THE ULTIMATE GUIDE TO
PLANT 3D

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Applied Software®

The Ultimate Guide to Plant 3D

This guide was written to empower you to become a Plant 3D expert. Use this eBook to enhance the way you work and get a step ahead of the industry.

What is Plant 3D?

Plant 3D is an Autodesk application targeted to the design and layout of process plant facilities. It has the tools and features designers need to create detailed plant models, including piping, structural and equipment built on the familiar AutoCAD platform. Using spec-driven technology and standard parts catalogs, designers can streamline the placement of piping, equipment, support structures, and other plant components.

What can a designer do in Plant 3D?

• Create and edit P&IDs
  - Create P&ID quickly from Industry-standard symbol libraries.
  - Use data validation to quickly identify possible errors.

• Create and edit accurate 3D models for structural steel, pipe and equipment customized to fit many process applications.

• Create piping specs.

• Extract and edit piping orthographic drawings.

• Automate piping isometrics.

• Automate project specific reports.

• Create documentation for BIM models.

[Overview Video](#)

What can you do in Plant 3D?

Use Plant 3D to create and edit P&IDs, work with 3D models, extract piping orthographics, and work with isometrics with this industry-specific toolset for plant design.

Intelligent P&IDs

Each component placed into a P&ID drawing has data that links to the Data Manager. With the Data Manager, users can view data reports, export them to a spreadsheet or a CSV (comma separated values) file and import them back into the program.

• Quick PID drafting with in-context AutoCAD commands.

• Project-specific tag and report formats enable customization to client standards.

• Data validation quickly determines data consistency and identifies potential errors.

• Industry-standard symbol libraries in tool palettes . . .

A dynamic P&ID drawing is created by combining various types of components and lines, from which data reports can be produced and edited. Each P&ID component and line has an assigned layer name, color, scaling factor, tagging behavior, and other properties that are set up as part of the project.

• Components include equipment (pumps, tanks, vessels), nozzles (flanged or flow), instruments (control valves, flow meters, instrument bubbles), inline components (valves and reducers), non-engineering items (connectors, flow arrows, other items lacking reportable data).

• Schematic lines include pipe lines (primary and secondary line segments, jacketed pipe segments) and signal lines (electrical, hydraulic, pneumatic).

P&ID Component and Line Symbols:
Plant 3D includes a set of component and line symbols based on P&ID industry standards, PIP, ISA, ISO, DIN, and JIS. The P&ID tool palette provides a visual library of the symbols or components and lines that are used to create and document P&ID drawings.

Component and Line Creation:

If the user notices there are components and lines that are not part of the out-of-the-box symbol libraries, it is likely that they were created and added to the tool palette by an administrator. The default symbols or those provided by an administrator are recommended to ensure they comply with company standards and will show up in reports. If needed, AutoCAD objects can be converted to P&ID components or lines.

Need a Plant 3D administrator? Contact Applied Software for a discovery call to find out how the Plant 3D experts at Applied can get you through the hardest parts of Plant 3D administration?

3D Modeling

• Rapid plant modeling in 3D.

• Parametric equipment templates.

• Structural modeling.

• Creation of project-specific piping specifications . . .
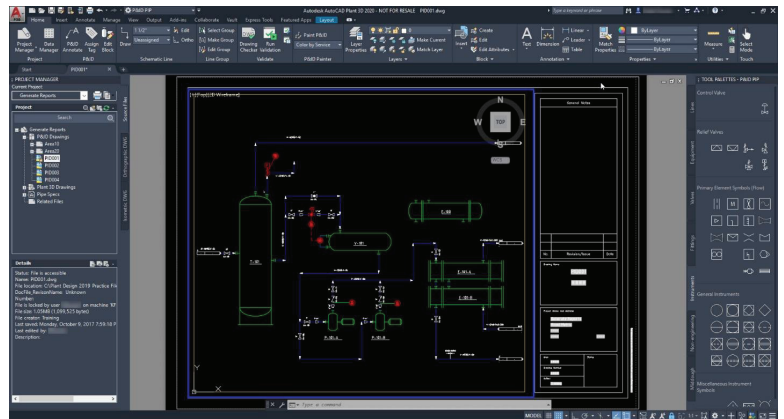
Users can customize piping specifications to meet job requirements. Spec Editor creates and modifies specs, which include a spec sheet and a branch table. Parts can be added to the spec sheet and used in Plant 3D when routing pipe. Spec Editor will do the following:

- Create, view, and edit a spec.

