



Application Notes

Surface profiler procedure using the MicroWriter ML[®] 3 direct write photolithography system

EXECUTIVE SUMMARY

Here we present the surface profiler procedures to scan the designed patterns on the real-time microscope view using the MicroWriter ML[®] 3 direct write lithography system.

INTRODUCTION

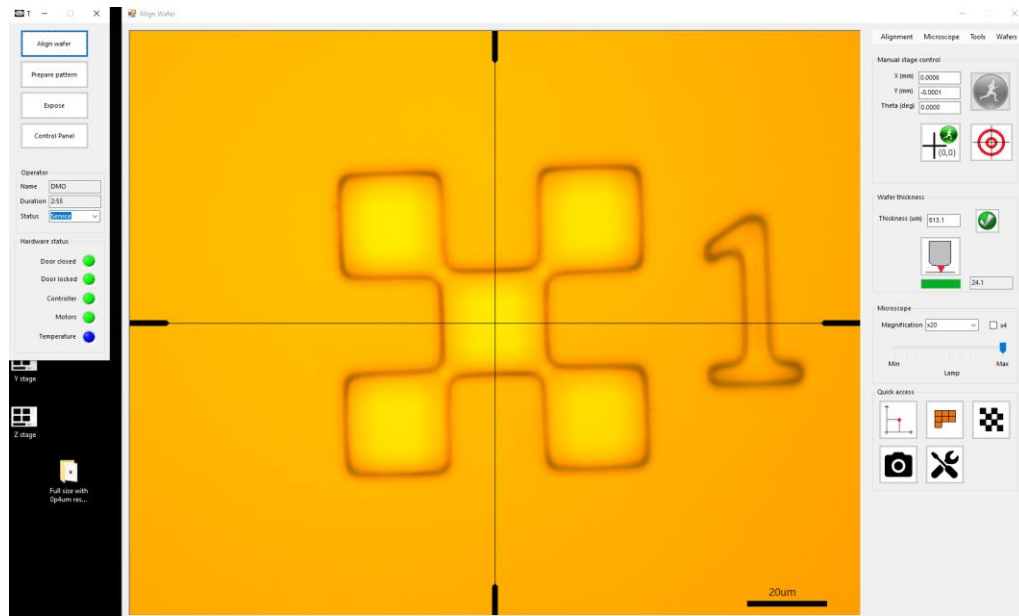
The surface profiler scan the area on the real-time microscope screen. It cannot scan more than the view on this screen. The screen view can grow if a low magnification is being used. But it will be smaller if a high magnification objective is engaged. This tool use the checkerboard focus along a range of thickness to map the structures.

PROCESS

A. Load the resist-coated chip with existing patterns.

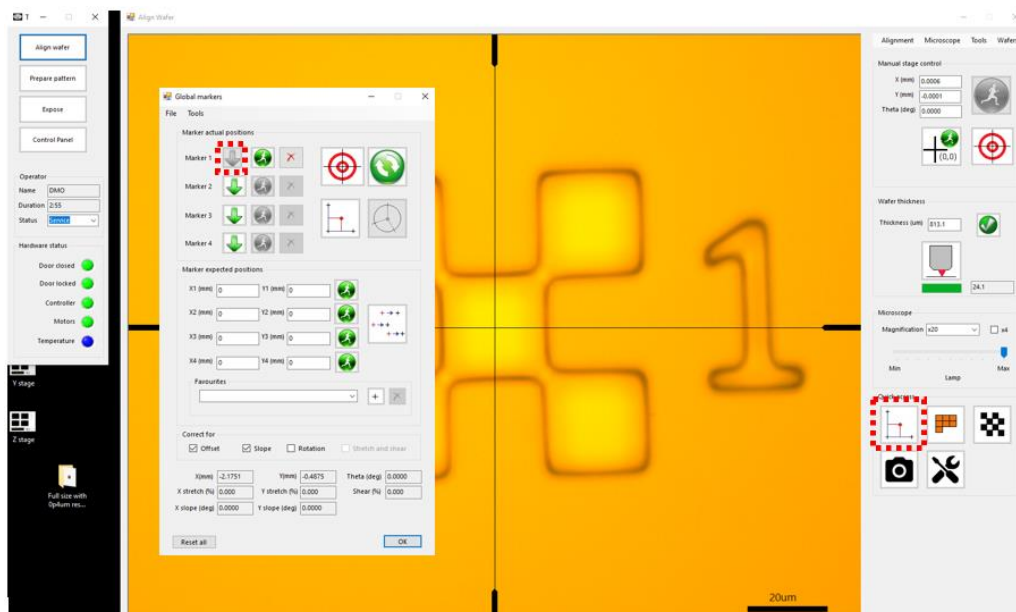
B. Bring the top surface of the chip in focus.

