DAVID LEITH

Adjunct Professor – 2013 to present
Department of Environmental Sciences and Engineering http://www.unc.edu/~leith
University of North Carolina
Chapel Hill, NC 27599-7431

EDUCATION

BS in Chemical Engineering with honors, University of Cincinnati, June 1970.

MS in Chemical Engineering, University of Cincinnati, August 1970.

ScD in Environmental Health Sciences, Harvard University, June 1975.

EMPLOYMENT

Co-op Engineer, Eastman Kodak, Peabody, MA 1966 - 1970.

Engineer, APT Inc., Riverside, CA 1970 - 1972.

Assistant Professor, Harvard University, 1975 - 1980.

Associate Professor, Harvard University, 1980 - 1985,
University of North Carolina, 1984 - 1985.

Professor, University of North Carolina, 1985 – 2012; retired 7/1/2012
Director, Air, Radiation and Industrial Hygiene Program, 1986 – 1994
Director, Environmental Engineering Program, 2007 – 2012
Associate Chair and Director of Graduate Studies, 2009 – 2012

Intern, Colorado State University, 2012 – present (summers only)

HONORS

Bernard G. Greenberg Alumni Endowment Award for excellence in teaching, research and service to the broader public health community, presented by the Dean, School of Public Health, 2008.

Distinguished Teaching Award for Post-Baccalaureate Instruction, presented by the Chancellor, University of North Carolina at Chapel Hill, 2005

Newton Underwood Award for excellence in teaching, presented by the students of the Department of Environmental Sciences and Engineering, UNC, 2003.

John E. Larsh, Jr. Award for Student Mentorship, presented by the Dean, School of Public Health, UNC, 2001.

Newton Underwood Award for excellence in teaching, presented by the students of the Department of Environmental Sciences and Engineering, UNC, 1993.

"Best Engineering Paper in Industrial Hygiene Published during 2000" for:
Boundy, Maryanne, David Leith, David Hands, Michael Gressel and G. Edward Burroughs, "Performance of Industrial Mist Collectors Over Time", *Appl. Occup. Environ. Hyg.*, **15** (12): 928-935 (2000).

"Best Paper Published in AIHA Journal during 1999" for:
Volckens, John, Maryanne Boundy, David Leith and David Hands, "Oil Mist Concentration: A Comparison of Sampling Methods", *Am. Indust. Hyg. Assoc. J.*, **60**: 684-689 (1999).

"Best Paper Published in AIHA Journal during 1996" for:
Raynor, Peter C., Steven Cooper, and David Leith, "Evaporation of Polydisperse Multicomponent Droplets", *Am. Indust. Hyg. Assoc. J.*, **57**: 1128-1136 (1996).

"Best Paper Published in App. Occup. Env. Hyg. during 1995" for:
McAneny, John J., David Leith and Maryanne G. Boundy, "Volatilization of Mineral Oil Mist Collected on Sampling Filters", *Appl. Occup. Environ. Hyg.*, **10**(9): 783-787 (1995).

"Outstanding Aerosol Paper Award", 1992 for:
Plinke, Marc A. E., David Leith, David B. Holstein and Maryanne G. Boundy, "Experimental Examination of Factors that Affect Dust Generation", *Am. Indust. Hyg. Assoc. J.*, **52**: 521-528 (1991).

"Best Paper Published in AIHA Journal during 1990" for:
Todd, Lori and David Leith, "Remote Sensing and Computed Tomography in Industrial Hygiene I: Theoretical Basis", *Am. Indust. Hyg. Assoc. J.*, **51**: 224 (1990).