- Add parts to a spec sheet from a catalog.

- Set part-use priority for part groups based on part size.

- Assign parts for use as branch fittings.

- View, filter and locate parts in parts catalogs.

- Assign wall thicknesses to DIN parts.

- Export a spec sheet to Excel or import a modified spec sheet from

n even be reviewed and checked for interferences by

ᴐk Navisworks Manage.

Piping Documentation

• Create automated, project-specific reports.
• Document BIM models.
• Create and edit piping orthographic drawings.
• Produce automated piping isometrics – snapshots of the models created using styles . . .
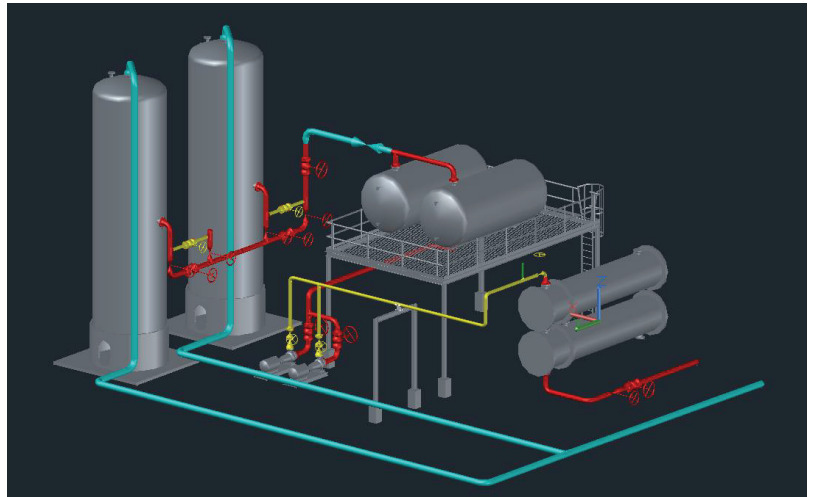
Configuring AutoCAD Plant 3D Isometrics
Getting the Most Out of AutoCAD Plant 3D Isometrics
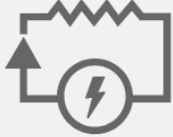Connecting Piping Design in Plant 3D to Piping Fabrication Through Spoolgen

Piping Deliverables

• Piping isometrics – Plant 3D offers automated isometrics that can be customized with title blocks, symbols, flow arrows, supports, insulation symbols, and more.
• Orthographic drawings (sections and plans) – Sections and plans are made easy with Plant 3D. View ports are infinitely adjustable with viewcubes and an enhanced interface for creating detailed and easy to read sections and plans.
• Reports – Create automated, project-specific reports, and document BIM models.

Installation & Purchase

New to 2019, Autodesk announced that AutoCAD 2019 will no longer be separated into different distinct programs. Instead, subscribers to AutoCAD 2019 can access multiple offerings referred to as "specialized toolsets" from their Autodesk Account. Included in these toolsets is Plant 3D, formerly known as AutoCAD Plant 3D 2018.

AUTOCAD	ARCHITECTURE TOOLSET	ELECTRICAL TOOLSET	MECHANICAL TOOLSET	PLANT 3D TOOLSET
MEP TOOLSET	MAP 3D TOOLSET	RASTER DESIGN TOOLSET	AUTOCAD WEB APP	AUTOCAD MOBILE APP

Installation Links

Plant 3D System Requirements
Guide for installing Plant 3D
Installation and configuration
Selecting content packs
Installing for Autodesk Vault (plant projects)
Installing Object Enablers
Plant Collaboration in BIM 360 Design

Purchasing

The Plant 3D toolset is included with AutoCAD including Specialized Toolsets. For a quick discovery call about Plant 3D and AutoCAD subscriptions, or to talk to an account manager, contact Applied Software today.

When purchasing BIM 360 for Plant 3D, you must use a BIM 360 Team hub. The product manager of Autodesk PlantTools applications for AutoCAD Plant 3D/P&ID, taught a class at Autodesk University 2017 about how to share AutoCAD Plant 3D software with BIM 360 Team and Fusion Team for collaboration. The class, Collaborate with AutoCAD Plant 3D and BIM 360 Team, included: sending the AutoCAD Plant 3D project into the cloud; checking DWGs in and out; the workflow with BIM 360 Team; and limitations.

