

Jocelyn Doucet, P. Eng., Ph. D.

Positions

- a) Research and Engineering Director, Kengtek Engineering Services Inc.
- b) Adjunct professor, Ecole Polytechnique de Montréal, Department of Chemical Engineering/Research Center in Biorefining

Summary

Jocelyn Doucet is president of Kengtek Engineering Services Inc, a company specialized in technical due diligence for new and complex processes and provides full engineering and R&D services for companies who are looking into getting their process to the level of commercial production. He is also adjunct professor at the Department of Chemical Engineering at the Polytechnic School of Engineering of University of Montreal where he teaches Element of Chemical Reaction Engineering and Process Design. He holds a degree in Chemical Engineering and specialized in multiphase flows and complex reactor design. His young career had led him to major process breakthroughs, specifically in the field of yeast fermentation, complex extraction (using refrigerant, flammable solvents and liquefied petroleum gas), food and dairy process design in aseptic conditions and, more recently in waste conversion. His research is now mostly oriented in complex reactor design and valorization of waste through pyrolysis and gasification. He is member of various professional associations and research centers.

Academic Background

2008 Ph. D. in Chemical Engineering, University of Montreal, Polytechnic School of Engineering

2004 B. Eng., Chemical Engineering, University of Montreal, Polytechnic School of Engineering

Associations

American Association of Chemical Engineering (AIChE)

National Fire Protection Association (NFPA)

Canadian Society of Chemical Engineering (CSCHE)

Canadian Institute of Chemistry

Ordre des ingénieurs du Québec (OIQ)

Professional Engineer in Alberta and Saskatchewan (non-active)

Industrial projects

Jocelyn Doucet has a Ph.D. in Chemical Engineering in the field of mixing and multiphase flows. He was involved in many aspects of multiphase reactor design, especially in the field of gold extraction, biomass pyrolysis, phosphorus removal and gasification. He also gathered extensive experience in the food industry while managing numerous projects with major food and biotechnology processors such as Kraft, Liberty Yogurts, Baxter's soups, and Lallemand yeasts. Below is a quick list of recent projects.

- Kraft Food Enzyme Modified Fresh cheese process development – Project engineer for a 5M\$ core business project development within Kraft involving multiple enzymatic reactor design in food grade environment.
- Dismantling and relocation of the Kraft-Aylmer soup/broth and vegetable processing facility from Exeter ON to Montreal QC.
- Conversion of whey to ethanol project – Research principal on development of a new combined whey conversion process into ethanol through enzymatic reactors.
- Continuous and batch fermentation of various yeast strain– Client with plants in Europe, US and Canada involved in wine and bread yeast production. We've developed an extensive expertise in

continuous fermentation and batch fermentation process involving full scale fermentation and other unit operations (separation, concentration, drying).

- Phosphate removal from wastewater – Project with the Montreal Biodome to address the design of steel slag phosphate absorber for the wastewater from the large scale aquariums.
- Canola protein extraction plant – Project in Western Canada with low temperature solvent extraction of oil and proteins from canola.
- Liberty Yogurt – Reengineering of the fermentation process to double capacity of the facility.
- Process development for the Vitamin D addition technology in baker's yeast for new generation of vitamin D breads.
- Tire pyrolysis plant development with several technology providers: several implications with various technologies (direct burning, fluidized bed, microwave).
- Extraction and purification of polyphenols from biomass waste.
- Various spray dryer, drum dryer and fluidized bed dryer design, start-up and operation.

Publications and conferences

Patents

1. Doucet, Jocelyn and Rozenszain, Luis (2010). Process for removing solvent from a biomass (2011).
2. Doucet, Jocelyn, Chaouki, Jamal, Sohby, Amr (2011). Catalyst for domestic batch microwave pyrolysis, system and process thereof. (pending)
3. Doucet, Jocelyn (2011). Method of distributing pyrolysis of domestic waste and products therefrom.(pending)

Articles in peer-reviewed journals

1. Farag, Sherif, Sohby, Amr, Cevdet, Aykel, Doucet, Jocelyn, Chaouki, Jamal (2011): Temperature Profile Prediction within Selected Materials Heated by Microwaves at 2.45GHz, Accepted in Applied Thermal Engineering.
2. Doucet, Jocelyn, Hudon, Nicolas, Bertrand, Francois and Chaouki, Jamal (2010). Mixing Properties of Markovian Granular Dynamics. Submitted to Computers and Chemical Engineering
3. Doucet, Jocelyn, Bertrand, Francois and Chaouki, Jamal (2008). A measure of mixing from Lagrangian tracking and its application to granular and fluid flow systems. Chemical Engineering Research and Design, 86, 1313-1321.
4. Doucet, Jocelyn, Bertrand, Francois and Chaouki, Jamal (2008). An experimental characterization of the chaotic dynamics of cohesionless particles in a V-blender using radioactive particle tracking. Granular Matter, 10, 133-138.
5. Doucet, Jocelyn, Bertrand, Francois, Hudon, Nicolas and Chaouki, Jamal (2008). Modeling of the mixing of monodisperse particles using a stationary DEM-based Markov process. Computers and Chemical Engineering, 32, 1342-1349.
6. Doucet, Jocelyn, Chaouki, Jamal and Bertrand, Francois (2008). An extended radioactive particle tracking method for systems with irregular moving boundaries. Powder Technology, 181, 195-204.
7. Lemieux, Marc, Leonard, Guillaume, Doucet, Jocelyn, Viens, Francis, Leclaire, Louis-Alexandre, Chaouki, Jamal and Bertrand, Francois (2008). Large scale investigation of solid mixing in a v-blender using a discrete element method. Powder Technology, 181, 205-216

