newview 9000

SERVICE TEST PROCEDURE

6311-0100-X1

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1. PURPOSE

This procedure describes performance testing for NV9000 OPTICAL PROFILERS (6311-0100-X1). The purpose of this document is to provide Zygo service personnel with instructions and specifications for evaluating and certifying the performance of the NV9000 system.

As you proceed, be sure to complete the checklist in Section 8. Failure of any test must be noted on the System History Sheet.

If a change is made to the instrument as part of the Service call, this procedure must be executed twice to document both the As-Found and As-Left state of the tool.

2. EQUIPMENT REQUIRED

6300-0194-01	10X Infinite Conjugate Mirau Objective
6401-0101-0X	5.5X Infinite Conjugate Michelson Objective
1776-666-012	Silicon Carbide (SiC) Flat
6306-4036-01	Focus Grating (200 lpmm)
1776-666-010	1.8 µm Step Height Standard
0220-0719-01	NV8k Calibration Filter Tool
SMM6300-9004	MicroATP software (on USB flash drive, CD-ROM, or the service utilities folder located at C:\ProgramData\Zygo\Utilities)

ESD Wrist Strap

3. RELATED DOCUMENTS

OMS-6311-XX	NV9000 ASSY
6311-0100-XX	NV9000 OPTICAL PROFILER
ZSP-0093	NV9000 SERVICE MANUAL
ATP-0578	NEWVIEW 9000 ASSEMBLY TEST PROCEDURE

4. TIME ESTIMATE

The estimated time to perform this process is 1.5 hours.

5. SKILLS REQUIRED

Windows OS, Mx, and NV9000 training

Optical handling and cleaning training

ESD awareness

6. PERFORMANCE SPECIFICATIONS

This STP will verify NV9000 profilers to the following performance specifications:

Attribute	Specification	Conditions
Surface Topography Repeatability [1]	0.08 nm	Null cavity SmartPSI mode 1 sec acquisition 3x3 denoising filter
Repeatability of RMS [2]	0.008 nm	
Height Response Linearity [3]	30 nm	65 µm scan
Step Height Repeatability [4]	≤ 0.1%	4 tilt fringes (perpendicular to step) No averaging
Step Height Accuracy [5]	≤ 0.3%	
Interferometric Cavity Stability [6]	CNF (95Hz) ≤ 1.5 nm RMS CNF (max) ≤ 2.5 nm RMS	Single objective mounted on dovetail 800Hz camera rate

[1] Surface Topography Repeatability is defined by the mean RMS difference for the differential between 30 sequential measurements and a synthetic reference (defined as the average of all 30 measurements). A least-squares best-fit plane is removed from each individual measurement map before computing the ensemble average and subsequent difference maps.

[2] Repeatability of RMS is defined by the standard deviation of the measured RMS surface roughness parameter.

[3] Height Response Linearity is defined as the maximum deviation with respect to the best-fit linear response. This specification applies to PZT scan devices.

[4] Step Height Repeatability is defined by the standard deviation of the measured step height for 30 sequential measurements expressed as a percentage of the certified step height value for the Step Height Standard in the measurement region.

[5] Step Height Accuracy is defined by the mean of the measured step height for 30 sequential measurements expressed as a percentage of the certified step height value for the Step Height Standard in the measurement region.

[6] Interferometric Cavity Stability is defined by the cumulative noise function (CNF) computed from the average vibration amplitude spectrum, which is computed from 10 individual vibration amplitude spectrum measurements.

7. PROCESS DESCRIPTION

7.1 System Setup and Serialization

7.1.1 *Shipping Locks*. Make sure that the shipping locks have been removed from all stages.

7.1.2 *Power Cycle*. Connect and power-up the NV9000 instrument. If already powered on, cycle the power. If necessary, allow the instrument to warm up for at least 30 min (so that fringes do not drift).

7.1.3 *Operating Environment*. Verify that the NV9000 isolation feet are floating the instrument uniformly above the instrument stand. Verify that the NV9000 cover is isolated and not making direct contact with the head. Verify that the temperature and humidity conform to the following specifications:

a) Temperature: 59 – 86°F (15 – 30°C)

b) Relative Humidity: 5 – 95% (non-condensing)

7.1.4 Connect and power-up the system computer. Log on to the computer as "**Administrator**" and enter "**zygo22**" as the password.

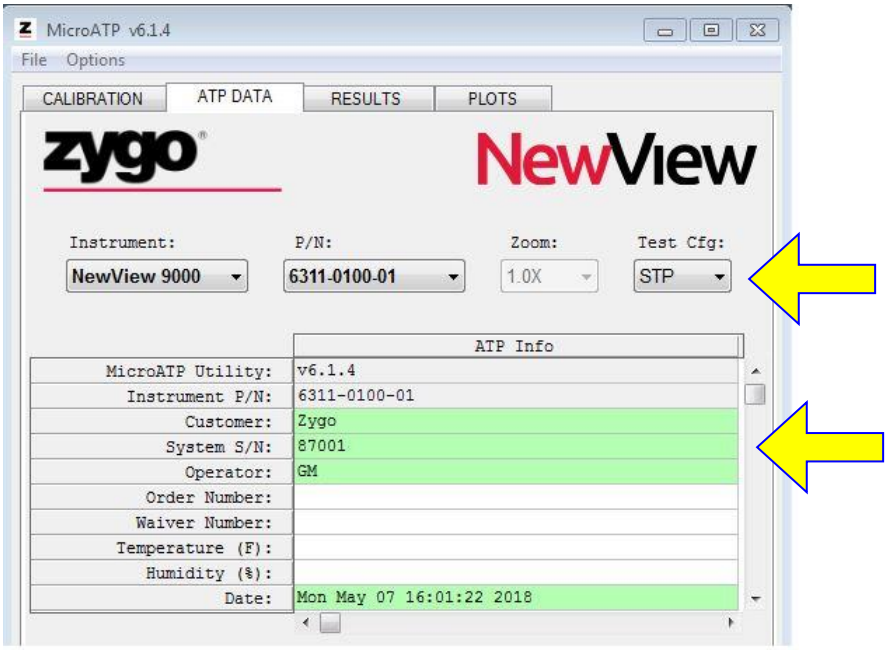
7.1.5 *Unzip Service Utilities.* Navigate to C:\ProgramData\Zygo\Utilities, right click on **Service Utilities.zip** and select **Extract All…** then click **Extract**. Enter **Star2017** for the password.
Note: This password is confidential and for ZYGO personnel only.
The service utilities folder contains Profiler Utilities, (ContraPro, MicroATP) PI-Test, and Bridge Configurator.