Find the pattern you will use to make a surface profiler, select the magnification and focus on the pattern.



C. Save this position on a marker

Click on the centre wafer button on the quick access menu and save the current position using the green arrow pointing down as marker 1. Close the global markers window.



D. Move to a clean position to use it to subtract the background

In order to get better results is necessary to start the profiler on a zone without patterns to use it as background.



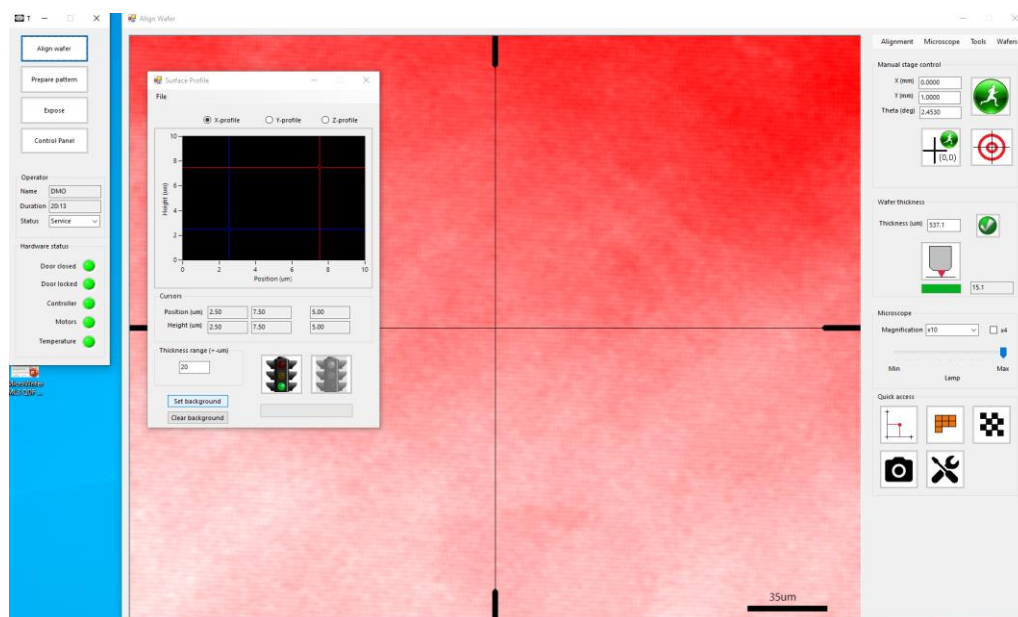
E. Start the surface profiler to set the background

Open Tools/Surface profiler. This will open the surface profiler window. If you are using the x10 magnification, uses a default scanning thickness of 30 um adjust the thickness range if needed more for thicker resists. If you are using x20, the default thickness scanning range is 15 um. You can set the thickness range to 0 if your resist is lower than these values. Click on the green light to start with the surface profiler.

