

Martin Thermal Engineering, Inc.

Richard J. Martin, PhD, PE, CFI
P.O. Box 873
Manhattan Beach, California 90266
+1 (310) 937-1424
rmartin@martinthermal.com

Dr. Rick Martin is an expert in industrial heating and cooling equipment and he investigates fires, explosions and thermal accidents in structures, vehicles and vessels. He has design, analysis and troubleshooting experience with equipment used in the agricultural, cement, ceramic, chemical, food, foundry, metallurgical, metal finishing, paper, petroleum, pharmaceutical, power generation, printing, recreational, refining, smelting, and textile industries. He also performs safety and energy audits, technology due diligence analyses, and patent assessments.

EDUCATION

- PhD (12/89) Mechanical Engineering. University of California, Berkeley, CA.
Dissertation: "Nitrous Oxide Combustion Chemistry".
- MS (6/81) Mechanical Engineering. Stanford University, Stanford, CA.
- BS (6/81) Mechanical Engineering. Stanford University, Stanford, CA.

EXPERIENCE

Martin Thermal Engineering Inc., Inc. (8/09 to present) **Principal**

Consultant to corporations, attorneys and insurance professionals on thermal science and engineering issues. Investigates fires, explosions, heating/cooling/cooking equipment failures, burn/scald injuries, and material releases. Presented expert opinions and testimony at deposition, trial, and mediation.

Industrial Heating Magazine (1/08 to present) **Safety & Environmental Issues Columnist**

Author of a regular column on safety and environmental issues related to furnaces and other high temperature processing equipment.

Martin Thermal Engineering, Inc.

University of Southern California (1/10 to present) Part-Time Lecturer

Faculty member in Aerospace and Mechanical Engineering, responsible for teaching undergraduate Heat Transfer (AME 331) and Thermal Systems Design (AME 430).

Exponent Inc. (8/99 to 8/09) Senior Managing Engineer

Senior consultant to corporations, attorneys and insurance professionals. Investigated property losses, defective products, code compliance, intellectual property, environmental hazards, etc. Provided engineering consultation on hundreds of projects including furnace explosions, residential and restaurant fires, and industrial refrigeration failures. Testified as an expert witness and presented technical opinions at mediations.

California Baptist University (1/09 to 5/09) Adjunct Professor

Faculty member in Mechanical Engineering, responsible for teaching undergraduate chemistry for engineers (CHE 130).

Thermatrix Inc. (10/90 to 8/99) Director of Technology

Lead engineer in charge of technology development and intellectual property protection. Managed R&D activities involving U.S. and international business partners. Inventor of nineteen utility patents involving flameless thermal oxidation. Performed commissioning of combustion equipment in refineries, pharmaceutical and chemical facilities, remediation sites.

Ceramic Bonding Inc. (12/88 - 10/90) Research and Development Manager

Thermal equipment engineer for hazardous waste technology development firm. Designed, built, and tested pilot and demonstration thermal processing units. Developed predictive models for high temperature thermal-fluid systems.

25 Jul 2011

Martin Thermal Engineering, Inc.

Lawrence Berkeley Laboratory (1/84 - 12/88) Research Assistant

Researcher of nitrogen compound combustion chemistry. Performed experiments on steady and transient combustion systems. Modeled flame chemistry and physics.

Acurex Corporation (8/81 - 1/84) Staff Engineer

Engineer in charge of design, procurement, maintenance and experimentation tasks for federally-funded research programs. Performed research on pollutant reduction in coal-fired utility boilers and low-NO_x, radiant, gas-fired burners.

MISCELLANEOUS

- Registered Professional Mechanical Engineer, California, #M025029
- Registered Professional Mechanical Engineer, Arizona, #36052
- Registered Professional Mechanical Engineer, Illinois, #062.062006
- Registered Professional Mechanical Engineer, Colorado, PE-44184
- Certified Fire Investigator, International Association of Arson Investigators, #22-080802
- Member; American Society of Mechanical Engineers
- Member, American Society of Heating, Refrigerating and Air Conditioning Engineers
- Member; National Fire Protection Association
- Member; The Combustion Institute
- OSHA 40-Hour Certification - Hazardous Waste Operations and Emergency Response
- Fire Cause and Origin Investigation Training, State of California, Office of State Fire Marshal
- Qualified Specialist, Process Heating Assessment and Survey Tool (PHAST), Industrial Technologies Program, U.S. Department of Energy.
- Principal Member (2000-present) and Secretary (2008-present); Technical Committee 86 on Ovens and Furnaces, for the National Fire Protection Association.
- Secretary (2008-present); Task Group 87 on Fluid Heaters, for the National Fire Protection Association.
- Affiliate Member (2007); Society of Accredited Marine Surveyors.
- Member (2006-2007); Technical Committees C16 on Thermal Insulation, and F03 on Gaskets, for the American Society of Testing and Materials
- Executive Committee Member (1995-2001), Western States Section of the Combustion Institute.

