Current Status: *Active* **PolicyStat ID:** *10369883*

Origination: *12/8/2021*
Effective: *12/8/2021*
Last Approved: *12/8/2021*
Last Revised: *12/8/2021*
Next Review: *12/8/2023*
Document Contact: *Michele Sedlak: Medical Technologist Lead*
Area: *Laboratory-Hematology*
Key Words:
Applicability: *Royal Oak*

Microhematocrit-RO

Document Type: Procedure

I. PURPOSE AND OBJECTIVE:

This procedure gives instructions on how to perform a microhematocrit using the Hematastat II™ microhematocrit centrifuge. It also provides instructions on maintenance and troubleshooting.

II. ACRONYMS:

A. Revolutions Per Minute (RPM)
B. Liquid Crystal Display (LCD)

III. PRINCIPLE:

A given volume of whole blood is centrifuged to obtain maximal packing of erythrocytes. The volume of erythrocytes is measured and expressed as a percentage of the total volume.

IV. SPECIMEN COLLECTION AND HANDLING:

Type	A. Whole blood collected in a 4 mL vacutainer. This is the preferred sample.-OR- B. Capillary blood collected in a microtainer.
Anticoagulant	K_2EDTA
Amount	A. Whole blood: 1. Minimum sample size is 2.0 mL. 2. Optimum sample size is 4.0 mL. B. Capillary blood: 1. Minimum sample size is 300 µL. 2. Optimum sample size is 500 µL.
Special Handling	A. Specimen must be well mixed for minimum of two minutes before

	being analyzed. **Ensuring adequate mixing is essential. Mix the sample well before filling the first tube and again before filling the second tube.** B. Samples containing hemolysis may give false results (see IX, Note C).
Timing	Specimen is stable for 8 hours at room temperature; 72 hours at 4°C.
Criteria for Unacceptable Specimens	Specimens containing clots, hemolysis or inappropriate volume are unacceptable and must be redrawn.

V. EQUIPMENT:

A. SafeCrit™ plastic microhematocrit tubes

B. Critoseal™

C. HemataStat II™ microhematocrit centrifuge with microhematocrit reader

VI. QUALITY CONTROL:

A. Quarterly checks are made of rpm and the timer. See Attachment A for these maintenance procedures.

B. A microhematocrit is performed on a normal blood analyzed on the main hematology analyzer. Results should agree ±2.0 %. Run a normal blood every time you have a patient to run.

C. **Samples are run in duplicate and results averaged.**

VII. PROCEDURE:

A. Using well-mixed specimen, fill 2 plastic microhematocrit tubes between ½ and ¾ full. **Ensuring adequate mixing is essential. Mix the sample well before filling the first tube and again before filling the second tube.**

B. Seal one end with critoseal.

NOTE: The interface between critoseal/ blood should be flat.

C. Place tubes into tube holders with sealed ends at the bottom of the tube holder. To balance the rotor, place tubes opposite each other in the centrifuge.

D. With the tube holders and hematocrit tubes in place, lock the lid by firmly pressing down on the lid tab. Start the run cycle by pressing the RUN button. The centrifuge will spin the sample for 60 seconds. Observe the 60 second count down on the LCD. The lid will automatically unlock and open when the rotor stops.

E. **Read hematocrit as soon as centrifuge stops.** Only one tube at a time should be removed from the rotor for reading. **Once a tube has been removed from the rotor, it should be read within 1 minute.** Additional tubes may be left in the rotor for up to 5 minutes without any adverse effects. To use the reader:

