status of the Loud Speaker	11 – g-force/speed
5 – Status of Centrifuge (lid locked, unlocked, or in progress)	12 – Temperature
6 – Temperature Control Cycle Programming	13 – Centrifuge Duration
7 – Time	

8.3. Preparing for Centrifugation:

8.3.1. Turning ON the Centrifuge:

- 8.3.1.1. Switch on the centrifuge using the main power switch or the standby key.
- 8.3.1.2. Open the closed centrifuge lid by pressing the open key. The parameter settings of the last run are displayed.

8.3.2. Inserting the Rotor:

- 8.3.2.1. Fit the rotor vertically on the motor shaft.
- 8.3.2.2. Swing-bucket rotors: remove the buckets before inserting and/or removing the rotor. Use both hands to pick up the rotor cross.
- 8.3.2.3. Rotor F-35-6-30: only use the rotor removal tool supplied to insert or remove the rotor.

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8.3.2.4. Insert the supplied rotor key into the rotor nut.

8.3.2.5. Turn rotor key clockwise until the rotor nut is firmly tightened.

**Note:** The centrifuge has automatic rotor detection. It detects a newly inserted rotor during centrifugation and displays its name for approximately 2 seconds.

#### 8.3.3. Removing the Rotor:

8.3.3.1. Swing-bucket rotors: remove the buckets before inserting and/or removing the rotor. Use both hands to pick up the rotor cross.

8.3.3.2. Rotors: only use the rotor removal tool supplied to insert or remove the rotor.

8.3.3.3. Turn the rotor nut counterclockwise using the supplied rotor key.

8.3.3.4. Remove the rotor vertically in an upward motion.

8.3.3.5. Switch off the centrifuge after use and empty the condensation water tray (remove it from the left side of the device). Leave centrifuge lid fully opened and protect it against closing.

#### 8.4. Loading the Rotor:

8.4.1. Load rotors symmetrically with identical tubes or plates and buckets. Only load adapters with suitable tubes or plates.

8.4.2. Always use tubes or plates of the same type (weight, material/density and volume). Check that loading is symmetrical by balancing the adapters and tubes or plates used with scales.

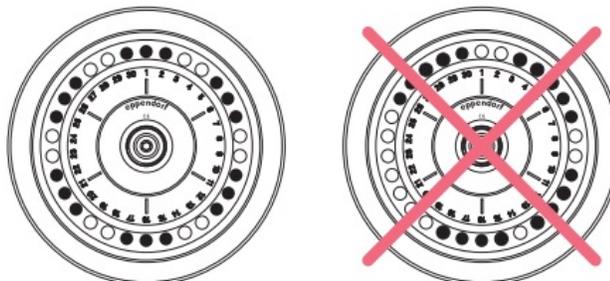
8.4.3. The device automatically detects imbalances during operation and stops the run immediately with an error message and a signal tone. Check the loading, balance the tubes and re-start the centrifugation.

#### 8.5. Fixed Angle Rotors

8.5.1. Fixed-angle rotors may only be operated with the appropriate rotor lid in each case. This is clearly shown by the identical rotor name labeling on the rotor and on the rotor lid.

8.5.2. Insert tubes opposite each other in pairs into the rotor bores. To ensure symmetric loading, tubes that are arranged opposite each other must be of the same type and contain the same filling quantity.

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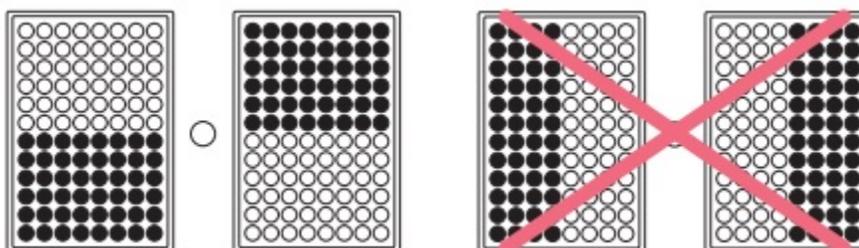


8.5.3. Attach and tighten rotor lid.

8.6. Loading Swing-Bucket Rotor:

**Note:** When using the A-2-MTPs, centrifuge without the upper shell of the wind shield in order to guarantee precise and quick temperature control of samples. The centrifugation noise will increase slightly in this case.

