Subject	Attachments
Stago Satellite Maintenance (Specific to Arden Hills, Apple Valley, Bloomington, Brooklyn Center, Como, Coon Rapids, 401 HSC, Inver Grove, Maplewood, St. Paul, White Bear Lake, Woodbury)	☐ Yes ☒ No
Key words Coagulation, Daily, Weekly, Monthly Maintenance	**Number** **GHI-PC-CLINIC LAB-PROCEDURES- Stago Satellite Maintenance v. 04-2019**
Category Provision of Care	**Effective Date** **See Electronic File**
Manual Coagulation Procedure Manual	**Last Review Date** **See Electronic File**
Issued By Regional Clinic Laboratories Supervisors	**Next Review Date** **See Electronic File**
Applicable Clinic Laboratory Staff	**Origination Date** **October, 2017**
	Retired Date
Level of Complexity Moderate	**Contact** Regional Clinic Laboratories Supervisors
Review Responsibility Regional Clinic Laboratories Supervisors	**Approval Date** **See Electronic File**
APPROVAL(S) Laboratory Medical Director	

Purpose/ Principle
This procedure provides instruction for the routine maintenance of the Stago Satellite Coagulation Analyzer.

Reagents/Equipment/Supplies
Supplies
Distilled Water STA Cleaner Solution Desorb Paper Towels NP swab
20% Ethanol Scissors Cotton Tipped Swabs
Dilute Bleach Solution- Add 2 mls of bleach to 30 mls of NERL water.

1. Refer to the Stago Satellite Prothrombin Time Assay for a list of reagents used to perform testing on this analyzer, their preparation and stability.
2. Reagents used to perform maintenance:
   - Ethanol 95%, Remel
     ● Store product in flammable cabinet, in its original container at 18-25°C until used.
     ● Do not use if the color has changed from a clear liquid, the expiration date has passed or there are other signs of deterioration.
     ● Ethanol 95% reagent is toxic, use smallest volume needed for procedure.
     ● Diluted ethanol 20% is used to clean the measurement cells and the incubation cells.
     Prepare 20% ethanol from 95% ethanol:
     ► Mix 1 part of ethanol at 95% with 4 parts of sterile water or deionized water.
     Solution is stable for 2 hours and should be disposed of immediately after use in the hazardous waste barrel.

- Dilute Bleach
    - Calculation to prepare 0.37% active chlorine decontamination solution: N=(B/0.37) – 1
      N = parts of water to add to 1 part bleach. B = % active chlorine in the bleach you are using.
    - Comes in 2 strengths: 8.25% or 6.0%
    - Clorox Regular Bleach using 6.0% sodium hypochlorite solution.
        - Decontamination Solution is made by mixing 1 part Chlorox Regular Bleach (6.0%) with 15 parts of sterile water or deionized water. Stable for 24 hours when stored at room temperature in squirt bottle.
    - Clorox Regular Bleach using 8.25% sodium hypochlorite solution.
        - Decontamination Solution is made by mixing 1 part Chlorox Regular Bleach (8.25%) with 21 parts of sterile water or deionized water. Stable for 24 hours when stored at room temperature in squirt bottle.

- Satellite - Desorb U – refer to the Operating Procedure for the Stago Satellite Coagulation Analyzer for information on this reagent.
- Staples Screen Cleaning Wipes

Special Safety Precautions

1. Ethanol: Special precautions should be taken when using ethanol during weekly maintenance procedures. Comes in 250 ml plastic bottle.
    a. Ethanol may be fatal or cause blindness if swallowed.
    b. Ethanol is known to be a skin irritant. Gloves should be worn when handling ethanol.
    c. Ethanol is flammable. Store away from heat of flame. The smallest amount needed to perform a task should be used.
2. Clorox Regular Bleach: Special precautions should be taken when using this product to make the decontamination solution used for weekly maintenance.
    a. If bleach is splashed in eyes, hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lens if present, after the first 5 minutes, then continue rinsing the eye.
    b. If bleach is splashed on skin or clothing, take off contaminated clothing. Rinse skin immediately with plenty of water.
    c. Gloves should be worn when handling Clorox Regular Bleach.

PREVENTIVE MAINTENANCE

Daily

- Inspect cuvette roll for adequate supply.
- Verify Temperature for needle, incubation area and product carousel.
- If reagent is changed, rinse the stir bar and follow decontamination procedure.