25 Jul 2011

Martin Thermal Engineering, Inc.

- Guest Lecturer (2007-present), Biola University, “Introduction to Engineering”, La Mirada, CA.
- Guest Lecturer (1994-1997), University of California Extension, “Air Pollution Control Systems/Strategies”, Berkeley and Davis, CA.
- Recipient (1981), Distinguished Service Award, Stanford University School of Engineering.
- President (1980), Tau Beta Pi, California Gamma Chapter.

PATENTS

- “Device for Thermally Processing a Gas Stream, and Method for Same,” United States Patent 6,532,339, issued March 11, 2003 (with B. Edgar and M. Barkdoll).
- “Method of Reducing Internal Combustion Engine Emissions, and System for Same,” United States Patents 6,391,267 and 6,003,305, issued May 21, 2002 and December 21, 1999 (with J. Stilger, M. Holst, J. Young, M. Barkdoll, and B. Edgar).
- “Devices for Reducing Emissions, and Methods for Same,” United States Patent 6,282,371, issued August 28, 2001 (with B. Edgar, D. Page, and P. Paul).
- “Matrix Bed for Generating Non-Planar Reaction Wave Fronts, and Method Thereof,” United States Patents 6,257,869 and 5,989,010, issued July 10, 2001 and November 23, 1999 (with J. Stilger, M. Holst, J. Young, and B. Edgar).
- “Method of Removing Sulfur from a Process Gas Stream Using a Packed Bed Calcinator,” United States Patent 6,136,144, issued October 24, 2000 (with J. Schofield).
- “Thermal Oxidizers with Improved Preheating Means and Processes for Operating Same,” United States Patent 6,126,913, issued October 3, 2000 (with J. Stilger and M. Holst).
- “Method and Apparatus for Thermally Reacting Chemicals in a Matrix Bed,” United States Patent 6,015,540, issued January 18, 2000 (with S. McAdams, B. Edgar, M. Kilgo, C. Baer, and J. Stilger).
- “Methods for Destroying Colliery Methane and System for Practicing Same,” United States Patent 5,921,763, issued July 13, 1999.
- “Systems for the Treatment of Chemical Wastes and Methods for Treating Chemical Wastes,” United States Patent 5,819,673, issued October 13, 1998 (with A.C. Heywood, J.D. Stilger, and A.B. King).
- “Processes for the Synthesis of Hydrogen Cyanide,” United States Patent 5,817,286, issued October 6, 1998 (with J.D. Stilger and J.D. Young).
- “Systems for the Treatment of Commingled Wastes and Methods for Treating Commingled Wastes,” United States Patent 5,770,784, issued June 23, 1998 (with A. Heywood, M. Holst, and J. Schofield).
- “Method for Destruction of Volatile Organic Compound Flows of Varying Concentration,” United States Patents 5,650,128 and 5,635,139, issued June 3, 1997 and July 22, 1997 (with M. Holst).
- “Method and Afterburner Apparatus for Control of Highly Variable Flows,” United States Patents 5,637,283 and 5,601,790, issued February 11, 1997 and June 10, 1997 (with J. Stilger, M. Holst, and S. Yee).

Martin Thermal Engineering, Inc.

- “Method and Apparatus for Control of Fugitive VOC Emissions,” United States Patent 5,533,890, issued July 9, 1996 (with M. Holst, J. Stilger, and S. Yee).
- “Method and Apparatus for Recuperative Heating of Reactants in a Reaction Matrix,” United States Patent 5,320,518, issued June 14, 1994 (with J. Stilger and M. Holst).
- “Method and Apparatus for Controlled Reaction in a Reaction Matrix,” United States Patent 5,165,884, issued November 24, 1992 (with J. Stilger and M. Holst).