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Common Challenges

1. Line Tagging – Access David Wolfe's how-to video to learn the best practices of line tagging in just 25 minutes.

2. Isometric Title Block Setup

One of the most common challenges when setting up Plant 3D with a new user is the isometric title block. A customized isometric title block with a company's logo and other custom information is often essential to project deliverables.

3. Local Data Cache Purger

4. Reporting Tools Customization

5. Pipe Specs

6. Custom P&ID blocks

7. Line List

Worksharing

1. Plant 3D + SQL Server

2. Plant 3D + Vault

3. Plant 3D + BIM 360

Training

See Applied Software LiveLab Learning training calendar for Plant 3D opportunities.

For the basics of using Plant 3D and more in-depth features, visit Autodesk Knowledge Network Learn.

Find Plant 3D related news, tips, tricks, Plant 3D content packs, applications, and other useful information on Autodesk Plant Exchange on Facebook. There is also an Autodesk Plant Exchange on Twitter.

You can search for previous years' Autodesk University classes that pertain to Plant 3D.

Autodesk Resources

Autodesk describes AutoCAD Plant 3D as specification-driven software for creating 3D models of process plant components – routing pipe, adding equipment, adding components, and including support structures. Within Plant 3D, the underlying data is exchanged directly among the 3D model, P&IDs, isometrics, and orthographics, ensuring that the information is consistent and up-to-date.

Autodesk YouTube Channel with video tutorials and product and industry videos.

AutoCAD Plant 3D videos – video content for users getting started with Plant 3D.

Autodesk Knowledge Network – AutoCAD Toolsets page with video tutorials on Plant 3D features and using Plant 3D.

Includes videos:

• Quick PID drafting
• Rapid plant modeling in 3D

Includes learning articles on:
• P&ID components and lines – In the tool palettes, Plant 3D offers the standard symbol libraries for PIP, ISA, ISO/JIN, and JIS.

- Working with annotations – Annotation and reports can be customized to meet the project or client standards.
- Validating P&ID drawings and Plant 3D models – Rules can be defined to scan P&IDs for data consistency errors.
- Equipment – Parametric templates can enable faster plant equipment layouts.
- Structure – Industry standard steel sections (AISC, CISC, DIN) enable efficient layout of structural components.
- Project-specific piping specs – Piping specifications can be customized to meet the project standards.
- Working with orthographic views – Piping ortho drawings can be extracted from the 3D model and updated real-time.
- Isometric drawings – Piping iso drawings can be created directly from the 3D model.
- Collaboration workflow – Create BIM models for the plant in collaboration with other teams.
- Project-specific reporting – Reports can be formatted then automatically populated from the 3D model.

Python Scripting

Interested in custom Python scripts for Plant 3D?
See this AU presentation by David Wolfe, Applied Software Director of MTG Services.
David also wrote a three-part blog series on the topic:
Custom Python Scripts for AutoCAD Plant 3D – Part 1
Custom Python Scripts for AutoCAD Plant 3D – Part 2
Custom Python Scripts for AutoCAD Plant 3D – Part 3

Performance

AutoCAD Plant 3D is built on the general purpose CAD engine platform of AutoCAD. Since AutoCAD is used for many things, it is not optimized for 3D graphics. AutoCAD Plant 3D default settings are not set up specifically to favor editor response speed over display quality.

When looking to improve performance, the first thing to consider is using the Visual Styles Manager to reduce 3D display detail. You can also use 3dconfig to set options that affect the graphics card hardware performance.

Performance increases can be accomplished by turning off disconnect markers, breaking up large drawings using external references and operating in 2dwireframe mode. Plant 3D palettes not being used can be closed when working in the model. For example, closing the Data Manager can improve performance, especially when editing. Project Manager can also be closed (as opposed to Auto-Hide) to improve performance.

AutoCAD Settings

There is no single best AutoCAD setting for performance, because some settings are designed to disable features needed for selecting and editing.

The most significant choice is between 2D and 3D view modes. 2D modes can display 3D objects that look similar to 3D wireframe, but the modes use a significantly different redraw database.

The 3D redraw database is designed for quality and response, but not scalability. In practical terms, this means that in 3D view modes, performance deteriorates faster as the model in the display gets larger.