Weekly

- Cleaning the needle and the washing well
- Cleaning the shield
- Cleaning the carousels
- Cleaning the sample and product compartments
- Cleaning the rail
- Cleaning the rail glass
- Cleaning the rail, sample and product covers and the
- Needle passage (if necessary)
- Cleaning the optical sensor

- Cleaning the covering (if necessary)
- Cleaning the monitor (if necessary)
- Save test config.

Monthly

- Cleaning the dust filters
- Archive

Quarterly

- Replace the dust filters

Yearly

- Replace the needle
- Preventive maintenance visit by your local authorized Service Representative

Procedure

Cuvette Roll Loading

To change a cuvette roll, the operator must:

- Access the CUVETTE ROLL CHANGE window
- Remove the empty roll
- install the new cuvette roll

After changing the cuvette roll, the cuvette bin must systematically be emptied.

Accessing CUVETTE ROLL CHANGE window

There are two ways to access CUVETTE ROLL CHANGE window:

1. From an error window
2. From the Main Menu, from the TEST PANEL screen

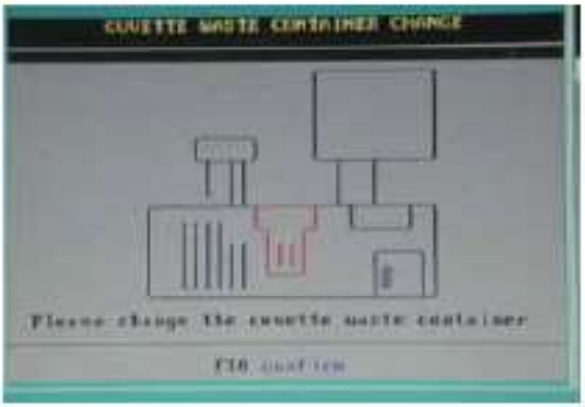
Accessing **CUVETTE ROLL CHANGE** window from the **ERROR WINDOW**
The following window is displayed:

ACTIONS	RESULTS
➢ Press F1 key to load the new cuvette roll	✓ The following window is displayed:  If this window is not displayed, press the Esc key to go back to the **TEST PANEL**
➢ Proceed roll change *(see the following)*	

Accessing **CUVETTE ROLL CHANGE** window from the **TEST PANEL**
TEST PANEL SCREEN displayed

ACTIONS	RESULTS
➢ Press the Esc key	✓ The **Main menu** is displayed: with the cursor on **Status**
➢ Press the **L** key (**Loading**) OR ➢ Press the → key until you reach **Loading**, then confirm with **Enter**	✓ The **Loading** menu is displayed:  with the cursor positioned on **Samples**.

ACTIONS	RESULTS
▸ Press the C key (Cuvettes) OR ▸ Press ↓ until you reach Cuvettes, then confirm with Enter	✓ A load guide window is displayed: 
CUVETTE ROLL CHANGE PROCEDURE: ▸ Remove the support with the empty cuvette roll from the STA Satellite® *(see chap. 3.4.2)* ▸ Confirm with the **F10** key	✓ The following window is displayed: 
▸ **Install** the new cuvette roll in its support *(see chap. 3.4.3)* ▸ **Put** the support with the new roll back in its place on the STA Satellite® *(see chap. 3.4.3 below)* ▸ **Confirm** by pressing the **F10** key	✓ Cuvettes are correctly placed into the loading rail ✓ The following window is displayed: 

ACTIONS	RESULTS
➢ **Confirm** the number of cuvettes with the **Enter** key if a new cuvette roll is used ➢ Otherwise, type the number of cuvettes left and **confirm** with the **Enter** key	✓ The following window is displayed:  Contaminant products: observe precautions regarding the use of potentially contaminated products
➢ **Change** the cuvette bin according to the procedure described in *chap. 3.5* ➢ **Confirm** with the **F10** key	

Removing the empty roll
During this procedure, do NOT lift the cover of the measurement rail. If the cover is lifted, the STA Satellite stops immediately.

- Take out the roll support from its location by lifting it up.
- Take out the empty roll from its support *(see below)*, and throw it away.

- Place the new roll by passing the cuvette strip behind the axis support (see below).
- Unroll the cuvette roll until the limit shown below.
- Replace the support with the new cuvette roll back in its place.
- Make sure to leave a minimum space of two cuvettes from the previous cuvette strip.
- Confirm with the F10 key.