7.1.6 *STP Utility*: Open the ATP utility found in the IDLvm Utilities folder: **MicroATP.exe**.

Select the **Instrument type** , **PN**, and **Test Cfg** is **STP**. Then enter the system info on the ATP DATA tab. **Customer**, **System S/N**, and **Operator** initials are required. Leave this utility open throughout the STP.

NOTE: Enter only the **87ZZZ** portion of the System S/N. The YY-WW- prefix will be added later.

7.1.7 Open **Mx** and load the application **C:\Program Files\Zygo\Mx\UserSetup\Apps\MicroMFG.appx**.



7.2 Mechanical Operation

7.2.1 *Stage Homing*:

a) In **Mx**, open the Motion Utilities dialog from the main "**Motion**" menu and make sure the "**Goto System Load After Homing**" checkbox is selected

b) Home the stages by clicking the "**Home All Axes**" button and verify that all axes home without error and that the XY stage returns to the center of its travel

7.2.2 *Stage Operation*:

a) Move the PR, XY, and Z Stages through their full range of travel in both directions for all axes to verify that the pendant and limits function correctly

b) Return the stages to be nominally flat and centered

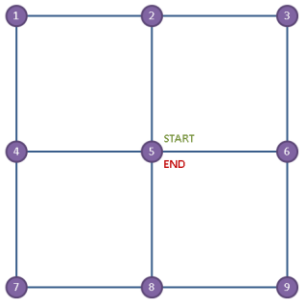
c) Close Motion Utility window.

7.2.3 *Stage Programmed Moves* [for systems with MOTORIZED XY]:

a) Click on the **AUTOMATE** tab in **Mx**

b) Click the "**Load Pattern**" toolbar button and select the **NV9k_StageTest_#axis.patx** file based on the number of motorized axes from to C:\Users\Administrator\My Documents\Mx\STP9K\settings.

c) Click the "**Run Pattern**" button and make sure the stage moves to all the positions shown below without jerking or stalling:



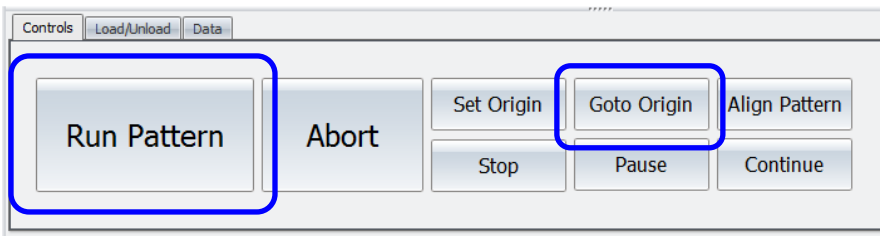
7.2.4 *Emergency Stop Operation*: **NOTE** – Read the entire following procedure before taking any action!

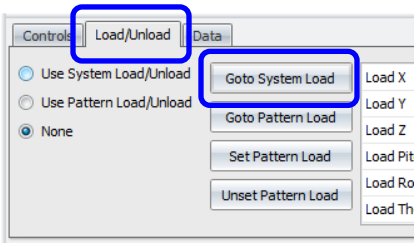
a) Click the "**Goto System Load**" button (on the Load/Unload tab of the Controls panel below the pattern window) to raise the head to the top of its travel

b) Click the "**Goto Origin**" button (on the Controls tab) to start the head moving back down

c) *While the z-stage is still moving*, press the **Emergency Stop** on the pendant and verify that motion stops

d) Release the E-Stop and verify that all Mx errors are cleared





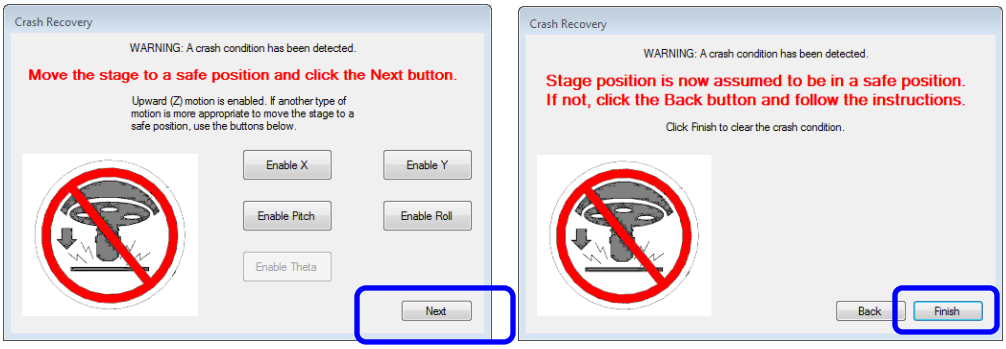
7.2.5 *Crash Detection*: **NOTE** – Read the entire following procedure before taking any action!

a) Open the Motion Utilities dialog and click "**Home All Axes**"

b) After the stages home, click the "**Goto Origin**" button

c) *While the z-stage is still moving*, **LIGHTLY** tap up on the dovetail bracket and verify that a crash is detected and motion stops

d) Move the Z-Stage up several mm to enable the Next button. Click "**Next**" and then "**Finish**" in the Crash Recovery dialog to clear the crash condition; verify that all Mx errors are cleared and all motion axes are functional. (Home all axis again before proceeding)



e) Click "**Goto Origin**" to complete the z-stage move

f) Close the Motion Utilities dialog

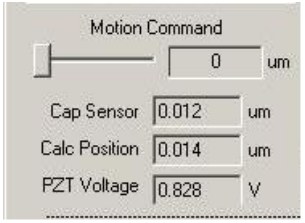
7.2.6 *Scanner Zero Offset:*

NOTE: If you are unfamiliar with PI Test, please refer to ZSP-0093, section 7.

a) Start PI Test by double clicking the exe in the cfg folder. If the pitest.exe does not exist, then you should use a copy from a memory stick or from the service utilities folder.

b) Remove all objectives* and the Turret*. * *If customer application makes removal impossible make a note of setup in the checklist.*

c) Check the scanner for full range of travel, use action: "Read Cap Sensor, PZT" and click Start. The positions should update in the "Motion Command" window.



d) Note the PZT voltage at 0um: _____V

e) Close PI Test. **NOTE: Be sure to move the scanner back to 75um before closing PI-Test.**

