



Exponent[®]
Engineering & Scientific Consulting

Richard D. LaRoche, Ph.D.

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Professional Profile

Dr. LaRoche specializes in granular flow, fluid flow, mixing and reactor scale-up processes. He has had highly diverse roles ranging from VP Engineering and R&D to Chemical Engineering Consultant to CEO of an engineering software company. He excels at creating engineering solutions to solve business problems. His chemical engineering experience along with being on forefront of the application of software technologies such as discrete element method (DEM) and computational fluid dynamics (CFD) has enabled him to solve real-world problems for industrial companies worldwide.

Dr. LaRoche's most recent position prior to joining Exponent in 2019 was as CEO/CTO of DEM Solutions, makers of the market-leading DEM software package, EDEM™, for bulk and granular material flow. While at DEM Solutions, he focused on providing software and consulting services for clients with granular flow problems in the construction, mining, agricultural, steel-making, chemical and pharmaceutical fields. His technology and business leadership paved the way for the sale of EDEM to Altair Engineering in 2019.

Dr. LaRoche has held engineering consulting positions at DuPont Engineering, ANSYS/Fluent and Cray Research where he consulted for an impressive and diverse array of clients ranging from oil and gas (O&G) to the pharmaceutical/biotechnology space. His technology expertise includes classical chemical engineering approaches to fluid flow, mixing and reactor scale-up in addition to the application of CFD and DEM. He began his career as a chemical process engineer at Shell Chemical and Dow Chemical where he focused on agricultural and pharmaceutical pilot plant and scale-up issues.

Dr. LaRoche formerly held the position of DuPont Assistant Professor of Chemical Engineering at Penn State University. He also held visiting professor positions at the University of Delaware and Dartmouth College.

Academic Credentials & Professional Honors

Ph.D., Chemical Engineering, University of Illinois, Urbana-Champaign, 1987

M.S., Chemical Engineering, University of Illinois, Urbana-Champaign, 1985

B.S., Chemical Engineering, Montana State University, 1980

Tau Beta Pi

Academic Appointments

Visiting Professor of Engineering, Dartmouth College, 2006

Visiting Professor of Chemical Engineering, University of Delaware, 2000

Adjunct Assistant Professor of Chemical Engineering, Penn State University, 1990-1992

Assistant Professor of Chemical Engineering, Penn State University, 1987-1992

Visiting Lecturer, University of Illinois at Urbana-Champaign, 1986

Prior Experience

Chief Executive Officer / Chief Technology Officer, DEM Solutions Ltd., 2015-2019

Vice President of Engineering & US General Manager, DEM Solutions Ltd., 2008-2015

Global Director of Engineering, DEM Solutions Ltd., 2007-2008

Regional Support Manager, ANSYS/Fluent, 2007

Business Services Manager, ANSYS/Fluent, 2005-2007

Consulting Manager, Fluent, 2003-2004

University Program Manager, Fluent, 2001-2002

Fluid Flow & Mixing Consultant, DuPont Engineering, 1998-2001

Senior Chemical Engineering Consultant, Cray Research/SGI, 1990-1998

Assistant Professor of Chemical Engineering, Penn State University, 1987-1990

Visiting Lecturer, University of Illinois at Urbana-Champaign, 1986

Chemical Engineer, Dow Chemical, 1981-1982

Process Engineer, Shell Chemical, 1981

Professional Affiliations

American Institute of Chemical Engineers

- AIChE, Senior Member
- Environmental Division
- Ichthyologists (Boston) Local Section
- North American Mixing Forum
- Particle Technology Forum
- Sustainability Engineering Forum

Patents

King M, Warden JA, Lopath PD, LaRoche RD. Dry Powder Inhalers That Inhibit Agglomeration, Related Devices and Methods, US Patent 8365725, <https://www.google.com/patents/US8365725> Issued February 5, 2013.

Publications

Narang AS, Tao L, Zhao J, Keluska R, Gour S, Stevens T, Macias K, Remy B, Pandey P, LaRoche RD, Sosnowska A, Cole S, Dubey A, Ramachandran R, Li J, Bindra D. Effect of Binder Attributes on Granule Growth and Densification, Chapter 10 in the Handbook of Pharmaceutical Wet Granulation, 2019, <https://doi.org/10.1016/B978-0-12-810460-6.00005-1>

Moore B, Fuata J, Cole S, LaRoche R, Grima A, Wypych P. Designed for Utmost Reliability: Maximising the Reliability of Bulk Handling Equipment, Mining Magazine, January/February 2012.

Grima A, Hastie D, Curry D, Wypych P, LaRoche R. The Beginning of a New Era in Design: Calibrated Discrete Element Modelling Australian Bulk Handling Review, September/October 2011

Shao X, Lynd L, Bakker A, LaRoche R, Wyman C. Reactor Scale Up for Biological Conversion of Cellulosic Biomass to Ethanol, Bioprocess and BioSystems Engineering, 33 (4), pp. 485-493, 2010, <https://doi.org/10.1007/s00449-009-0357-2>

Bakker A, LaRoche RD, Wang MH, Calabrese RV. Sliding Mesh Simulation of Laminar Flow in Stirred Reactors, TranslChemE, Vol 71, Part A, 42-44, 1997, <https://doi.org/10.1016/B978-0-12-810460-6.00005-1>

Presentations

LaRoche RD. Discrete Element Method (DEM) and CAE Software Technology Adoption, Keynote presentation at the 12th International Conference on Bulk Materials Storage, Handling and Transportation (ICBMH 2016), Darwin, Northern Territory, Australia, July 2016.

LaRoche, RD. Biopharmaceutical Scale-up and Scale-down Using Fluid Mixing Analysis and Computational Fluid Dynamics (CFD), Presentation at the AIChE Annual Meeting, Cincinnati, Indiana, November 2005.

LaRoche, RD. Evolution of CFD as a Tool for Chemical Engineering, Invited presentation at the Computational Fluid Dynamics in Chemical Reaction Engineering Conference, Barga, Italy, July 2005.

LaRoche, RD. The Use of Computational Fluid Dynamics in Chemical Process Engineering, Invited presentation at the National Nuclear Security Agency (NNSA) Future Technologies Conference, Washington, D.C., May 2004.

Advisory Appointments

Advisor to the Board, DEM Solutions Ltd., 2019

Trustee / Officer, CACHE Corporation (Educational Non-Profit Organization), 2002-2010