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Aerosol Particle Collection Efficiency Testing of the Bladewerx™ Breathing Zone Monitor (BZM) and SabreAlert™

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Information in this presentation is from LA-UR-06-1861.

Samplers

- SabreBZM™ Breathing Zone Monitor
 - Weight: 2.6 lbs
 - Dimensions: 4" x 7" x 5"
- SabreAlert™ Portable Workplace Monitor
 - Weight: 5.2 lbs
 - Dimensions: 4" x 7" x 5"



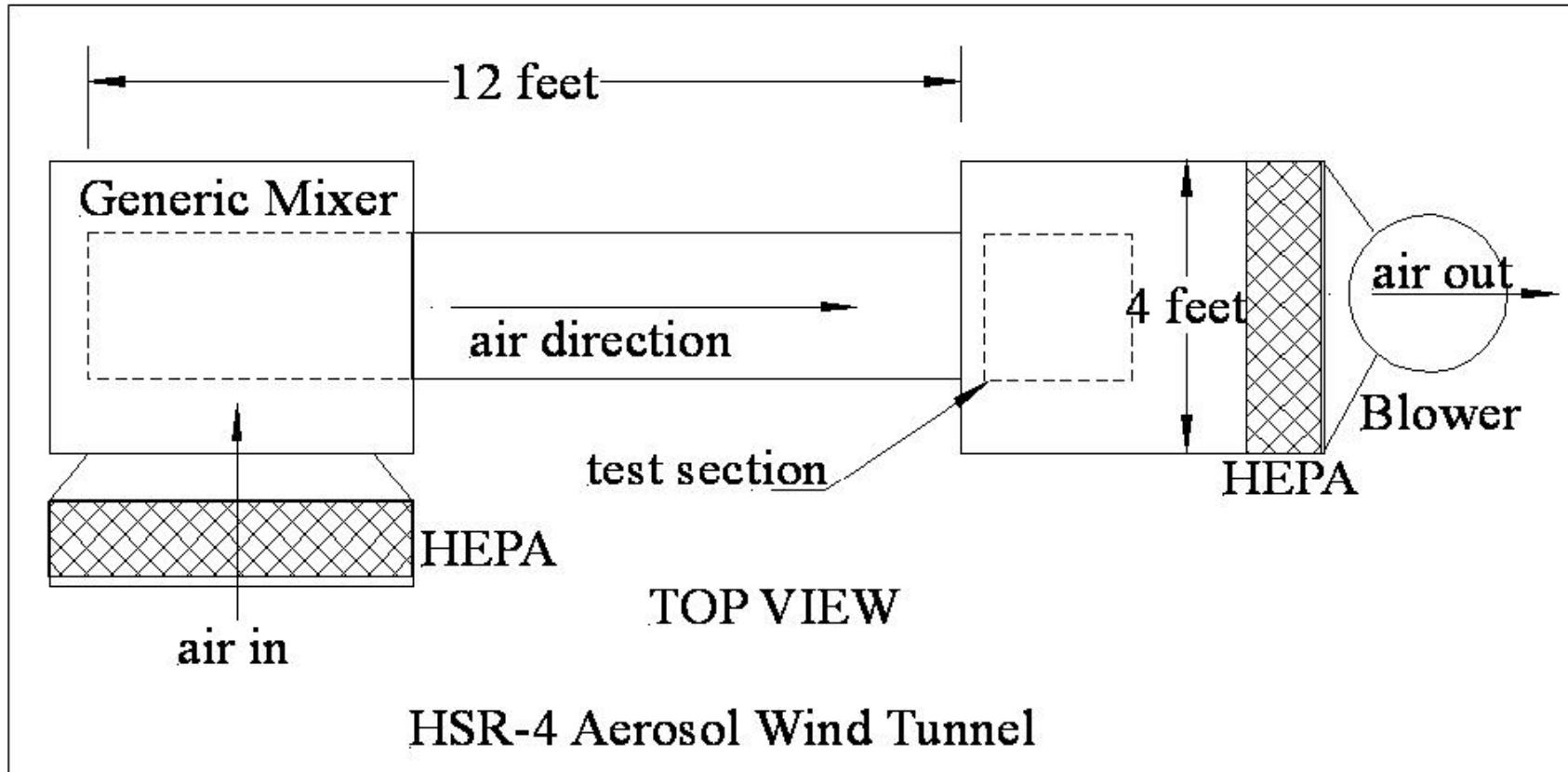
Slide 2

11 1.2 kg; 10 cm * 18 cm * 13 cm

2.4 kg; 10 cm * 18 cm * 13 cm

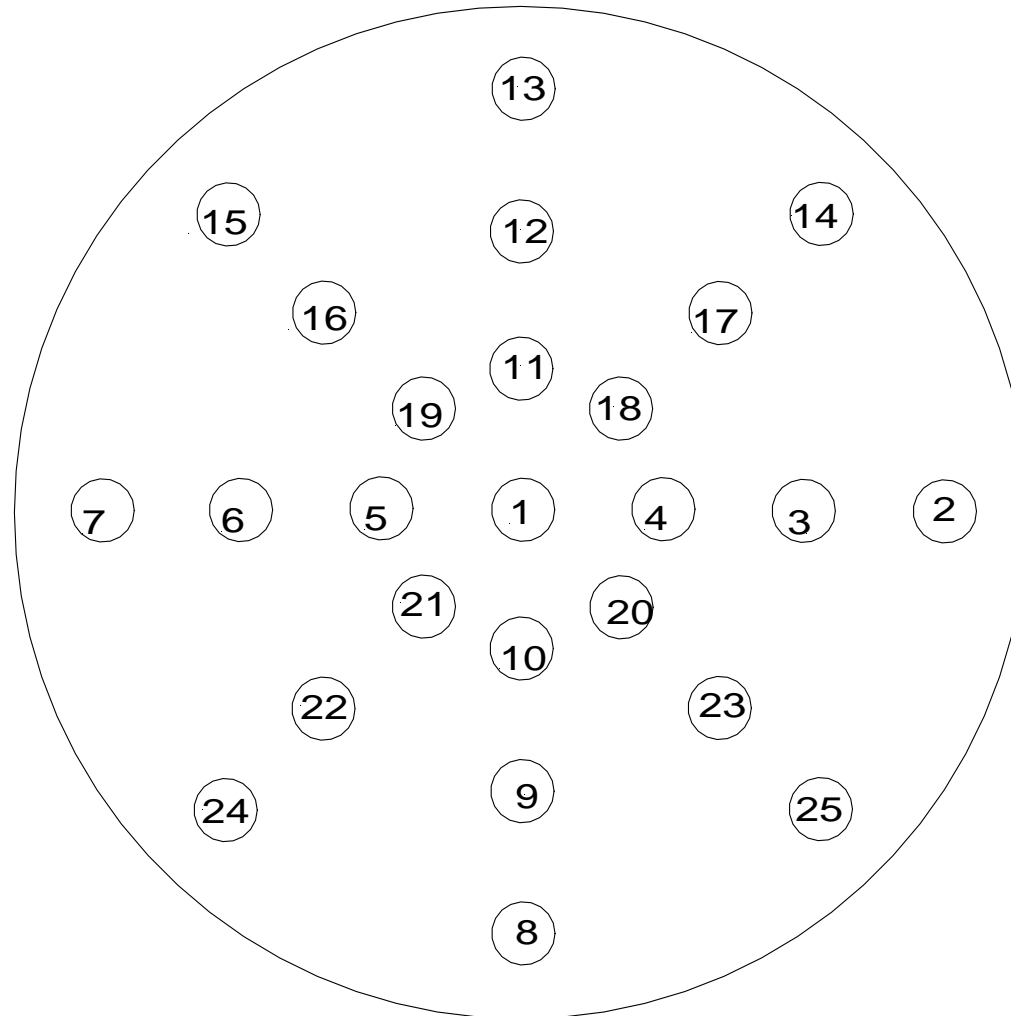
117546, 7/17/2006