7.3 Optical System Performance

7.3.1 *System Artifacts*: **Refer to ZSP-0093, section 6 for artifact specifications.**

a) Install the **5.5X objective**. Make sure there is no part on the stage under the objective.

b) Click on the **MEASURE** tab in **Mx.**

c) Set the Mx Live Display **Scale Mode** to "**High Contrast**" and visually inspect the image for artifacts

d) For NV9300 systems, repeat for **0.5X** and **2X** zooms

e) Set the Scale Mode back to "**Normal**"

7.3.2 *Focus Aid Reference Acquisition*:

a) Insert the **Focus Grating** on the part stage underneath the 5.5X objective

b) Select the **5.5X objective** icon and the **1X zoom** in the Mx Measurement Setup controller

c) Click the "**Focus Aid**" button on the Measure tab toolbar (**or press F8**) to turn the focus aid on

d) Verify that the Z-Stage moves up to record the focus reference, and then the Z-Stage moves back down with the software in Align Mode

7.3.3 *Focus Aid Operation*:

a) Move the Z-Stage down towards the part until a spot appears on the Live Display screen, as shown in the left figure below

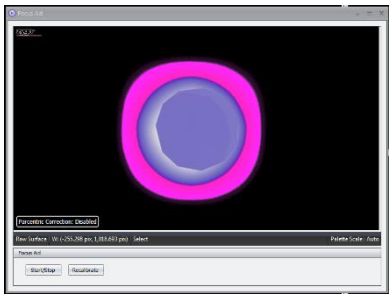
b) Verify that the Pendant speed was automatically toggled to "Slow or Medium" when the spot appeared

c) Set the Pendant speed to "Fast" and continue to move the Z-Stage down until the Focus Align spot overlaps the red circle fiducial, as shown in the center figure below

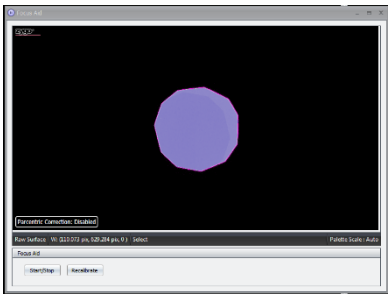
d) Close the Focus Aid tool to return to View mode; fringes should be visible, but may not be centered in the FOV

NOTE: You may need to set the light level for View mode by pressing "**F9**"

NOTE: Fringe density and orientation may vary from the image in the right figure below



Align Mode image above focus



Align Mode image at focus

View Mode following focus

7.3.4 *Z-Stop Operation*:

Move the z-stage 1-2mm below focus and press the "**Z-Stop**" button on the Pendant. The pendant should no longer buzz when moving Z.

7.3.5 *System Focus*:

a) Install the **10X Mirau objective** and select it in the Lateral Calibrator [F7]; select the **2X zoom**

b) Setup a cavity with the focus grating and visually confirm that interferometric and optical focus coincides. Check all three zoom settings.

c) If only one zoom appears out-of-focus, perform the following:

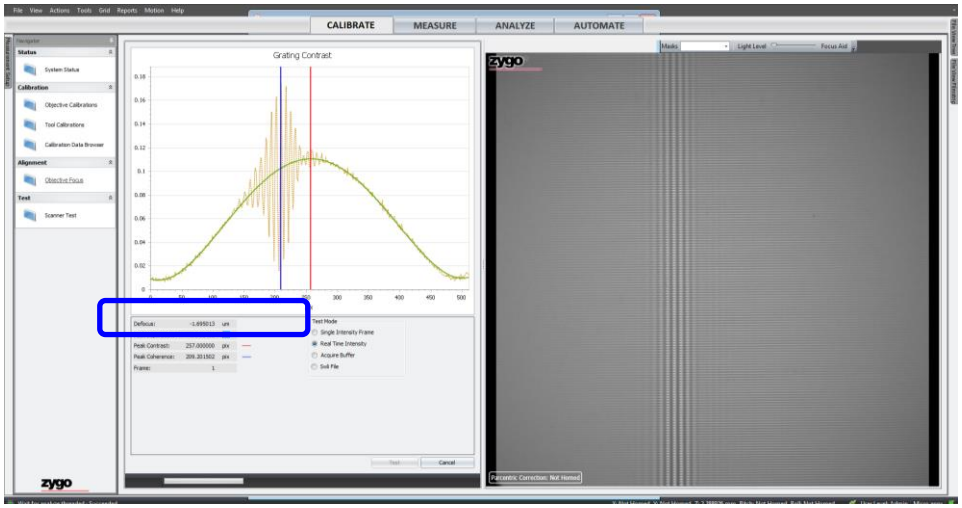
d) Click the **CALIBRATE** tab in Mx and then select "**Objective Focus**" in the Navigator

e) Setup the grating focus test with the grating lines horizontal and tight vertical fringes, as shown in the focusing section of the service manual; select "**Real Time Intensity**" and click "**Test**"

f) Verify that the zoom Defocus < 2.5 µm

g) Adjust focus of the zoom tube until |Defocus| < 0.5 µm

h) If all the zooms are out of focus refer to the service manual for the system focus procedure.



7.4 Auto Alignment Performance

7.4.1 *Setup*

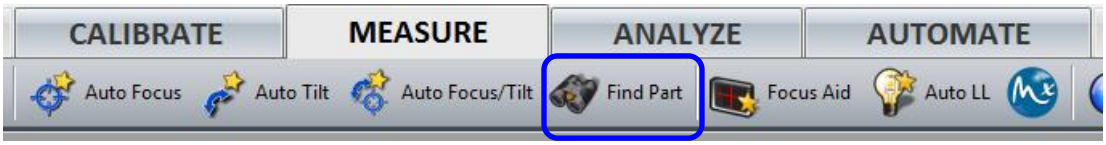
a) The 10X objective, 0.5X zoom, and grating focus target should still be setup from the test above

b) Ensure the Z stop is set 1-2mm below focus

7.4.2 *Part Finder:*

a) Drive the Z stage to the Z stop

b) Click the **"Find Part"** button on the toolbar



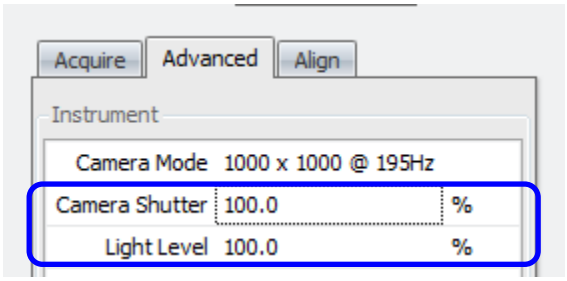
c) Verify that fringes are within the field of view, but may not be centered in the FOV

