

Adding an Additional Filter to the SkyScan 1275

Tip of the Month: November 2016

There are times when you may wish to use a different filter other than the standard 1mm aluminum or 1mm copper filters. For example, when scanning an item with metals or other high-density material, adding a dense filter, such as a brass filter, cuts down on noise and provides the best contrast.

Following are the steps for manually adding your own filter to the existing aluminum filter.

WARNING: Before attempting to add a filter, it is critical not to touch the X-ray source beryllium window as it is extremely fragile (Figure 1). If touched, it could result in a costly X-ray source replacement.

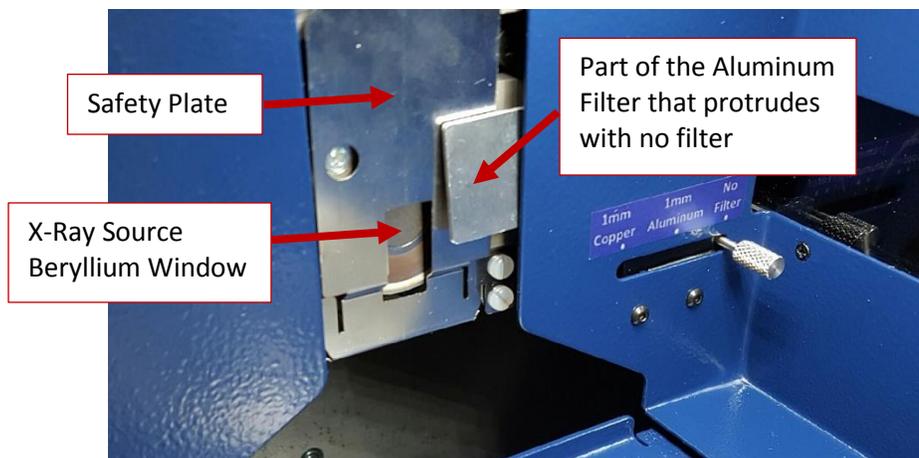


Figure 1. Filter and X-ray source beryllium window

When the system is set to "no filter", the 1mm aluminum filter will protrude slightly from behind the blue cover plate and will not cover the X-ray source beryllium window (Figure 1). Any new filter will need to be carefully taped to the part of the aluminum filter that is protruding (Figure 2). When doing this, make sure the filter you add aligns with the bottom edge of the aluminum filter and extends past the beryllium window. Also, make sure the filter you add is not pressing in the safety plate behind it (Figure 1). The safety plate is there to prevent a sample from hitting the X-ray source; if the safety plate is pressed in, it will give an error that the sample is hitting the source and will not allow you to start a scan.

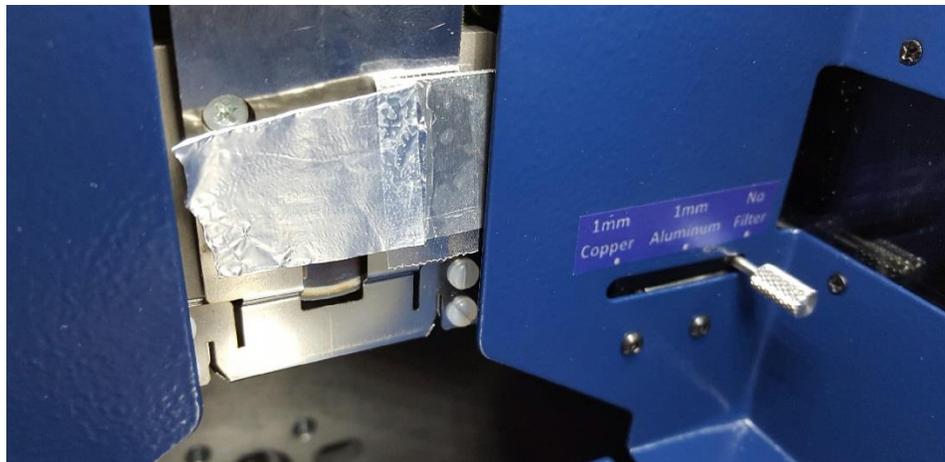


Figure 2. Thinner aluminum filter taped to the existing 1mm aluminum filter.

