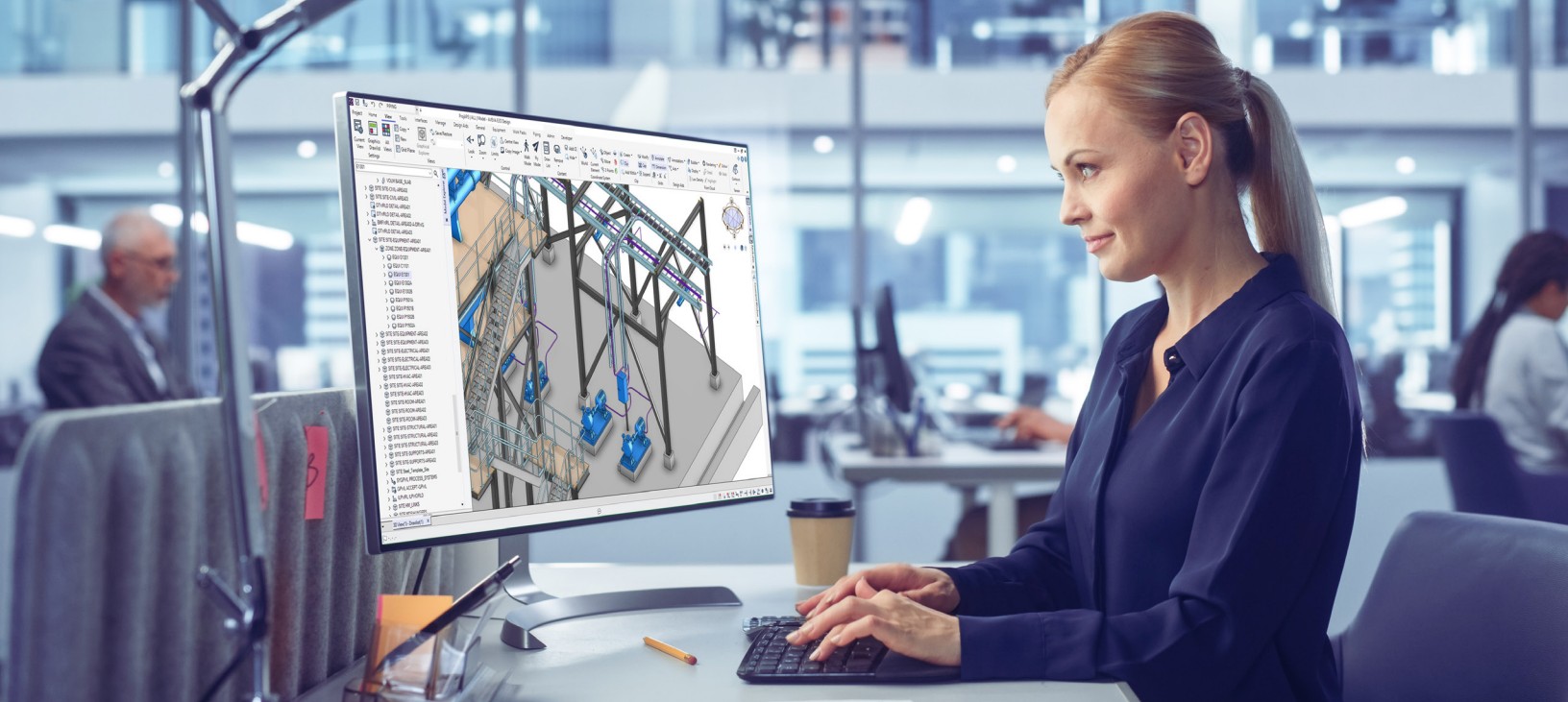




DATASHEET

AVEVA™ E3D Design

Seamless, collaborative 3D design—anytime, anywhere

AVEVA E3D Design, available as part of AVEVA™ Unified Engineering, is an advanced, powerful 3D engineering design solution that gives engineering teams the tools they need to seamlessly create, design, and collaborate on projects in the cloud in a clash-free multi-discipline environment. Created for the process plant, marine, and power industries, AVEVA E3D Design maximizes engineering and design efficiency while minimizing rework. AVEVA E3D Design allows teams to rapidly generate accurate drawings and reports to reduce costs, timescales, and commercial risks associated with greenfield and brownfield capital projects.