7.4.3 *Smart Setup: (smooth surface)*

a) Drive the Z stage to the Z stop

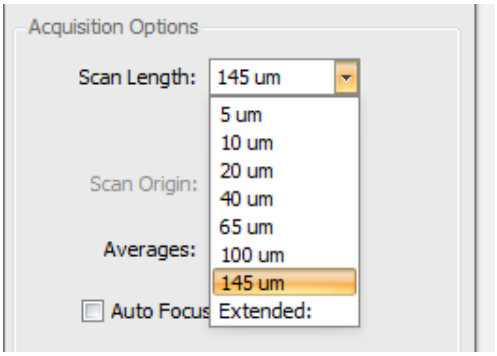
b) Set the scan length to 145µm

c) Saturate the image by typing **100** into the fields for **Shutter Speed** and **Light Level** in the Advanced tab of the Measurement Panel



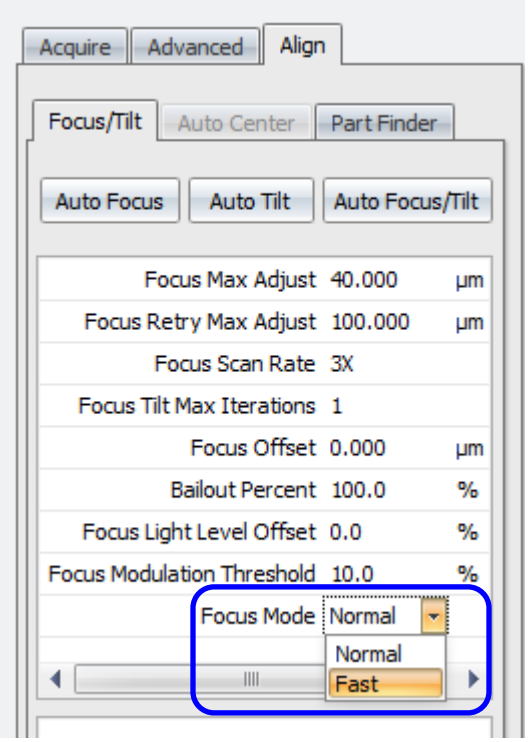
d) Click the **"Smart Setup"** button on the toolbar

e) Verify that fringes are found, that the scan length was lowered (to anything other than 145µm), that the light level was optimized (i.e. not saturated), and that a measurement was taken



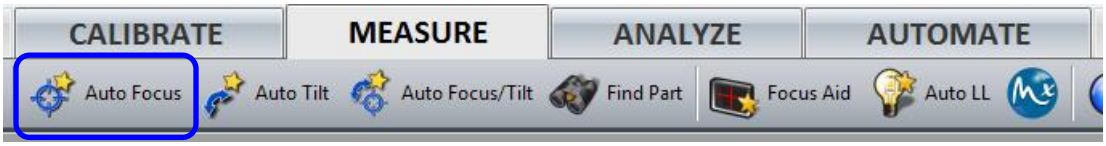
7.4.4 *Fast Focus:*

a) In the Measurement Panel, in the Align tab, change **Focus Mode** from **Normal** to **Fast**



b) Move Z so that the fringes are off to one side of the field of view, as shown below

c) Click the "**Auto Focus**" button in the main toolbar



d) Set the scan length to 30µm and click the **Measure** button on the toolbar

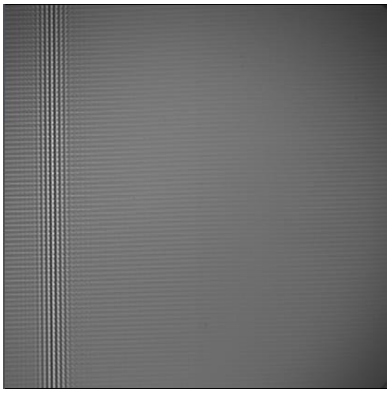
e) Verify that the measurement was successful, which indicates that fringes are within the measurement capture range

7.4.5 Auto-focus:

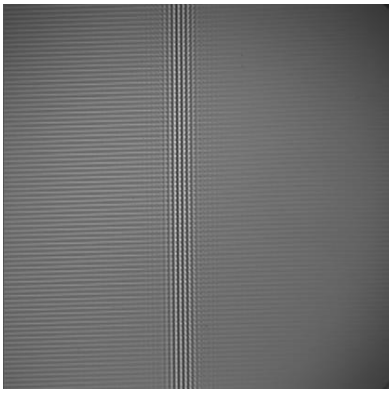
a) Change **Focus Mode** from **Fast** back to **Normal**

b) Move Z so that the fringes are off to one side of the field of view, as shown below

c) Click the "**Auto Focus**" button in the main toolbar; verify that the fringes are repositioned in the center of the field of view



Fringe position before Auto Focus



Fringe position after Auto Focus

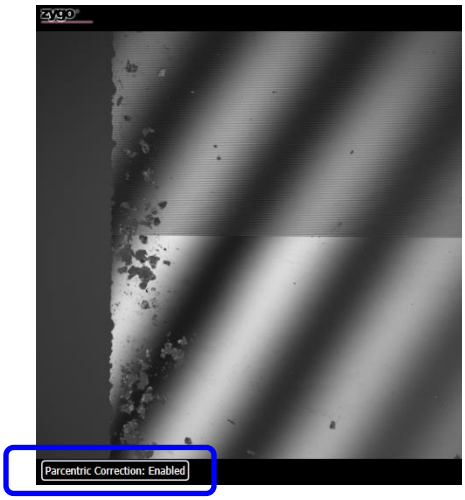
7.4.6 *Auto-tilt with parcentric correction* [for systems with 5-AXIS MOTORIZED MOTION]:

a) Adjust PR to obtain 5-10 diagonal fringes

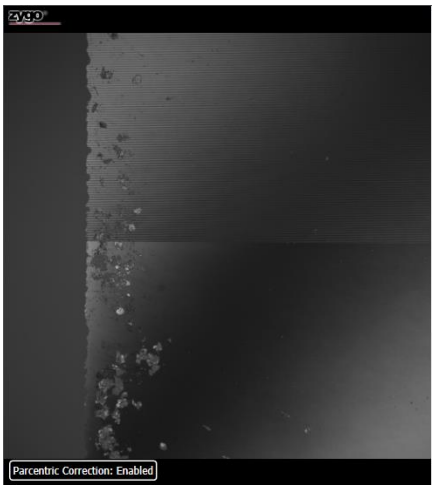
b) Adjust XY so that the corner of the solid chrome region is in the field of view, as shown below

c) Make sure the status bubble at the bottom of the Live Display shows that Parcentric Correction is **Enabled**; if not, click the bubble

d) Click the "**Auto Tilt**" button in the main toolbar; verify that the fringes are nulled to <2 fringes and that the corner of the chrome region of the target is still in approximately the same location in the field of view