DOCTORAL STUDENTS

Primary advisor to the following doctoral students:

Name	*Graduated*	*From*	*Now*
Michael Ellenbecker,	June l979	Harvard	Professor, Univ. Lowell
Thomas Kalinowski,	June 1981	Harvard	V.P. Erler and Kalinowski, Inc.
David L. Johnson,	May 1985	UNC	Professor, Univ. Oklahoma
(co-advisor with Dr. Parker Reist) distinguished alumni award winner			
John L. Koehler,	Nov. 1986	Harvard	Consultant, Walnut Creek, CA
Chung-te Lee,	Jan. 1988	UNC	Professor, National Central Univ.
Donna Iozia,	May 1988	UNC	Research Scientist, U.S. EPA
John A. Dirgo,	June 1988	Harvard	Consultant, Chicago, IL
Lori Todd,	May 1990	UNC	Consultant, Chapel Hill NC
G. Ramachandran,	May 1993	UNC	Professor, Univ. Minnesota
Marc Plinke	June 1994	Karlsruhe	Consultant, Boulder CO
Peter Raynor	May 1998	UNC	Associate Professor, Univ. Minn.
EPA STAR Fellowship recipient			
Jon Thornburg	May 1999,	UNC	Scientist, RTI
Jeff Wagner	May 2000	UNC	EM Specialist, Calif. Health Dept.
EPA STAR Fellowship recipient			
Jacky Rosati	Dec. 2002	UNC	Research Scientist, U.S. EPA
Alfredo Armendariz	June 2002	UNC	Region VI Adminsitrator, U.S. EPA
Royster Fellowship recipient			
John Volckens	June 2003	UNC	Associate Professor, Colorado State
Thomas Peters	June 2004	UNC	Associate Professor, Univ. of Iowa
Nicole Hagan	June 2014	UNC	Scientist, U.S. EPA

Postdoctoral students:

David Nash	2008 to 2010	UNC	postdoc, U.S. EPA
William Funk	2009 to 2010	UNC	Assistant Professor, Northwestern

Joseph Pedit	2010 to 2012	UNC	UNC

CLASSROOM TEACHING

Academic courses taught at UNC:

ENVR 416: Aerosol Technology, 4 hours, each fall, 1984 - 2010
https://sakai.unc.edu/access/content/group/d2d62d29-4b10-44c4-8f78-2d547f989918/public/001/index.html

ENVR 754: Air Pollution Control, 3 hours, fall 2011
https://sakai.unc.edu/access/content/group/e64cd41d-8ddd-4001-aca7-356227cd8a54/public/001/index.htm

EPID 785: Environmental Epidemiology (Wing, Engel), 2010, 2012
module on Air Pollution

ENVR 150: Principles and Applications of Environmental Engineering
(with Professor Philip Singer), 3 hours, each spring, 1998 - 2002
http://www.unc.edu/courses/2002spring/envr/150/001/

ENVR 401: Unifying Concepts, 2001 - 2009
module on Air Pollution Control

ENVR 411: Environmental Measurements (Weinberg), 2007 – 2009
two to four two-week modules on air measurements

ENVR 516: Aerosol Technology Lab, 2 hours, most springs, 1991 - 2006
http://www.unc.edu/courses/2006spring/envr/116l/001/

ENVR 890: Environmental Risks (Characklis), 2008 – 2009
module on Air Pollution Control

Academic course taught at Harvard:

EHS 265 c,d: Air and Gas Cleaning, 5 hours, each spring (Harvard), 1975 - 1984

RECENT RESEARCH SUPPORT

Investigator: UAE, "Exposure Assessment for Study of Indoor Air Quality and Health", Jackie MacDonald Gibson, PI, 7/1/08 – 7/1/12, $802,759 (direct costs)

Investigator: NIEHS, "Community Health and Environmental Stress Study", Steve Wing, PI, 1/1/09 – 7/31/12, $82,573 (direct costs)

Investigator: GRACE Foundation, "Exposure Assessment for Study of Air Pollution and Health in North Carolina Schools", Steve Wing, PI, 9/1/07 – 8/31/11, $100,000 (direct costs).

Principal Investigator: Mactec Corporation; "Research Agreement", 5/1/07 – 9/30/08, $76,000

Principal Investigator: Delphi Corporation; United Auto Workers Grant, "Characterizing Fine and Ultrafine Particle Concentrations as Related to Potential Worker Exposures", 1/1/08 – 6/30/09, $250,000 (approved for support)

Principal Investigator: Chrysler Corporation; United Auto Workers Grant, "Effectiveness of Mist Suppressants," 2/1/06 – 4/1/07, $116,230 (approved for support)

Principal Investigator: UNC Cogeneration Facility, "Measurement of Air Contaminants", 1/1/04 – 7/1/06, $150,000 (direct costs).