AVEVA Unified Engineering is a comprehensive 1D, 2D, and 3D engineering and design solution. By situating all engineering tools into a common tech stack, AVEVA Unified Engineering empowers teams to continuously build the foundation of the digital twin and seamlessly collaborate so they can track, demonstrate, and deliver better, more efficient project outcomes.

AVEVA

Rapid business benefits enable bottom-line results

Intuitive interface streamlines adoption

- Minimal staff training requirements enable rapid ramp-up to full productivity
- Quick, easy connection of individual remote workers and globally dispersed teams to project data

Start global projects fast

- Set up new global projects in hours, not days, with minimal system administration
- Templatize and re-use previous project work

Realize new design efficiencies

- Tools are available for use from any authorized machine via linked browser access to the application
- Adopt a seamless, intuitive user interface
- Make informed decisions and bolster project management using accurate and comprehensive change and status reporting
- Import design data from AVEVA schematic applications and automatically create corresponding 3D objects from 1D and 2D data
- Import electrical data from AVEVA schematics tools, route cables according to configurable rules, and return accurate cable lengths for future construction

Minimize rework, maximize efficiency

- Efficiently and comprehensively detect clashes to eliminate costly on-site rework in the design stage
- Use laser scans directly within the 3D design space to update the design model and enable rapid and effective correction or accommodation of any non-compliant construction
- Produce accurate drawings, reports, and bills of materials (BoMs) directly from the 3D project model
- Automatically produce rule-based drawings to ensure fabrication and construction drawings meet project standards and are based on the most up-to-date design data

Stay compliant every step of the way

- Consistently enable high-quality design using rule-based automation and configurable consistency checking, significantly reducing person-hours
- Streamline collaboration and ensure compliance, best practices, and contractual requirements with change highlighting, tracking, and status management

Seamlessly execute projects from concept to handoff

- Build libraries of design assemblies or commonly used modules for reuse on new projects
- Rapidly and flexibly configure and reconfigure multi-location projects
- Advanced work packaging (AWP) capabilities support construction planning and path of construction activities

Scale up and out to meet future needs

- AVEVA E3D Design is a scalable solution with no limit on project size or complexity

Take a simple, integrated approach to design

Easy configuration

AVEVA E3D Design is seamlessly deployed as part of AVEVA Unified Engineering and can be quickly configured to suit specific company or project requirements, including:

- Data structures
- Access rights
- Design status controls
- Consistency-checking rules
- Report and drawing formats

AVEVA E3D Design makes it simple to manage multiple concurrent projects. Users can apply configurations at a project level and customize company- or project-specific procedures and workflows, enabling compliance with client requirements on individual concurrent projects. From there, teams can use built-in macro language and PML together with a .NET API to create custom, flexible functionalities to build valuable proprietary expertise.

AI Capabilities

Artificial Intelligence (AI)

AVEVA Unified Engineering has a host of inbuilt AI tools, designed to allow users to work more efficiently and effectively. Our AI tools augment user experience, assisting users to work smarter and faster.

Industrial AI assistant – AVEVA Proprietary cloud-based AI chat assistant

Talk directly to your engineering and design tools via AI to assist your teams with their project work. Soften the onboarding process for new staff, and capture and propagate institutional knowledge throughout your organization.

Predictive design AI assistant – Train ML models using your own data

Easily create your own machine learning (ML) models that address your own bespoke challenges without the need for coding. Upload your data, determine your parameters, and train and test your own models to optimize your inhouse processes.

Generative design AI assistant – In-built AI algorithms to build 3D models faster

Use AI to analyse design constraints and generate optimized layout options, for example pipe routing. Enabling faster, more informed decision-making, and ultimately more efficient designs ready for construction.

Intelligent Point Cloud Framework – Cloud-based AI classification of 3D laser scan data

AVEVA Unified Engineering automatically reads, imports, and displays point cloud data augmented with AI classification using AVEVA™ Point Cloud Manager and our industrial cloud platform, CONNECT. The augmented point cloud data is available in context, directly alongside the projects' integrated engineering and design data.

Marine capabilities

AVEVA E3D Design can work alongside AVEVA marine products on projects, creating a fully clashable and drawable hull model available to AVEVA E3D Design users. Users can also create hull symbolic views inside AVEVA E3D Design's DRAW module, making AVEVA E3D Design an ideal partner for any marine project.