Changing to 2D wireframe with silhouettes off can significantly improve performance. If dispsilh is turned off to improve performance in wireframe, isolines should be set to 4. Piping also uses plantpipesilhdisplay, which displays silhouettes for tube segments when dispsilh is off. For more information, see Control the Visual Style of the Plant 3D Model.

Some alternative settings could cause undesired behavior. For example, turning off pickfirst speeds up browsing, but it disables the select connected parts shortcut menu. Dragging in 2dwireframe can be slower than 3dwireframe. The best performance configuration depends on how the user is working with the model. Setting a low viewres speeds up dragging in 2D mode. Facetres is a similar variable that affects 3D views.

Vtoptions can be used to set a fast transition speed, lower the performance (fps) threshold, or disable view transitions.
Other settings that are not specific to display can be used. For example, unused layers can be frozen to improve performance, instead of turning a layer off.

Users can also turn off features not used. For example, the properties window does not need to be open until it is needed. Tracking, dynamic input, and even grips can be turned off when not used.

Breaking up larger drawings into smaller ones using external references can significantly improve performance. For example, equipment, piping, and structure can be placed into different drawings, and large drawings can be broken up by area.

RESOURCES

Webinars

How to Manage Plant Skids & Packages With Plant Express

Presented by: Owen Whitehouse

7 STEPS TO SUCCESSFUL PLANT 3D IMPLEMENTATIONS

WEBINAR

HOW PLANT 3D BOOST WILL TAKE YOU *TO THE MOON AND BACK*

AUTODESK® AUTOCAD® PLANT 3D

Each image is clickable and will take you to a free on-demand webinar. Let us know what you think!

PLANT + BIM 360 PROCESS: DESIGN FROM ANYWHERE

Presented by: Kaleb Flowers

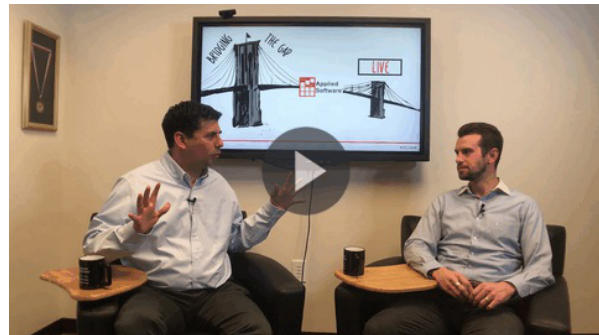

MASTER REPORTING WITH THE PLANT 3D WOLFE
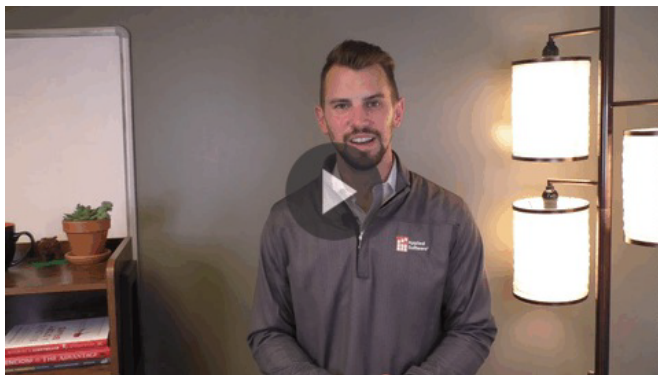
RESOURCES

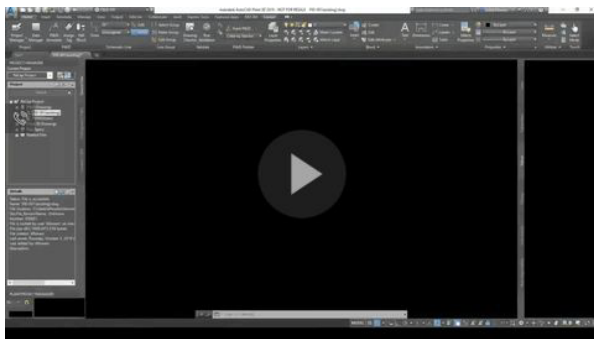## Plant 3D Feature Videos

Chat with David Wolfe

Trends in Plant 3D

Plant 3D FAQ

Each thumbnail is clickable and will take you to a free feature video. Let us know what you think!

As-Builts Using Point Cloud

Master Plant 3D Reporting

Thanks for reading!

Let us know what you think! Email marketing@asti.com for comments and questions.