After adding the new filter and before starting the scan, you will need to adjust the exposure time and take a new flat-field correction. Make sure the intensity profile is around 60% with the flat-field off and around 90% with the flat-field on. You may already be familiar with the steps to take a flat-field correction, but if not, here are the appropriate steps:

1. Make sure the sample chamber is empty and the new filter is installed.
2. Turn off the flat-field correction by double clicking the "ff" text in the upper left hand corner of the control software (Figure 3). Check that that the intensity is around 60% with the flat-field correction off. If it needs adjustment, go to step 3. If it is fine, then continue to step 4.

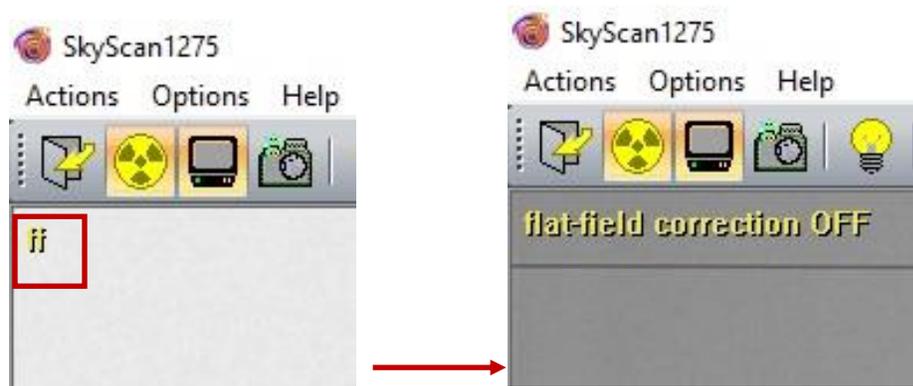


Figure 3. Turning off the flat-field correction in the upper left corner (in red).

5. Go to “Options -> Scanning Settings” and adjust the exposure time accordingly to bring the intensity to 60%. Then press “OK” (Figure 4).