Wind Tunnel

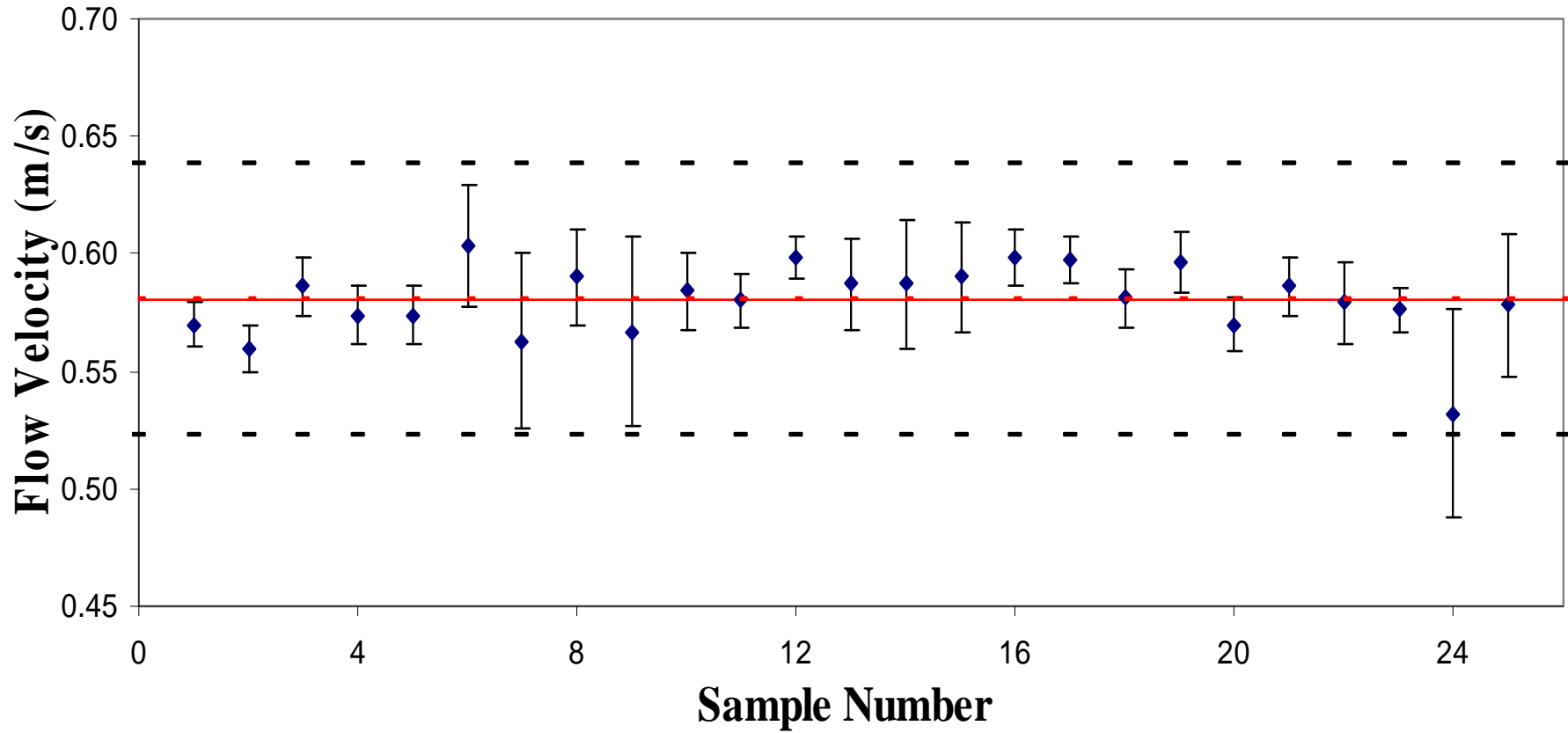


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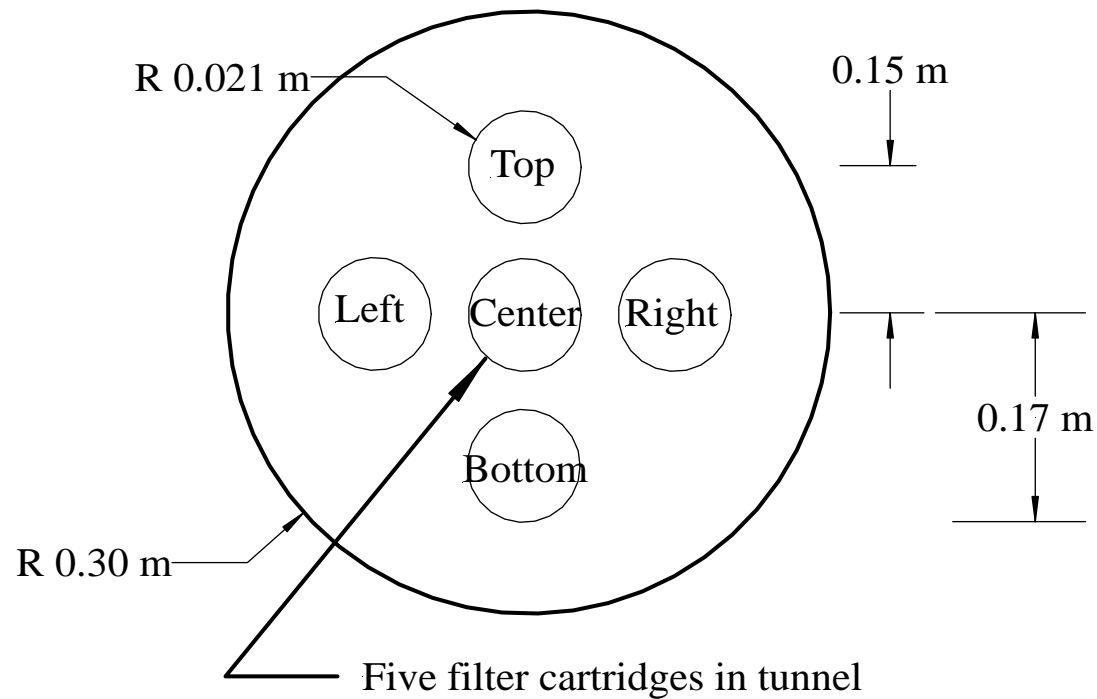
Wind Tunnel / Test Section Spatial Velocity Uniformity

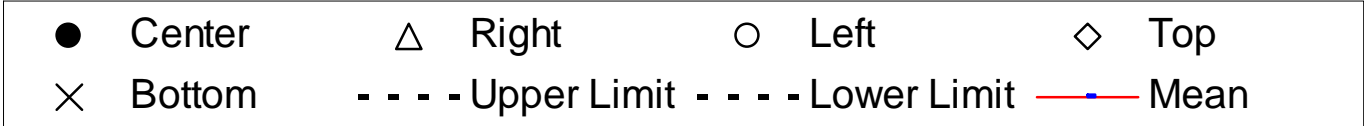
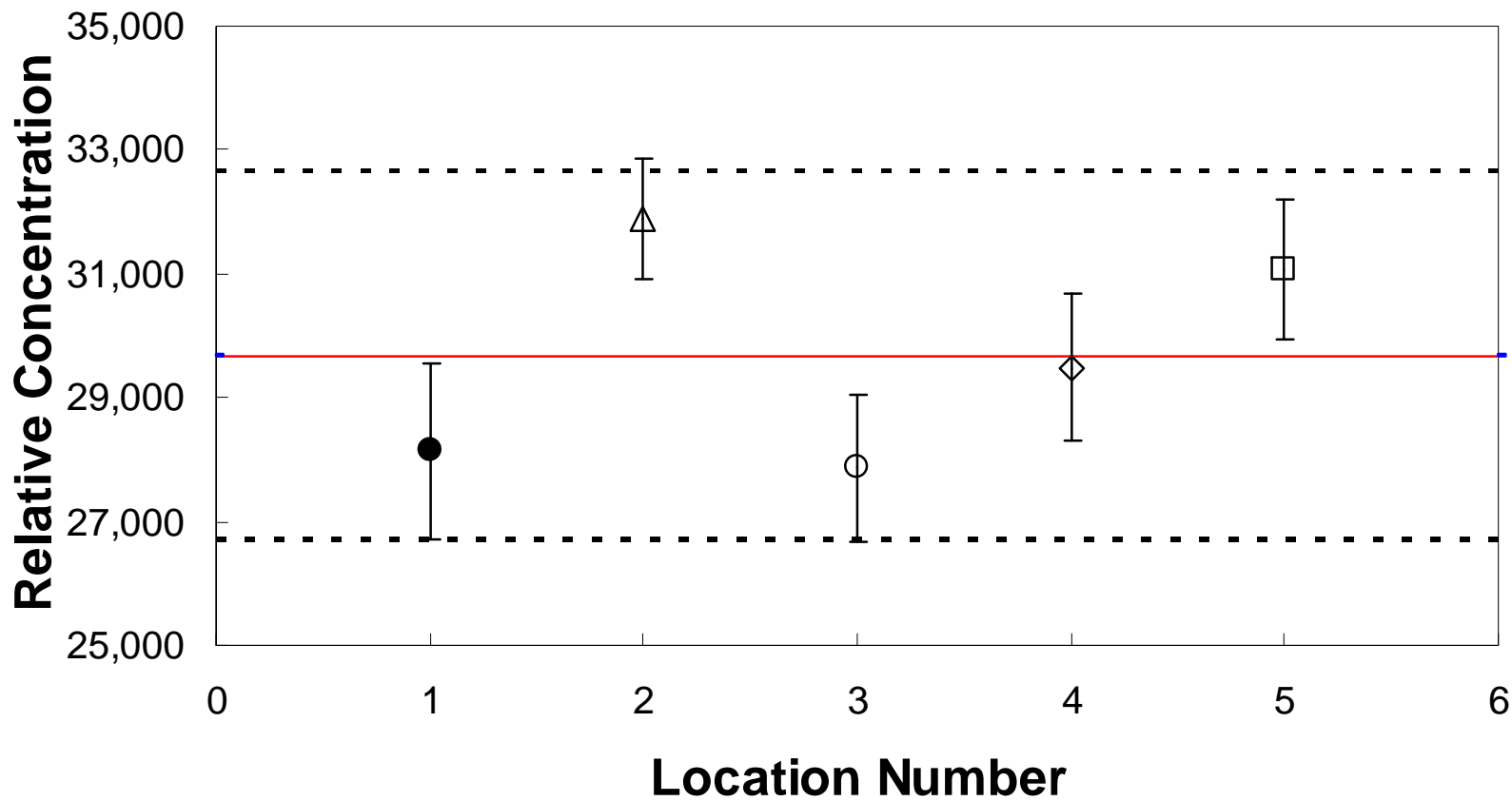


Test Section Velocity Profiles

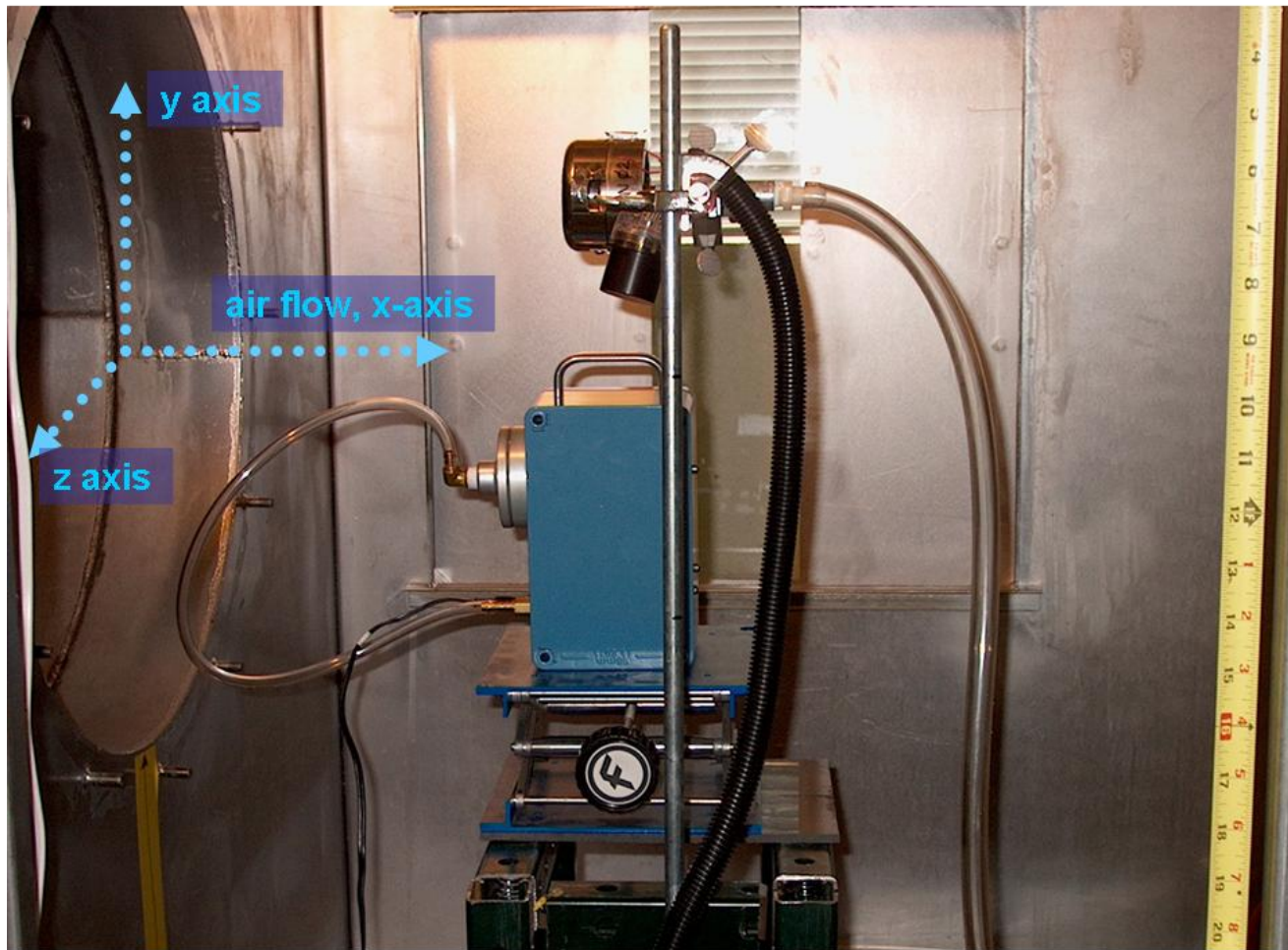


Wind Tunnel / Test Section Particle Distribution





Air Sampler Orientations



Fluorometric Analysis

- Relative Fluorescent Concentration

Formula:

$$C = \frac{FL}{QT}$$

F = Fluorometer digital response.

L = Liquid volume in respective beaker.

Q = Actual air sampling flowrate.

T = Elapsed time of sampling test.

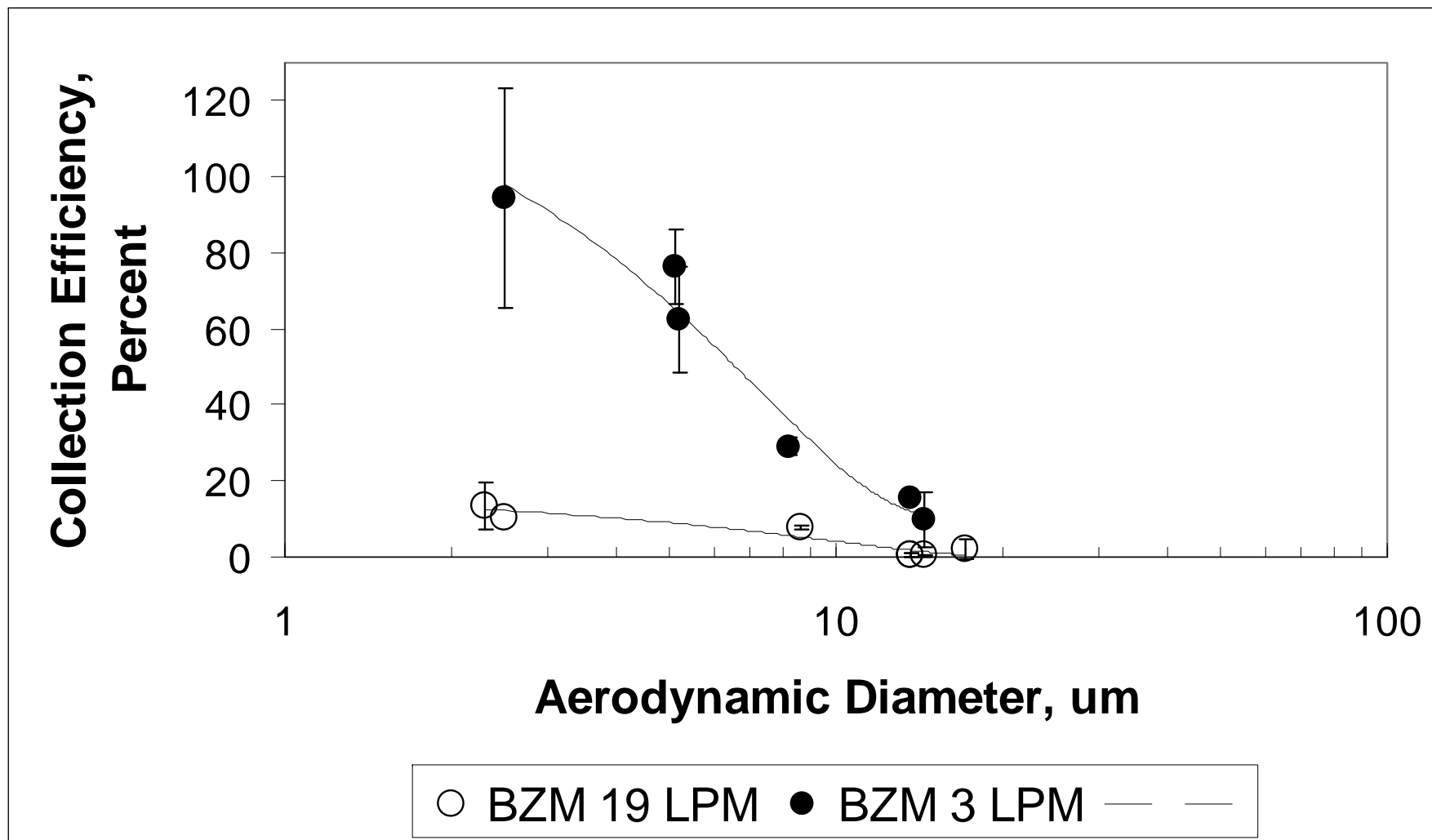
Fluorometric Analysis

- Aerosol Collection Efficiency

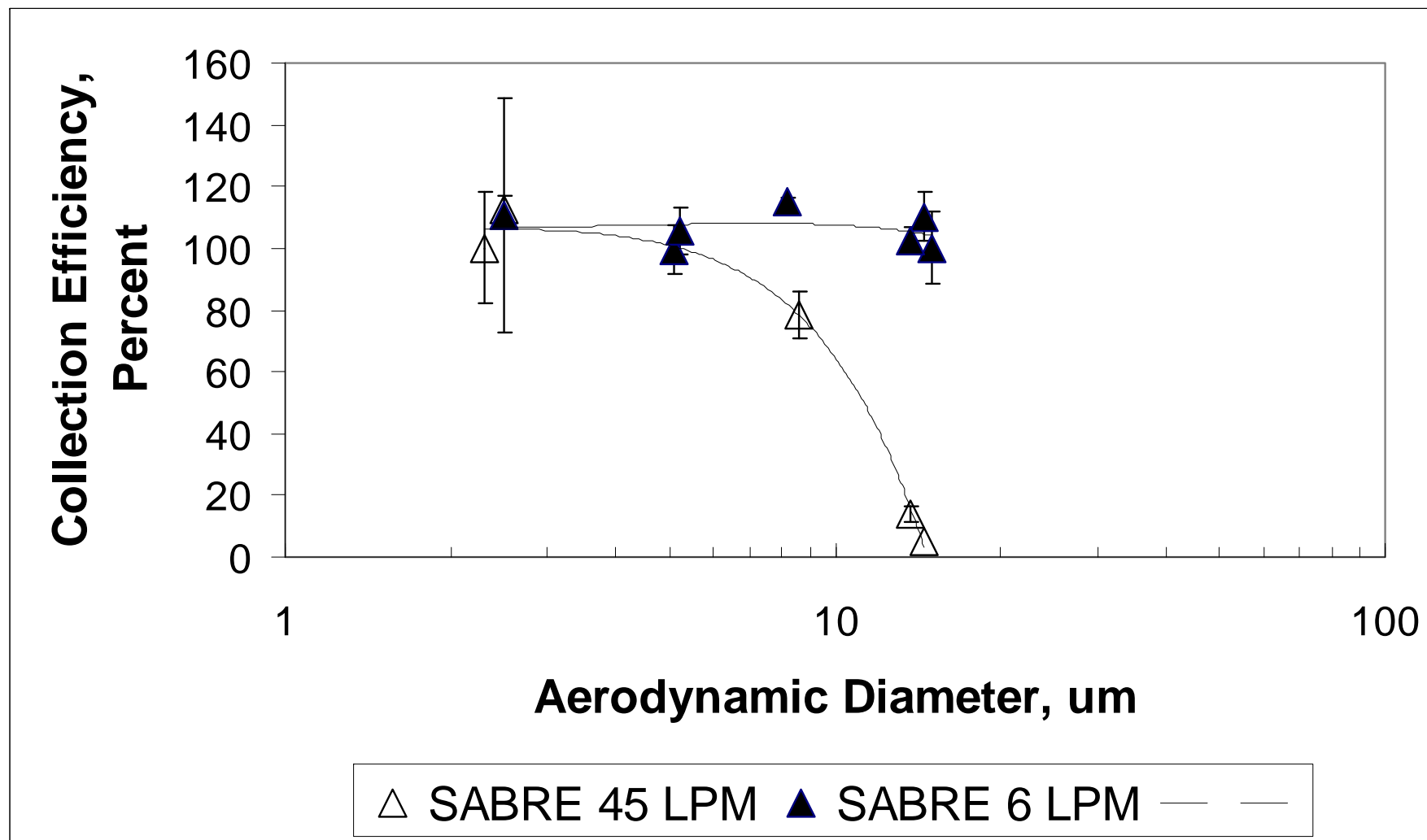
$$E = \frac{C_{TEST}}{C_{REFERENCE}}$$

- * fluorometer zeroed with a fresh filter
- * filters corrected for background

BZM Results



SabreAlert Results



Conclusions

- The SabreAlert has proven to have much better aerosol transmission (to the collection filter) performance than the BZM.
- Improving the BZM: Learn from the SabreAlert design. (This initial Bladewerx™ BZM design is being evaluated for improvements.)

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THE END