Principal Investigator: Pfizer Corp. "Dust Generation in the Pharmaceutical Industry", 1/1/01 – 12/31/06, $200,000 (total costs).

Principal Investigator: Industrial Consortium, "Performance of Coolant Mist Collectors", 1/1/95 – 1/1/2005, $177,000. Support from Apex Industries, Monsanto Corp., Donaldson Corp., Trion, Inc., Kirk and Blum Inc. Absolent, and others (direct costs)

Principal Investigator: Ford Motor Company; United Auto Workers Grant, "Coolant Mist Collector Study", 6/1/92 – 9/30/03, $1,040,000 (direct costs).

Principal Investigator: US Air Force Grant "Measurements of the Concentration of JP-8 Aerosol", 9/1/97 - 10/30/01, $275,000 (total costs).

Principal Investigator: NIOSH Grant 5 R03 OH03774-01, "Passive Sampler for Particles", 9/30/98 – 9/29/00, $50,000 (direct costs).

Principal Investigator: NIOSH subcontract through Triangle Research Corp., "Use of Phase-Change Microspheres in Metalworking Fluid", 9/30/98 - 3/31/99, $30,000 (direct costs).

Principal Investigator: Donaldson Corp. "Investigation of Oily Dusts", 5/1/98 – 5/1/99, $81,000 (direct costs).

Principal Investigator: Chrysler Corporation; United Auto Workers, "Mist Concentration Measurement", 2/1/97 - 1/31/99, $149,998 (direct costs).

Principal Investigator: NIOSH Grant 1R01 OH03293-01, "Factors that Affect Generation of Coolant Mists", 9/30/95 - 9/29/98, $257,959 (total costs).

Principal Investigator: EPA Cooperative Agreement CR-818060-01-0, "Methods to Evaluate Dust Generation", 3/1/91 - 2/28/94, $306,756 (total costs).

Principal Investigator: Glaxo Inc. Grant, "Use of the Peschl Shear Cell to Evaluate Dispersion of Dry Drug Aerosols", 7/1/92 - 10/1/92, $24,030 (direct costs).

RECENT SERVICE

Societies

Associate Editor, Aerosol Science and Technology 1997 – 2002; editorial board, 1993-2002.

American Association for Aerosol Research Awards Committee, 2003 – 2006; chair, 2006.

Reviewer of manuscripts for publication, many journals, 1975 – present.

Proposal Reviewer

NIH Study Section for Occupational Safety and Health, 1988 - 1992. Reviewed all proposals submitted to NIOSH for support during this period. Re-appointed member of NIH study sections in 1999 – 2005.

Reviewer of NIOSH ERCs at Johns Hopkins University, 1998; University of California Berkeley, 2001; Mt. Sinai School of Medicine, 2004; University of Minnesota, 2007; member of NIOSH Special Emphasis Panel for all ERC applications received in 2004 and for all TPG applications received in 2005.

DOE Panel to Review University and Student Applications to DOE Fellowship Program in Industrial Hygiene, 1991-1999.

Panel to review research proposals for Center for Indoor Air Research, 1990-1999

State of North Carolina

State Board of Refrigeration Examiners, 1996 – 2003; Secretary, 1999; Chair, 2002. http://www.refrigerationboard.org/ This board is responsible for writing and administering examinations for commercial refrigeration contractors, and for handling administrative matters concerned with those licensed.

Task Force on Determining State of the Art for Control of Emissions of Volatile Organic Compounds, appointed by Environmental Management Commission, State of North Carolina, 1991-1992.

University

Associate Chair, Director of Graduate Studies, Director of Graduate Admissions: Department of Environmental Sciences and Engineering, 2009 – 2012.

Director: Environmental Engineering Program, 2007 – 2012.

