

AVEVA PDMS

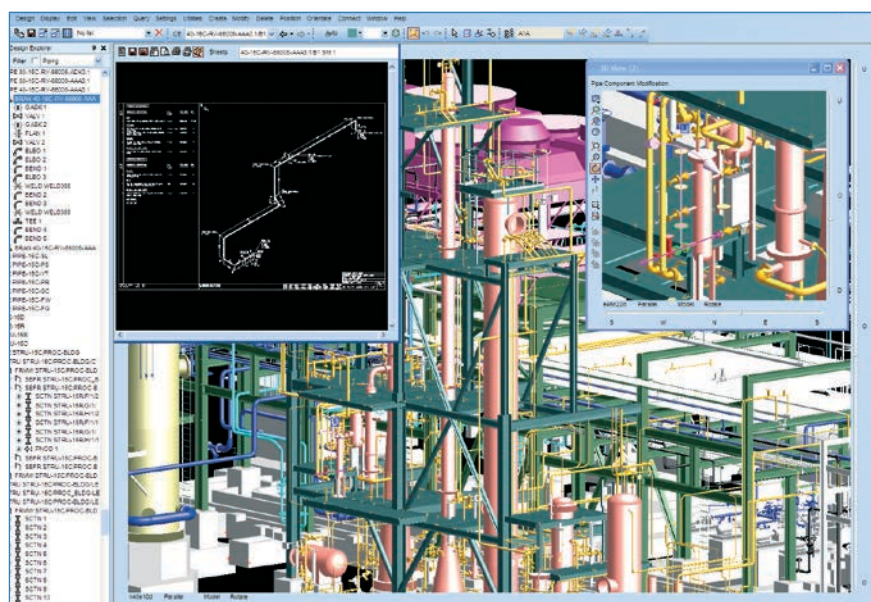
Accurate and clash-free 3D plant design

With ever increasing global demand for products from process and power plants, AVEVA PDMS™ enables companies to design, construct and maintain high quality plants quickly and efficiently.

Using PDMS, the logical model of a plant can be quickly and efficiently modelled into a full 3D design layout, where suitability and fit can all be tested in a virtual world, and the list of materials needed to construct the plant generated automatically.

PDMS enables teams of designers from a range of different disciplines to work concurrently to develop a complete digital model of a process or power plant. Each discipline works within its own specialist 3D environment, but is still able to view all of the design work taking place around them.

An extensive catalogue of predefined parametric components and objects can be quickly selected and positioned within the model, and then automatically checked for clashes and integrity using configurable rules. Changes made as the design evolves are highlighted and tracked, making it easier to identify, manage and communicate the changes across the different disciplines. The end result is a more accurate, better quality design that helps avoid costly on-site rework.



AVEVA PDMS can design every detail – even on the world's largest projects



Business Benefits

Reduced site rework

- Higher quality design. The ability to perform multiple design checks across the entire design eliminates errors, and enables 'right-first-time' engineering.
- Accurate materials information eliminates over-ordering and delays on site due to a lack of required materials or information.

More effective use of globally dispersed design teams

- PDMS, combined with AVEVA Global™, allows geographically separate design teams to work together as though they were in a single office. The environment delivers high performance for the designer, centralised administration and control, and protection from communication limitations or failures.
- Effective use can be made of design capability, wherever it exists. Project teams can be quickly assembled and mobilised.

Maximised project quality

- 3D multi-discipline working environment improves communication between teams and facilitates 'right-first-time' design.
- Clash checking and integrity checking ensure higher quality designs and less rework.
- Database-driven drawing production achieves consistency between drawings, reports and design data.

Business Benefits

Minimised schedule times

- Reduced site work, concurrent multi-location engineering, higher design efficiency and higher quality all combine to reduce schedule time.
- Greater ability to react quickly to major project changes, including the capability to change the project structure during execution and to dynamically add in new locations or remove existing ones, all protect the project schedule.

