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*BASE CHEMICALS AND POLYMERS MANUFACTURING**

▲ Who should attend?

Graduate engineers looking for a general approach to the polymer industry.

▲ Duration

72 days

▲ Dates & Location

March 3 to June 30, 2008
Rueil-Malmaison (Paris)
Ferrare (Italy)
Alençon (France)

▲ Tuition Fees

€ 9,950
Transport and living expenses non included

▲ Course Coordinator

Carole Le Mirronet

Ref. **PTF / PPM**

OBJECTIVES

To provide a theoretical and applied expertise in monomer manufacturing, polymerization processes, storage and transport of products. Environmental, safety, quality and economic aspects are also covered.

On completion of the program, participants are able to:

- take part in studies involving the design, sizing and technical-economic analysis of the processes and main equipment used in the refining, petrochemicals, polymers and plastics sectors
- become rapidly operational on taking up a position in production due to in-depth knowledge of the problems encountered in industrial plants, particularly where safety and environment are concerned
- interface with research and development and production departments within companies
- handle the quality aspects of manufactured products and liaise between suppliers and processors of plastics materials.

COURSE CONTENT

BASE CHEMICALS AND MONOMERS MANUFACTURING — 9.5 days

First and second generation monomers.
Basics of chemical reactions, description of industrial units, operating parameters, purification, polymerization grades.
Plant visit.

CHEMICAL ENGINEERING AND BASICS FOR POLYMERIZATION — 20 days

Position of macromolecular chemistry, polymer structure, conformation and properties, characterization methods.
Polymers derivated from the main monomers.
Chemistry of polymerization. Rheology. Chemical engineering of non-Newtonian viscous media.
Different types of industrial processes (batch or continuous polymerization).

POLYMERS MANUFACTURING — 5 days

Main polymerization reactions and processes, unit description, main operating parameters, technical evolution of processes, troubleshooting, main producers, trends of the market, economics.
Overview of polymer processes.
Plant visits.

FROM INNOVATION TO INDUSTRIAL REALITY — 10 days

A period of two weeks in Italy is organized with lectures including case studies and plant visits.
Development of a product (PP) and associated process, main characteristics of PP, manufacturing industrial process, main relations between the operating parameters and final characteristics of the product.

RISK MANAGEMENT — 6 days

Methodology for organizing a sustainably safe and clean operation of petrochemical plants.
Reaction run-away, powder explosions. How to handle toxic chemicals.
Life cycle analysis of products.

TECHNICAL AND ECONOMIC STUDY — 11.5 days

General economics, competitors analysis, benchmarking.
Conceptual study of a new petrochemical plant project.

OVERVIEW OF POLYMER PROCESSING(1) — 10 days

Structure of polymer processing industry.
Various processing technologies.
Optimum technico-economical selection of material during a final product development.
Resin specifications, process control and quality control.
(1) 5 days are spent at the "Institut Supérieur de la Plasturgie", in Alençon - France (ISPA).

** This program is the second part of a 16 month maste's degree program at IFP school. In order to take benefit from this module, you must be familiar with the topics covered in module 1 described in the course number 34.*