Director: Air, Radiation, and Industrial Hygiene Program, 1987 – 1994.

Chair: search committees that brought Professors Flynn, Rappaport, and Todd to our faculty. Member of search committees that brought Professors Glaze, Martin, and Characklis. Member of search committee for Chair of ESE, 2006.

ESE Admissions Committee: 2005-2008; 2009-2012. Chair, 2007 - 2008.

Chair: ESE Shop Committee, 1990 - 2005.

SPH Awards Committee: 1993 – 1996; 2002 – 2009; Chair 1996, 2003.

SPH Student Awards Committee: 2006 – 2009.

Committee on Appointments on Promotions: School of Public Health, 1998-1999.

Member or Chair: committees to evaluate ESE faculty for promotion, 1985 – 2012.

Member: Committee on UNC Energy Use, 2000 – 2005

Member: UNC University Research Council awards committee, 2003 – 2006

Member: Graduate School Awards Committee, 1998 – 2002

Chair: Postgraduate Teaching Awards Committee, UNC, 2006 – 2007.

Member: School of Public Health Space Committee, 2009 – 2012.

Outside Reviewer: many candidates for promotion at universities in the US and overseas, 1985 – present.

David Leith

Publications in Journals and Books

Leith, David and William Licht, "The Collection Efficiency of Cyclone Type Particle Collectors--A New Theoretical Approach," *AICHE Symposium Series*, **68** (126): 196 (1972).

Calvert, Seymour, Jhuda Goldshmid, David Leith and Dilip Mehta, Wet Scrubber Handbook, Publication PB 213-016, NTIS, Springfield, VA 1972.

Leith, David and Dilip Mehta, "Cyclone Performance and Design," *Atmos. Environ.*, **7**: 527 (1973).

Calvert, Seymour, Jhuda Goldshmid and David Leith, "Scrubber Performance for Particle Collection," *AICHE Symposium Series* **70** (137): 357 (1974).

Leith, David and Melvin W. First, "Uncertainty in Particle Counting and Sizing Procedures," *Am. Ind. Hyg. Assoc. J.* **37**: 103 - 108 (1976).

Leith, David and Melvin W. First, "Performance of a Pulse-Jet Filter at High Filtration Velocity - I. Particle Collection," *J. Air Poll. Control Assoc.*, **27**: 534 (1977).

Leith, David, Melvin W. First and Henry Feldman, "Performance of a Pulse-Jet Filter at High Filtration Velocity - II. Filter Cake Redeposition," *J. Air Poll. Control Assoc.*, **27**: 636 (1977).

Leith, David and Melvin W. First, "Performance of a Pulse-Jet Filter at High Filtration Velocity - III. Penetration by Fault Processes," *J. Air Poll. Control Assoc.*, **27**: 754 (1977).

Leith, David and Melvin W. First, "Pressure Drop in a Pulse-Jet Fabric Filter," *Filtration and Separation*, **14**: 473 (1977).

Leith, David, Dwight D. Gibson and Melvin W. First, "Performance of Top and Bottom Inlet Pulse-Jet Fabric Filters," *J. Air Poll. Control Assoc.*, **28**: 696 (1978).

Leith, David, Melvin W. First and Dwight D. Gibson, "Effect of Modified Cleaning Pulses on Pulse-Jet Filter Performance," *Filtration and Separation*, **15**: 393 (1978).

Leith, David, "Cyclones" in Environmental Pollution Control Engineering, L.C. Wang and N.C. Pereira, eds., Humana Press, New York, l979, pp. 61 - 101.

Ellenbecker, Michael J. and David Leith, "Theory for Dust Deposit Retention in a Pulse-Jet Fabric Filter," *Filtration and Separation*, **16**: 624 (1979).

Hinds, William, Melvin W. First and David Leith, "Measurement of Aerosol with Narrow Size Distribution by the Polarization Ratio of Light Scattered at 90°," *J. Aerosol Science*, **10**: 437 (1979).

Ellenbecker, Michael J. and David Leith, "Dust Deposit Profiles in a High Velocity Pulse-Jet Fabric Filter," *J. Air Poll. Control Assoc*., **29**: 1236 (1979).

