

Coulter Multisizer II

Introduction and Instrument Specifications

The Coulter Multisizer II analyzer is a versatile, multichannel, particle size analyzer, which employs the Coulter electrical impedance method to provide a particle size distribution analysis within the overall range 0.4 μ m to 1200 μ m. Each result is displayed graphically as a percentage of channel content, which can be selected to represent volume(weight), number(population) or surface area, in either differential or cumulative form.

Full range accumulation can be selected to cover either 64, 128, or 256 size channels and additional accumulations can then be performed, using the same range of channels, over two successively smaller size ranges, thus giving very high resolution. A Pulse Edit function, fitted as standard, allows mis-shapen pulses due to either non-axial flow of particles through the aperture or from the coincidence of particles in the aperture to be edited (eliminated) from the data. This significantly improves the accuracy of measurement of narrow size range particle distributions or narrowly classified particulate materials. Numerical data, which is displayed alongside the graphics displays, includes: total raw count; total coincidence corrected count; total channelized count between the upper and lower cursors; upper and lower channel number, with equivalent size; time taken for accumulation and, whilst the sample is being aspirated, an indicator of the concentration of the sample being analyzed.

The Coulter Multisizer II analyzer comprises of a Sample Stand, with its associated Vacuum Control Unit and the main electronics unit. The Coulter Multisizer II is software driven by the Coulter Accucomp software package that is designed to provide the user with a simple straightforward tool for the quick and accurate calculation and presentation of sample data statistics.

Coulter Multisizer II Operation and Guidelines

Policy

Projects:

All new users should meet with Johnafel Crowe (Office: 404.894-2212, johnafel.crowe@ibb.gatech.edu) to discuss their project **BEFORE** they use the instrument. An abstract or brief description of each user's project involving particle characterization or cell counting should be discussed in person or forwarded to johnafel.crowe@ibb.gatech.edu. At that time objectives and goals of the user can be discussed as well as the best means of achieving these objectives. **Important note:** If projects involve potential biohazards, the user must inform Johnafel and supply protocols for decontamination at this time.

Instrument Use:

Basic training sessions are administered upon request. These sessions usually last about 30 minutes. Basic training session topics include but are not limited to operation of the system, how to acquire, save, transfer data, and shut down the instrument.

Coulter Multisizer II Session:

All users will read and have available the condensed equipment instructions for the Coulter Multisizer II. Equipment will be left as clean or cleaner than the user originally encountered it. Each user is required to sign a log before and after each session. Users are required to report any instrument problems encountered during each session to Johnafel Crowe. This action will help to keep the Coulter Multisizer II up and running properly. Each user can save data on the User data drive in a folder to temporarily store their statistical data. The User data drive connected to the computer has a limited amount of disk space. **Therefore, users are required to bring blank storage media** (e.g. blank Zip disks, blank CDs, MO disks, or hard drives via the GT network) **to each session** and transfer their images to some form of storage media **BEFORE** each session is complete. **The core laboratory is not responsible for the backup of user folders and files.**

IF YOU REQUIRE OPERATOR ASSISTANCE, YOU SHOULD NOTIFY JOHNAFEL AND RESERVE A TIME NO LATER THAN THE DAY BEFORE YOUR DESIRED APPOINTMENT. In the event you need to cancel the appointment please notify Johnafel at 404-894-2212 or johnafel.crowe@ibb.gatech.edu.

Coulter Multisizer II Operating Instructions:

1. Fill the buffer reservoir with Isoton II and empty the waste reservoir into the sink (**NOTE: The instrument will not function if the waste reservoir is not screwed on tightly.**) Turn on the power to the electrical unit and the sample stand.
2. Allow the instrument to warm up 10 minutes.
3. Press SETUP and select manual. Verify that your settings for your count are correct. The manometer select should be set to 500ul.

4. Check the diameter of the orifice that is located on the aperture tube. The 100 microns tube is commonly used for particles ranging from 2 microns to 60 microns.
5. Remove the blue solution and install a small plastic beaker containing Isoton.
6. Turn the knobs from CLOSE to FILL and from COUNT to RESET. This allows the blue solution to be flushed from the aperture tube. Turn to from RESET to COUNT and from FILL to CLOSE for the bottom knob. (**NOTE: Always turn knobs in a clockwise direction.**)
7. Press FULL. Remove the beaker containing Isoton and install sample after several inversions. (**NOTE: The sample should be either in Isoton or PBS.**)
8. Press reset in order to clear the screen and turn the knob from COUNT to RESET. The light in the sample stand should come on and the Mercury level should drop. Turn the knob from RESET to COUNT. The instrument will stop counting when 500ul of sample pass through the orifice of the aperture tube.
9. When you are finished counting, install the plastic beaker containing the blue solution and turn the knob from COUNT to RESET. Turn the knob from RESET to COUNT. Repeat 4X.
10. Turn off the power to both pieces of equipment.

Dilution Factor Equation: $DF = \frac{\text{ml of sample} + \text{ml of electrolyte solution (20ml)}}{\text{mano volume(.500ml)} \times \text{ml of sample}}$

DF X cell count = Number of cells per ml

Instrument Modifications:

No modifications are to be made to the Coulter Multisizer II or the attached computer. Only certified Coulter Corporation representatives may make hardware and software modifications to the system.

After Hours Use:

Please see Johnafel if you are a trained user and require access. To gain access to the Coulter Multisizer II after hours when you come to your session, remember to bring your buzz card it will give you programmed slide key access to the lab.

Safety

Emergency procedures:

In case of an emergency, please contact:

Johnafel Crowe Office: 404-894-2212, Home: 770-210-9145

Steven Woodard Office: 404-894-5891, Cell: 404-725-0023, Home: 770-322-0187

Kay Kinard Office: 404-894-8896, Home: 770-944-0519

In the event we cannot be reached and the matter requires immediate attention, call Georgia Tech Police 404-894-2500. These numbers will be posted near the instrument and on the outside of Room 1328.

Biohazardous Materials:

Please notify Johnafel of any potentially biohazardous samples that are analyzed using the Coulter Multisizer II. Any sample that is either human or primate in nature is considered a potential biohazard. Therefore it is the user's responsibility to perform their analyses in such a way as to not contaminate the instrument. Furthermore, it is the user's responsibility to provide the facility with decontamination protocols. In the event that the instrument becomes contaminated by the sample (e.g. blood, sputum or waste products), it is the user's responsibility to notify Johnafel Crowe immediately. All biohazardous waste will be disposed of in red biohazardous bags and placed in a designated waste area. Regular waste pick-ups will be scheduled with the Department of Environmental Health and Safety.

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