

## **Dr. John H Klote, P.E. Resume**

### **Education**

In 1986, John Klote earned his doctorate in mechanical engineering at George Washington University, and his dissertation, *Pulsatile Infiltration*, addressed the flow of air or smoke under conditions of fluctuating pressures. Klote earned an MS degree from George Washington University and an BS degree from the University of Michigan.

### **Experience**

#### **Teaching and Writing, 2008 to Present:**

Dr. Klote has developed and taught smoke control courses for SFPE and ASHRAE. Klote conducts courses, seminars and workshops on smoke control for A&E firms and private companies. The seminars and workshops can be tailored for the specific needs of the client. He writes technical papers and articles about various aspects of smoke control technology. Klote headed a three-year project that resulted in the *Handbook of Smoke Control Engineering*. Of three publishers interested in this handbook, Klote selected ASHRAE as the publisher, and ICC, SFPE and NFPA are copublishers. Klote developed the spreadsheet application, AtriumCalc, that can be used for engineering design calculations of atrium smoke exhaust systems. AtriumCalc is available from ASHRAE.

In 2016, Klote was sponsored by the New Zealand Chapter of SFPE to conduct a series of 6 one-day smoke control workshops in Auckland, Wellington and Christchurch. While in New Zealand, he conducted two seminars at the University of Canterbury in Christchurch. Klote has conducted webinars on various aspects of smoke control for Colt International, Ltd. Dr. Klote is active in ASHRAE and NFPA technical committees.

#### **Fire and Smoke Consulting, 1997 to 2008:**

John Klote formed a company that used the results of research to provide consulting services to fire protection engineers, mechanical engineers and code officials concerning practical solutions to various fire protection problems. Klote's consulting consisted primarily of engineering design analyses of smoke control systems. He conducted these analyses for a wide range of projects using the following methods of analysis: (1) algebraic equation method, (2) the CFAST zone fire model, (3) the CONTAM network flow model, and (4) the Fire Dynamics Simulator (FDS) model. Klote also did design review, and he provided consulting to companies regarding products. Dr. Klote conducted research projects sponsored by ASHRAE and NIST that studied the threat to life due to smoke flow in buildings. He developed the zone fire model, AZONE, specifically for analysis of atrium smoke control systems, and AZONE was included with Klote's 2002 ASHRAE smoke control book. Because of advances in CFD modeling, AZONE is no longer supported. Dr. Klote remained active in NFPA and ASHRAE committees, and he developed and taught smoke control courses for SFPE.

Dr. Klote conducted a research project sponsored by ASHRAE (1203-TRP) on the consequences of open doors in pressurized stairwells. Klote also conducted an elevator smoke control research project sponsored by NIST. Dr. Klote is the primary author of the 2002 book, *Principles of Smoke Management*, jointly published by ASHRAE and SFPE. Dr. Klote was also the primary author of a book about the smoke control provisions of the IBC which was published by the ICC. Dr. Klote worked to make the results of research available for practical application by participation in numerous ASHRAE and NFPA committees.

#### **National Institute of Standards and Technology, 1978 to 1997:**

Dr. Klote was a Project Leader at the National Institute of Standards and Technology (NIST) in Gaithersburg, Maryland. He conducted numerous research projects in the areas of smoke management, smoke movement and elevator use during fires. Techniques used by Klote include full-scale fire experiments, field tests, and computer simulations. The full-scale fire experiments included those at the Plaza Hotel in Washington DC that demonstrated the effectiveness of smoke control and provided insight into the interaction of smoke control and fire growth. Methods of computer simulation include network flow modeling, zone fire modeling and CFD. He is the primary author of the 1992 book, *Design of Smoke Management Systems*, jointly published by ASHRAE and SFPE.

June 4, 2018

Klote headed the Building Fire Physics Group that procured the first commercial CFD model for fire simulations at NIST. To allow this CFD model to simulate fires, FORTRAN computer code was written at NIST under Klote's supervision. Klote used this CFD model to study smoke detector activation in the presence of HVAC induced airflow. Klote acted as a consultant in the area of smoke movement for the investigations of the MGM Grand fire and the First Interstate Bank fire. Klote's research was the basis of the 1997 revision to the NFPA Life Safety Code (section 5-2.13) allowing elevators to be used as a second means of egress from towers.

### **Naval Facilities Engineering Command, 1967 to 1978:**

At the Naval Facilities Engineering Command (NAVFAC), he was involved in the design of mechanical systems for buildings including HVAC systems, and he established worldwide criteria within the Navy for such systems. During his last four years with NAVFAC, Klote was the senior cost engineer for the design and construction of the new Bethesda Naval Hospital and the tri-service medical university at Bethesda.

### **Professional Registration**

Mechanical Engineering in the District of Columbia.

### **Honors & Awards**

Dr. Klote has received numerous honors and awards including ASHRAE Distinguished Lecturer (1998 –2000), Keynote Speaker at CIBSE/ASHRAE Smoke Control Seminar (London England 1998), ASHRAE best paper awards (1993, 1992, 1991 and 1989), and awards from NIST.

### **Professional Affiliations**

Dr. Klote has participated in several ASHRAE, SFPE and NFPA committees that pertain to fire and smoke management, and he has been chairman of a number of these. He is the vice chairman of ASHRAE TC 5.6 Control of Fire and Smoke and a member of NFPA Smoke Management Committee. Klote is a fellow of SFPE, a fellow of ASHRAE, and a member of NFPA.

### **Publications**

**Books:** Klote has written seven books about smoke control, and the following are the most recent.

Klote, J. H., Milke, J. A, Turnbull, P. G., Kashef, A. and Ferreira, M. J. 2012. *Handbook of Smoke Control Engineering*, ASHRAE, Atlanta, GA.

Klote, J. H. and Evans, D. H., 2007. *A Guide to Smoke Control in the 2006 IBC*, International Code Council, Country Club Hills, IL.

### **Other Publications**

Dr. Klote has written chapters about smoke control in a number of books, and he has written over 80 papers and articles on smoke control and other aspects of fire protection. The following are a few of the most recent.

Klote, J. H. 2018. *A New Look at Door Opening Forces and Smoke Control*. 2018 ASHRAE Annual Conference, ASHRAE Atlanta, GA.

Klote, J. H., et al. 2017. *Pressurized Stairwells with Open Doors and the IBC*. 2017 ASHRAE Annual Conference, ASHRAE Atlanta, GA.

Klote, J. H. 2017. *Tenability Analysis and Atrium Smoke Control*. 2017 ASHRAE Annual Conference, ASHRAE Atlanta, GA.

Klote, J. H. 2016. *Smoke Control in Buildings*, ICB Journal, Vol. III, No. 1.

Klote, J. H. 2015. *MGM Grand Fire and Fire Safety Then, Now*. ASHRAE Journal, November, 2015.

Klote, J. H. 2013. *Elevator Pressurization in Tall Buildings*. International Journal of High-Rise Buildings, Vol. 2, No. 3.

Klote, J. H. 2012. *Sustainable Smoke-Control Systems*. HPAC Engineering, July.

Klote, J. H. 2011. *Stairwell Smoke Control by Ventilation*, ASHRAE Transactions. Vol. 117, Part 1.

Klote, J. H. 2009. *Minimum Smoke-Layer Depth in Atrium Smoke Control*. HPAC Engineering, March 2009.

Klote, J. H. and Hadjisophocleous, G. 2008. *An Overview of Evacuation Analysis with Application to Smoke Control Systems*, ASHRAE Transactions, Vol. 114, Part 2, pp 143-149.