Ellenbecker, Michael J. and David Leith, "The Effect of Dust Retention in a High Velocity Pulse-Jet Fabric Filter," *J. Powder Technology*, **25**: 147-154 (1980).

Leith, David and Douglas W. Cooper, "Venturi Scrubber Optimization," *Atmos. Environ*., **14**: 657-664 (1980).

Leith, David and Michael J. Ellenbecker, "Theory for Penetration in a Pulse-Jet Cleaned Fabric Filter," *J. Air Poll. Control Assoc*., **30**: 877 (1980).

Leith, David and Michael J. Ellenbecker, "Theory for Pressure Drop in a Pulse-Jet Cleaned Fabric Filter," *Atmos. Environ*. **14**: 845 (1980).

Ellenbecker, Michael J., David Leith and John M. Price, "Impaction and Particle Bounce," *J. Air Poll. Control Assoc.*, **30**: 1224 (1980).

Leith, David, "Cyclones" in Handbook of Multiphase Systems, Gad Hetsroni, ed., McGraw Hill, New York, l981, pp. 9-89 to 9-97.

Ellenbecker, Michael J. and David Leith, "Dust Removal from Non-Woven Fabrics," *Filtration and Separation*, **18**: 316 (1981).

Kalinowski, Thomas W. and David Leith, "Aerosol Filtration by a Cocurrent Moving Granular Bed: Penetration Mechanisms," *Environment International*, **6**: 379 (1981).

Sundstrom, George and David Leith, "High Efficiency Collection of Fly Ash in a Parallel Flow Filter," *Filtration and Separation*, **19**: 34 (1982).

Leith, David and Michael J. Ellenbecker, "Effect of Dust Size Distribution on the Collection Efficiency of Pulse-Jet Fabric Filters," *J. Air Poll. Control Assoc*., **32**: 740 (1982).

Leith, David and Michael J. Ellenbecker, "Dust Emission Characteristics of Pulse-Jet-Cleaned Fabric Filters," *Aerosol Science and Technology*, **1**: 401 (1982).

Kalinowski, Thomas W. and David Leith, "Aerosol Filtration by a Cocurrent Moving Granular Bed: Penetration Theory," *Environ. Sci. Technol*., **17**: 21 (1983).

Leith, David and Michael J. Ellenbecker, "Dust Emissions from a Pulse-Jet Fabric Filter," *Filtration and Separation*, **20**: 311 (1983).

Ellenbecker, Michael J. and David Leith, "Dust Removal Characteristics of Fabrics Used in Pulse-Jet Filters," *Powder Technology*, **36**: 13 (1983).

Koehler, John L. and David Leith, "Pressure Drop in a Pulse-Jet Cleaned Fabric Filter: Theory Calibration," *Atmos. Environ*., **17**: 1909 (1983).

Leith, David, "Cyclones", in Handbook of Powder Science and Technology, M.E. Fayed and L. Otten, eds., Van Nostrand Reinhold, New York, 1984, pp. 730 to 763.

Cooper, Douglas W. and David Leith, "Venturi Scrubber Optimization Revisited," *Aerosol Science and Technology*, **3**: 63 (1984).

Leith, David and Kenneth P. Martin, Jr., "Precision of Particle Concentration Measurements Determined by Counting," *Am. Ind. Hyg. Assoc. J*., **45**: 242 (1984).

Leith, David, "Discussion on Fundamental Processes in Gas Filtration", *Mechanical Engineering Transactions*, **ME9**: (3) 236 (1984).

Leith, David, Douglas W. Cooper and Stephen N. Rudnick, "Venturi Scrubbers: Pressure Drop and Regain", *Aerosol Science and Technology*, **4**: 239 (1985).

Dirgo, John A. and David Leith, "Performance of Theoretically Optimized Cyclones", *Filtration and Separation*, **22**: 119 (1985).

Dirgo, John A. and David Leith, "Cyclone Collection Efficiency: Comparison of Experimental Results with Theoretical Predictions", *Aerosol Science and Technology*, **4**: 401 (1985).