PUBLICATIONS

- “Energy-Saving Thermal Insulation: Industrial Hygiene and Occupational Health Considerations”; *Industrial Heating*; Vol. LXXV, No. 6, p. 54; June 2008; (with D. Malzahn, J. Hicks, and P. Sheehan)
- “New Explosion Relief Standard Affects Heat Treating and Other Furnaces”; *Industrial Heating*; Vol. LXXIV, No. 12, p. 41; December 2007; (with E. Christiansen)
- “New Explosion Relief Standards Impact Coating Equipment”; *Metal Finishing*; 27 July 2007; (with E. Christiansen)
- “Prediction of Particulate Loading in Exhaust from Fabric Filter Baghouses with One or More Failed Bags”; *J. Air & Waste Manage. Assoc.*, Vol. 56, pp. 1177-1183, August 2006 (with W. Qin and M. Dekermenjian)
- “Fires and Explosions in Vapor Control Systems: A Lessons Learned Anthology,” *Process Safety Progress*, Vol. 22, p. 195, December 2003 (with T. Myers and H. Kytomaa).
- “De Novo VOC from Regenerative Thermal Oxidizers,” *Proceedings ASME-HT2003, Summer Heat Transfer Conference, Las Vegas, NV, July 22, 2003* (with J.D. Colwell).
- “Test your Incinerator Knowledge,” *Chemical Engineering Progress*, Vol. 99, pp. 36–9, February 2003 (with T. Myers, P. Hinze, and H. Kytomaa).
- “Thermal Oxidizing Systems—Test your Knowledge to Improve Your Refinery’s Safety and Reliability,” *Hydrocarbon Processing*, pp. 79–80, November 2002 (with T. Myers, P. Hinze, and H. Kytomaa).
- “What is an Explosion? A Case History of an Investigation for the Insurance Industry,” *Journal of Loss Prevention in the Process Industries*; Vol. 13, p. 491, 2000 (with A. Reza and L.W. Anderson).
- “HAPhazard No More,” *Industrial Wastewater*, Vol. 2, May/June 1994 (with K.B. Woods and J.T. Schofield).
- “The Destruction of Air Toxic Emissions by Flameless Thermal Oxidation,” *Proceedings, Conference on Incineration and Thermal Treatment Technologies, Knoxville, TN, May 3, 1993* (with W.D. Binder).
- “Nitrous Oxide Formation and Destruction in Lean, Premixed Combustion,” *Combustion and Flame*, Vol. 80, p. 238, 1990 (with N.J. Brown).
- “Analysis and Modeling of Nitrous Oxide Chemistry in Lean, Premixed Combustion,” *Combustion and Flame*, Vol. 82, p. 312, 1990 (with N.J. Brown).
- “The Importance of Thermodynamics to the Modeling of Nitrogen Combustion Chemistry,” *Combustion and Flame*, Vol. 78, p. 365, 1989 (with N.J. Brown).

Martin Thermal Engineering, Inc.

- “Pilot-scale Characterization of Dry Sorbent Injection for SO₂ Control in a Low-NO_x Tangential System,” ASME Journal of Engineering for Power, Vol. 110, p. 111, 1988 (with J.T. Kelly, S. Ohmine, and E.K. Chu).
- “A Comparative Study of Combustion in Kerosene Heaters,” Environmental Science and Technology, Vol. 20, p. 78, 1986 (with T. Lionel and N.J. Brown).

BOOK CHAPTERS

- “Sources of Perchlorate Releases to the Environment”; Perchlorate: A Scientific, Legal, and Economic Assessment; Eds: E.M. Hagstrom and Brian S. Aikin; Lawyers & Judges Publishing Company; 2006 (with Peter M. Mesard).
- “Flameless Thermal Oxidation,” Standard Handbook of Hazardous Waste Treatment and Disposal, 2nd Edition, Section 8.7, H.M. Freeman (ed.), McGraw-Hill, New York, NY, 1997 (with S.G. DeCicco).