Easily integrate laser scan data into the design environment

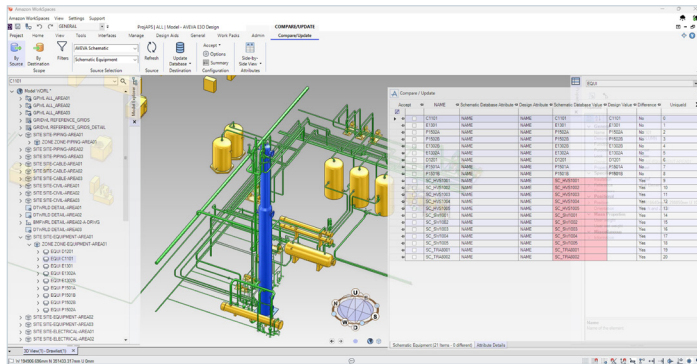
AVEVA E3D Design users can both import and interact with data from any laser scanner, including traditional static scanners and mobile, airborne, and handheld devices from a wide choice of manufacturers such as FARO, Leica, Geosystems HDS, Rieggl, Trimble Dimensions, and Z+F. AVEVA E3D Design's laser capabilities are based on point cloud technology and work with AVEVA™ Point Cloud Manager data sets.

With AVEVA E3D Design, companies can realize new value and efficiencies on both greenfield and brownfield projects. When designing modifications to existing assets, users can accurately align new design tie-in points while eliminating clashes between the new and existing construction. By rapidly importing laser scans of individual fabrications, modules, or the current status of the as-built site, users can easily verify imported information against the design model.

Incorporating new and unique technology allows the user to work in a fully immersed as-built environment. AVEVA E3D Design allows users to demolish parts of the point cloud data. When used with supporting work processes, they can demolish and add updated scans, delivering a trusted living point cloud.

Users can treat this as their 3D world for modeling, confident that they have the most up-to-date information possible.

The ability to demolish laser data and keep the point cloud up to date is critical, but AVEVA E3D Design goes one step further by allowing users to add the point cloud to drawings, as with any other model element. Now, rather than modeling old plans using incomplete or unclear information, users can represent up-to-date laser data in drawings with a simple, cost-effective laser scan — reducing person-hours and saving significant project costs.



AVEVA E3D Design can be used for multi-discipline design on a wide variety of complex projects across several industries

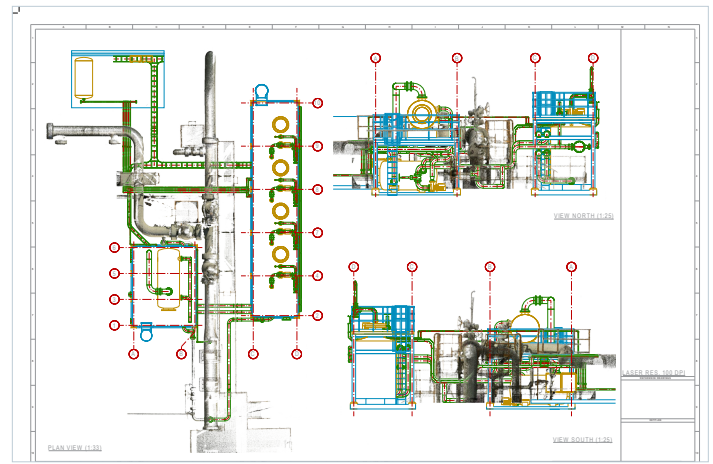
With access to one single source of truth, they can quickly resolve any non-compliance issues and ensure the project continues to run on schedule.

Machine learning module

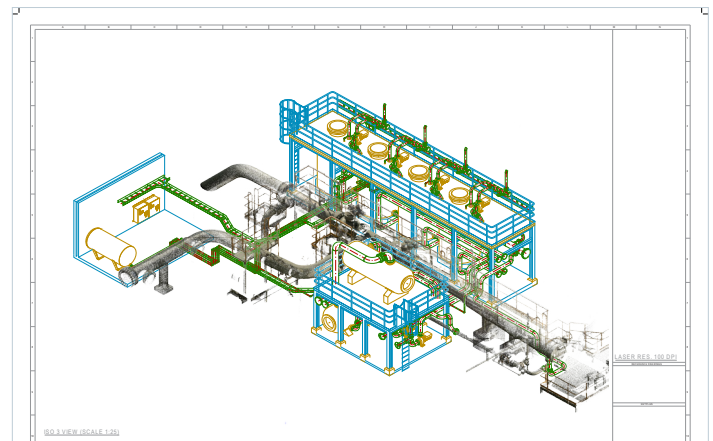
Easily import trained machine learning (ML) models directly from the user interface using PML to give users access to ML-enabled technology.