Leith, David, Kenneth P. Martin and Douglas W. Cooper, "Liquid Utilization in a Venturi Scrubber", *Filtration and Separation*, **22**: 191 (1985).

Rudnick, Stephen N., John L. Koehler, Kenneth P. Martin, David Leith, and Douglas W. Cooper, "Particle Collection Efficiency in a Venturi Scrubber: Comparison of Experiments with Theory", *Environ. Sci. Technol*., **20**: 237 (1986).

Leith, David, John A. Dirgo and Wayne T. Davis, "Control Devices: Centrifugal Force and Gravity, Filtration, and Dry Flue Gas Scrubbing", in Air Pollution, Vol VII, 3rd ed., Arthur C. Stern, ed., Academic Press, New York, 1986.

Dirgo, John A. and David Leith, "Design of Cyclone Separators", in Encyclopedia of Fluid Mechanics, Gulf Publishing Co., West Orange, NJ, 1986.

Leith, David and R.W.K. Allen, "Aerosol Filtration by Fabric Filters," in Progress in Filtration and Separation, vol. 4, R.J. Wakeman, ed., Elsevier, Amsterdam, 1986.

Leith, David, "Drag on Non-Spherical Objects", *Aerosol Science and Technology*, **6**: 153 (1987).

Johnson, David L., David Leith and Parker C. Reist, "Drag on Non-Spherical, Orthotropic Aerosol Particles", *Journal of Aerosol Science*, **18**: 87 (1987).

Koehler, John L., Henry A. Feldman and David Leith, "Gas-Borne Liquid Flow Rate in a Venturi Scrubber with Two Different Liquid Injection Arrangements", *Aerosol Science and Technology*, **7**: 15 (1987).

Templin, Bobby R. and David Leith, "Effect of Operating Conditions on Pressure Drop in a Pulse-Jet Cleaned Fabric Filter", *Chemical Engineering Progress, Plant Operations/Progress*, **7**: 215 (1988).

DiGiano, Francis A., Daniel Elliot and David Leith, "Application of Passive Dosimetry for Detection of Trace Organic Contaminants in Water", *Environ. Sci. Technol*. **22**: 1365 (1988).

Iozia, Donna Lee and David Leith, "Effect of Cyclone Dimensions on Gas Flow Pattern and Collection Efficiency, " *Aerosol Science and Technology*, **10**: 491 (1989).

Lee, Chung-te and David Leith, "Drag force on Agglomerated Spheres in Creeping Flow", *Journal of Aerosol Science,* **20**: 503 (1989).

Iozia, Donna Lee and David Leith, "Cyclone Optimization", *Filtration and Separation,* **26**: 272 (1989).

Caminiti, S.P., P.J. Fracica, C.A. Piantadosi, D.H. Leith, and S.L. Young, "Aerosol Delivery of Natural Surfactant for the Treatment of Hyperoxic Lung Injury in Baboons" (abstract), *American Review of Respiratory Disease* **141** (4): A931 (1990).

Iozia, Donna Lee and David Leith, "The Logistic Function and Cyclone Fractional Efficiency", *Aerosol Science and Technology,* **12**: 598-606 (1990).

Todd, Lori and David Leith, "Remote Sensing and Computed Tomography in Industrial Hygiene I: Theoretical Basis", *Am. Indust. Hyg. Assoc. J.*, **51**: 224 (1990).

Leith, David, "Introduction to Aerosol Science", in Aerosol Control in the Microelectronics Industry, R.P. Donovan, ed., Marcel Dekker, New York, 1990.

Leith, David, "Fundamentals of Light Scattering by Aerosol Particles", in Aerosol Control in the Microelectronics Industry, R.P. Donovan, editor, Marcel Dekker, New York, 1990.

Sherman, Christopher P.C., David Leith, and Michael J. Symons, "Outlet Mass Flux from a Pulse-Jet Cleaned Fabric Filter: Testing a Theoretical Model", *Aerosol Science and Technology,* **13**: 426-433 (1990).

