

OptiPlant Configurator is a knowledge-based engineering application for optimizing plant layouts by automating 3D Modeling and Pipe Routing. The Optiplant work process involves integration with front-end process engineering tools and costing tools to reduce time and allow for more options. Optiplant optimizes the plant layout through an iterative process that is fast, interactive, and involves multiple elements including equipment, piping, and structures. Once the process is complete, the deliverables include drawings, reports, and MTO.s. Best of all, the data can be carried to the next stage and is not thrown away.

Optiplant, a new member to the ASD OPD suite of products is based on mature technologies (pipe routing algorithms developed over 12 years) combined with cutting edge tools (latest graphics engine and web portability). The benefits to the business model include:

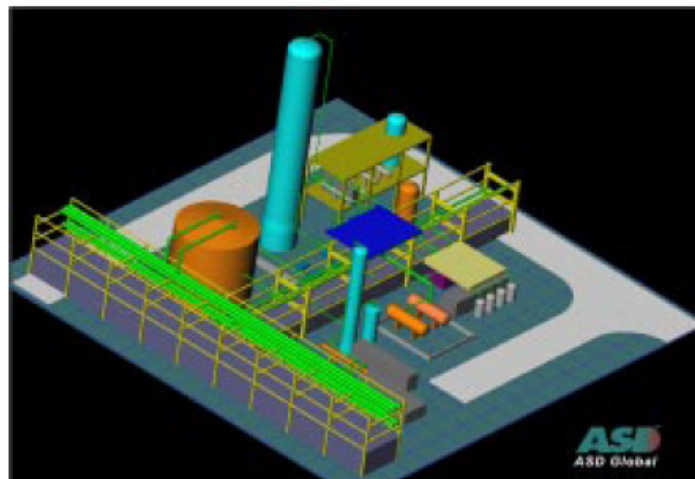
- ✓ Reduces amount of time to select an optimal plant layout based on maximum safety and minimum cost
- ✓ Allows for evaluation of more options
- ✓ Shortens overall time to market
- ✓ Integrates with leading products for greater value

Functionality and Features

- ✓ Create equipment and structures from existing libraries.
- ✓ Stand-alone graphics engine requires no CAD knowledge.
- ✓ Enter equipment data through fill-in-the blank parametric form interface.
- ✓ Many editing tools including.. Move.. Copy.. Rotate..etc.
- ✓ View handling and rendering using scroll wheels or mouse.
- ✓ New: Generate a 3D Model from an equipment data sheet in EXCEL or Text Format.

- ✓ Integrated 3D modeling & routing in one package.
- ✓ Routes generated are optimized and interference free.
- ✓ Several piping rules are applied automatically including: tower-hugging, accessible valve placement, pump templates, line prioritization and many more.
- ✓ Conforms to ANSI Piping Material Standards

OptiPlant is used here to model a conceptual design of a chemical plant. Several equipment, structure and piping elements are shown.



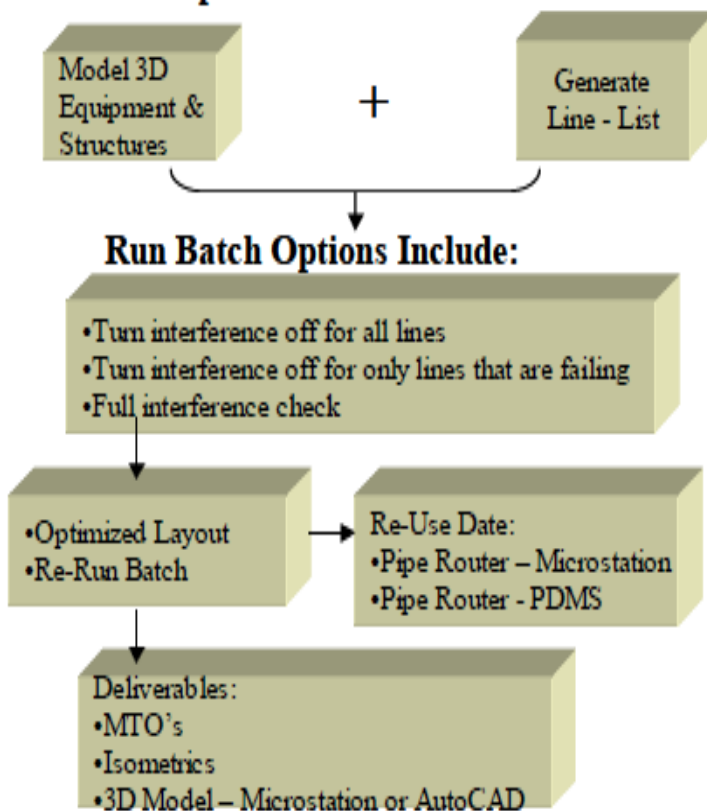
Deliverables

- ✓ Generates MTO report of optimized routes which includes total cost-information based on client cost data.
- ✓ Creates equipment summary and structure MTO reports
- ✓ 3-D model can be imported into other software packages including Microstation and AutoCAD

Automatic Pipe Routing

Automatic Pipe Routing is one of the most powerful features of this program, which incorporates knowledge-based software to produce efficient and rapid pipe routes.

OptiPlant Work Process



The program automatically routes each line to find a clash free, cost efficient route. By default the program complies with ANSI piping design standards. A cost factor is assigned for the piping according to material, pipe size, number of bends and unsupported pipe sections. The user can also influence the piping route produced by editing these cost factors.

A series of rule based Nozzles are associated with each equipment type. The program will apply nozzles according to equipment orientation and position. However, user has the control over the placement and orientation of the nozzles. The sequences in which the lines will route depend on the pipe material, size and branch connections. Valves may be placed automatically by the program or specified by the user.

The program's tower hugging feature forces lines to use towers as a support. Pump lines may be routed in symmetrical or asymmetrical arrangements. Tees are automatically sequenced according to the location of the branch lines connected.

OptiPlant is very flexible by allowing the user to customize individual pipes or whole batch of pipes according to preference. The user may change various parameters that govern the way the line will be routed such as bend to bend distance, routing cost factors, valve locations etc.

"The combination of easy to use interface of the modeling environment and power of the automatic routing produces a very useful capability that can be used in detail design as well as in the conceptual phase of the design. Designers as well as Process Engineers are comfortable with this product because it does not require any other 3D CAD software"

*~ Larry Killingsworth
Manager
Air Products*