- 8.6.1. Hang the buckets into the rotor. All rotor positions must be loaded with carriers.
- 8.6.2. Check that all carriers are hanging properly and can swing freely.
- 8.6.3. Carry out a manual loading and swing test the first time a tube or plate type is used.
- 8.6.4. Load the buckets symmetrically.



**Note:** The plate arrangement shown on the right-hand side is incorrect, as the buckets will not swing properly. The plates have some play in the buckets.

8.6.5. Closing the centrifuge lid.

8.7. Closing the Centrifuge Lid:

- 8.7.1. Push down the centrifuge lid until the lid latch engages and the lid is automatically closed. The centrifuge will close automatically.
- 8.7.2. The open key lights up blue. The symbol ■ appears in the display.

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8.8. Temperature Adjustment:

8.8.1. Set the temperature using the **temp arrow** keys between -11°C and +40°C. You can also modify the temperature during centrifugation.

8.8.2. At higher ambient temperature a brief fan noise is possible until the desired temperature has been reached. This indicates a heavy cooling performance.

8.8.3. **FastTemp pro** function:

(This function can be used to start a temperature control run directly without samples with a rotor and temperature-specific speed in order to quickly adjust the rotor chamber, including the rotor, buckets and adapters, to the previously set nominal temperature)

8.8.3.1. Press the **fast temp** key. The display shows Fast Temp, the remaining duration of the temperature control run as well as the current temperature and g-force (rcf)/speed (rpm). The temperature control run automatically ends when the set temperature is reached. A periodic signal tone sounds.

8.8.3.2. Press the start/stop key to terminate the temperature control run early.

8.9. Centrifugation with Time Setting:

8.9.1. Use the time arrow keys to set run time.

8.9.2. Use the **speed** arrow keys to the g-force (rcf)/speed.

8.9.3. Press **start/stop** to start centrifuging.

8.10. Centrifuging in continuous operation:

8.10.1. Use the time arrow keys to set the continuous run. The continuous operation function can be set above 99:59 h or below 30 seconds. The timer indicates continuous operation.

8.10.2. Use the **speed** arrow keys to set the g-force (rcf)/speed.

8.10.3. Press **start/stop** to start centrifuging.

8.10.4. Press **start/stop** to end centrifuging after the desired time.

8.11. Short-spin centrifugation:

**Note:** You can carry out a short-spin cycle with the currently set or with the maximum g-force (rcf)/speed of the rotor used.

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8.11.1. For short-spin cycle with the current g-force (rcf)/speed, set this directly with the arrow keys **speed**.

8.11.2. Start the short run: Hold the **short** key pressed down.

8.11.3. End short spin run: Release the **short** key.

8.12. Closing the rotor lid:

8.12.1. Check the correct positioning of the external sealing ring in the groove.

8.12.2. Place the rotor lid on the rotor in a vertical motion.

8.12.3. To lock the rotor, turn the red rotor lid screw clockwise as far as it will go, and after an audible "click" is heard. The rotor is correctly locked after the audible "click" is heard!

## 9. MAINTENANCE

9.1. Monthly Maintenance:

9.1.1. Clean instrument surfaces, rotors and buckets, by pre-wetting paper towel with cavicide then wiping clean.

9.1.2. Clean buckets and inserts by submerging these items into a pan of 10% bleach. Allow the items to soak for 30 minutes, then rinse the items thoroughly with Type II water. Allow the items to dry prior to use.

9.1.3. Record maintenance on form HSL\_EQ\_020.01: Eppendorf Centrifuge Use and Maintenance Form.

9.2. Annual Maintenance:

9.2.1. Centrifuge must be calibrated annually by FME or external vendor.

9.2.2. Record maintenance on form HSL\_EQ\_020.01: Eppendorf Centrifuge Use and Maintenance Form.

## 10. ATTACHMENTS

10.1. Not applicable

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**11. REVISION HISTORY**

Revision Start Date	Version #	Changes	Reasons
24Mar17	New	New SOP for the use and maintenance of Eppendorf centrifuge	Currently no SOP

Eppendorf Centrifuge Use and Maintenance Form

**Form ID: HSL\_EQ\_020.01**

Associated SOP: HSL\_EQ\_020

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Equipment ID:

Calibration  
Date:

Calibration  
Due Date:

Date	Analyst	Speed Used	Run Time	Activity Performed	Comments
		<input type="checkbox"/> N/A	<input type="checkbox"/> N/A		<input type="checkbox"/> N/A
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QA Review By/ Date: