

## Aerodynamic Particle Sizer® Spectrometer

Bibliography

### 2006

Bhave, P. V.; Prather, K. A.; Qin, X., 2006, "Comparison of two methods for obtaining quantitative mass concentrations from aerosol time-of-flight mass spectrometry measurements," *Analytical Chemistry*, 78 (17) 6169-6178

Beddows, D. C. S.; Dall'Osto, M.; Donovan, R. J.; Freney, E. J.; Harrison, R. M.; Heal, M. R., 2006, "Single-particle detection efficiencies of aerosol time-of-flight mass spectrometry during the North Atlantic marine boundary layer experiment," *Environmental Science and Technology*, 40(16) 5029-5035

Blevins, L. G.; Cauley III, T. H., 2006, "Fine Particulate Formation During Switchgrass/Coal Cofiring," 127 (3) 457-463

Chan, T. L.; Dong, G., 2006, "Particle number and size distributions along the vehicular exhaust plume from a light-duty diesel vehicle," *Neiranji Xuebao (Transactions of Chinese Society for Internal Combustion Engines)*, 24(1) 50-56

Kriech, A. J.; Mickelsen, R. L.; Osborn, L. V.; Redman, A. P.; Shulman, S. A., 2006, "Status of worker exposure to asphalt paving fumes with the use of engineering controls," *Environmental Science and Technology*, 40 (18) 5661-5667

Lee, D. Cheng, M., 2006, "Particle Generation by Ultraviolet-Laser Ablation during Surface Decontamination," *Journal of the Air & Waste Management Association*, 56 (11), 1591-1598

Larson, T. V.; Covert, D. S.; Kim, E.; Elleman, R.; Schreuder, A. B.; Lumley, T., 2006, "Combining size distribution and chemical species measurements into a multivariate receptor model of PM<sub>2.5</sub>," *Journal of Geophysical Research. D. Atmospheres*, 111 (D10S09), doi:10.1029/2005JD006285

Peters T.M., 2006, "Use of the Aerodynamic Particle Sizer to measure ambient PM<sub>10-2.5</sub>: The coarse fraction of PM<sub>10</sub>," *Journal of Air and Waste Management Association* 56, 411-416

Peters T.M., Ott D., O'Shaughnessy P.T., 2006, "Comparison of the GRIMM 1.108 and 1.109 portable aerosol spectrometer to the TSI 3321 Aerodynamic Particle Sizer for dry particles," *Annals of Occupational Hygiene* 50 (8): 843-850

Reid, Jeffrey S; Brooks, Barbara; Crahan, Katie K; Hegg, Dean A; Eck, Thomas F; O'Neill, Norm; De Leeuw, Gerrit; Reid, Elizabeth A; Anderson, Kenneth D, 2006, "Reconciliation of coarse mode sea-salt aerosol particle size measurements and parameterizations at a subtropical ocean receptor site," *Journal of Geophysical Research. D. Atmospheres*, 111, D02202, doi:10.1029/2005JD006200

Stein S.W. and Myrdal P. B., 2006, "The Relative Influence of Atomization and Evaporation on Metered Dose Inhaler Drug Delivery Efficiency," *Aerosol Science and Technology*, 40:335–347

## 2005

Asbach, C.; Fissan, H.; Kuhlbusch, T.A.J., 2005, "Investigation on the gas particle separation efficiency of the gas particle partitioner," *Atmospheric Environment*, 39 (40) 7825-7835

Asking, L.; Bohgard, M.; Gudmundsson, A.; Gustavsson, E.; Pagels, J., 2005, "Evaluation of aerodynamic particle sizer and electrical low-pressure impactor for unimodal and bimodal mass-weighted size distributions," *Aerosol Science and Technology*, 39 (9) 871-887

Bonnamy, A.; Hermsdorf, D.; Signorell, R.; Ueberschaer, R., 2005, "Characterization of the rapid expansion of supercritical solutions by Fourier transform infrared spectroscopy in situ," *Review of Scientific Instruments*, 76 (5) 1-8

Bottenheim, J. W.; Brickell, P.; Brook, J. R.; Hayden, K.; Jayne, J. T.; Leaitch, W. R.; Li, S. M.; Lohmann, U.; Lu, G.; Rupakheti, M.; Toom-Sauntry, D.; Vet, R.; Worsnop, D. R., 2005, "An intensive study of the size and composition of submicron atmospheric aerosols at a rural site in Ontario, Canada," *Aerosol Science and Technology*, 39 (8) 722-736.

Gilbert, D.; He, C.; Morawska, L., 2005, "Particle deposition rates in residential houses," *Atmospheric Environment*, 39 (21) 3891-3899

Han, Hee-Siew; Whitby, Evan R.; Plate, Douglas B.; Albertson, Daniel P., 2005, "Combining TSI Scanning Mobility Particle Sizer and Aerodynamic Particle Sizer for Wide Range Particle Size Distribution Measurement," *European Aerosol Conference Poster Presentation*, Ghent, Belgium, August 28–September 2, 2005

Hwang, J.; Lee, D.Y.; Lee, J.; Park, D., 2005, "Measurements of particle size distribution and average particle charge in operating a hard disk drive," *Microsystem Technologies*, 11 (11), 1223-1229

Lazaridis, M.; Moravec, P.; Schwarz, J.; Smolik, J.; Zaripov, S. K.; Zdimal, V., 2005, "Indoor aerosol particle deposition in an empty office," *Water, Air, and Soil Pollution*, 165 (1-4) 301-312

Peters, T. M.; Volckens, J., 2005, "Counting and particle transmission efficiency of the aerodynamic particle sizer," *Journal of Aerosol Science*, 36 (12), 1400-1408

Tan, Z.; Wang, X.; Zhang, Y., 2005, "Comparison of different instruments for particle concentration measurements," *ASHRAE Transactions*, 111 (2), 467-475

## 2004

Alexander, W. K., 2004, "Influence of abrasive grit size/lead concentration on dust particle size when sanding lead based paint," *Ph.D. Thesis, The Johns Hopkins University*.

Ambs, J. L.; Ellestad, T. G.; Hanley, T. D.; Harmon, M. K.; Hunike, E. T.; Murdoch, R. W.; Natarajan, S.; Noble, C. A.; Scheffe, R. D.; Sem, G. J.; Solomon, P. A.; Tisch, J.; Vanderpool, R.W., 2004, "Multi-

site evaluations of candidate methodologies for determining coarse particulate matter (PM<sub>c</sub>) concentrations,” *Symposium on Air Quality Measurement Methods and Technology*, 399-418

Baron, P. A., Deye, G., Martinez, A., and Jones, E., 2004, “Apparent size shifts in measurement of droplets with the Aerodynamic Particle Sizer and the Aerosizer,” *23<sup>rd</sup> Annual American Association for Aerosol Research Meeting*

Ceburnis D., Jennings S.G. and O'Dowd C.D. 2004, “Atmospheric evaluation of the aerodynamic particle sizers 3320 and 3321: counting efficiency and particle status,” *Journal of Aerosol Science*, Abstracts of the European Aerosol Conference 2004, Vol. I, S121-S123, 2004.

Chakrabarti, B.; Singh, M.; Sioutas, C., 2004, “Development of a near-continuous monitor for measurement of the Sub-150 nm PM mass concentration,” *Aerosol Science and Technology*, 38(S1), 239-252

Chan, W. R.; Khlystov, A. Y.; Mandiro, M.; Pandis, S. N.; Stanier, C. O., 2004, “A method for the in situ measurement of fine aerosol water content of ambient aerosols: The dry-ambient aerosol size spectrometer (DAASS),” *Aerosol Science and Technology*, 38(S1), 215-228

Demerjian, K. L.; Drewnick, F.; Hogrefe, O.; Lala, G. G.; Schwab, J. J., 2004, “Development, operation and applications of an aerosol generation, calibration and research facility,” *Aerosol Science and Technology*, 38(S1), 196-214

Demokritou, P.; Ferguson, S. T.; Koutrakis, P.; Lee, S. J., 2004, “A compact multistage (cascade) impactor for the characterization of atmospheric aerosols,” *Journal of Aerosol Science*, 35(3), 281-299

Gilbert, D.; He, C.; Hitchins, J.; Morawska, L., 2004, “Contribution from indoor sources to particle number and mass concentrations in residential houses,” *Atmospheric Environment*, 38(21), 3405-3415

Ifarraguerri, A. I.; Vanderbeek, R.G.; Ben-David, A., 2004, “Biological aerosol detection with combined passive-active infrared measurements,” *Proceedings of SPIE*, 5584,85-92

Khlystov, A.; Pandis, S. N.; Stanier, C., 2004, “An algorithm for combining electrical mobility and aerodynamic size distributions data when measuring ambient aerosol,” *Aerosol Science and Technology*, 38(S1), 229-238

Kline, J; Huebert, B; Howell, S; Blomquist, B; Zhuang, J; Bertram, T; Carrillo, J., 2004, “Aerosol composition and size versus altitude measured from the C-130 during ACE-Asia,” *Journal of Geophysical Research. D. Atmospheres*, 109(D19)

Tsai, C.-J.; Chen, S.-C.; Huang, C.-H.; Chen, D.-R., 2004, “Universal calibration curve for the TSI aerodynamic particle sizer,” *Aerosol Science and Technology*, 38(5), 467-474

## 2003

Peters, T. M., Leith, D., 2003, “Concentration measurement and counting efficiency of the Aerodynamic Particle Sizer 3321,” *Journal of Aerosol Science*, 34(5), 627-634

Singh, M.; Misra, C.; Sioutas, C., 2003, “Field evaluation of a personal cascade impactor sampler (PCIS),” *Atmospheric Environment*, 37(34), 4781-4793

Stein, S. W.; Myrdal, P. B.; Gabrio, B. J.; Oberreit, D. R.; Beck, T. J., 2003, "Evaluation of a new Aerodynamic Particle Sizer<sup>®</sup> spectrometer for size distribution measurements of solution metered dose inhalers," *Journal of Aerosol Medicine*, 16, 107-119

## 2002

Armendariz, A. J.; Leith, D., 2002, "Concentration measurement and counting efficiency for the aerodynamic particle sizer 3320," *Journal of Aerosol Science*, 33(1), 133-148

Stein, S. W.; Gabrio, B. J.; Oberreit, D. R.; Hairston, P. P.; Myrdal, P. B.; Beck, T. J., 2002, "An evaluation of mass-weighted size distribution measurements with the Model 3320 Aerodynamic Particle Sizer," *Aerosol Science and Technology*, 36, 845-854

Yanosky, J. D.; Williams, P. L.; MacIntosh, D. L., 2002, "A comparison of two direct-reading aerosol monitors with the federal reference method for PM<sub>2.5</sub> in indoor air," *Atmospheric Environment*, 36(1)

## 2001

Oberreit, D. R.; Holm, R. L.; Hairston, P. P.; Quant, F. R.; Sem, G. J., 2001, "Improvements in particle mass distribution measurement with the TSI 3320 APS," *poster paper presented at American Association for Aerosol Research Conference*

## 2000

Bartley, D. L.; Martinez, A. B.; Baron, P. A.; Secker, D. R.; Hirst, E., 2000, "Droplet distortion in accelerating flow," *Journal of Aerosol Science*, 31(12), 1447-1460

Chan, T. L.; Cheung, C. S.; Leung, C. W.; Wong, C. P., 2000, "Performance of diesel oxidation catalyst for a light duty vehicle under Hong Kong driving conditions," *Advances in Transport*, 6, 393-401

Demmer, T. G. M.; Goodman, J.; Richards, P. A.; Taylor, L. L.; Teer, N.; Wathes, C. M., 2000, "A facility for controlled exposure of pigs to airborne dusts and gases," *2000 ASAE Annual International Meeting, Technical Papers: Engineering Solutions for a New Century*, 2, 4717-4737

Leinert, S.; Wiedensohler, A., 2000, "APS counting efficiency calibration for submicrometer particles," *Journal of Aerosol Science*, 31(S1), 2000, S404-S405

Riskowski, G. L.; Wang, X.; Zhang, Y., 2000, "Comparison of sampling efficiencies of a laser particle counter and an aerodynamic particle sizer," *2000 ASAE Annual International Meeting, Technical Papers: Engineering Solutions for a New Century*, 2, 3927-3945

Secker, D. R.; Hirst, E.; Kaye, P. H., 2000, "Measurements of deformed droplets and droplets with inclusions in an aerodynamic particle sizer," *Journal of Aerosol Science*, 31(S1), 2000, S971-S972

Stein, S. W., Beck, T. J., and Gabrio, B. J., 2000, "Evaluation of a new Aerodynamic Particle Sizer<sup>®</sup> spectrometer for MDI size distribution measurements," *Proceedings of Respiratory Drug Delivery VII*, 2, 283-286

## 1999

Maynard, A. D.; Kenny, L. C.; Baldwin, P. E. J., 1999, "Development of a system to rapidly measure sampler penetration up to 20  $\mu\text{m}$  aerodynamic diameter in calm air, using the aerodynamic particle sizer," *Journal of Aerosol Science*, 30(9), 1215-1226

Sreenath, A.; Ramachandran, G.; Vincent, J. H., 1999, "Experimental approach to correcting counting errors in the aerodynamic particle sizer (APS Model 3310)," *Particle and Particle Systems Characterization*, 16(6), 257-265

## 1998

Chen, Y.; Barber, E. M.; Zhang, Y., 1998, "Sampling efficiency of the TSI aerodynamic particle sizer," *Instrumentation Science and Technology*, 26(4), 363-373

Gudmundsson, A.; Liden, G., 1998, "Determination of cyclone model variability using a time-of-flight instrument," *Aerosol Science and Technology*, 28(3), 197-214

## 1997

Gudmundsson, A.; Schneider, T.; Bohgard, M.; Vinzents, P.; Akselsson, K. R., 1997, "Deposition of airborne particles onto the human eye: wind tunnel studies of the deposition velocity onto the eyes of a mannequin," *Journal of Aerosol Science*, 28(6), 1085-1100

Holm, R. L.; Caldow, R.; Hairston, P. P.; Quant, F. R.; Sem, G. J., 1997, "An enhanced time-of-flight spectrometer that measures aerodynamic size plus light-scattering intensity," *Journal of Aerosol Science*, 28(S1), S11-S12

## 1995

Heidenreich, S.; Buettner, H.; Ebert, F., 1995, "Investigations on the behavior of an aerodynamic particle sizer and its applicability to calibrate an optical particle counter," *Particle and Particle Systems Characterization: Measurement and Description of Particle Properties and Behavior in Powders and other Disperse Systems*, 12(6), 304-308

Kinney, P. D.; Pui, D. Y.H., 1995, "Inlet efficiency study for the TSI aerodynamic particle sizer," *Particle and Particle Systems Characterization: Measurement and Description of Particle Properties and Behavior in Powders and other Disperse Systems*, 12(4), 188-193

Miller, S. J.; Dunham, G. E.; Laudal, D. L.; Heidt, M. K., 1995, "Online process monitoring with the combined aerodynamic particle sizer and scanning mobility particle sizer," *DEHEMA-Bibliothek*, Published by NuernbergMesse, ISBN- 3-921590-30-2, 401-409

## 1994

Altmann, J.; Rudolph, A.; Wessely, B., 1994, "Particle sizing of highly concentrated monodisperse aerosols," *Journal of Aerosol Science*, 25(S1), 523-524

Taylor, P.; Dudek, R.; Flaherty, D.; Kaempfe, T., 1994, "Evaluation of two instruments for the measurement of aerosols," *Journal of Aerosol Science*, 25(2), 419-423

## 1993

Cheng, Y. S.; Chen, B. T.; Yeh, H. C.; Marshall, I. A.; Mitchell, J. P.; Griffiths, W. D., 1993, "Behavior of compact nonspherical particles in the TSI aerodynamic particle sizer model APS33B, Ultra-stokesian drag forces," *Aerosol Science and Technology*, 19(3), 255-267

Peters, T. M.; Chein, H-M.; Lundgren, D. A.; Keady, P. B., "Comparison and combination of aerosol size distributions measured with a low pressure impactor, differential mobility particle sizer, electrical aerosol analyzer, and aerodynamic particle sizer," *Aerosol Science and Technology*, 19, 396-405

## 1992

Becker, P. J., 1992, "Development of a real-time fiber analyzer: a feasibility study," Report No. AFIT/CI/CIA-92-022 (Unclassified), 135 pages, NTIS order number - AD-A252-572 (1-800-553-NTIS)

Marshall, I. A.; Mitchell, J. P., 1992, "Behaviour of spheroidal particles in time-of-flight aerodynamic particle sizers," *Journal of Aerosol Science*, 23(S1), S297-S300

## 1991

Heitbrink, W. A.; Baron, P. A.; Willeke, K., 1991, "Coincidence in time-of-flight aerosol spectrometers: phantom particle creation," *Aerosol Science and Technology*, 14, 112-126

Karg, E.; Dua, S. K.; Tschiersch, J., 1991, "Experimental counting efficiency of the TSI aerodynamic particle sizer in the submicron size range," *Journal of Aerosol Science*, 22(S1), S351-S354

Kenny, L. C.; Liden, G., 1991, "Technique for assessing size-selective dust samplers using the APS and polydisperse test aerosols," *Journal of Aerosol Science*, 22(1), 91-100

Marshall, I. A.; Mitchell, J. P.; Griffiths, W. D., 1991, "Behaviour of regular-shaped non-spherical particles in a TSI aerodynamic particle sizer," *Journal of Aerosol Science*, 22(1), 73-89

## 1990

Ball, M. H. E.; Mitchell, J. P.; Kissane, M. P., 1990, "Experimental studies of the gravitational agglomeration of aerosols." Pt. 1, Report No. AEEW-R--2580(pt.1), 52 pages, GB, NTIS document order number DE91622742, Corporate entry code 9050984

Ball, M. H. E.; Mitchell, J. P., 1990, "Development of an improved high-volume sampling arrangement for the TSI aerodynamic particle sizer," *Journal of Aerosol Science*, 21(S1), 649-652

Cheng, Y. S.; Chen, B. T.; Yeh, H. C., 1990, "Behaviour of isometric nonspherical aerosol particles in the aerodynamic particle sizer," *Journal of Aerosol Science*, 21(5), 701-710

Lee, K. W.; Kim, J. C.; Han, D. S., 1990, "Effects of gas density and viscosity on response of aerodynamic particle sizer," *Aerosol Science and Technology*, 13(2), 203-212

Marshall, I. A.; Mitchell, J. P.; Griffiths, W. D., 1990, "Calibration of a TSI aerodynamic particle sizer with monodisperse non-spherical particles," *Journal of Aerosol Science*, 21(S1), 613-616

Rader, D. J.; Brockmann, J. E.; Ceman, D. L.; Lucero, D. A., 1990, "Method to employ the aerodynamic particle sizer factory calibration under different operating conditions," *Aerosol Science and Technology*, 13(4), 514-521

## 1989

Brockmann, J. E.; Rader, D. J., 1989, "The response of the aerodynamic particle sizer to nonspherical particles and use in experimental determination of dynamic shape factor," Report Nos. NUREG/CR--5454; SAND--89-2040, 51 pages, Document Order Number- TI90005468, Corporate entry code- 9525084; 9511100

Chen, B. T.; Cheng, Y. S.; Yeh, H. C., 1989, "Experimental approach to studying particle density effects in the TSI aerodynamic particle sizer (3300)," *Journal of Aerosol Science*, 20(8), 1489-1492

Marshall, I. A.; Mitchell, J. P., 1989, "Method for presenting aerosol particles to a TSI aerodynamic particle sizer after size selection under stokesian conditions," *Journal of Aerosol Science*, 20(8), 1601-1604

Wang, H.-C.; John, W., 1989, "Simple iteration procedure to correct for the density effect in the aerodynamic particle sizer," *Aerosol Science and Technology*, 10(3), 501-505

## 1988

Blackford, D.; Hanson, A. E.; Pui, D. Y. H.; Kinney, P.; Ananth, G. P., 1988, "Details of recent work towards improving the performance of the TSI aerodynamic particle sizer," *Presented at the 2<sup>nd</sup> Annual Meeting of the Aerosol Society*, Bournemouth, UK

## 1987

Chen, B. T.; Cheng, Y. S.; Yeh, H. C., 1987, "TSI aerodynamic particle sizer: calibration and use, particulate and multiphase processes." *Volume 2: Contamination Analysis and Control*, Publ by Hemisphere Publ Corp, Washington, DC, USA, 283-290

Wang, H.-C.; John, W., 1987, "Particle density correction for the aerodynamic particle sizer," *Aerosol Science and Technology*, 2, 191-198

## 1986

Baron, P. A., 1986, "Calibration and use of the aerodynamic particle sizer (APS 3300)," *Aerosol Science and Technology*, 5, 55-67

Chen, B. T.; Crow, D. J., 1986, "Use of an aerodynamic particle sizer as a real-time monitor in generator of ideal solid aerosols," *Journal of Aerosol Science*, 17(6), 963-972

Griffiths, W. D.; Iles, P. J.; Vaughan, N. P., 1986, "Calibration of the APS 33 aerodynamic particle sizer and its usage," *TSI Journal of Particle Instrumentation*, 1(1), 3-9

Griffiths, W. D.; Iles, P. J.; Vaughan, N. P., 1986, "Behavior of liquid droplet aerosols in an APS 3300," *Aerosols: Formation and Reactivity, Proceedings - Second International Aerosol Conference*, Publ by Pergamon Press, Oxford, Engl and New York, NY, USA, 583-585

## 1985

Chen, B. T.; Cheng, Y. S.; Yeh, H. C.; Crow, D. J., 1985, "Study of density effect and droplet deformation in the TSI aerodynamic particle sizer, Inhalation Toxicology Research Institute annual report," 10/1/1984-9/30/1985, Report No. LMF-114, 3-6 pages, Document order number- DE86008522, Corporate entry code-9513153, Editor: Medinsky, M. A.; Muggenburg, B. A.

Chen, B. T.; Cheng, Y. S.; Yeh, H. C., 1985, "Performance of a TSI aerodynamic particle sizer," *Aerosol Science and Technology*, 4(1), 89-97

## 1984

Baron, P. A., 1984, "Aerodynamic particle sizer calibration and use, aerosols: science, technology, and industrial applications of airborne particles," *Proceedings of the First International Aerosol Conference*, Publ by Elsevier, New York, NY, USA and Amsterdam, Neth, 215-216

Cheng, Y.-S.; Chen, B. T.; Yeh, H.-C., 1984, "Performance of the aerodynamic particle sizer under different conditions, aerosols: science, technology, and industrial applications of airborne particles," *Proceedings of the First International Aerosol Conference*, Published by Elsevier, New York, NY, USA and Amsterdam, Neth, 207-210

Griffiths, W. D.; Patrick, S.; Rood, A. P., 1984, "An aerodynamic particle sizer analyser tested with spheres, compact particles and fibres having a common settling rate under gravity," *Journal of Aerosol Science*, 15(4), 491-502

Harrison, R. E.; Cocke, J. B., 1984, "Use of a diluter with aerodynamic particle sizer," *Paper - American Society of Agricultural Engineers*, Publ by ASAE, St. Joseph, MI, USA Pap 84-3577, 8p

## 1979

Agarwal, J. K.; Fingerson, L. M., 1979, "Real-time aerodynamic particle size measurement with a laser velocimeter," *TSI Quarterly*, V(1)

---

**TSI Incorporated** – 500 Cardigan Road, Shoreview, MN 55126 U.S.A

**USA** Tel: +1 800 874 2811

**E-mail:** [particle@tsi.com](mailto:particle@tsi.com)

**Website:** [www.tsi.com](http://www.tsi.com)

**UK** Tel: +44 149 4 459200

**E-mail:** [tsiuk@tsi.com](mailto:tsiuk@tsi.com)

**Website:** [www.tsiinc.co.uk](http://www.tsiinc.co.uk)

**France** Tel: +33 491 11 87 64

**E-mail:** [tsifrance@tsi.com](mailto:tsifrance@tsi.com)

**Website:** [www.tsiinc.fr](http://www.tsiinc.fr)

**Germany** Tel: +49 241 523030

**E-mail:** [tsigmbh@tsi.com](mailto:tsigmbh@tsi.com)

**Website:** [www.tsiinc.de](http://www.tsiinc.de)

**India** Tel: +91 80 41132470

**E-mail:** [tsi-india@tsi.com](mailto:tsi-india@tsi.com)

**China** Tel: +86 10 8260 1595

**E-mail:** [tsibeijing@tsi.com](mailto:tsibeijing@tsi.com)



TRUST. SCIENCE. INNOVATION.

Contact your local TSI Distributor or visit our website [www.tsi.com](http://www.tsi.com) for more detailed specifications.