RUSH
Rush Copley Medical Center

Proc.#4840-BB-1001

TITLE: Thermo Scientific CW3 Cell Washer

Principle: The Thermo Scientific CW3 cell washer is designed to perform cell washing in multiple washing cycles using saline solution. The cell washer provides blood cells after sample separation, which can be used for further blood testing such as Antiglobulin test, ABO compatibility, Rh test, Cross-matching and Antibody screening.

Clinical significance: It is crucial, especially at antiglobulin phase of testing that the correct amount of saline is dispensed during the cell washing process. It is because as little as 1:4000 dilution of human plasma can neutralize one (1) drop of antiglobulin reagent.

Personnel: All blood bank staff must be familiar with this procedure.

Materials:

1. Thermo Scientific CW3 Cell Washer
2. 0.9% NaCl
3. 2-5% red cell suspension
4. 12x75mm test tubes
5. Volumetric cylinder
6. Bleach

Stepwise procedure:

To properly maintain the equipment, the Thermo Scientific CW3 cell washer will be cleaned and wiped as needed by the blood bank staff using the cell washer. Only non-bleach wipe may be used on the surface of the cell washer.

Blood cell washing:

1. Add one (1) drop of 2-5% red cell suspension to be tested per test tube.
2. Balance tubes loaded.
3. Press **AUTO**, to select automatic mode.
4. Press **FEED**, to adjust to desire number of cycles.
5. Press **START**, to begin washing process.

Note: Press **STOP** to stop a process/the end buzzer/alarm buzzer. When an operation is stopped in automatic mode or during agitation/centrifugation, the operation can be restarted at the stopping point by pressing **START**. However, the operation will not restart at the stopping point when manual mode is in use.

Calibration: To be done quarterly by BioMed.

Quality Control:

Condition-setting Panel setting:

CYCLE	CENTRI TIME		SPEED		PUSH SPEED	OVER FLOW	PROGRAM	AGITATE TIME	MELODY	OPTION	SALINE PRIME
	AUTO	MANUAL	MANUAL	DECANT							
4	35 sec	60 sec	L	H	1	0	1	5 sec	Any	N/A	N/A

If needed/when changing saline cube, Pump Prime – to ensure the nozzle is free of bubbles:

1. Ensure adequate amount of saline in saline container.
2. Hold a graduated cylinder to the nozzle at the bottom of the lid.
3. Open the cover of the condition-setting panel at the front bottom of the unit.
4. Press **SALINE PRIME** to discharge saline until the saline coming out of the nozzle is free of bubbles.

Daily, Tube Fill Check – to ensure all tubes are filled equally when saline is dispensed:

1. Place 12 empty test tubes into the 12-place rotor.
2. Press **AUTO**, to select automatic mode.
3. Press **FEED**, to adjust to **1 cycle**.
4. Press **START**, to being washing process.
5. Listen carefully for saline fill.
6. Press **STOP**, once the saline is filled or the light for CENTRIFUGE is lit up.
7. Visually observe to ensure all tubes are filled equally or very close to equally.
   Note:

Weekly, Saline Injection Volume Check – to ensure adequate saline is dispensed at each wash (43 – 53mL):

1. Ensure adequate amount of saline in saline container.
2. Hold a volumetric cylinder to the nozzle at the bottom of the lid.
3. Open the cover of the condition-setting panel at the front bottom of the unit.
4. Press **OPTION** once.
   NOTE: Hold the volumetric cylinder to the nozzle for at least 10 second. The saline will dispense between 2 – 3 times until the preset volume is reached.

5. Compare the preset volume (48mL ± 10%) and the actual volume injected in the volumetric cylinder.
6. Notify Blood Bank Senior Tech (BBST) if the injection volume is out of range.

Monthly, Decontamination:

1. **Tubing:**
   1) Prepare 1L of washing solution – 0.5% NaClO by diluting NaClO in deionized water. To determine the volume of CoA (certificates of analysis) required based on the concentration in the bottle, use the formula (V1)(C1) = (V2)(C2) → (V1) = (V2)(C2)/(C1), where
      - V1 = volume of undiluted NaClO required
      - V2 = volume of 0.5% NaClO desired (1000mL)
      - C2 = concentration of desired (0.5%)
      - C1 = concentration of NaClO indicated on the CoA

C1 NaClO Concentration	DiH2O	V1 Volume of undiluted CaClO	Final Volume of 0.5% NaClO solution
8.25%	940mL (1000mL – 60mL)	60mL	1L (1000mL)

   2) Insert the inlet tube inside the washing solution.
   3) Flush the tubing by running through four (4) wash cycles.

   Note: Do not run wash cycles without the rotor and distributor installed as it may cause damage to the bearing.
   4) Pour out the washing solution into a gray bucket.
   5) Replace the washing solution with distilled water/deionized water.
   6) Flush the tubing by running through four (4) wash cycles.
   7) Remove the inlet tube from the deionized water.
   8) Insert the inlet tube inside the saline source.
   9) Flush the tubing by running through four (4) wash cycles.

2. **Rotor and Distributor Bowl:**
   1) Soak in washing solution (≤ 1 hour) inside the gray bucket.
   2) Wash and dry.

Reporting Results: N/A

Reference ranges:

1. Tube fill lever must be at no less then 2/3 of the tube.
2. Saline fill volume must be between 43 – 53mL.

Notes:

Operational sequence for antiglobulin test (For information only)

1. Wash – A fixed amount of saline is pumped into the distributor when the rotor speed reaches 1200rpm. The saline is injected by centrifugal force from the distributor into the test tubes. The blood cells in the test tubes are sufficiently suspended in the saline.
2. Centrifuge – Blood cells are centrifuged.
3. Decant – The rotor spins at low speed with the rotor holder kept at an angle to slightly open its top end by magnetic force. By this operation, only the saline decants from the test tubes and the blood cells remains.
4. Agitate – The rotor repeats rotation and stops at short, quick intervals to disentangle the remaining blood cells.
5. Repeat steps 1 – 4, three to four times.
6. Centrifuge – The rotor spins about 5 seconds to collect the blood cells adhered to the wall surfaces of the test tubes at the bottom. This is done to ensure the reaction with the antiglobulin reagent.

Related documents:

1. PROC.#4840-BB-1001.1F (Thermo Scientific CW3 Cell Washer Check)

References:

1. AABB, Standards for Blood Banks and Transfusion Services, *current edition*
2. AABB, Technical Manual, *current edition*
3. Thermo Scientific CW3 Cell Washer Instruction Manual, Rev. 12/2021