Cavity setup before Auto Tilt



Cavity setup after Auto Tilt

7.4.7 Dovetail Blank:

a) Place a dovetail blank on the stage (installed in objective mount when system shipped)

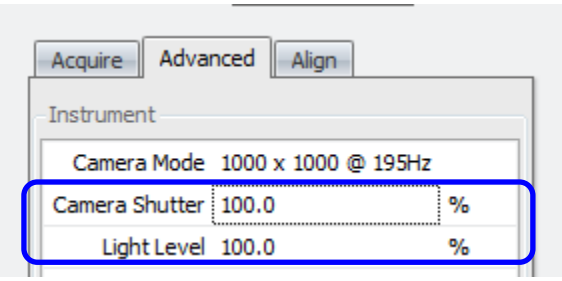
b) Drive the stages to the dovetail blank, and set the Z-stop 1-2mm below focus

7.4.8 *Smart Setup: (rough surface)*

a) Drive the Z stage to the Z stop

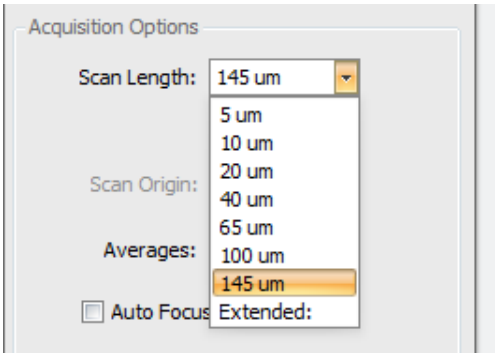
b) Set the scan length to 145um

c) Saturate the image by typing **100** into the fields for **Shutter Speed** and **Light Level** in the Advanced tab of the Measurement Panel



d) Click the **"Smart Setup"** button on the toolbar

e) Verify that fringes are found, that the scan length was lowered (to anything other than 145µm), that the light level was optimized (i.e. not saturated), and that a measurement was taken (Tap the instrument base to see the fringes move)



7.5 Interferometric Cavity Stability

SiC | 5.5x | 0.5z* | 800Hz CR

In this test the environmental noise signature of the head will be measured 4 times and averaged. The cumulative noise function (CNF) for the average amplitude spectrum will be computed and used to verify the interferometric cavity stability of the head in the ATP environment to be:

{ CNF (95 Hz) ≤1.5 nm RMS }

{ CNF (Max) ≤2.5 nm RMS }

7.5.1 Load the **NV9k_EnvTest.setx** settings file and verify the following Measurement Setup control settings:

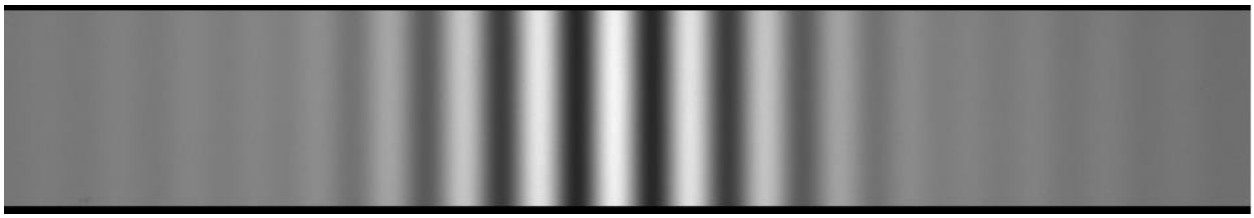
MEAS. ADVANCED	Camera Mode:	**1000 x 200 @ 800Hz**

7.5.2 Open the **Environment Test** utility from the "**Tools**" menu.

7.5.3 Setup a cavity with 15-20 vertical fringes using the **SiC** flat, **5.5X** objective, and **0.5X*** zoom.

a) * If a 0.5X zoom is not installed on the system, use the lowest available zoom mag.

7.5.4 Make sure the fringes are nominally centered in the FOV, as shown below, and then perform an Auto Light Level adjustment by pressing "**F9**".



7.5.5 **IMPORTANT:** Make sure that fans and other environmental noise sources are turned off in the area at this point. Airborne and ground vibrations and air turbulence will impact this test.

7.5.6 Set the **Number of Averages** to "**4**" and click "**Test**". Do not disturb the instrument while the test is in progress (~20 sec).

7.5.7 Right-click on the lower (spectrum) plot and select "**Export**". Click the Save icon and save the results as C:\Users\Administrator\My Documents\Mx\Data\ATP**EnvTest.csv**

7.5.8 In the **MicroATP** utility, on the ATP DATA tab, click on the **Data File Status** table column header. If the Environment Test file name turns green, click the "**CALCULATE [F2]**" button. Verify that the **Cavity Stability** results are within spec.

a) If the Cavity Stability results are not within spec due to the environment where the instrument is installed, the test configuration for the performance tests will be modified as follows:

Surface Topography Repeatability → **SmartPsi Averages = 16**

Step Height Repeatability → **SureScan = ON**

7.5.9 Close the Export Data window and the Environment Test utility in Mx.

7.6 Height Response Linearity

SiC | 5.5x | 0.5z* | ASTOP – OPEN | BP 3nm FILTER

In this test the 65µm metrology ramp will be measured 10 times to determine an average non-linearity value. The spec for the non-linearity, defined as the maximum deviation from the best-fit line is:

{ Non-linearity ≤30 nm }

NOTE: If the customer has a turret installed it may need to be removed to pass this test.

7.6.1 Click the **CALIBRATE** tab in Mx and then select "**Scanner Test**" in the Navigator. If the Scanner Test link does not appear in the Navigator, select "Switch User Level" from the Mx File menu and log in as **AppsEngineer**.

