

PRESENTATION ABSTRACT**Presentation topic: The history of freeze drying and its evolution in the latest 50 years****Speaker:**Mr. Giorgio Ferrato
Business Manager Europe**Company:**

IMA Edwards

Presentation abstract:

- The new requirements of the pharmaceutical industry brought the industry to a ne re-thinking of the freeze drying process.
- New trends in reducing the manufacturing costs have created dedicated and smaller aseptic environments.
Following this cost reduction, the freeze dryers have been designed in order to reduce the energetic consumption.
This has been achieved by replacing the heat exchangers with consequent reduction of the diatermic fluid quantity and by the construction of new shelves with less weight, increasing in this way the efficiency.
- New automatic washing systems, pressure vapour sterilization, with innovation like nitrogen cooling, two stage screw compressors allowed to achieve a higher efficiency of the equipment.
- The improved uniformity of the final temperatures ease the validation process of the equipment.
According to the new needs of the pharmaceutical industry also the layout of the freeze dryers has undergone some changes; due to space constraints, systems can be now configured on two or three-levels.
- Contamination issues in the aseptic environments, due to operators working in the loading/unloading phases, brought at a rapid development on the loading systems, too, from semi-automatic to fully automated ones.