

## Curriculum Vitae of Marco Derudi

### Education and Professional Experience:

MS in Chemical Engineering, Politecnico di Milano, Italy, 2001

Admission to Professional Engineering Council, Italy 2002

Research Fellow, Dip. di Chimica, Materiali e Ingegneria Chimica "G. Natta", Politecnico di Milano, Italy 2002-2004

Assistant Professor (scientific area: ING-IND/23 Applied Physical Chemistry), Dip. di Chimica, Materiali e Ingegneria Chimica "G. Natta", Politecnico di Milano, Italy 2005-2014

Associate Professor (scientific area: ING-IND/24 Principles of chemical engineering), Dip. di Chimica, Materiali e Ingegneria Chimica "G. Natta", Politecnico di Milano, Italy 2014-

### Principal Research Interests:

The research activity mainly involves the study of combustion and chemical reaction kinetics, industrial safety and environmental pollution problems. The common matrix of these activities concern the study, through preliminary experiments and a subsequent mathematical modeling of phenomena characteristic of each topic, using all analytical and theoretical tools of the Chemical Engineering. The experimental activity has been focused mainly on the design, construction, development and use of equipment on a laboratory-scale. The final goal is to obtain experimental data for the development and validation of mathematical models for simulation of the main phenomena involved in the process of interest.

All research activities were conducted at the dip. CMIC and in collaboration with several research centres (CNR-IENI, ENEA, CNRS), Italian and foreign universities and industrial partners. Since 2005 Marco Derudi is responsible of one research laboratory of the dip .CMIC, Politecnico di Milano. With this role, Marco Derudi has participated in several research programs, contributing to both research, organization and coordination activities.

Among the experimental activities, Marco Derudi has contributed mainly to the following ones:

- Design and construction of both a laboratory-scale burner for MILD combustion and an experimental atomizer of liquid fuels;
- Burner for the characterization of laminar premixed flames; studies on emissions control and formation concerning gaseous pollutants and particulate matter;
- Laboratory scale equipment for the characterization of emissions produced by combustion or degradation of solid materials;
- Design of a laboratory-scale equipment for the chemical / biological remediation of contaminated soils.

Conversely, among the modeling activities, Marco Derudi has contributed and he is still contributing significantly to the following ones:

- Chemical reaction kinetics of combustion;
- Gas treatment processes for pollutants removal;
- Kinetics and fluid dynamics of low-emissions MILD burners;
- Fluid dynamics design of both a system for the dispersion of PM aerosols and an experimental chamber for exposure clinical trials;
- Dispersion of hazardous compounds in urban areas or in congested environments through integrated models and techniques of computational fluid dynamics.

Thanks to his experience concerning experimental procedures for the detection of indoor air pollutants and quantification of exposure to toxic chemicals, in 2013 Marco Derudi has been involved in the activities of the EU technical body CEN/TC 421, that is elaborating a standard about "Emission safety of combustible air fresheners", and in a research project of the Consumers, Health and Food Executive Agency of the European Commission (Tender EAHC/2013/CP/06).

Author of more than 120 scientific publications in these areas (journals, books and proceedings of international interest).