

Standard Operating Procedure Operation, Calibration & Maintenance for Alloy Analyzer	SOP No. 7.033
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- 1 Purpose
 - 1.1 To establish a procedure for operation, calibration and routine maintenance of Niton XLt 800 series alloy analyzer.
- 2 Scope
 - 2.1 The following procedure is for Niton XLt 800 series alloy analyzer that will be used for checking alloy's material chemical composition. The alloy material includes 316L stainless steel, 304 stainless steel, etc.
- 3 Responsibility
 - 3.1 Therma's quality control (QC) Examiner shall read through and understand the entire Niton XLt Alloy Analyzer User's Manual and this SOP prior to using the instrument. The QC Examiner shall be trained by the manufacturer who provides the analyzer.
 - 3.2 Therma's QC Examiner shall be responsible for operating, calibrating, performing routine maintenance of the analyzer per the following procedures and User's Manual.
 - 3.3 Therma's QC Examiner shall store the analyzer in its case whenever it is not being used with the User's Manual.
 - 3.4 Therma's QC Examiner shall always remove the battery pack when transporting or storing the analyzer.
 - 3.5 Therma's Quality Assurance Manager shall be responsible for auditing the procedures periodically.
- 4 Reference
 - 4.1 Niton XLt 800 Series Alloy Analyzer User's Guide, Version 4.0.
- 5 Material & Tool Requirement
 - 5.1 Lens Cleaning Solution

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5.2 Soft Cloth

5.3 Cotton Swab

5.4 Kapton Window Part # 187-095

6 Safety Tips

6.1 The machine shall not be operated within 100 feet of any person who is pregnant, or could possibly be pregnant.

6.2 When the analyzer is turned on, it shall not be pointed in any direction that causes a person within 100 feet to be exposed to the beam. This includes through walls, floors and ceilings.

6.3 In the event a 100 foot exclusion zone can not be established safely, shielding shall be used to block the inadvertent broadcast of radiation.

6.4 When the analyzer is not in use, the battery pack shall be removed from the analyzer and store in a secured area.

6.5 During transporting, the battery pack shall be removed from the analyzer.

6.6 If the analyzer is lost or stolen, the closest police department shall be immediately notified in compliance with local, state and federal law.

7 Unit Description

7.1 The Niton Xlt alloy analyzer is a single unit, hand held, high performance portable x-ray fluorescence (XRF) elemental analyzer. (See Figure I-1 in User's Manual for detail components).

7.2 A control panel is located on the instrument's top housing, directly below the LCD touch screen. The touch panel consists of 4-way touch pad and two control buttons: on/off/escape button and clear/enter button.

7.3 The on/off/escape button on the left side of the 4-way touch pad controls the power to the instrument and serves as an "escape" button.

7.3.1 When the on/off/escape button is pushed and immediately released, it functions as an "escape", and brings you back

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to the Main Menu from the current screen in the menu system.

7.3.2 Push and hold the on/off escape button for at least 3 seconds to turn the instrument on. A “beep” will sound as the power comes on.

7.3.3 Push the on/off/escape button and hold it for about 10 seconds to shut off power to the instrument from any screen in the menu system. The instrument will “beep” as it shuts down.

7.4 The clear/enter button on the right side of the 4-way touch pad is used to select highlighted menu options.

7.5 Three LED warning lights (one on each side and one on the back of instrument) will blink on and off whenever the x-ray tube is on, and those lights will continue to blink as long as the x-ray tube is on.

7.6 See User’s Manual for more information about the options of operating the instrument.

8 Operation Procedure

Note 1: Whenever the Niton XLt 800 alloy analyzer has been off for more than 30 minutes, QC Examiner should measure a check sample to assure proper operation.

Note 2: QC Examiner shall ensure that the instrument has completed calibration before taking a sample measurement.

Note 3: If there is any trouble to set up the instrument, please review User’s Manual.

8.1 Depress the on/off/escape button on the control panel for approximately 3 seconds, until you hear a “beep” for turning on the instrument.

8.2 On the startup, the screen will be replaced by a Restart screen (See Figure I-3 in User’s Manual), which will automatically count down from 9 to 0 in increments of one second.