Axis location in the roll support

Installation of the new roll

1. **Cuvette roll support**
2. **Cuvette roll limit**

Change of the Cuvette Bin - Risk of BIOLOGICAL CONTAMINATION

Each time the cuvette roll is changed, the cuvette bin must be systematically emptied. The cuvette bin contains potentially biologically hazardous material. It must be discarded according to local regulations.

Emptying used cuvette bin (change of disposable bin)

- **Take out the cuvette bin from the STA Satellite by pulling it to the right.**
- **Put the cuvette bin on a flat and stable surface.**
- **Take a disposable bin cover.**
- **Clip the cover on the disposable bin (see below)**

Installation of the disposable bin cover

Take out the disposable bin by pulling it up

Removal of the disposable bin

Discard the disposable bin and its content in the biohazardous waste container.

Installation of the disposable cuvette bin

- Take a new disposable bin.
- Insert the disposable bin into the bin.
- Replace the cuvette bin with the new disposable bin in place, make sure the bin is pushed in as far as it will go.
- Press F10 to confim the cuvette bin replacement.

Daily Maintenance

1. Verify the temperature is within range for the needle, incubation area and product carousel.
2. If reagent is changed, replace with new or decontaminated stir bar.

Decontaminate the Stir Bar - The stirring-bar used in the reagent vial should never be the source of contamination.

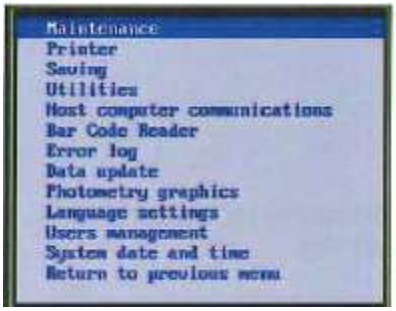
- Place the stir bar in a plastic screw top aliquot tube.
- Add 2mL of Desorb
- Cover and place on the hematology mixer for 5 minutes
- Replace the bleach solution with water and mix for 5
- Repeat
- After that second rinse, dry the stir bar and store in a dry aliquot tube until the next time the Neoplastine needs to be replaced.

To ensure that stirring-bars are contamination-free:

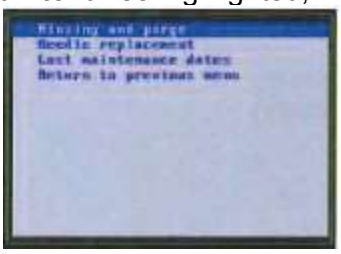
- **Daily or as Needed:** Rinse the stir bars with distilled water and dry them carefully to remove all traces of moisture before adding them to reagent vials.
- **Weekly:** Decontaminate stir bars according to the following procedure:
    a. Immerse the bars in a vial of STA-Desorb U and let them soak for 5 minutes with constant magnetic stirring.
    b. Use tweezers to transfer the bars from the Desorb U vial to a vial of distilled water and let them soak for another 5 minutes with constant magnetic stirring.
    c. Repeat this rinsing step with another vial of distilled water
    d. Finally, remove the stirring-bars from the distilled water vial and dry them carefully to remove all traces of moisture.

Weekly Maintenance
Decontaminate needle and washing well

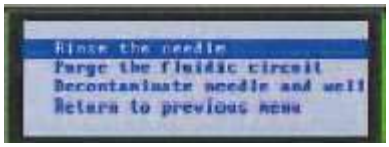
1. Access **Test Status Screen** and record number of cuvettes.
2. Access **User Maintenance** Menu.



3. With **Maintenance** highlighted, hit [enter] again.



4. **[Enter]** to access **Rinsing and Purge** menu.



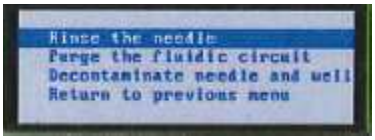
5. ↓ arrow until to **Decontaminate Needle and Well**. **[Enter]** to confirm.

6. Follow instructions on the screen:
    - Open cover and unload product from position 1.
    - Press any key to continue.
    - Load Desorb into position 1 of product carousel. Close cover and press any key to continue.
    - Decontamination time is 15 minutes.

- When complete, a message appears to open the cover and remove the Desorb. Press any key to continue.

- Close the product cover.