Overview

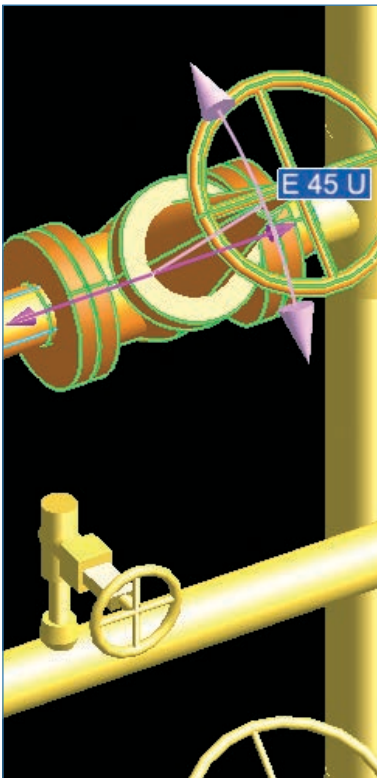
Working with PDMS, engineers and designers can achieve very high levels of productivity on all types of plant project, from the smallest plant upgrade project to new-build projects of unlimited size and complexity. PDMS users range from small engineering contractors to many of the world's largest multinational process and power companies.

As projects are increasingly executed globally, PDMS, combined with AVEVA Global, delivers powerful work-share functionality. This enables complex, multi-site collaborative projects to be executed using a 'virtual design office'. Projects can utilise PDMS resources wherever they are located in the world, and smaller EPCs can contribute to large projects as part of a global team.

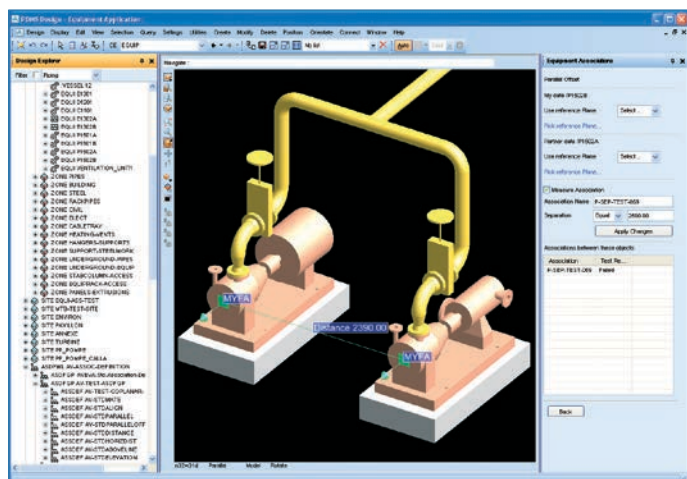
PDMS is highly configurable and customisable to fit the working practices of the organisation where it is being deployed. It can be easily adapted to integrate with existing work processes, but can also help drive business process change within an organisation to improve competitiveness.

Key Features

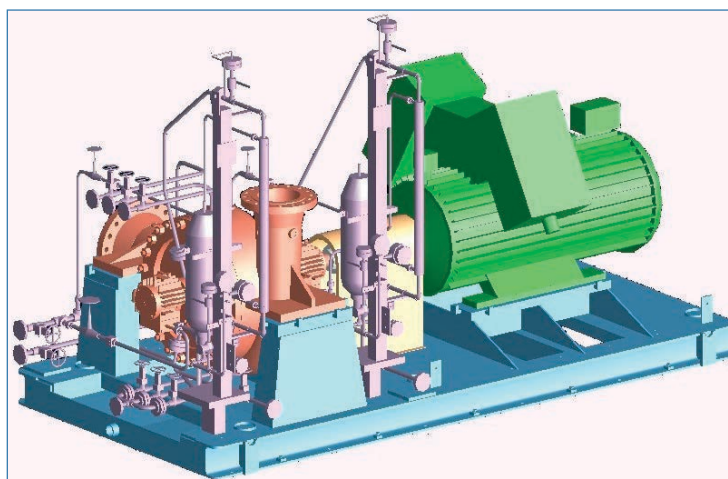
- PDMS provides a fully interactive, easy-to-use 3D environment for every designer on the project.
- As the designers work with their specialist functions, they have visibility of the entire design at all times. To create their part of the design they place instances of parametric components from a catalogue (under the control of engineering specifications) and, in doing so, construct a highly intelligent PDMS database.
- Clash checking and configurable integrity checking rules identify errors and inconsistencies across the design.
- Conventional issue, revision, and change-control processes can all be applied without introducing a large overhead or delays in projects which can have many hundred users.
- Advanced 3D editing features with graphical handles and numeric feedback make design and modification quick and easy.
- Built-in intelligence, combined with configurable rules and associations, ensures that designers are highly productive during all design and modification activities.
- Design and component information from earlier PDMS projects can be reused or shared across multiple projects. Utilities to change pipe size or specification enable rapid modification to adjust to new project conditions.
- The standard PDMS application can be customised to fit individual industry or project requirements, or to add further design rules or automation into the design process.
- Undo and Redo facilities are widely available. Whole or part projects can be rewound to any previous state.



