Mastersizer 3000 Laser Diffraction Particle Size Analyzer-Dry

Warning: This instrument may only be operated by those who have been trained by AAF staff and have read and signed the AAF laboratory policies.

1. Make sure the instrument has been on at least for 20 min.
2. Computer should be on. [Use your UWM account to login]
3. Connect the cell (Aero S for dry measurement and Hydro EV for wet measurement.
4. Open the software Mastersizer 3000
   A) Click on view and select 2-pane Vertical as your window layout
   B) Create a new measurement at Home→ New →Measurement files and save it at Windows (C:)/DATA/User Data/Your PI's Name/Your Name
   C) For more information, Check the user manual at Tools→User Manuals
5. Select the cell: on the bottom right of the screen check that the appropriate cell is connected to the instrument (choose CAN1: Hydro EV for wet measurement and CAN 2: Aero S for the dry measurement.
6. On the bottom right of the screen check that Usb is connected
7. Manual measurement: Dry measurement
   A) Change the cell to Aero S and connect the dispersion unit
   B) Connect the gas tube to the back of dispersing unit.
   C) Turn the main valve of the air regulator on.
   D) Check that the hopper is set to 1
   E) Add the sample to the tray (skip to 9 if you have a SOP)
   F) Check that the background is stable and the cell is clean
      i) Choose Manual measurement
      ii) Enter the sample information: Type sample name under Identification, select shape of the sample from the options in Particle Type (spherical is the typical option), in Material, Brows database and select your material. If the sample material is not included in the database, click on Add on top right of the screen window and input Material name, Refractive index, Absorption index, and Density.
      i) Under Measurement enter the Method for your data collection, Background measurement duration and sample measurement duration (The right measurement time will produce representative data and at the same time optimizes instrument productivity). Under Sequence specify the number of measurements and other delay times during measurements. Set the Obscuration limit depending on your sample particle size (0.3-10 is the typical range). No Filtering in Manual mode.
      ii) Disperse your sample by setting appropriate air pressure and feed rate. Adjust the feed rate to make sure obscuration is in range. (be aware that excess air pressure can break fragile particles to smaller sizes.) Set the cleaning type depending on your sample. (Cleaning cycle needs to be repeated until the background is stable)
   G) Click OK
   H) Initialize the instrument (Click  to start)

I) Measure the background click on initialize instrument and check the background (A good background is less than 100 on detector 1, less than 20 on detector 20 and continuously decreasing curve.) Background measurement captures the scattering from the cell windows.

J) (after background subtraction it should show random fluctuation around zero line without any permanent peaks)

K) Measure the sample (Click  to start) then click Feed

L) Clean the system (Follow the pop up messages on the screen until the system is clean)

8. Develop your Method and create your SOP
   A) Once you measured the particle size you can right click on the data file and extract the SOP, make any desired changes and save the SOP at (C:)/DATA/User SOP/Your PI's Name/Your Name.
9. Run your SOP
   A) To run SOP, click on Run SOP and select the saved SOP and click OK.
10. Verify your data
11. Clean-up (Follow the cleaning instruction for the corresponding cell accordingly)
12. When you are done make sure to close the software otherwise it will lock other users from opening it.