

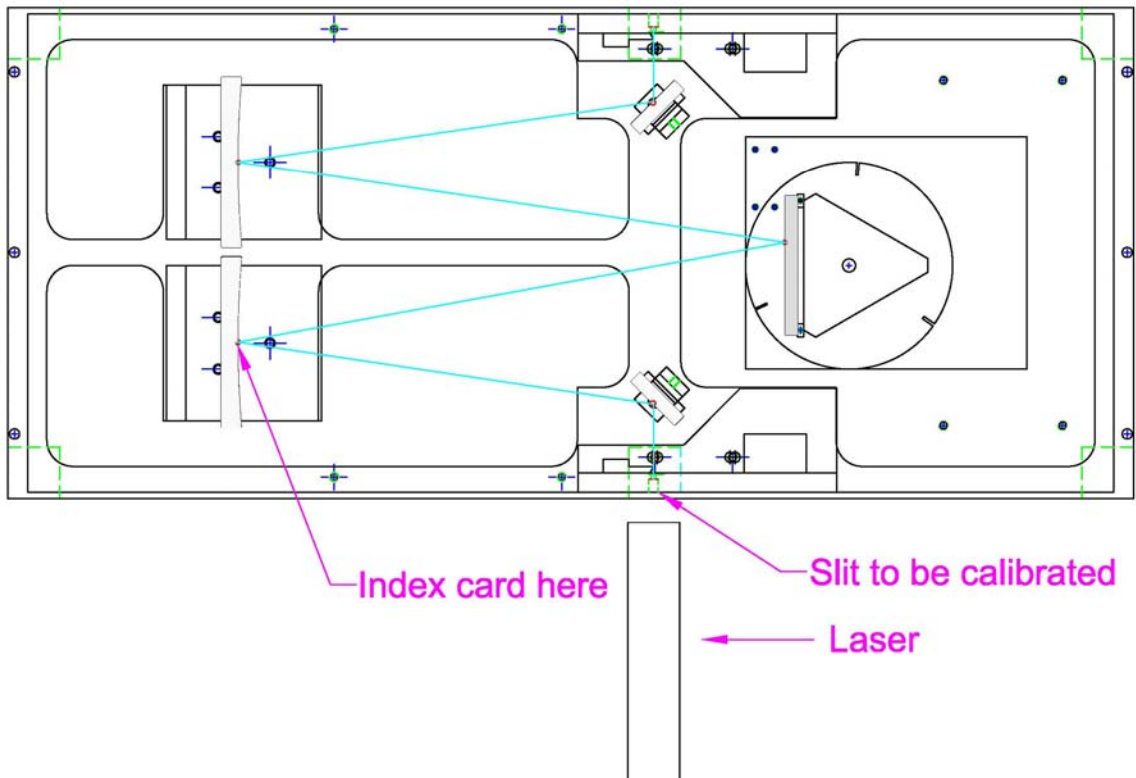
DK Series Slit Calibration

NOTE: Calibration of the DK240 and DK480 slits is identical, the only difference being the length of the diffracted laser beam observed. For this calibration procedure, we will assume a DK240 is being calibrated. Refer to figure 3 for the diffraction pattern of the laser when calibrating slits in a DK480.

These instructions are written with the assumption the user is familiar with the Spectral Products DK Visual Basic software commands. The software and instructions may be downloaded at www.spectralproducts.com

A HeNe laser and white card are needed to perform slit calibration. A standard 3 x 5 inch index card works very well, as the lines on the card, when placed vertically, correspond exactly to the diffraction pattern of the laser during the calibration procedure.

1. Remove the monochromator cover.
2. Shine the HeNe laser through the slit being calibrated.
3. Power on the monochromator. The slits default to 50 microns width.
4. Place an index card directly in front of the spherical mirror adjacent to the slit being calibrated. Use care so as to not mar the mirror surface. See below:



5. Observe the laser beam diffraction pattern on the index card and compare to Figure 1 below. When looking at the beam, it is the main middle portion that we are interested in, not the edge fringes.
6. If the beam length matches, no further action is needed. Replace the cover and continue with your work. If calibration is required, continue on to step 7.