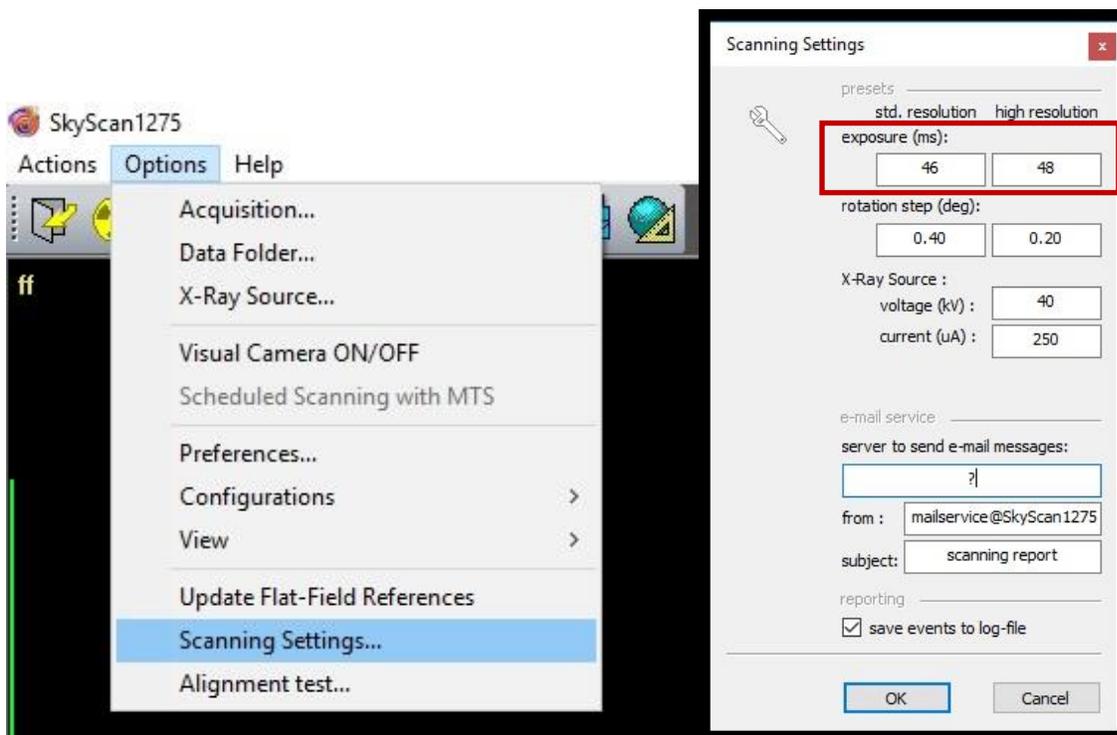


Figure 4. Scanning settings to adjust the exposure time.

6. Go to “Options -> Update Flat-Field References” and check the appropriate boxes. If you have not already done a dark flat-field for the day, uncheck the box “update only bright references”. Otherwise, keep all the selections and press “OK” (Figure 5).

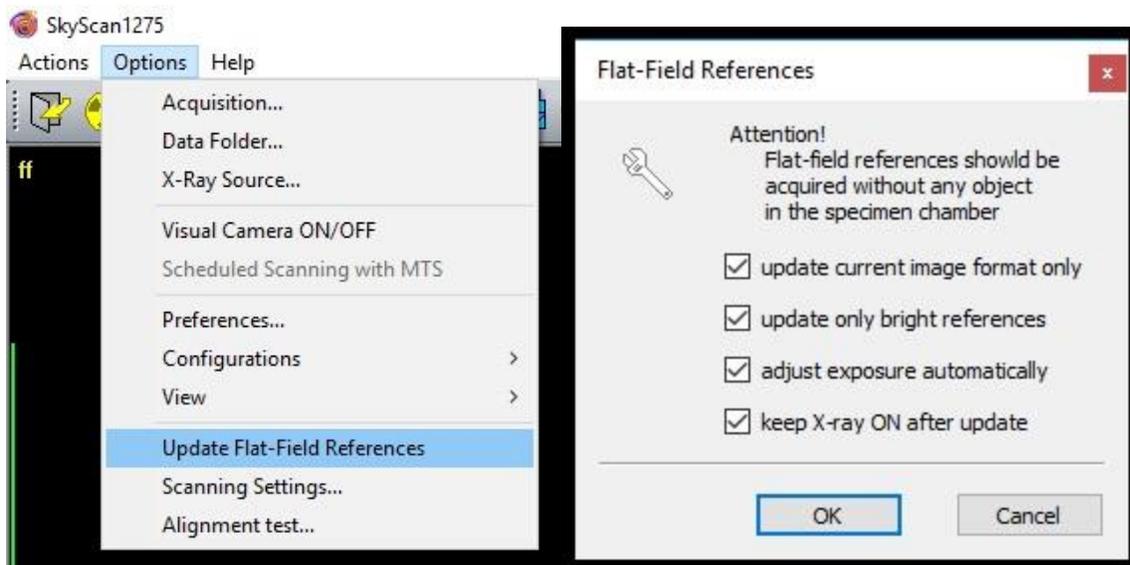


Figure 5. Updating the flat-field references.

Micro Photonics Inc.

Instrumental to your success

After acquiring the flat-field you are ready to start scanning with your new filter. If you need further assistance, feel free to contact us at 610-366-7103 and one of our trained engineers will be glad to help you.

NOTE: Our filter choice varies according to the material we are scanning. For example, no filter and low voltage is good for tissue and low-density materials, an aluminum 0.5mm filter and medium voltage is good for medium-density material, such as bone, and a brass 0.25mm filter and high voltage is good for high-density materials, such as rocks or titanium. If you have questions about which filter may be good for your sample feel free to contact us and one of our engineers will be glad to assist you.

(See our Image of the Month for November 2016 for an example battery scan, which benefited from the use of a copper filter. Adding a brass filter would also have been a good choice for this scan).