ATA SCIENTIFIC PTY. LTD. Inc in NSW ABN: 85 003 951 737
TODAY'S INSTRUMENTS. TOMORROW'S INSIGHTS

Postal Address: PO Box 2172, Taren Point, NSW, 2229, Australia
Phone: (02) 9541 3500
Email: enquiries@atascientific.com.au

User training – Laser Diffraction
Achieving reliable particle sizing

Presenters: ATA Scientific Pty Ltd

Time: Registration 9am finish approx 4.30pm*

Course fee: $250(+gst), includes notes, refreshments and lunch

Venues: Contact us for updates

This one day course is designed for users of Malvern Laser Diffraction particle size analysers. It will help users understand how these instruments work, how to make reliable measurements and how to interpret the data. Important sampling and maintenance procedures are also covered in practicals.

Who should attend

Users of Malvern Mastersizer series particle size analysers. This course will valuable for both new users and existing users who will learn "best practise" in the operation and maintenance of these instruments.

The course consists of theory presentations and practical sessions.

Theory presentations

- **Basic Principles** and the definition of "particle size "as it is measured using laser diffraction.
- **Sampling** methods and how to obtain and recognise high quality data.
- **Optical Properties** and why they are used to calculate size distributions.
- **Robust Method** development and how to create standard operating procedures.

Practicals

- Correct measurement procedures
- Representative sampling and dispersion
- Maintenance and Cleaning
- Method development
- Software and good Report design

*Lunch will be provided (please advise of any special dietary requirements).

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Course Outline

This course introduces the user to the Mastersizer 3000. It will allow the user to understand, what the Mastersizer is, what it does, how to make good measurements and how to interpret the data from measurements. The course consists of both theory presentations and practical sessions.

Section 1: Introduction

- Basic Principles of Particle Sizing
- Common terms and numbers - volume distribution, equivalent spherical volume
- Introduction to Laser diffraction – what is measured, light scattering, instrument components
- Fraunhofer v Mie
- How does the instrument produce a size distribution; Iterative process

Section 2: Sampling and Data quality

- Sampling techniques
- Sample preparation is key to good results

- How to recognise and obtain high quality laser diffraction results
- Alignment and stability of the system
- Gaining sufficient signal to noise
- Avoiding negative data
- Limiting the effect multiple scatter
- Avoiding beam steer
- Good data quality for wet vs dry analysis
- Modelling

Section 3: Optical Properties

- Understanding when optical properties such as refractive indices are important (mentioned in ISO13320)
- Residuals and weighting
- Inspecting fit data
- Analysis models - determine which is the most appropriate for the analysis of your samples.

Section 4: Method development

- Achieving robust method development
- Manual and SOP measurements
- Difference between repeatability and reproducibility
- The importance of getting good repeatable measurements (an indication of stability of dispersion)
- Development of a wet/dry measurement method
- Effect of ultrasound
- Data interpretation

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Practicals

1. Correct measurement procedure
Aim of this practical:

- How to set up the instrument correctly and achieve a good background
- How to run a manual measurement
- How to setup a Standard Operating Procedure (SOP)
- The importance of running QAS glass bead standards
- How to achieve good quality results

2. Representative sampling and dispersion
Aim of this practical:

- How to select the suitable dispersants using Jar tests
- Demonstrate good dry powder sampling techniques (using a riffler)
- Investigate material using a microscope (check dispersion state and particle shape)

3. Maintenance and Cleaning
Aim of this practical:

- To understand the importance of window/cell cleaning
- How and when to replace tubing
- Investigate solvent compatibilities/transitions

4. Method development
Aim of this practical:
Use the software to:

- How to optimise parameters to achieve high quality results
- Investigate effect of ultrasound and surfactants

5. Software
Aim of this practical:
Use the software to:

- Customise Report pages
- Create & Edit SOP's
- Use Advanced software features
- Re-calculate results with different optical properties

For more information or to register please complete the online registration form.