Selected conferences proceedings

1. Doucet, Jocelyn, Bertrand, Francois, and Chaouki Jamal. Effect of time integration error on the accuracy of granular mixing simulations with the discrete element method. PARTEC 2007, Nuremberg, Allemagne. Mars 25-27, 2007.
2. Doucet, Jocelyn, Bertrand, Francois, Hudon, Nicolas and Chaouki, Jamal. Modeling of Granular Mixing Using a Dem-Based Markov Process Method. AIChE meeting , San Francisco, CA. Novembre 12-17, 2006.

3. Doucet, Jocelyn, Bertrand, Francois, Chaouki, Jamal. An experimental characterization of the chaotic dynamics of cohesionless particles in a V-blender using radioactive particle tracking. AICHe 5th World Congress on Particle Technology, Orlando, Florida. Avril 23-27, 2006.
4. Doucet, Jocelyn, HUDON, N. ,Chaouki, Jamal and Bertrand, Francois. Modeling of granular mixing using Markov chains and the discrete element method. 2006 CSChE Congress, Sherbrooke, Qc. Canada.
5. Doucet, Jocelyn, Chaouki, Jamal and Bertrand, Francois. Determination of macroscopic mixing properties of granular materials from particle tracking experiments. 2006 CSChE Congress, Sherbrooke, Qc. Canada.
6. Lemieux, Marc, Doucet, Jocelyn, Leclaire, Louis-Alexandre, Bertrand, Francois, Chaouki, Jamal. DEM-based models for the simulation of particulate flows in pharmaceutical processes. Trends in Numerical and Physical Modeling for Industrial Multiphase Flows, Cargese, Corsica, Septembre 19-23 2005.
7. Lemieux, Marc, Leonard, Guillaume, Doucet, Jocelyn, Leclaire, Louis-Alexandre, Chaouki, Jamal and Bertrand, Francois (2005). Large scale investigation of solid mixing in a v-blender using a discrete element method. 2005 CSChE Congress, Toronto, Ont. Canada.
8. Doucet, Jocelyn, Chaouki, Jamal and Bertrand, Francois. An extended radioactive particle tracking method for systems with irregular moving boundaries. 2005 CSChE Congress, Toronto, Ont. Canada.
9. Doucet, Jocelyn, Chaouki, Jamal and Bertrand, Francois. Mapping of solid flow field in a v-blender. International Conference on Mixing Operations in the Pharmaceutical Industry, Montreal, Quebec, Canada. June 25th to 29th 2005.
10. Lemieux, Marc, Leonard, Guillaume, Doucet, Jocelyn, Leclaire, Louis-Alexandre, Chaouki, Jamal and Bertrand, Francois (2005). Large scale investigation of solid mixing in a v-blender using a discrete element method. International Conference on Mixing Operations in the Pharmaceutical Industry, Montreal, Quebec, Canada. June 25 - 29th 2005.

Selected talks

1. Doucet, Jocelyn (2011). Scale-up challenges in chemical engineering: the role of chemical engineers in the 21st century. Presented at the first OCP (Office chériféen des Phosphates) conference in Marrakech, May 2011.
2. Doucet J., Dubé O., Bouffard J., Bertrand F. and Chaouki J., 2008. Experimental Measurement of Mixing Rates of Granular Materials Using a New Bulk Radioactive Tracking Method (BRPT), 2008. 1st Int. Conf. on Application of Intelligent Particles and Sensors in Environmental and Process Engineering, Penang, Malaysia.
3. Doucet J., Bouffard J., Bertrand F. and Chaouki J., 2008. A Measure of Mixing from Lagrangian Tracking and its Application to Granular and Fluid Flow Systems, 6th Int. Symp. on Mixing in Industrial Processes, Niagara-on-the-Lake, Canada.
4. Doucet J., Bouffard J., Dubé O., Chaouki J. and Bertrand F., 2008. Investigation of Mixing of Fine Granular Ingredients Using a New Bulk Radioactive Particle Tracking Technique, Particulate Processes in the Pharmaceutical Industry, Porto Rico.
5. Doucet J., Dubé O., Bouffard J., Bertrand F. and Chaouki J., 2008. Modeling the Mixing of Granular Materials with the Discrete Element Method: Present and Future, Particulate Processes in the Pharmaceutical Industry, Porto Rico.