1. Look at the LCD to ensure that the tube size **1.1 mm** appears in the LCD between the READ and SPIN messages.

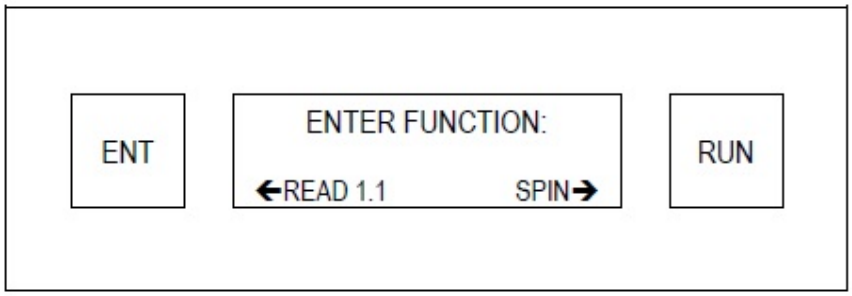

Image 1, courtesy of HemataStat II™ Centrifuge Operator's Manual.

2. Move the slider to the far left side of the reader tray.
3. Remove a capillary tube from the rotor and place it in the groove located in front of the LCD. Make sure the sealant end of the tube is to the far left, against the end of the groove. Rotate the tube in the groove so that the full diagonal interface of the Red Blood Cells (RBCs)/PLASMA can easily be seen as shown below:

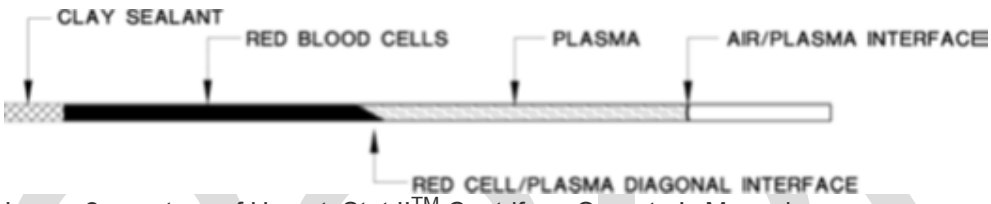

Image 2, courtesy of HemataStat II™ Centrifuge Operator's Manual.

NOTE: Once it has been properly positioned, make sure you do not move the tube during the reading process.

4. Press the ENT button. The LCD will change to:

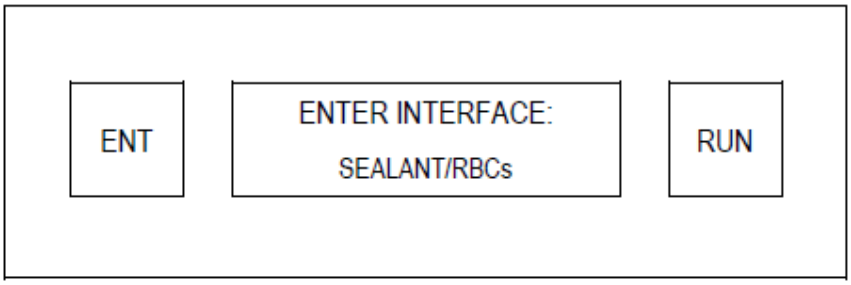

Image 3, courtesy of HemataStat II™ Centrifuge Operator's Manual.

5. Move the slider along the capillary tube to the interface of the tube sealant and red blood cells. Look through the transparent slider and position the vertical black line on the interface as shown in the following diagram.

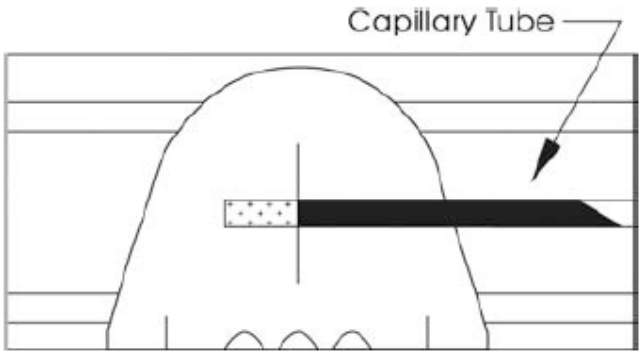

Image 4, courtesy of HemataStat II™ Centrifuge Operator's Manual.