8.3 When the Restart is complete, the Restart Screen will be replaced by the Logon screen (See Figure I-4 in User’s Manual). Tap anywhere on this screen to access the virtual touch pad:

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- 8.3.1 Select 4 digit security code, followed by the enter (E) key. (See Figure I-5 in User's Manual).
- 8.3.2 A temporary password assigned by default is 1-2-3-4, followed by the (E) key. After completing the log on procedure, the word "SUCCESS" will appear on the bottom of the screen, then the Main Menu will appear.
- 8.4 If necessary, check the date/time (See Set Date & Time on Page 2-7 in User's Manual).
- 8.5 If necessary, adjust the contrast of the touch screen display, press and hold the left and right ends of the 4-way Touch Pad until a beep sounds. After the beep, you may press the up portion of the 4-way Touch Pad to darken the screen, and the down portion to lighten the screen. When the display is set, press the enter (E) key to save the current setting.
- 8.6 Enter Heat Number
 - 8.6.1 Select Test icon from Main Menu screen.
 - 8.6.2 Select Data Entry All Alloy icon from Test screen.
 - 8.6.3 Press KB area under line 2 for Heat #.
 - 8.6.4 Enter heat number and then press Return icon.
- 8.7 After press Return icon, it will bring you back to All Alloy screen and ready to take a sample measurement.
- 8.8 Place the measurement window against the sample to be analyzed to engage the proximity sensor on the front of the instrument, then pull the trigger for sample analysis until a "beep" for the completion of analysis.
- 8.9 The alloy analyzer will display the Results Screen throughout the duration of each reading. The Results Screen is updated regularly throughout the reading. When the reading is complete, a final screen update will appear, and the analyzer will display the final results of the measurement, which has just been completed. The Results Screen displays the following information.
 - 8.9.1 The Reading Number line shows a number automatically assigned by the analyzer in order to uniquely identify each

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reading. The reading number automatically increments up by one with each successive reading.

- 8.9.2 The Nominal Seconds Test Duration line shows the number of nominal (source) seconds elapsing since the initiation of the reading. Nominal seconds are true, clock seconds slowed down to compensate for the electronic dead-time that occurs when the analyzer is taking a measurement.
- 8.9.3 The Mode line displays the test mode in use during the measurement.
- 8.9.4 The Match/No Match line indicates whether the analyzer has found a matching alloy in its' library, and displays the name(s) of any matching alloys and the Match Number.
- 8.9.5 The Element (left) column shows the elements that have been detected in the sample.
- 8.9.6 The Concentration Level (central) column shows the concentration levels of the corresponding elements in percentages.
- 8.9.7 The Confidence (right) column displays the 2 sigma (95%) confidence interval for the corresponding elements.
- 8.9.8 If there are too many elements detected to fit onto a single screen, you can see the balance of the elements and their results by pressing the down portion of the 4-way touch pad. To see previous results, use the left portion of the 4-way touch pad. To go forward to later readings, use the right portion of the 4-way touch pad.
- 8.10 Record the chemical compositions of the sample on a form FN 7.033.1.
- 8.11 Check the results against with vendor's material/mill test report if necessary.
- 9 Download data to a computer
 - 9.1 Check the instrument and make sure that any data is shown on the screen. That means the instrument is still on.
 - 9.2 Connect a cable to RS-232 port of the instrument.

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- 9.3 Connect the other end of the cable to a pin port of a computer.
- 9.4 Open Niton Xlt analyzer program.
- 9.5 Create a file to save all data.
- 9.6 Select an appropriate type of data, such as All Data.
- 9.7 Click on Download.
- 9.8 After the download is complete, the Niton Xlt analyzer program will create an Excel format and show all data on a spreadsheet.

10 Erase Data After the Download

- 10.1 Check the instrument and make sure that any data is shown on the screen. That means the instrument is still on.
- 10.2 Select Data icon from Main Menu screen.
- 10.3 Select Erase icon from Data Menu screen.
- 10.4 Select Erase Readings icon to erase all accumulated test readings from the instrument.
- 10.5 A confirmation screen (see Figure 2-13) asking you "Are you sure" with options to select "Yes" or "No". Select "Yes" to erase all accumulated test readings.