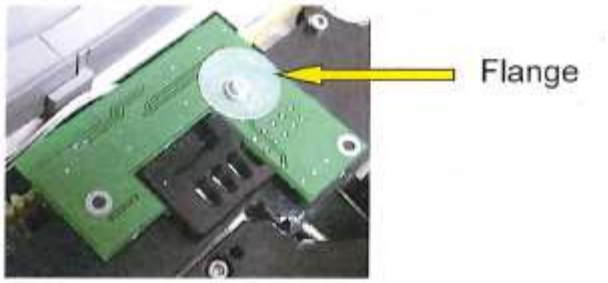
7. From the **Rinsing and Purge** Menu:



- Access **Rinse the Needle** menu.
- **[Enter]** to confirm- the needle is rinsed.
- Access **Purge the Fluidic Circuit** menu.
- **[Enter]** to confirm. The fluidic circuit is purged.
- Quit the Rinsing and Purge Screen.
- Press ↓ to return to Return to Initial Menu
- **[Enter]** to confirm.

*The **Decontaminate Needle and Well** menu is used if the system has become contaminated (i.e. waste container accidentally loaded in place of cleaner solution). If Decontamination is required, follow the procedure outlined in the Operator's Manual, Section 4.6.6. This procedure takes approximately 4 hours to complete.*

8. From the **User Maintenance Menu**, turn the analyzer off. The toggle switch is on the right side of the instrument.
9. Remove the rail cover.
10. Slightly unscrew the flange (transparent washer) so that it swivels and release the shield.



Clean the shield

1. Place the shield in the dilute bleach solution.
2. Set a timer and soak for 15 minutes.

3. Perform the rest of the maintenance while the shield soaks.
4. Clean the product and sample carousels.

Clean carousels

1. Remove sample and product carousels from their compartments.
2. Wipe carousels with a damp cloth moistened with warm water.
3. If the carousels become contaminated (broken tube or spilled plasma), clean with dilute bleach solution.

Clean sample and product compartments

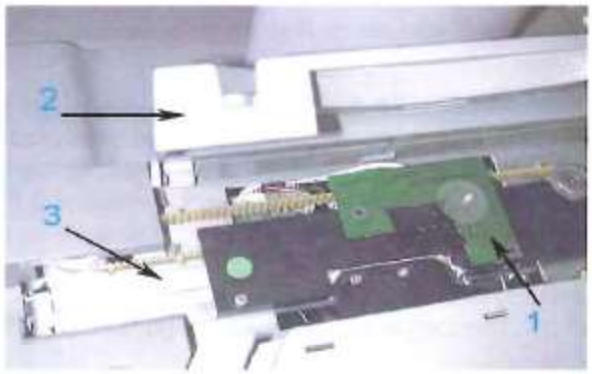
Clean sample and products compartments with a damp cloth moistened with warm water

Clean the rail

1. Remove cuvette roll by manually driving the belt.
2. Remove the cuvette roll and its support
3. Use a scissors to cut off any used cuvettes. Discard the cuvettes. (This is very important).
4. Carefully clean the rail with a cotton tipped applicator moistened with hot water. Do not allow water to contact the electronic card.

Clean the rail glass

Carefully clean the rail glass with a cotton tipped applicator moistened with Sta Cleaner. Slide the applicator through the rail window and gently clean the glass.



1. Electronic card and flange.
2. rail cover
3. rail

Clean the rail, sample and product covers

1. Remove the sample cover needle protection, product cover needle protection and the wash well needle protection.

2. Clean the covers with a damp cloth moistened with dilute bleach. (See supplies)
3. Clean the needle passage with a cotton tipped applicator moistened with dilute bleach.
4. Place the needle protection covers back into their notches.

Clean the optical sensor
Clean the optical sensor with a nasopharyngeal swab slightly moistened with Sta Cleaner.

Remove shield from dilute bleach
1. Remove shield from dilute bleach solution.
2. Rinse shield with distilled water and dry well.
3. Using dry gloves,,put the shield in place by placing the notch on the right side.

- Swivel the flange back around to keep shield in place.
- Put the rail cover back on.

If performing monthly maintenance, skip the remainder of this section and proceed to Monthly Preventative Maintenance Section.

4. Turn the Satellite back on.

Clean Monitor

1. While the analyzer performs Global Verification, clean the monitor, cover and keyboard with a cloth moistened in 20-40% ethanol.
2. When the cuvette management message displays, press the **Esc** key to quit the error message.

3. When Global Verification Done window appears, select **[continue].** Load any needed products.
4. When the **[cuvette roll change]** window appears, reload the cuvettes.

5. Replace the cuvette support and rol to complete the process. Enter the number of cuvettes on the wheel (this number was recorded at the beginning of the procedure).
6. Simulate changing the cuvette bin to complete the procedure.