6. Press the ENT button. The LCD will change to:

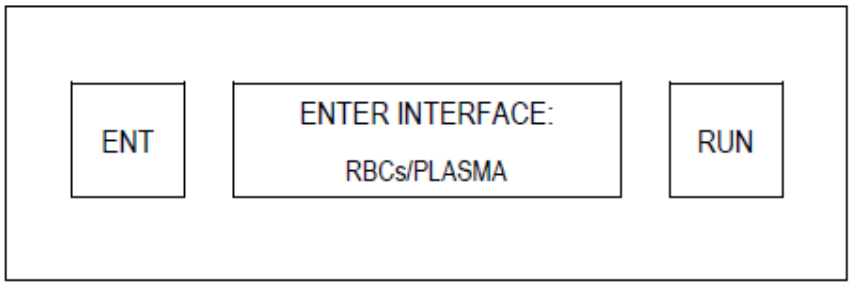

Image 5, courtesy of HemataStat II™ Centrifuge Operator's Manual.

7. Move the slider to the RBCs/PLASMA interface. Look through the transparent slider and position the vertical black line on the middle of the diagonal interface as shown in the following diagram.

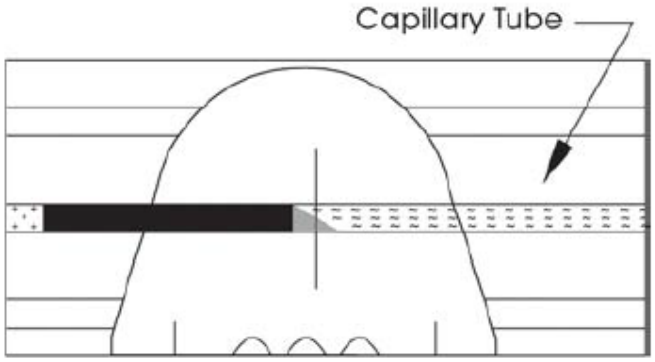

Image 6, courtesy of HemataStat II™ Centrifuge Operator's Manual.
NOTE: In some instances, a line of red blood cells extending from the RBCs/PLASMA interface through the PLASMA/AIR interface can be observed. These fine lines of red blood cells are residuals from the migration and they have not been found to affect the results.

8. Press the ENT button. The LCD will display:

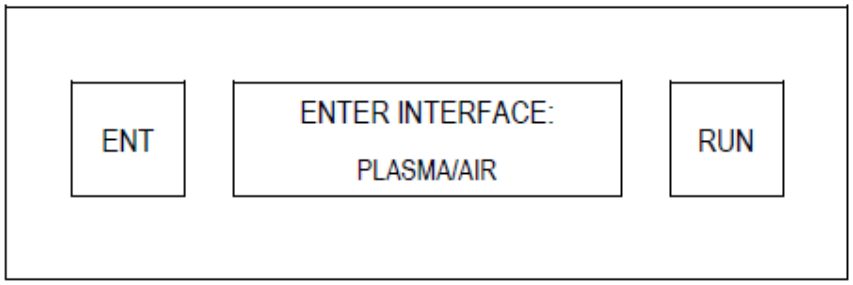

Image 7, courtesy of HemataStat II™ Centrifuge Operator's Manual.

9. Move the slider to the PLASMA/AIR interface. Place the vertical black line of the slider over the interface at the end of the plasma curve as shown in the following diagram.

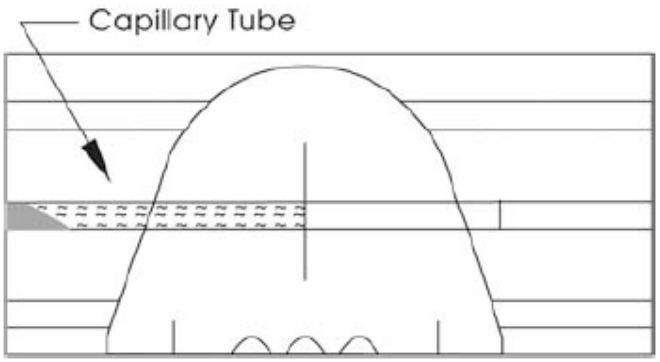

Image 8, courtesy of HemataStat II™ Centrifuge Operator's Manual.