PRESENTATIONS AND PUBLISHED ABSTRACTS

- “New NFPA 87 Recommendations for Fluid Heaters – How they affect you.”; webinar produced by Process Heating magazine; June 9, 2011.
- “NFPA 86 Major Rewrite – How the Revisions Affect your Business”; webinar produced by Industrial Heating magazine; March 17, 2010.
- “NFPA 86 Major Rewrite – How to Impact Proposed Changes”; webinar produced by Industrial Heating, Process Heating, and Pollution Engineering magazines; July 14, 2009.
- “Vehicle and Vessel Fires: When to Retain an Engineer”; International Association of Special Investigation Units – Southern California Chapter; Continuing Education Seminar; Diamond Bar, California, January 16, 2008 (with D. Slee and E. Christiansen)
- “Propane Appliances on Small Vessels – Personal Injury Flash Fire”; Proceedings of the 2007 China National Failure Analysis Conference; Changsha, China; Vol. 32; p.95-98; November 2007; (with F. Zhang, B.A. McGoran)
- “Fire Science for Marine Professionals,” Society of Accredited Marine Surveyors, Southern California Sub Regional Meeting, Los Angeles, November 14, 2006.
- “Liquefied Petroleum Gas Cylinder Safety--Can Solar Heating Lead to Venting?” 2006 International Symposium on Safety, Science, and Technology. Changsha, China, October 24–27, 2006 (with W. Qin).
- “Fires and Explosions in Vapor Control Systems: A Lessons Learned Anthology,” AIChE 36th Annual Loss Prevention Symposium, New Orleans; March 10–13, 2002 (with T. Myers and H. Kytomaa).
- “CNG Filter Canister Failure and System Reliability Analysis,” Paper 2001-01-2471, SAE Future Transportation Technology Conference, Costa Mesa, CA, August 20, 2001 (with S. Agrawal).

Martin Thermal Engineering, Inc.

- “Destruction Threshold for the Elimination of Fine Particles by Diesel Aftertreatment,” Proceedings, Western States Section, Combustion Institute, Paper 98F-16, Seattle, WA, October 26, 1998.
- “Heavy Metal Waste Conversion by Thermally-Driven Chemical Bonding: Bench and Prototype Experiments,” ACS Symposium on Emerging Technologies for Hazardous Waste Treatment, p. 24, 1990 (with B.A. Johnson and C.B. Rubenstein).
- “Nitrogen Species Measurement in a Flash Ignited Combustion System,” Proceedings, Western States Section, Combustion Institute, p. 294, Banff, Alberta, Spring 1990 (with D. Lucas and N.J. Brown).

TESTIMONY

Depositions

- 9/25/2009. Petrie v Exterran Energy et al., Harris County District Court, Houston, TX
- 9/16/2009. Wang v Hai-Chen Enterprises, Los Angeles County Superior Court, Norwalk, CA
- 7/10/2008. Taylor v Conopco, et al., U.S. District Court, Eastern District of Kentucky, Pikeville, KY
- 1/18/2007. Chiou v. Gold 8&8 et al., Los Angeles County Superior Court, Los Angeles, CA
- 5/02/2006. Clark, et al. v. PSI Energy et al., Marion County Superior Court, Indianapolis, IN
- 2/08/2006. United States of America v. El Dorado County, et al., United States District Court, Eastern District of California, Sacramento, CA
- 1/31/2006. Maah v. Marlon Manor, et al., Los Angeles County Superior Court, Los Angeles, CA
- 5/27/2005. United States of America v. RSR Corporation, et al., United States District Court, Western District of Washington, Seattle, WA
- 2/17/2005. Lexington Insurance v. Flue Steam, et al, Los Angeles Superior Court, Los Angeles, CA
- 12/04/2004. Diaz v. Ceragem International, Los Angeles County Superior Court, Los Angeles, CA
- 4/26/2004. Yuen v. Ethos Environmental, Los Angeles County Superior Court, Los Angeles, CA
- 11/19/2002. Tafuri v. Northern Energy, Los Angeles County Superior Court, Los Angeles, CA
- 9/18/2002. Plourde v. Pallos, Orange County Superior Court, Santa Ana, CA
- 6/28/2002. Sanders v. L.A. Fitness, Orange County Superior Court, Santa Ana, CA
- 5/15/2002 and 5/22/2002. RSR Corp v. AIU Insurance, 71st Judicial District Court, Harrison County, TX

Martin Thermal Engineering, Inc.

- 10/17/2001. Remtech v. A.R.T., United States District Court, District of Alaska
- 1/2/2001. Ostermeyer v. World Kitchen, Orange County Superior Court, Santa Ana, CA

Arbitrations

- 7/21/2004. American Family Insurance – Hays; Yavapai County Superior Court, Prescott, AZ.

Trials

- 3/12/2001. Ostermeyer v. World Kitchen, Orange County Superior Court, Santa Ana, CA
- 6/2/2010. Petrie v Exterran Energy et al., Harris County District Court, Houston, TX