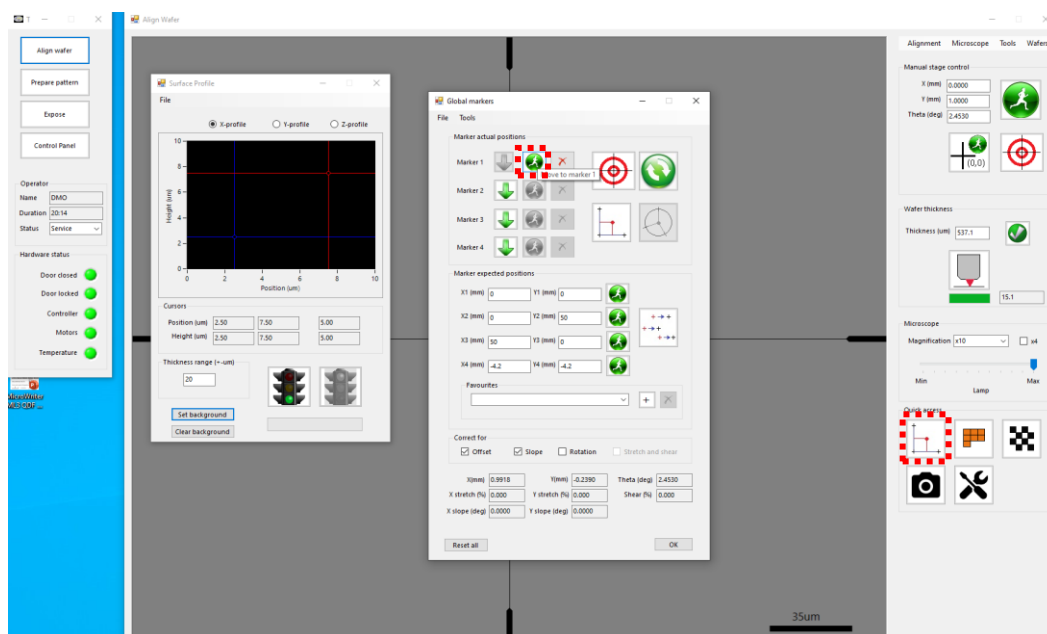


F. Set the background

Once the scanning has finished you will see an image with a gradient from white to red. White color are high zones and red are low zones. Click on “Set background” button

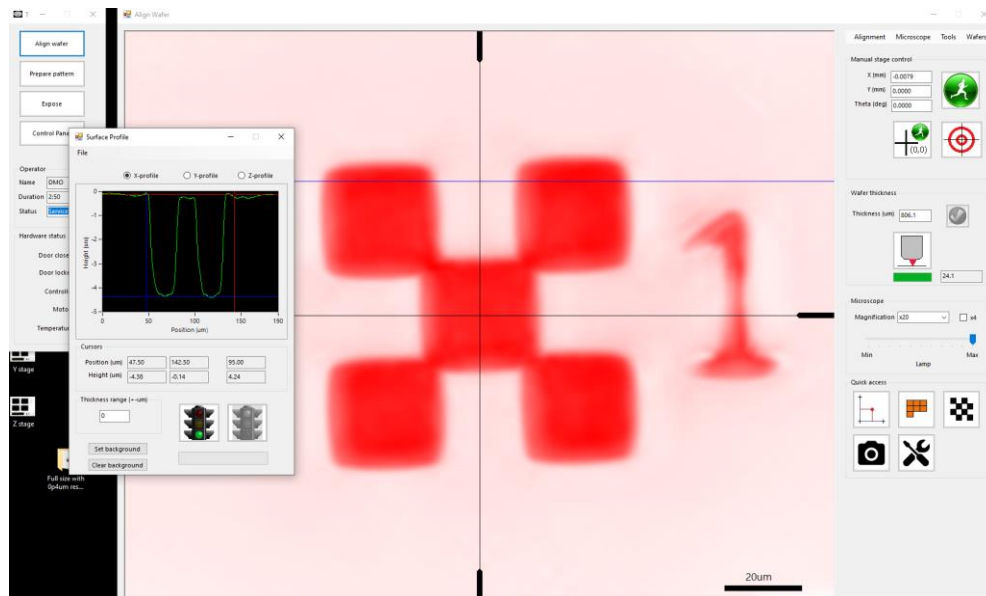


The screen will turn grey color after clicking “Set the background” button. Open “centre wafer” button on the quick access menu. And click on the running man on marker 1 to move to the position of the pattern. Once in this position you can click the green traffic light again.