Design and Modification is quick and easy – even for the novice user



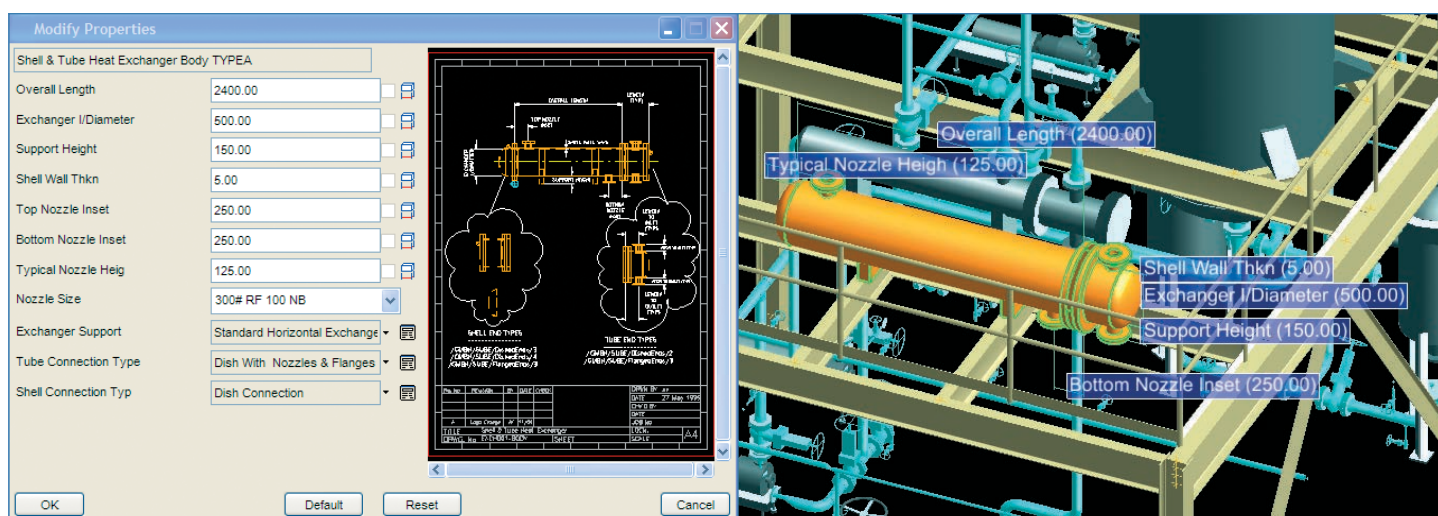
An example of association rules



A typical AVEVA PDMS Equipment model

Equipment

- The Equipment functions build 3D models for all kinds of plant items, from pumps and exchangers through to complex items such as reactor vessels and compressors. They are used in all kinds of layout studies, arrangement drawings and connectivity or clash checks.
- Multiple graphical representations are available, so that spaces required for key maintenance activities can be visualised and clash checked during layout and design.
- To create an equipment item in the design, the relevant template is selected and the required parameters are defined.
- Equipment templates allow complex parameterised design configurations to be defined so that they can be quickly and easily reused, even across multiple projects.
- Equipment items include intelligent connection points, with relevant attributes, for the connection of associated piping, ducting, instrument and electrical systems.

