

Health & Wellness

Chemical engineers in the pharmaceutical industry work toward the advancement of wellness, disease prevention, treatment and cures

What ChemE's Do:

Some traditional roles:

- Scale-up from R&D
- Pilot plant ops and clinical supplies
- Management of validation assurance
FDA regulations and GMP compliance
- Packaging and labeling (tablets, capsules, liquids, etc.)

Less common roles for ChemE's:

- Chemical production management
- Process simulation and troubleshooting
- Project support
- Process safety support

Chemical Engineering is Fun Because:

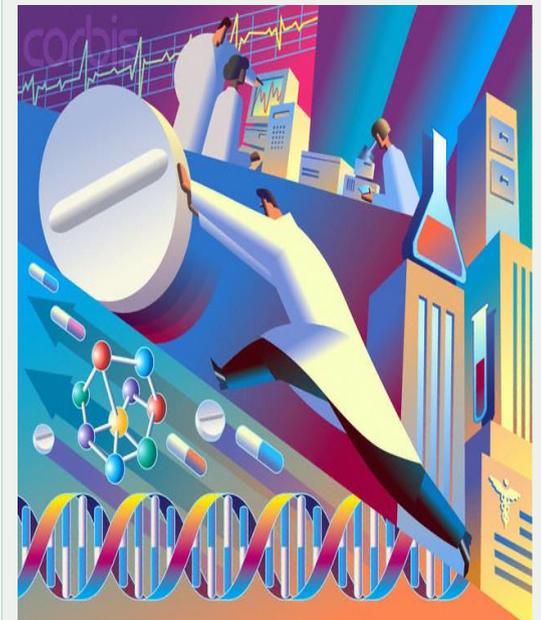
- There are opportunities to experiment in the Lab and in the Pilot Plant (Pilot plants are used for larger scale testing.)
- You work with large scale equipment
- You play a key role in bringing crucial products to market like water, fuels, electricity, polymers and medicines
- You work with many technologies
- You work with people from many trades and specialties
- You are always learning

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Chemical Engineering in the Pharmaceutical Industry



Prepared by: Greg Hounsell
AICHE, NY Metro Section

What it Looks Like

1



2



3



What it Does

1

These are the basic reactors, filters, pumps and piping used to make the raw or bulk pharmaceutical drugs before they are transformed into the tablets and capsules that consumers are familiar with. This can sometimes be very dangerous and environmentally sensitive, so a knowledge of safety and environmental controls is important.

2

This is a packaging line where pharmaceutical tablets, capsules and liquids and syrups are prepared for market in presentations that consumers are familiar with. Various forms, like blister packs, vials, bottles, foil packs, etc. are produced here. The packages are of high value for their size, so handling security, and labeling accuracy are important.

3

This is an area where bulk pharmaceuticals are converted to tablets and capsules for consumer use. Prevention of contamination and overall quality control are naturally important here. Sometimes it is necessary to conduct these operations under sterile conditions.

Uses these Engineering Principles

1

Engineers need an understanding of reactions and kinetics, heat transfer, fluid flow, distillation, extraction, crystallization, and filtration. They need an understanding of process instrumentation to design the control systems.

2

Engineers need familiarity with material flow, scheduling, and time and motion science.

3

Chemical engineers need to understand operations like vacuum drying, spray drying, freeze drying, tablet creation, and tablet coating. The science of sterility, cleaning and humidity control are also critical here. All personnel and material movement must be controlled in a precise way.