A seamless, streamlined user experience

By incorporating the latest technology, gesture interaction, and configurable context menus, AVEVA E3D Design streamlines the process of design, making it easier, more enjoyable, and more productive. Gain rapid access to frequently used functions using command accelerator, saving time and maximizing efficiency.



Layout and arrangement drawings can include laser data



Laser data in DRAW avoids the need to remodel existing constructions

AVEVA™ Model Simplification and AVEVA™ Native Model Simplification

These modules are available at no cost for all AVEVA E3D Design users and enable them to reduce file sizes by orders of magnitude. These modules import simplified versions of complex 3D CAD models of equipment items that have been created in external Mechanical CAD (MCAD) systems.

Optimal use of design automation and rules

AVEVA E3D Design features extensive design automation capabilities through rule configurations that respect engineering boundaries and access rights. These capabilities offer the productivity advantages of rule-based design automation while ensuring that design authority for changes remains with the relevant responsible disciplines.

If a non-compliant design feature is created, the system highlights and explains the non-compliance until it is corrected. By permitting a designer to create a provisional non-compliant feature as an interim step in the process of refining a compliant design, less experienced designers can rapidly increase their skills by learning while doing.

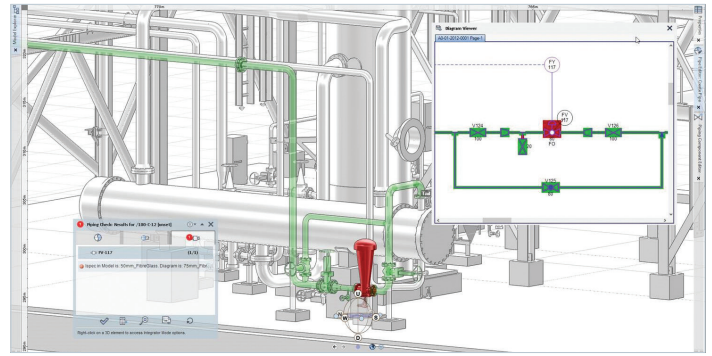
Similarly, users can configure rules for stairs, ladders, and handrails that follow project standards and designers can quickly and easily incorporate these standards-compliant structures into the overall design.

Automatic cable routing

As a standard feature, AVEVA E3D Design enables cable data sharing and allows users to import electrical data from AVEVA schematics tools. This facilitates accurate routing of cables according to configurable design rules and returning accurate cable lengths. Users can set preconfigured rules, define parameters such as tray fill levels, route selection, and signal/power cable separation to automatically route instrumentation and/or electrical cables into cable trays.



Automatic change highlighting



Integrated engineering – compare and update between P&ID and 3D model

In addition to direct data exchange through AVEVA Unified Engineering's electrical design tools, users can also obtain cable definitions or import this information from third-party systems via Microsoft Excel. Accurate cable lengths, including any excess allowances, can be returned in the same ways for the creation of BoMs and drumming.

Easily replicate standards across projects

AVEVA E3D Design enables companies to share and reuse data, engineering standards, catalogs, and reference designs between projects. This not only saves the cost and time associated with unnecessary duplication, it also eliminates many opportunities for error, maximizes the value of proprietary design expertise, and enables more efficient repeat projects.

Efficient management of subcontract work packages

Subcontracting work is common practice, and all companies must manage the interface with the subcontractor and validate their work before accepting it. AVEVA E3D Design provides unique extract functionality that enables a subcontractor to work independently and develop a design package without impacting the master project model. Upon approval, users can automatically incorporate that work into the project model.

Effective change management

Design is an iterative process, involving many continual changes as it progresses from the initial concept to its final, fully detailed state.

AVEVA E3D Design provides robust change management functions that enable designers to make and accommodate changes in a controlled manner, see what has changed, and automatically create an audit trail of changes as they work.

For example, AVEVA’s unique compare-and-update function enables AVEVA E3D Design piping designers to compare the definition of the line they are working on against the line list and P&ID data.