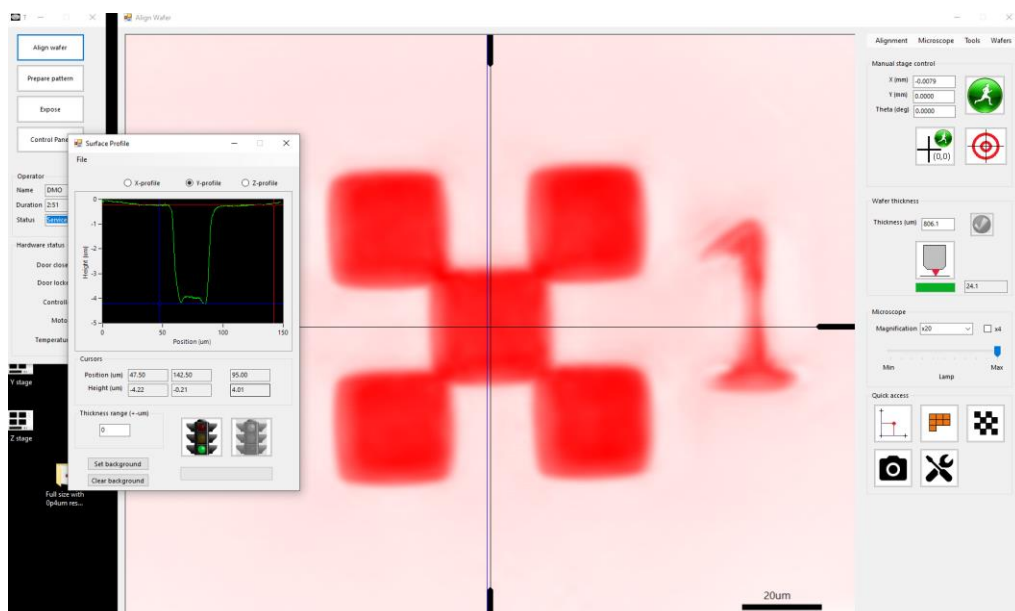


G. Start the surface profiler

Once in this position, close the global markers window, and you can click the green traffic light again to start the surface profiler over the pattern. Wait until it finishes and you will see a map of white and red colors with the shape of the pattern. If “x-profile” is selected, you can click on the real-time microscope to set a line on the x-axis and check the profile on the surface profiler window.



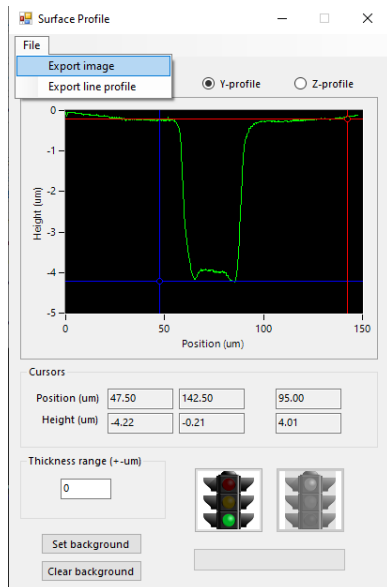
You can set a line on the y axis if “y-profile” is selected, by double clicking on the graph on surface profiler window you can control four lines to make measurements on that graph.



OPTIONAL

Export the image to create a 3D surface using ImageJ

a) Click on file/Export image



b) Import that txt image on ImageJ

c) On ImageJ, click on plugins/3D/Interactive 3D surface plot, this will generate a 3D surface that the user can manipulate.