7.6.2 Setup a cavity with ~15 vertical fringes using the **SiC** flat, **5.5X** objective, **0.5X*** zoom; make sure the fringes are nominally centered in the FOV. (*or lowest available zoom mag)

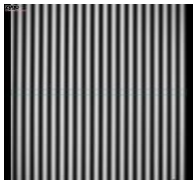
7.6.3 Install the NV8000 Calibration Filter Tool* (0220-0719-01) and load the **NV9k_RampTest.setx** settings file, click the "**Override values**" checkbox, and verify/set the following Measurement Setup and Scanner Test control settings:

* If the tool is not available run PI test and visually check the ramps. You may load the original test from the ATP to complete the report if all the ramps look correct.

MANUAL	Filter:	**BP 3 nm** (NV8k Calibration Filter Tool)
MANUAL	Field Stop:	**Open**
MANUAL	Aperture Stop:	**Open**
MEAS. ADVANCED	Camera Mode:	**1000 x 1000 @ 195Hz**
SCANNER TEST	Acquisition Count:	**10**
SCANNER TEST	Scan Length:	**65 µm**
SCANNER TEST	Obliquity Factor:	**1.000600**
SCANNER TEST	Wavelength:	**Instrument specific** (§7.6.4)

7.6.4 Update the Wavelength control with the calibrated "EWL" value written on the Filter Tool

7.6.5 Perform an Auto Light Level adjustment by pressing "**F9**".



7.6.6 Click "**Acquire Test**". The process stats results will automatically be saved to C:\Users\Administrator\My Documents\Mx\Data\ATP**RampTest.csv**

7.6.7 In the **MicroATP** utility, on the ATP DATA tab, click on the **Data File Status** table column header. If the Ramp Test file name turns green, click the "**CALCULATE [F2]**" button. Verify that the **Mean Scan Increment Error** and **Mean Scan Linearity Error** results are within spec.

a) If the results are not within spec and the scan nonlinearity curve has a distinctive quadratic shape, the scanner may have been damaged. Repeat the test for another ramp length. If the same nonlinearity looks similar, proceed to diagnosing the scanner with PiTest.exe.

7.7 Surface Topography Repeatability

SiC | 5.5x | 1z*

In this test, a SiC flat will be measured 30 times. The data will be averaged to generate a system reference map which is then subtracted from the original data to generate 30 difference maps. The RMS height in each difference map is computed and used to verify the following performance specifications:

{ Surface Topography Repeatability ≤0.08 nm }

{ Repeatability of the RMS ≤0.008 nm }

NOTE: the SIC flat needs to be very clean to pass this test.

7.7.1 Click the **MEASURE** tab in Mx.

7.7.2 Load the **NV9k_TopoRepeat.setx** settings file and verify the following control settings:

MANUAL	Filter:	**Measure**
MANUAL	Field Stop:	**Open**
MANUAL	Aperture Stop:	**Open**
MEAS. ACQUIRE	Measurement Type / Mode:	**Surface / Smart PSI**
MEAS. ACQUIRE	Scan Length:	**10 µm**
MEAS. ADVANCED	Camera Mode:	**1000 x 1000 @ 195Hz**
MEAS. ACQUIRE	Signal Oversampling:	**Off**
MEAS. ADVANCED	Denoise:	**On**
MEAS. ADVANCED	SmartPsi Averages:	**8** (or 16 if EnvTest exceeds spec)

7.7.3 Setup a cavity with 2-3 vertical fringes using the **SiC** flat, **5.5X** objective, and **1X*** zoom.

a) * If a 1X zoom is not installed on the system, use the closest available zoom mag.

7.7.4 Make sure the bright fringe is nominally centered in the FOV and then perform an Auto Light Level adjustment by pressing "**F9**". Move the z-stage slowly through focus and verify that the camera does not saturate. Adjust the light level if necessary.

7.7.5 Null the cavity.

7.7.6 Click the "**Start Sequence**" toolbar button to save 30 SmartPSI surface measurements. The DAT files will automatically be saved to …\My Documents\Mx\Data\ATP\ **TopoRepeat_CSI_##.dat**

7.7.7 In the **MicroATP** utility, on the ATP DATA tab, click on the **Data File Status** table column header. If the SiC Height Maps file name turns green, click the "**CALCULATE [F2]**" button. Verify that the **Topography Repeatability** and **Repeatability of the RMS** are within spec.

7.8 Step Height Repeatability

1.8µm SHS | 5.5x | 1z

This test measures the 1.8µm SHS 30 times and computes the step height repeatability and step height accuracy of the head. The performance specifications are:

Step Height Repeatability ≤0.1 %

Step Height Accuracy ≤0.3 %

7.8.1 In the **MicroATP** utility, on the ATP DATA tab, enter the certified values for the 1.8µm SHS in the appropriate boxes: **be sure to enter the number and press the Enter key.**

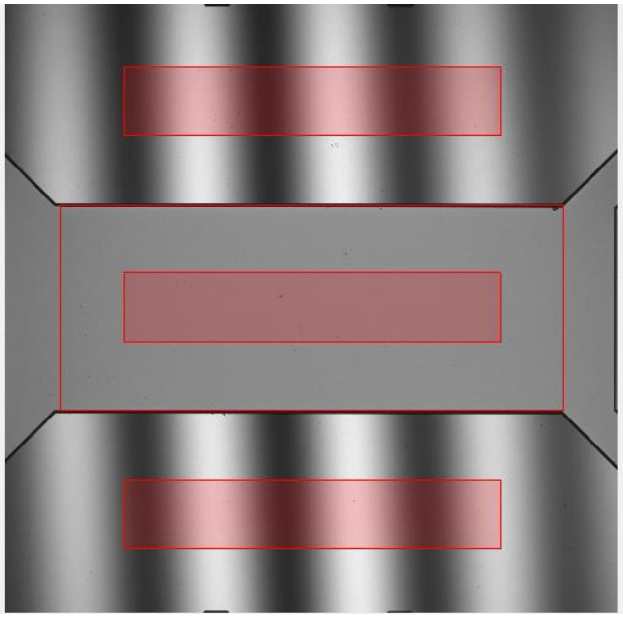
	1.8um SHS
Certified SHS Value:	1.7910

7.8.2 Place the **1.8µm SHS** under the objective. Orient the SHS so the text runs along the Y-axis of the stage with the top of the SHS on the left.