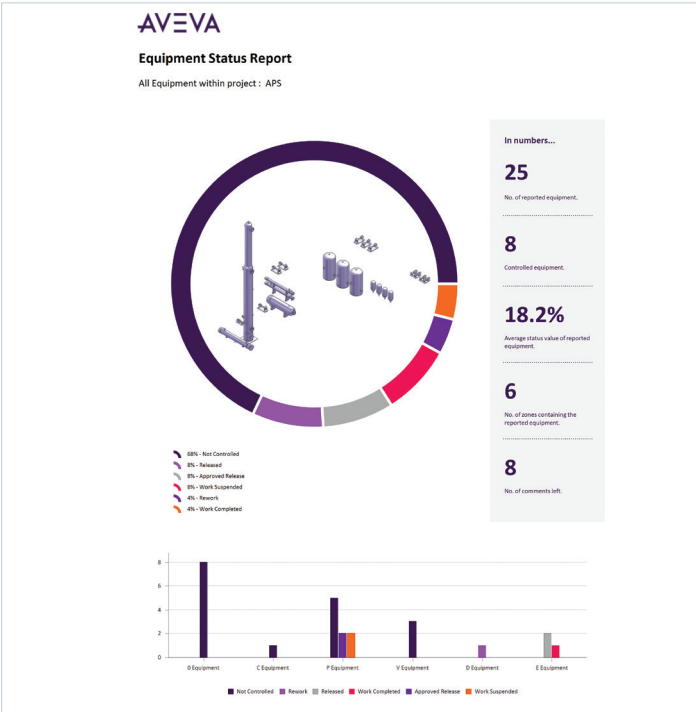
When designers identify differences, they can choose when to implement which changes, prioritize and plan an efficient workload, and ensure data consistency before producing deliverables.

They can highlight changes in the 3D model and in 2D drawings to communicate and ensure the visibility of changes until they are corrected.

Seamless clash prevention

Intelligent clash detection and highlighting between both individual design objects and between design objects and laser scans of an as-built structure helps designers avoid clashes as they work. Users can classify clashes for reporting and management purposes as “hard,” where objects physically occupy overlapping space, or “soft,” where objects’ exclusion volumes for accessibility overlap, or as intermediate conditions. All clashes are reported for project management purposes until eliminated.

- Inbuilt status control enables designers to clearly specify the status of their work and to easily understand the maturity of data from other disciplines that they work with
- Consistency checking between the 3D model and the P&ID highlights inconsistencies in the data and enables selective electronic updating
- Sophisticated data management and access controls ensure that each designer has the correct level of access to relevant project information
- Configurable design rule-checking enables users to extend or modify the default rules provided in the standard AVEVA E3D Design deployment, ensuring projects are meeting company or client-specific standards



AVEVA
Equipment Status Report
All Equipment within project : APS

Equipment Tag	Design Status Comment	Design Status	Status %
03SKID1-PUMPA	---	Not Controlled	0.0
03SKID1-PUMPB	---	Not Controlled	0.0
03SKID2-PUMPA	---	Not Controlled	0.0
03SKID2-PUMPB	---	Not Controlled	0.0
03SKID3-EQUIP1	---	Not Controlled	0.0
03SKID3-EQUIP2	---	Not Controlled	0.0
03SKID4-EQUIP1	---	Not Controlled	0.0
03SKID4-EQUIP2	---	Not Controlled	0.0
C1101	---	Not Controlled	0.0
D1201	Re-work Required	Rework	25.0
E1301	Phase 1 finished	Released	100.0
E1302A	Kick off meeting	Work Completed	40.0
E1302B	Kick off meeting	Released	100.0
P1501A	Release approved	Approved Release	80.0
P1501B	Release approved	Approved Release	80.0
P1502A	Requirement change	Work Suspended	15.0
P1502B	Requirement change	Work Suspended	15.0
PMP-10	---	Not Controlled	0.0
PMP-11	---	Not Controlled	0.0
PMP-7	---	Not Controlled	0.0
PMP-8	---	Not Controlled	0.0
PMP-9	---	Not Controlled	0.0
VESS-3	---	Not Controlled	0.0
VESS-4	---	Not Controlled	0.0
VESS-5	---	Not Controlled	0.0

Above and above, right: Examples of reports showing the design status of equipment in a project

Configurable deliverable automation

Many drafting tasks are repetitive. Configurable automation tools enable users to automatically generate annotated and dimensioned drawings, which can typically save thousands of person-hours on a project.

