



The CECON Group, Inc.

Science and Engineering Consultants

Chemical Engineering Consulting

Summary:

CECON assembles teams of experts to develop the basic technology package needed to design and build chemical plants and specific unit operations. Experienced chemical engineers, plant chemists, regulatory and other experts (product quality, simulation, waste disposal, raw material procurement) work together focused on the client's process.

Chemical Engineering Deliverables:

Chemical engineers and other technical team members have process and plant experience relevant to the client's process. They work together to develop basic chemical engineering data, including:

- Battery limits plant concept and process philosophy
- Unit operations and major process equipment
- Process flow diagrams
- Piping diagrams and lists
- Process chemistry, catalysts
- Raw material specifications
- Heat and mass balances
- Simulation modeling as needed (Aspen or other)
- Final product specifications and quality metrics
- Plant testing and test methods protocols
- Utility needs and flow diagram
- Waste product characterization and treatment
- Early design stage process hazard review
- Regulatory standards compliance.

Some clients request that technical data be free from valid and non expired patents and proprietary technology in order to avoid licensing fees.

CECON will work with the client to select chemical engineering firms specializing in final design, procurement and construction. This firm will work with the basic data package developed by CECON to complete the final engineering design, P&IDs, procurement and construction.

CECON Helps You By:

- **Saving you money and time** with focused and experienced engineering teams developing the desired process, often avoiding licensing fees.
- **Assembling teams of experts** covering all technical disciplines needed to develop the basic plant and process engineering data.
- **Developing basic engineering data** packages for chemical unit operation, chemical plants, polymer plants or pharmaceutical facilities.
- **Coordinating with other** firms for final design, P&ID, procurement and facility construction.

Representative Past Projects:

Optical Coating	Design of a manufacturing facility to produce a photochromic polymer for optical coatings.
Coating Equipment	Team of six chemical and mechanical engineers created concepts for unique process for coating proprietary materials. With client interaction, the selected equipment was successfully designed, built and delivered.
Polymer Plant Basic Data	Assembled the basic chemical engineering data, including Aspen process simulation, to manufacture an engineering polymer with a capacity greater than 50 thousand MT/year.
Coal Gasifier Reactor	Developed basic engineering data for the design and operation of Fischer-Tropsch coal gasifier reactor.
Inorganic Carbonate Process	For the Middle East, developed the basic engineering data and process to manufacture an inorganic carbonate.
Vinyl Chloride & Polyvinyl Chloride Plants	Engineering team helped develop proposals to maintain, modify or expand plants producing vinyl chloride monomer and polyvinyl chloride in South America. CECON experts have assisted in designing or operating VCM and PVC facilities around the world, including ethane to VCM and dehydrogenation of propylene.
Biochem Plant in China	Biochemical engineer and biochemist assessed low productivity amino acid plant in China. Visit to plant and analysis of plant quality and process records uncovered possible routes to improve yields.
Lump Charcoal Plant Feasibility Study	Chemical engineers developed preliminary design, investment and operating cost estimates for producing charcoal in an under-developed country. Required engineering assessment of plant and furnace options, available skill levels and safety.
Biomass/Syngas Conversion to Liquids	Small team developed capital and operating costs for two cases of biomass syngas conversion to liquid chemical and fuel products. Required analysis of furnace and catalyst technologies similar to traditional coal/syngas Fischer-Tropsch technology, adapted to various wood/rubber feed blends available in the U.S.