7.8.3 Load the **NV9k_StepRepeat_1p8.setx** settings file and verify the following control values:

MANUAL	Field Stop:	**Open**
MANUAL	Aperture Stop:	**Open**
MEAS. ACQUIRE	Measurement Type / Mode / Z Res.:	**Surface / CSI / High**
MEAS. ACQUIRE	Scan Length:	**10 µm**
MEAS. ADVANCED	Camera Mode:	**1000 x 1000 @ 195Hz**

7.8.4 Click the "**Mask Editor**" button in the Mx toolbar. From the "**Data Source**" dropdown, select **Intensity (Live)**. The appropriate mask should already be loaded.



7.8.5 Adjust the position of the SHS so that the etched portion of the calibrated step height region fits exactly within the fiducial mask. This also verifies that the magnification is correct. Adjust the cavity to obtain ~4 fringes perpendicular to the step, as shown in the image above.

7.8.6 Close the mask editor. Press "**F9**" to set the light level.

7.8.7 Make sure Process Stats logging is turned on and the log file is set to …\My Documents\Mx\Data\ATP\ **StepRepeat_1p8_PZT.csv**; click the "**Start Sequence**" toolbar button to measure the step 30 times.

7.8.8 When the measurements are complete, click the "Clear Results" button  on the Proc. Stats toolbar.

7.8.9 In the MicroATP utility, on the ATP DATA tab, click the "**CALCULATE [F2]**" button. Verify that the **SH Accuracy** and **SH Repeatability** results are within spec.

7.8.10 Load the **NV9k_StepRepeat_1p8_Z.setx** settings file and verify the following control values:

MEAS. ACQUIRE	Measurement Type / Mode / Z Res.:	**Surface / CSI / High**
MEAS. ACQUIRE	Scan Length:	**Extended: 100 um**
MEAS. ACQUIRE	Scan Origin:	**Center**
MEAS. ADVANCED	Camera Mode:	**1000 x 1000 @ 195Hz**
MEAS. ADVANCED	Aperture Stop:	**Open**
MEAS. ADVANCED	Filter:	**Open**
MEAS. ADVANCED	SureScan:	**On**

7.8.1 Press "**F9**" to set the light level, make sure Process Stats logging is turned on and the log file is set to …\My Documents\Mx\Data\ATP**StepRepeat_1p8_Z.csv**; click the "**Start Sequence**" toolbar button to measure the step 30 times with the **Z-stage**.

7.8.2 When the measurements are complete, click the "Clear Results" button  on the Proc. Stats toolbar.

7.8.3 In the **MicroATP** utility, on the ATP DATA tab, click the "**CALCULATE [F2]**" button. Verify that the **SH Accuracy** and **SH Repeatability** results are within spec.

7.9 Performance Verification

7.9.1 Load the default **Micro.appx**, and setup a cavity using the 5.5X objective and SiC flat. Make several measurements in **each camera mode** to verify tool operation. If the system has a turret, install it and **verify turret operation** in Mx.

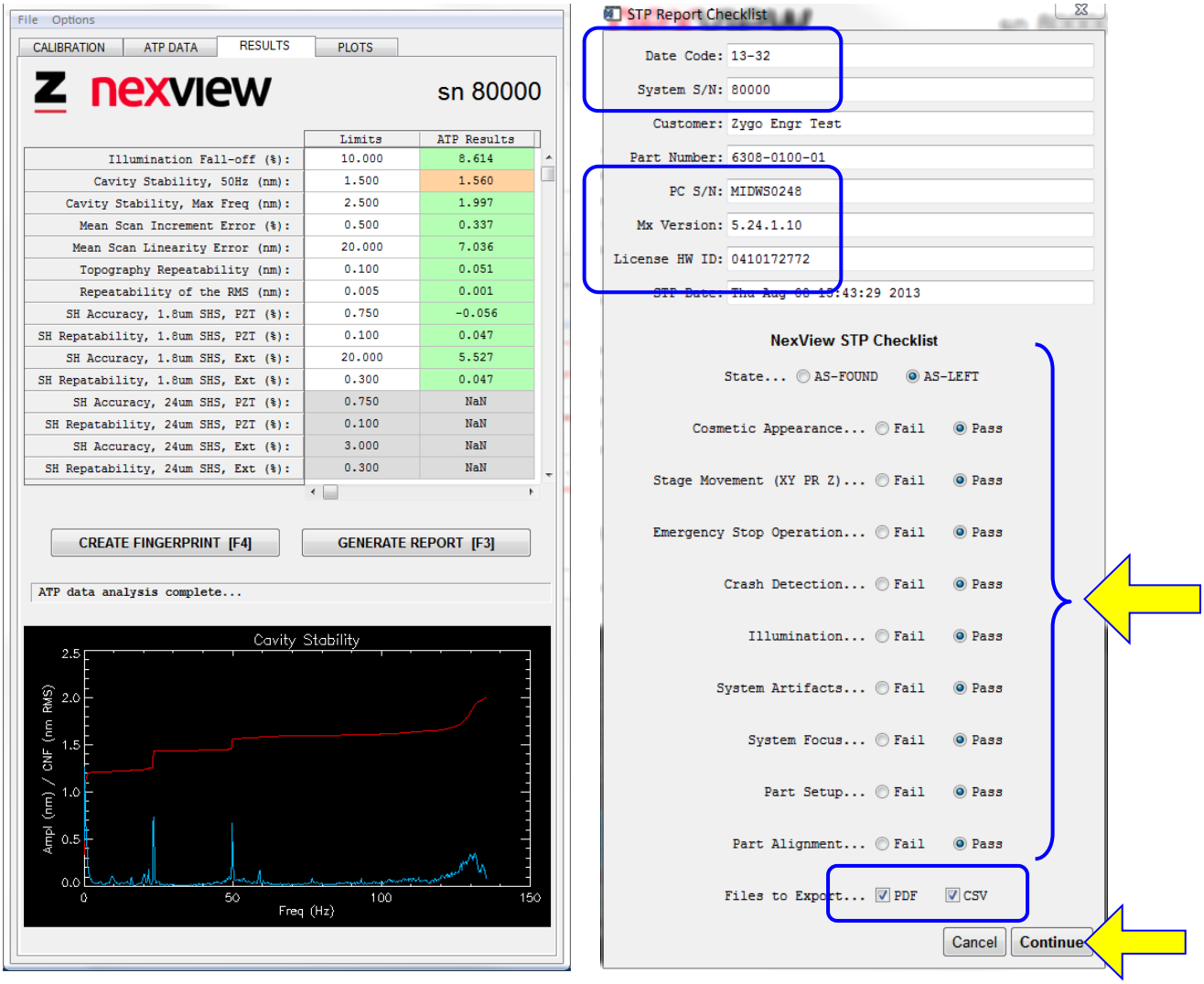
7.9.2 Once all STP data has been processed in MicroATP and all results meet specification, click the "**GENERATE REPORT**" button on the RESULTS tab to launch the STP Report Checklist shown below.

a) Verify the **Date Code**, **PC S/N**, **Mx Version**, and **License HW ID** fields in the form

b) Complete the **Pass/Fail STP Checklist**

c) Make sure both the **PDF** and **CSV** Files to Export boxes are checked, and then click "**CONTINUE**"

7.9.3 Print **and initial** two copies of the PDF Report. Leave one copy with the customer



7.10 STP Finalization

7.10.1 *Fingerprint*. Close Mx and archive the software and hardware state of the system by clicking the **CREATE FINGERPRINT** button on the Results tab in **MicroATP**.