Since all deliverables — drawings, piping isometrics, BoMs, or reports — are generated directly from the definitive 3D design model, users can ensure a drawing's accuracy, completeness, and compliance with project standards.

AVEVA E3D Design's DRAW module also includes advanced 2D drafting tools that interact with the design model, enabling customers to quickly and easily add notes, annotations, sketches, and dimensions without the need for a separate 2D drafting system.

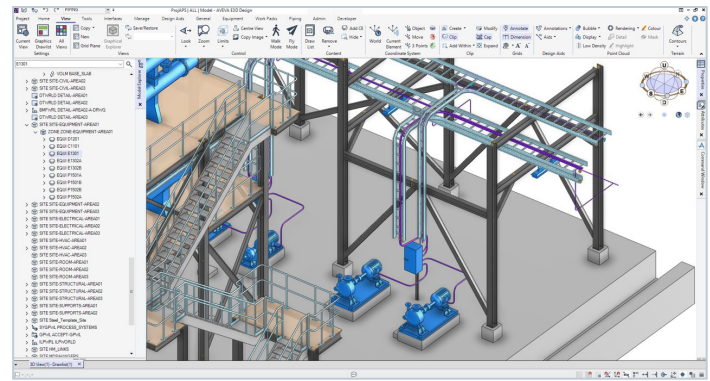
Object-centric data management

Unlike file-based design systems, AVEVA designs are database-driven. As designers work, they are creating an object-centric description of the entire project. Each object, such as a valve, pump, or pipe, can be viewed with extensive attribute and association data.

The project database represents a digital asset, which not only supports the access rights, change control, status management, and workflows required for efficient project execution, but can also be shared with AVEVA™ Enterprise Resource Management, ERP, and MIS systems for efficient business management. Companies can use this information to populate a client's information management system for asset life cycle management.

Project and discipline management tools

Designers, departmental managers, and discipline managers can use configurable status reporting in their day-to-day work to monitor progress, forecast workloads, and enforce adherence to workflows and change control.



User-adjustable edge definition, shadows, transparency and highlights make it easier to understand complex 3D models

Additional tools

To maximize and streamline new deployments of AVEVA E3D Design, users with no existing AVEVA infrastructure can leverage:

- System administration and configuration
- AVEVA catalog to define engineering specifications and component catalogs

Users can extend capabilities and efficiency with:

- AVEVA Global to manage distributed, multi-location working

AVEVA E3D Design add-ons

AVEVA™ E3D Whitespace Optimizer

AVEVA E3D Whitespace Optimizer frees technical staff from the time-consuming, repetitive, detail-focused burden of checking and editing automatically produced drawings. Backed by a powerful AI-enabled engine via CONNECT, our industrial intelligence platform, users can easily and efficiently use drawing whitespace to autonomously clean up annotations on drawing deliverables.

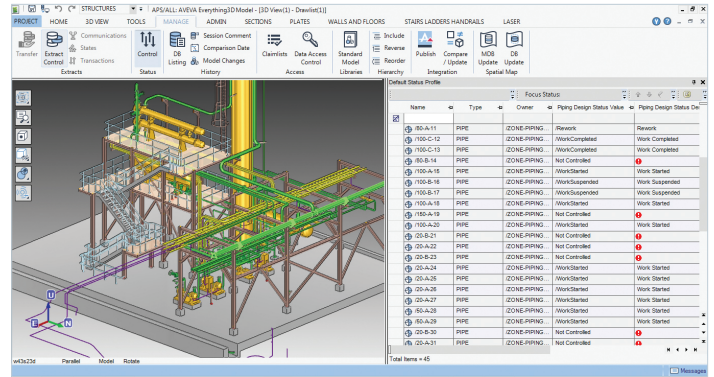
3DFindIt

3DFindIt is a free add-on that gives users access to Cadena's vast library of vendor-supplied, mechanical equipment models and data, which can be effortlessly integrated into 3D plant and ship models.

Training

AVEVA offers classroom training and online self-training in our secure cloud environment, giving them flexible options to deepen their knowledge with our team of experts.

To find out more or register your interest, please visit the [AVEVA training page](#).



Status information is managed in the 3D model and can be queried and included in reports

Talk to one of our experts to learn more about how AVEVA Unified Engineering and AVEVA E3D Design can optimize your engineering process from design to implementation.