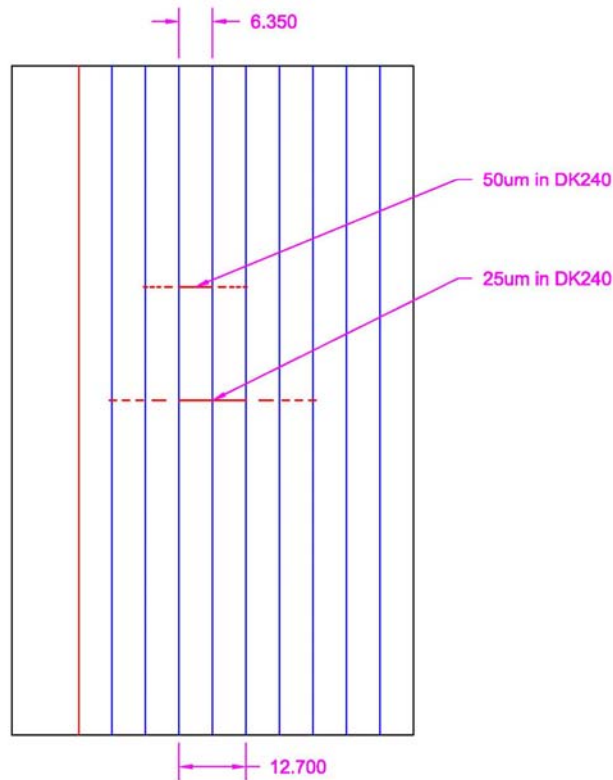


Figure 1. At 50 microns, the beam is 6.35mm in length.
At 25 micron, the beam is 12.7mm in length.

7. If the beam length is longer than those shown above, (or non-existent if the slits are totally closed), the slit blades are closed too much. Issue slit width commands to open the slit until the beam length matches those above, and then issue a **SLIT CALIBRATION** command. After each calibration command is given the slit must be reset. Issue a **SLIT RESET** command.
8. If the beam length is shorter than those above, the slit blades are open too much. CONSERVATIVELY issue slit width commands to close the slit until the beam matches those above, and then issue a **SLIT CALIBRATION** command. **Entering too large of a value will cause the slit to close too much which may result in permanent damage to the slit blades!** If you have told the slit to close to 10 microns (slit minimum) and find that the slits are still open too far, you must enter a number larger than the calibration target. For instance, if you have set the slit to 10 microns and the beam is only $\frac{1}{2}$ of a column wide (approximately 100um) issue a calibration command of 100. Reset the slit. It should then be close to 50

- microns wide. The closer the slit is to being calibrated properly, the more important it is to enter conservative calibration values to avoid damaging the blades. Refer to Figure 2 for some examples.
9. Once you are satisfied the beam length is correct, issue several **SLIT RESET** commands to ensure the slit is repeating.