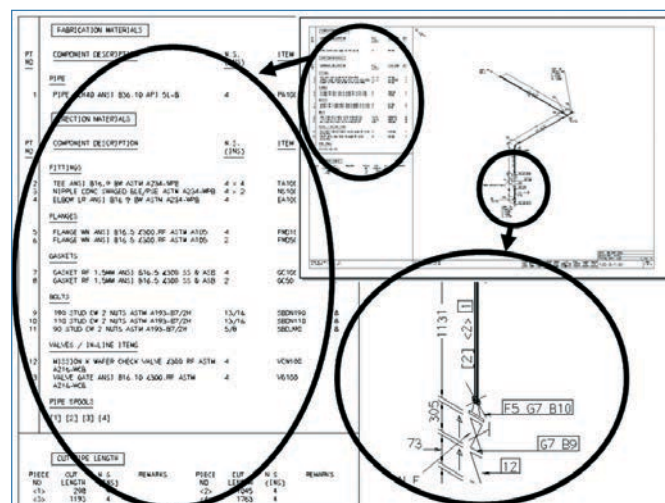


An equipment template

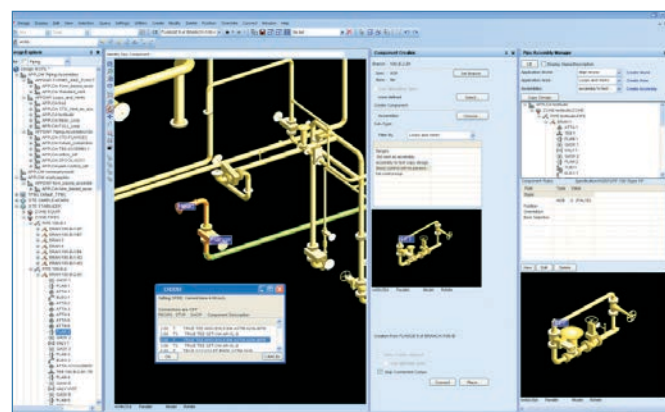
Key Features (continued)

Piping

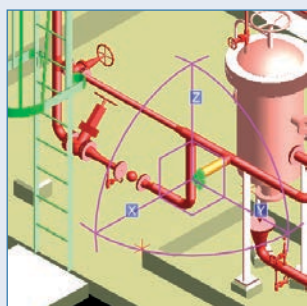
- The Piping functions build a fully detailed model of all piping systems, based on component catalogues and engineering specifications. From the piping model, Piping General Arrangement drawings, isometric drawings and bills of quantity are produced.
- A full range of automatically generated piping isometrics is available, from complete system isometrics, through to fabrication and erection isometrics and individual spool isometrics. An enormous number of options are available to fit any given industry, national, company or project requirement.
- PDMS manages and integrates all stages of the piping workflow from initial conceptual routing at the beginning of a project, through basic and detailed design and on to individual pipe spooling at the fabricator.
- PDMS piping integrates with AVEVA Multi-Discipline Supports™ for the detail design of pipe supports, and with specialist pipe stress applications, via the AVEVA Pipe Stress Interface™. Custom interfaces to flow calculation systems, wall thickness calculation and other software can easily be created.
- The Automated pipe routing function allows a preliminary route and MTO to be created very quickly. The routing includes an automatic selection of required items such as gaskets and flanges.
- The Quick pipe routing function enables the user to define the route of a pipe by using the mouse pointer to specify changes in direction, either in absolute terms, or relative to other model features. The route can be orthogonal or non-orthogonal and sloping pipes are fully supported. Components can be positioned explicitly or using feature snapping. The route can be completed automatically where completion is predictable.
- Sophisticated modification capabilities are available at each stage to allow the piping design to be further developed. These include highly interactive graphical editing functions, together with functions to apply specification and pipe bore changes across the line, and to define and modify slopes.



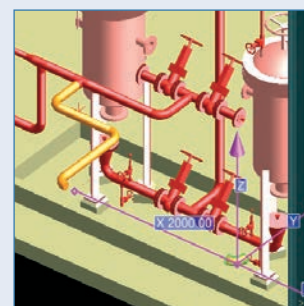
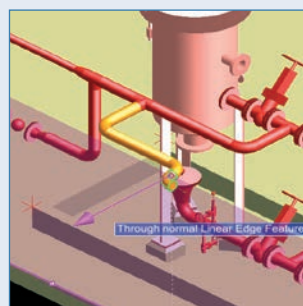
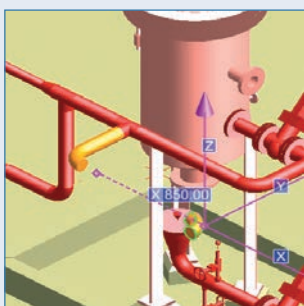
Piping isometrics with full MTO are produced automatically



