Package Insert Sheet
PI-011.03A
May 1, 2006

LASER DIFFRACTION CONTROLS – LD10

Product Description

LD10 is the first in a new series of particle suspensions developed by Microgenics Corporation for determining the precision of laser diffraction particle size analyzers. The product consists of a suspension of polydisperse (broad size distribution) polystyrene spheres in deionized water with a trace amount of dispersant. The nominal size range is 2–15µm. The product is to be used to check instruments at regular intervals to determine the precision over time and between instruments.

LD10 Size Distribution

LD10 was analyzed on the leading laser diffraction particle size analyzers. A summary of the results is presented below. The sample was analyzed multiple times on multiple instruments, and a range of results was obtained. The table presents the range from smallest to largest value measured, using properly aligned instruments with the correct optical model.

This product is not a NIST traceable size standard. It is a control material for monitoring instrument precision (repeatability). This size distribution data is presented only for general confirmation of instrument performance. Measured values well outside of the ranges presented below may be indicative of a problem such as improper sample handling, an incorrect optical model, or an instrument hardware failure.

The data below show the full range of results obtained from at least 75 total runs on different instruments. Results vary from instrument to instrument due to hardware configuration and optical model. In the table below D<10% is the diameter below which lies 10% of the particle volume, D<50% is the median volume diameter, and D<90% is the diameter below which lies 90% of the particle volume.

Volume Weighted Size Distribution Data

Quantity Measured	Results Range
Mean Diameter	5.89µm - 6.70µm
Median Diameter	5.73µm - 6.37µm

Cumulative distribution	
D<10%	3.43µm - 3.93µm
D<50%	5.73µm - 6.37µm
D<90%	8.33µm - 9.91µm

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Sampling Instructions

To ensure reliable and consistent performance from this product, it is important to follow the procedure outlined below each time the product is used.

Clean the instrument and obtain a clean background per the instrument manufacturer's instructions. To avoid the production of bubbles in the sample use clean, degassed water at room temperature. Using water that has not been degassed could result in a false second peak in the range of 100–200μm. This second peak is due to air bubbles which, while not significant in number, can make a substantial contribution to the volume distribution. A few suggestions for degassing sample water are listed below:

- Store clean water in a clean container to equilibrate with the surrounding temperature.
- Apply a vacuum to a clean container of clean water to draw out any dissolved air.
- Fill the laser diffraction instrument volume with clean water and leave the stirring mechanism on for 30 minutes before adding the LD10. Sonication is also helpful, if it is available.

Thoroughly disperse the sample by gently inverting the bottle thirty times in thirty seconds or rotating the bottle on a roller for at least fifteen minutes. Then sonicate the bottle for 30 seconds in a low power sonic bath. The sample must be dispensed into the instrument within 30 seconds of this procedure to ensure that the extracted sample is representative of the material in the bottle. Add LD10 by squeezing drops from the dropper tipped bottle directly into the sample chamber until an acceptable obscuration level is obtained as recommended by the instrument manufacturer. Continuously invert the bottle between drops to maintain a uniform suspension. For a typical sampler with a volume in the 75–300ml range, 10–30 drops are required. If it is available, use the factory provided optical model for polystyrene in water (index of refraction, n = 1.59 for polystyrene and n = 1.33 for water).

Recording Data

A control log has been provided (on the next page) to record the results of each series of runs of the LD10 This log provides a quick consistency check to ensure that the instrument is measuring correctly. At the top of the page, enter in the catalog number and the lot number printed on the bottle label.

If the sample analysis is the average of more than one run, enter the number of runs in the "# of runs" column. Thus, the mean, mode, D<10%, D<50% (Median), and D<90% may be average values of multiple runs. Following are definitions for the results columns:

Mean:	Mean volume diameter.
Mode	Modal volume diameter
D<10%:	Particle diameter below which 10% of the total particle volume lies.
D<50%:	Median volume diameter or the particle diameter at which half of the total particle volume is larger, and half of the total particle volume is smaller.
D<90%:	Particle diameter below which 90% of the total particle volume lies.

Storage and Shelf Life

The bottle should be stored upright and tightly capped at room temperature. Do not freeze. Each bottle has a limited shelf life and is stamped with an expiration date. After the expiration date, any remaining material should not be used.

Safety Information

Always wear appropriate eye protection when working with LD10. Avoid inhalation or ingestion of the particles. As an additional precaution, do not remove the dropper tip. See the enclosed MSDS for further information.

Limited Warranty

These products are intended for laboratory use by trained scientific personnel. Determination of their suitability for a specific end-use is the responsibility of the user, who assumes all liability for loss or damage arising out of the use of the product. Rebottling or relabeling voids the warranty and certification. Microgenics Corporation's warranty is limited to replacement of defective products if returned with our authorization within 60 days of purchase date.

THE FOREGOING WARRANTY SHALL BE IN LIEU OF ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION, ANY IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL MICROGENICS BE LIABLE FOR INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES.

Additional Information

Microgenics Corporation is the leading supplier of particle size standards for the world's laboratories. If you have any further questions regarding the use of this product, please contact the technical service staff at Microgenics by phone, fax, or e-mail: *DukeInfo@microgenics.com.*

CONTROL LOG

Control Catalog Number:_____

Lot Number:_____

Enter **Average** Value for Each Day's Control Runs in the Space Below

Date	Instrument Type / Model # / ID#	Run By	# of runs	Mean	Mode	D<10%	D<50%	D<90%

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