Enter the **Mfg/Field Eng** name, **Customer**, and **Inst S/N** then click "Start". After the program completes, verify that all check boxes are green indicating no errors.

7.10.2 Use File Explorer to delete the folder C:\ProgramData\Zygo\Service\Service Utilities from the local computer. The folder C:\ProgramData\Zygo\Service\Service Utilities.zip should remain in place.

7.10.3 *System Data Archive*. Copy the *.**log** file from C:\ProgramData\Zygo\Mx\Utilities\Fingerprint\ to a memory stick if allowed by customer.

If you have email access, send the file to zscservice@zygo.com for archiving.

NOTE: If any changes are made to the instrument, save the initial STP results to document the AS-FOUND condition of the tool, then repeat the procedure and save the final STP results for the AS-LEFT condition.

8. NV9000 SERVICE TEST PROCEDURE CHECKLIST

Customer:		Date:	
Order #:		Mx Version:	
System S/N:			
1.8 µm Step Height Standard			
Serial #:		Expiration Date	
Certified Value:			

		Before		After		
Sect.	**System Setup**	Pass	Fail	Pass	Fail	**Repair Method**
7.1.1-2	Remove Shipping Locks, Warm Up					
7.1.3	Verify Environment & Isolation					
7.1.4	Login as Administrator					
7.1.7	Load MicroMFG.appx					
Sect.	**Mechanical**	Pass	Fail	Pass	Fail	**Repair Method**
7.2.1	Stage Homing					
7.2.2	XY, RP, Z Stage Operation					
7.2.3	Stage Programmed Move					
7.2.4	Emergency Stop					
7.2.5	Crash Detection					
7.2.6	Scanner 0 µm Voltage	Voltage =_____V				
Sect.	**Optical Performance**	Pass	Fail	Pass	Fail	**Repair Method**
7.3.1	System Artifacts					
7.3.2	Focus Aid Reference Acquisition					
7.3.3	Focus Aid Operation					
7.3.4	Z-Stop Operation					
7.3.5	System Focus – 10x obj / 0.5X zm					
7.3.5	System Focus – 10x obj / 1X zm					
7.3.5	System Focus – 10x obj / 2X zm					
	Auto Alignment	Pass	Fail	Pass	Fail	
7.4.2	Part Finder					
7.4.3	Smart Setup (smooth surface)					
7.4.4	Fast Focus					
7.4.5	Auto Focus					
7.4.6	Auto Tilt w Parcentric Correction					
7.4.8	Smart Setup (rough surface)					
	Measurement Performance	Pass	Fail	Pass	Fail	
7.5-7.8	Attach PDF Report					
	Complete Service	**Complete**		**Complete**		
7.9.1	Check All Camera Modes & Turret					
7.9.2	Calculate STP Results					

Send Certificate to:_____ **Date Completed:** _____ **Initials:** _____

Zygo NV9000 STP Report

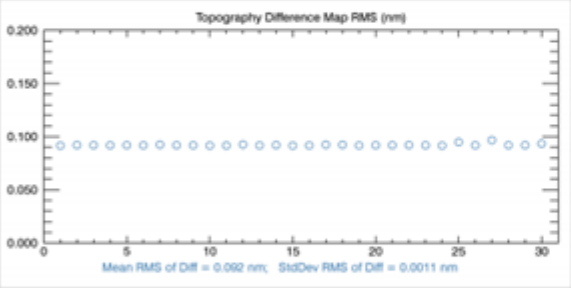
The ATP Report below is generated automatically by the MicroATP utility. Two copies should be printed, initialed by the Service Engineer, and one copy left with the customer.

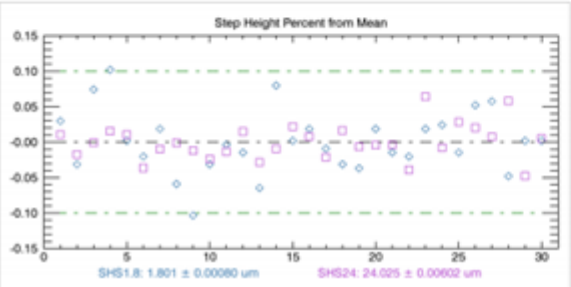
zygo

Acceptance Test Report

NewView 8000

Customer:	
System S/N:	14-11-81005
Date:	Sat Mar 29 07:47:43 2014
Part Number:	6307-0100-01
PC Serial Number:	4FLF8Z1
Software Version:	6.0.1.7 (License ID: 0344959290)





ATP CHECKLIST				
STEP	ITEM TO CHECK			RESULT
1	Cosmetic Appearance			PASS
2	Stage Operation:	X Axis, Y Axis P Axis, R Axis Z Axis		PASS
3	Emergency Stop Operation			PASS
4	Crash Detection			PASS
5	Illumination			PASS
6	System Artifacts			PASS
7	System Focus:	0.5X zoom 1X zoom 2X zoom		PASS
8	Part Setup:	Live Display Focus Aid		PASS
9	Part Alignment:	Auto-Focus Auto-Tilt		PASS
10	Cavity Stability			PASS
11	Height Response Linearity			PASS
12	Surface Topography Repeatability	0.092 nm	{ 0.2 nm }	PASS
13	Repeatability of the RMS	0.0011 nm	{ 0.010 nm }	PASS
14	Step Height Repeatability	0.04 %	{ 0.1 % }	PASS

Send 2 copies of Acceptance Test Report with customer shipment.

ATP-0540A

Final Result: PASS Tech Initials: _____