11 Calibration of Detector

If a check sample test reveals discrepancies in the reading or the instrument is not reading properly, QC Examiner should re-calibrate the instrument before start to take any readings. When the instrument is turned on after being off for more than 30 minutes, the instrument will require a 10 minute warm-up period before the instrument can be calibrated, unless this 10 minute warm-up period is manually overridden.

- 11.1 Select Utilities icon from Main Menu.
- 11.2 Select Calibrate icon from Utilities Menu.
- 11.3 Select Calibrate Detector icon to re-calibrate the instrument's electronics. As soon as the icon is selected, calibration will begin.

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11.4 After the calibration has finished, the calibration results will be displayed. Press the on/off/escape button or the Return icon to return to Main Menu.

12 Calibration of Touch Screen

12.1 Select Utilities icon from Main Menu.

12.2 Select Calibrate icon from Utilities Menu.

12.3 Select Calibrate Touch Screen icon to re-calibrate the instrument's touch screen display.

12.4 When the Calibrate Touch Screen icon is selected, the display will show the message: "Calibrate Touch Screen". There will be a small cross in the upper left-hand corner of the display. Tap on this cross with the stylus, and the cross will disappear and reappear in the lower left-hand corner of the screen. Tap on the cross again, and it will reappear in the lower right-hand corner of the screen. Tap on the cross again and it will reappear in the top right-hand corner of the screen. Tap on the cross more, and the Logon Screen will appear. Log as normal, and you will be presented with the Main Menu.

13 Routine Maintenance

13.1.1 Battery Pack and Battery Charger

Each Niton XLT 800 series alloy analyzer is shipped with two lithium ion battery packs and one standard battery charger.

13.1.2 Replacing the battery pack

13.1.2.1 Rest your Niton XLT analyzer on a clean surface. Avoid damp or dusty environments.

13.1.2.2 Point the front of the instrument away from you, and press in battery housing latch.

13.1.2.3 Slide out the battery pack out toward you.

13.1.2.4 Fully insert a new battery pack, making sure that it seats properly.

13.1.2.5 Press in until the latch resets.

13.1.3 Recharging the battery pack

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13.1.3.1 Follow step 5.4.2 to remove the battery pack from the instrument.

13.1.3.2 Plug one end of the battery charger (AC adapter or 12V adapter) into the battery charger port.

13.1.3.3 Plug the other end of the AC adapter into a wall outlet.

The standard battery charger has 2 lights in the top of the battery charger. When connected to a wall outlet, the lights will display the following information:

Left Hand Light	Right Hand Light	Battery Status
ON	OFF	Charging
ON	ON	80% Charged
OFF	ON	Complete
Blink	Blink	Error
OFF	OFF	No Battery

13.1.3.4 Cautions: Do not let the battery pack recharge for excessive periods of time. Do not store battery packs or charger in direct sunlight.

13.1.4 Clean Kapton window gently with a cotton swab periodically. If the window becomes frayed, ripped, or contaminated with metal particulates, replace it with a new window. (See Niton Analyzer User's Manual, Afterword 7 & 8.)

13.1.4.1 Remove the three Phillips head screws. (See Figure Afterword-4 on User's Manual)

13.1.4.2 Remove the face plate and place it face down. (See Figure Afterword-5 on User's Manual)

13.1.4.3 Remove the old Kapton window.

13.1.4.4 Clean the back surface of the face plate and install the new Window.

13.1.4.5 Turn the face plate over and replace it on the instrument's front end. (See Figure Afterword-6 on User's Manual)

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13.1.4.6 Reinstall the three screws, being careful not to over-tighten them.
(See Figure Afterword-7 on User's Manual)

13.1.5 Clean the body of the instrument with a soft cloth.

13.1.6 Clean touch screen area with a lens cleaning solution and a soft cloth.
Do not use detergents, solvents or water to clean Niton Analyzer.

14 Review and Approval

14.1 If customer's specification requests for Niton alloy analysis, project manager shall notify QC Examiner about the Niton alloy analysis requirement during the project's kick off meeting.

14.2 If customer's specification requests for Niton alloy analysis, QC Examiner shall record the measurement results in a form, FN 7.033.1.

14.3 After completion of material inspection, QC Examiner shall send the form FN 7.033.1 to project manager for his record.

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Document Approval

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3/5/12
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