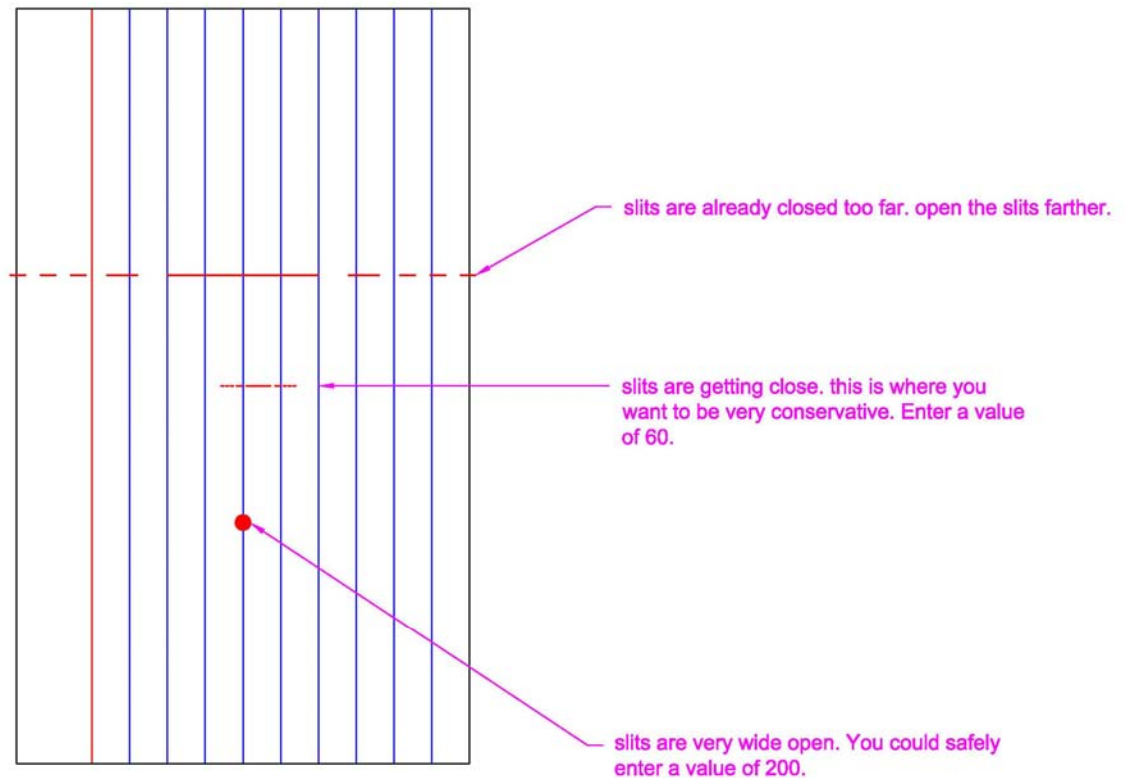


Figure 2. Various slit widths and calibration offset commands.

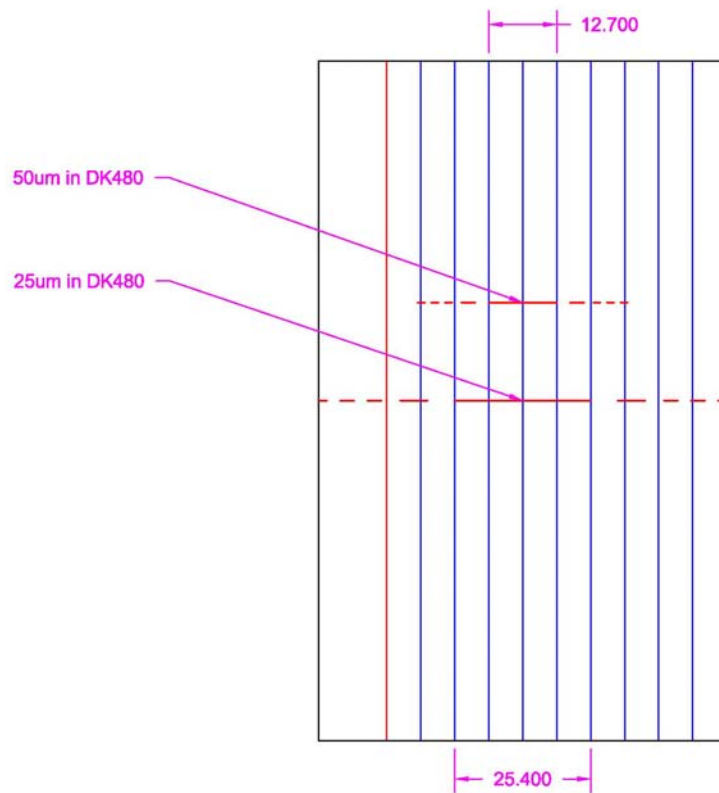


Figure 3. DK480 calibrated slits.

10. When calibrating slits in ad DK480, the procedure is the same. Note that the beam length is double that of a DK240 slit. A properly calibrated slit has a 25.4mm beam length at 25 microns.