Decontaminate stir bar

1. Place stir bars in a bottle of Desorb U and soak them for 5 minutes with constant magnetic stirring.
2. Using a tweezers, transfer the stir bars to a vial of distilled water and soak for another 5 minutes with constant magnetic stirring.
3. Repeat step 2 with another vial of distilled water.
4. Remove the stir bars and dry carefully to remove all traces of water

Save test configuration to disk/usb

1. Access User Menu.
2. Press the ↓ key to reach Saving. [Enter] to confirm.
3. Save/Reread Parameters displays. With the cursor on Selection of items, press [enter] to select.
4. Select “test settings” and “system parameters” using the space bar. Press [F10] to save.
5. Select Saving and [enter].
6. When prompted, “Do you want to save selected parameters?” press [enter] to confirm.
7. Follow instructions on the screen. Insert the formatted floppy disk/USB when requested. [Enter] to confirm.
8. When “Saving OK” displays, remove the floppy disk/USB, label as “test config, system parameters” and the date made.
9. Return to the previous menu, press [enter] to confirm.

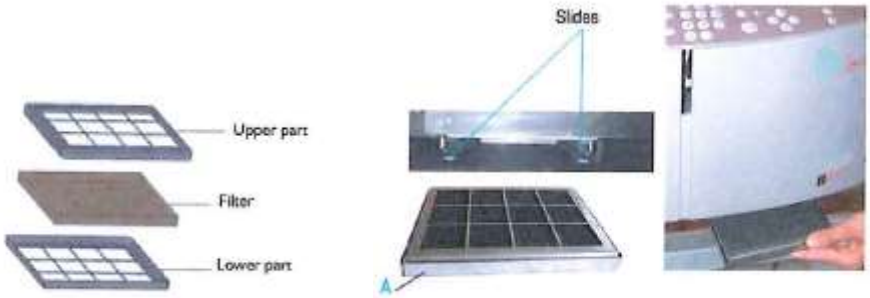
Monthly Maintenance

Clean air filters

1. Power off the Stago Satellite.
2. Use the filter tool from the tool box to remove all 3 filters.

3. The filters are located beneath the Satellite. One is in the front; the other two are on each side.

- Open the filter support.
- Wash each of the filters. Pat dry, leave at room temp. too totally dry. Store cleaned filter in tool box.
- Replace with spare filters from tool kit.
- Replace the filter in the support.
- Replace with filter in the Satellite. The larger side of the support (inferior part) must be facing down when placed on the instrument.



4. Turn instrument back on when procedure is complete, or if performed as part of weekly maintenance, finish weekly maintenance.

System Backup

1. Access **User Menu**.
2. Press the ↓ key to reach Saving. **[Enter]** to confirm.
3. Save/Reread Parameters displays. With the cursor on **Selection** of items, press **[enter]** to select.
4. Arrow down to "**Device Status"**. Press **[Enter]**.
5. Press "S" to save data files
6. Follow instructions on the screen. Insert the formatted floppy disk/USB when requested. **[Enter]** to confirm.
7. When "Saving OK" displays, Press **[enter]**.
8. Remove the floppy disk/USB, label as "Device Status" and the date made.
9. Return to the previous menu, press **[enter]** to confirm.

<u>Document all maintenance procedures in LIS.</u>

Dates of Recent Maintenance

The menu is displayed; press the ↓ arrow until you reach **[Last maintenance dates]** and **[enter].**

The date and time of recent maintenance is displayed for needle replacement, needle purge and decontamination.

Quarterly Preventive Maintenance

The only recommended quarterly maintenance is to change the air filters

STA Satellite replacement air filters may be ordered from Diagnostica Stago. Replacement part is #80132; 1 pack contains 3 air filters.

As Needed

Changing the Time on the STA Satellite

1. Access the User Maintenance Menu from the Menu Bar. Once the window is displayed for User Maintenance, move the cursor to the “System Date and Time” line. **[Enter]** to access the program. The following window is displayed.

2. Press the ↑ key until you reach **[change current system time].** The time format is defined in Global Options. When typing in the new time you must use the same format as displayed.
3. Confirm the new time with **[Enter].** The updated time will be displayed.
4. When complete, **[Back to previous menu]** and **[Esc]** out of the User Maintenance to return to the main menu.
5. When exiting out of User Maintenance, the STA Satellite will go through Global Verification.

References

STA Satellite® Operator’s Manual July 2016.
STA Satellite ® User Guide November 2011.

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Approved by

Laboratory Medical Director or Designee