



New Technologies and Innovative Quality Control Logics in Particulate Solids Waste Recycling

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Inclusive Resort, Cancun, Mexico**

Materials recycling at the end of their life cycle assessment (i.e. aluminum scrap from glass recycling, white house-ware, electronic board, electric and electric-mechanic devices, etc.) or deriving from the selective collection of urban waste or industrial waste (i.e. glass, plastics, aluminum alloys, metal scraps, slag, etc.) is assuming a more and more important role in many countries, primary in Europe where new and severe laws will force community towards integrated and low environmental impact recycling processes. In materials recycling, together with classical physical separation processes, sorting strategies play a fundamental role in order to realize a proper assessment of the materials characteristics in different stages of the process allowing this way: i) a better knowledge of fed materials characteristics and composition, ii) a better processing producing an high recovery of the materials of interest, iii) a reduction of materials to handle inside specific processing stage, iv) an energy saving and, finally, v) a general low environmental impact of the overall process and, finally, a continuous certification of the handled materials in all the different sections of the plant. Different innovative physical separation technologies as well as new sensing strategies finalized both to control and materials sorting, and related case studies, will be presented and analyzed, stressing those critical aspects that are at the base of the correctness of the different proposed approaches.

Course Outline

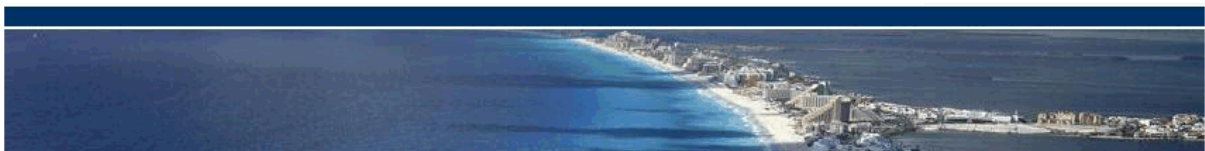
Main aim of the course is to present and analyze strategies and procedures, both in terms of innovative physical separation devices, sensing (detection-data-acquisition) architecture to utilize, targets and materials parameters to investigate and logic (algorithms) to apply, to efficiently define and innovative sorting architectures to utilize for bulk solid waste separation, quality control and recovered products certification.

Who should attend

Managers and engineers interested in innovation in the field of particulate solid waste recycling who want to understand the potentialities offered by the new technologies in real problems solving at recycling plant scale. All those who are planning, or that should like, to introduce innovative processing/quality control strategies in the recycling sector.

The participants will also receive:

CD with course material.
Certificate of completion.





A copy of instructors recently published articles related to new technologies and innovative control logics in solid waste recycling.



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Dr. P.C. Rem is a physicist who has worked as a researcher in the oil and gas industry (Shell Research) and in recycling. He has published over 100 papers on science and raw materials technology. At present, he is an associate professor at the Faculty of Civil Engineering at Delft University of Technology, heading a group of 14 researchers, PhD-students and technicians at the Recycling Laboratory. He is inventor of 20 patents on process technology, of which four are at the basis of new companies. In 2008, he won the two-yearly "Entrepreneurial scientist" award of TU Delft for Resteel and Inashco, two high-tech companies in steel scrap purification and bottom ash processing. In 2010 he consulted the National Environment Agency of Singapore on a waste processing facility to reduce the load on Singapore's land fills.



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Robert Leefink is a waste manager. He studied Mechanical engineering and Economics. After five years of management consultancy at Delft Hydraulics and Geodelft he privatized a public owned landfill and recycling company for two Provinces in the Netherlands and managed public and private owned waste collection and recycling companies. Five years ago he started his own business, investing in a simulation tool for design and operations management of processing plants for solids. This tool, focusing on the on-spec production of recovered raw materials and mixtures from waste, is developed in cooperation with the Faculty of Civil Engineering at Delft university of Technology. The La Sapienza University of Rome contributes with several waste characterization projects. Robert worked abroad for several public and private clients. From 2007 to 2010, he was project manager of a Sino-Dutch knowledge exchange and education program on waste management with governmental organizations and universities in the Netherlands and China. He aims at combining theory and practice to avoid the wastage of scarce raw material.



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Prof. Giuseppe Bonifazi is Full Professor of Particles and Particulate Solids Processing. He has an extensive experience over 25 years on characterization of particulate solids by image processing. Main scientific and technical fields object of investigation: i) study of software and hardware integrated architectures for the synthesis, the classification and the recognition of numeric signals; ii) development and set up of procedures for the identification of objects and material using pattern recognition techniques based on classical and hyperspectral imaging and iii) analysis and the application of methodologies to study and model industrial processes with reference to particulate solids waste materials.



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