10. Press the ENT button. The LCD will display the hematocrit result.

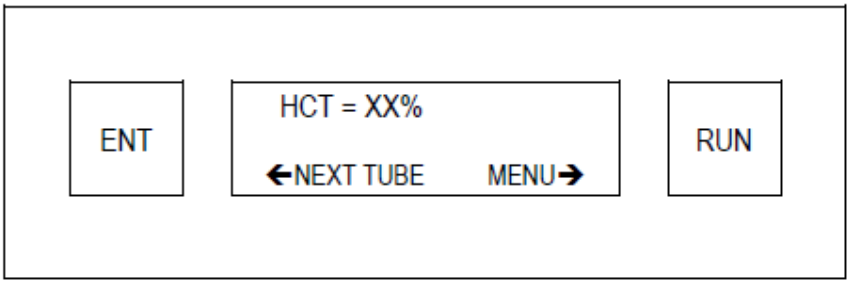

Image 9, courtesy of HemataStat II™ Centrifuge Operator's Manual.

11. Press ENT to read another tube. Press RUN to return to the main menu.

VIII. EXPECTED VALUES:

Refer to Hematology Normal Values-RO procedure for current normal ranges.

IX. NOTES:

A. Ensuring the sample is well-mixed is essential. Mix the sample well before filling the first tube and again before filling the second tube.

B. Leakage of blood from bottom of the tube if not sealed properly will cause erroneously low values.

C. Hemolyzed specimens will cause low values.

D. Hematocrit values less than 2.0% are reported as "<2".

E. For smooth operation and extended life of the centrifuge, the rotor must always be balanced before the spin cycle is initiated. There should always be an even number of tube holders (2, 4, or 6) in the rotor and they should be opposite each other to balance the rotor.

F. Tubes spun in HemataStat II™ must be read on the HemataStat II™. Tubes spun in any other brand of centrifuge cannot be read on the HemataStat II™.

G. The HemataStat II™ is designed to operate between 5,670 and 6,930 rpm. If the rpm should drop below the specified range, the motor will shut off, and the message LOW RPM will display on the LCD. To verify the LOW RPM message, press the ENT or RUN button to return to the main menu. Press the RUN button to restart the spin cycle. If the LOW RPM message is displayed again, refer to Attachment B for troubleshooting.

H. Cleaning the tube holders is not recommended. Should a capillary tube break or a sealant blowout occur, simply discard the affected tube and tube holder in accordance with proper laboratory procedures and replace with a new tube holder.

X. REFERENCES:

A. Wintrobe MM et al. Clinical hematology. Philadelphia: Lea & Febiger, 1974: 109-114.

B. Davidsohn I, Henry JB eds. Clinical diagnosis and management by laboratory methods. Philadelphia: WB Saunders Co, 1984: 585-586.

C. Miale J. Laboratory medicine. Hematology, 6th ed. St Louis: CV Mosby Co. 1982:360.

D. HemataStat II™ Centrifuge Operator's Manual.

Attachments

Attachment A - Microhematocrit Centrifuge Maintenance.pdf
Attachment B - Troubleshooting.pdf

Approval Signatures

Step Description	Approver	Date
	Ann Marie Blenc: System Med Dir, Hematopath	12/8/2021
Hematology Medical Director Designee	Ann Marie Blenc: System Med Dir, Hematopath	12/8/2021
Policy and Forms Steering Committee Approval (if needed)	Gail Juleff: Project Mgr Policy	12/7/2021
Policy and Forms Steering Committee Approval (if needed)	Michele Sedlak: Medical Technologist Lead	12/7/2021
System Manager	Rebecca Bacarella: Mgr Laboratory	9/30/2021
	Michele Sedlak: Medical Technologist Lead	9/5/2021

Applicability

Royal Oak