Boundy, Maryanne G., David Leith, and Michael R. Knowles, "Dispersion and Size Distribution of Amiloride by Metered Dose and Dry Powder Inhalers", *Journal of Aerosol Medicine*, **3**: 233-241 (1990).

Kamens, Richard, Chung-te Lee, Russell Wiener, and David Leith, "A Preliminary Study to Characterize Indoor Particles in Three Homes", *Environ. Sci. Technol*., **25A**: 939-948 (1991).

Kessler, Marc and David Leith, "Flow Measurement and Efficiency Modelling of Cyclones for Particle Collection", *Aerosol Science and Technology*, **15**: 8-18 (1991).

Ramachandran, G., David Leith, John Dirgo, and Henry Feldman, "Cyclone Optimization Based on a New Empirical Model for Pressure Drop", *Aerosol Science and Technology*, **15**: 135-148 (1991).

Plinke, Marc A. E., David Leith, David B. Holstein and Maryanne G. Boundy, "Experimental Examination of Factors that Affect Dust Generation", *Am. Indust. Hyg. Assoc. J.*, **52**: 521-528 (1991).

Plinke, Marc A. E., Ralf Maus and David Leith, "Experimental Examination of Factors that Affect Dust Generation Using the Heubach and MRI Testers", *Am. Indust. Hyg. Assoc. J.*, **53**: 325-330 (1992).

Ramachandran, G. and David Leith, "Extraction of Aerosol Size Distributions from Multispectral Light Extinction Data", *Aerosol Science and Technology*, **17**: 303-325 (1992).

Cawley, Brian and David Leith, "A Bench-top Apparatus to Examine Factors that Affect Dust Generation", *Applied Occupational and Environmental Hygiene*, **8**: 624-631 (1993).

Ramachandran, G., David Leith and Lori Todd, "Extraction of Spatial Aerosol Distributions from Multispectral Light Extinction Measurements with Computed Tomography", *Journal of the Optical Society of America A*, **11**: 144-154 (1994).

Plinke, Marc A. E., David Leith, Randall G. Goodman, and Friedrich Löffler, "Particle Separation Mechanisms in Flow of Granular Material", *Particulate Science and Technology*, **12**: 71-87 (1994).

Plinke, Marc A.E., David Leith, Royal Hathaway, and Friedrich Löffler, "Cohesion in Granular Materials", *Bulk Solids Handling*, **14**: 101-106, (1994).

Leith, David, "Apparatus for Administering Solid Particulate Aerosols to the Lungs", US patent 5,304,125, issued 19 April 1994.

Ramachandran, G., Peter C. Raynor and David Leith, "Collection Efficiency and Pressure Drop for a Rotary-Flow Cyclone", *Filtration and Separation*, **31**: 631-636 (1994).

Plinke, Marc A.E., David Leith, Maryanne G. Boundy and Friedrich Löffler, "Dust Generation from Handling Powders in Industry", *Am. Indust. Hyg. Assoc. J.*, **56**: 251-257 (1995).

Casper, Rober A., Malcom E. Taylor, Frank A. Leith, David H. Leith, and Maryanne G. Boundy, "Multi-dose Dry Powder Inhalation Device", US patent 5,415,162 issued 16 May 1995.

McAneny, John J., David Leith and Maryanne G. Boundy, "Volatilization of Mineral Oil Mist Collected on Sampling Filters", *Appl. Occup. Environ. Hyg.*, **10** (9): 783-787 (1995).

Lanning, Jeffrey S., Maryanne G. Boundy and David Leith, "Validating a Model for the Prediction of Dust Generation", *Particulate Science and Technology*, **13**: 105-116 (1995).

Cooper, Steven J., Peter C. Raynor and David Leith, "Evaporation of Mineral Oil in a Mist Collector", *Applied Occupational and Environmental Hygiene*, **11**: 1204-1211 (1996).

Raynor, Peter C., Steven Cooper, and David Leith, "Evaporation of Polydisperse Multicomponent Droplets", *Am. Indus. Hyg. Assoc. J.*, **57:** 1128-1136 (1996).

Leith, David, Frank A. Leith and Maryanne G. Boundy, "Laboratory Measurements of Oil Mist Concentrations Using Filters and an Electrostatic Precipitator", *Am. Indust. Hyg. Assoc. J.*, **57**: 1137-1141 (1996).

Leith, David, Peter C. Raynor, Maryanne G. Boundy and Steven J. Cooper, "Performance of Industrial Equipment to Collect Coolant Mist", *Am. Indus. Hyg. Assoc. J.*, **57:** 1142-1148 (1996).

Leith, David and Donna Lee Jones, "Cyclones" in Handbook of Powder Science and Technology, 2nd ed., M.E. Fayed and L. Otten, eds., pp. 727-752, Chapman and Hall, New York, 1997.

Cooper, Steven J. and David Leith, "Evaporation of Metalworking Fluid Mist in Laboratory and Industrial Collectors", *Am. Indus. Hyg. Assoc. J.*, **59:** 45-51 (1998).

Thornburg, Jonathan, Steven J. Cooper and David Leith, "Counting Efficiency of the API Aerosizer", *Journal of Aerosol Science*, **30** (4): 479-488 (1999).

Raynor, Peter C., and David Leith, "Evaporation of Accumulated Multicomponent Liquids from Fibrous Filters", *Annals of Occupational Hygiene*, **43** (3):181-192 (1999).

Volckens, John, Maryanne Boundy, David Leith and David Hands, "Oil Mist Concentration: A Comparison of Sampling Methods", *Am. Indus. Hyg. Assoc. J.*, **60:** 684-689 (1999).

Rosati, Jacky, David Leith and Peter C. Raynor, "Determinants of Filter Lifetime", *Filtration and Separation*, **36** (10): 30-32 (1999).

Raynor, Peter C. and David Leith, "The Influence of Accumulated Liquid on Fibrous Filter Performance", *Journal of Aerosol Science*, **31:** 19-34 (2000).

Raynor, Peter C., John Volckens, and David Leith, "Modeling Evaporative Loss of Oil Mist Collected by Sampling Filters", *Applied Occupational and Environmental Hygiene*, **15** (1): 90-96 (2000).

Volckens, John, Maryanne Boundy and David Leith, "Mist Concentration Measurements II: Laboratory and Field Evaluations", *Applied Occupational and Environmental Hygiene*, **15** (4): 370-379 (2000).

Thornburg, Jonathan and David Leith, "Mist Generation during Metal Machining", *Journal of Tribology (ASME)*, **122:** 544-549, (2000).

Thornburg, Jonathan, and David Leith, "Size Distribution of Mist Generated During Metal Machining", *Applied Occupational and Environmental Hygiene*, **15** (8): 618-628 (2000).

Boundy, Maryanne, David Leith, David Hands, Michael Gressel and G. Edward Burroughs, "Performance of Industrial Mist Collectors Over Time", *Applied Occupational and Environmental Hygiene*, **15** (12): 928-935 (2000).

Wagner Jeff. and David Leith (2000) "Laboratory and Field Testing of a Passive Aerosol Sampler", *Inhalation Toxicology*, **12**(6 Supplement 2) 139 (2000).

Wagner, Jeff and David Leith, "Field Tests of a Passive Aerosol Sampler", *Journal of Aerosol Science*, **32:** 33-48 (2001).

Wagner, Jeff and David Leith, "Passive Aerosol Sampler. I: Principle of Operation", *Aerosol Science and Technology*, **34**(2) 186-192 (2001).

Wagner, Jeff and David Leith, "Passive Aerosol Sampler. II: Wind Tunnel Experiments", *Aerosol Science and Technology*, **34**(2) 193-201 (2001).

Peters, Thomas, Maryanne Boundy, and David Leith, "Influence of Upstream Flow Characteristics on Filter Efficiency", *Filtration and Separation*, **38** (10) 40-47 (2001).

Wagner, Jeff and David Leith, "Passive Aerosol Sampler and Methods", US Patent 6,321,608 granted 27 November 2001.

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