Regularly used pipe assemblies can be stored and re-used throughout the design

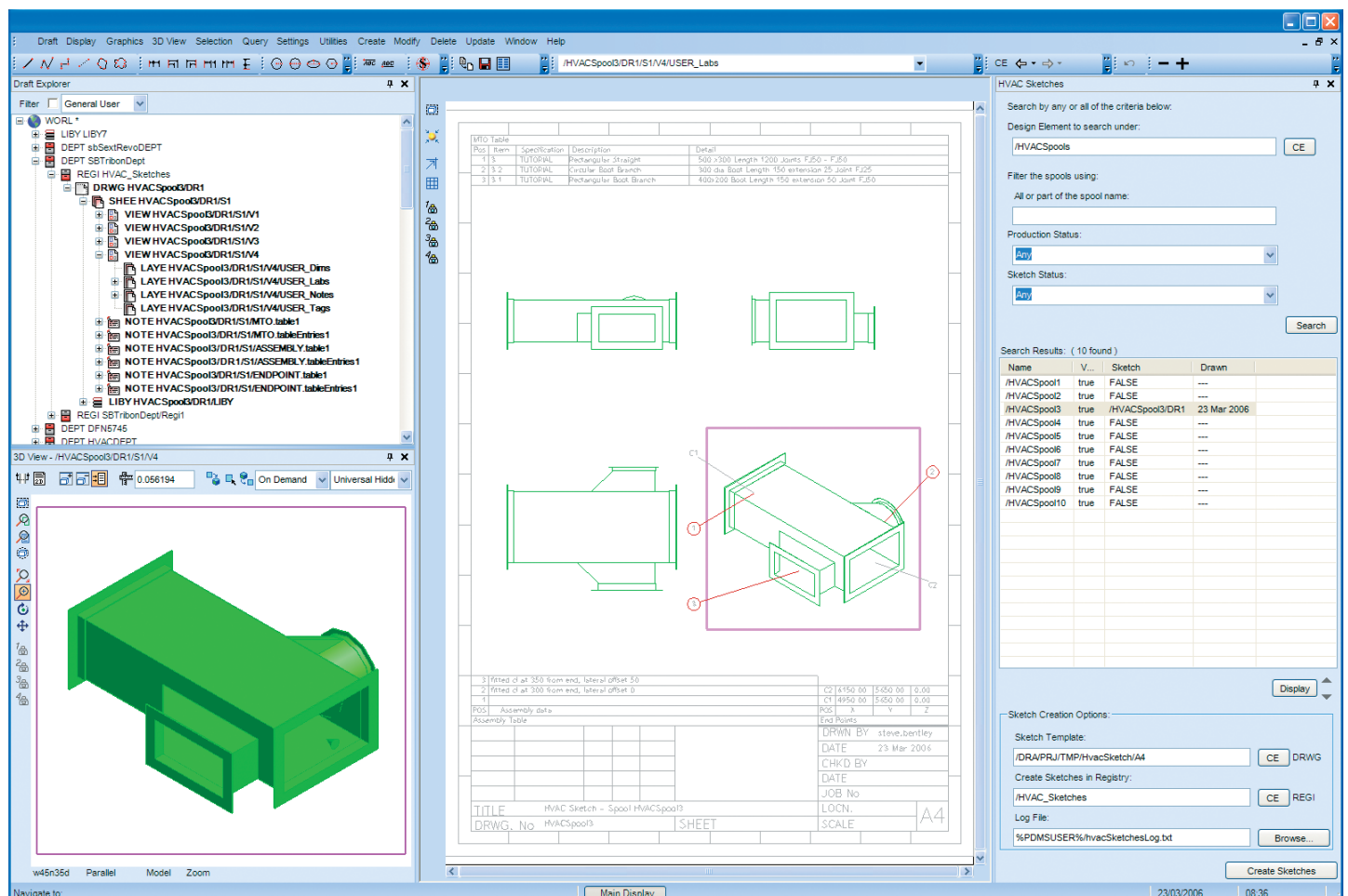


Quick pipe routing



HVAC and Ducting

- Piping assemblies such as vents, drains or control sets can be added to the design as an entity. Existing configurations can be saved as assemblies and reused elsewhere.
- All drawings, including Piping General Arrangements and isometrics, have associative dimensions and intelligent annotations, and can therefore be updated automatically in line with design changes.
- Accurate MTO information can be generated on each sheet or drawing, or via separate reports for any system, line, area, and so on.
- As the design reaches fabrication, the PDMS spooling functionality manages the creation of individual spool isos, including the creation of fully intelligent weld items in the model database, which can be maintained across multiple revision cycles.
- PDMS provides a specialist function for the design of all types of ducting.
- The function uses an engineering specification to select parametric components from a catalogue allowing a full 3D model to be built.
- A Fill command automatically fills the straight parts of the route with the appropriate number of straight lengths.
- In-line equipment such as dampers, vanes, diffusers and hoods can all be included.
- The ducting model can be split into spool parts for manufacture and pre-assembly and automatic spool and isometric drawings can be automatically produced.
- PDMS integrates with AVEVA Multi-Discipline Supports for the design of ducting supports.

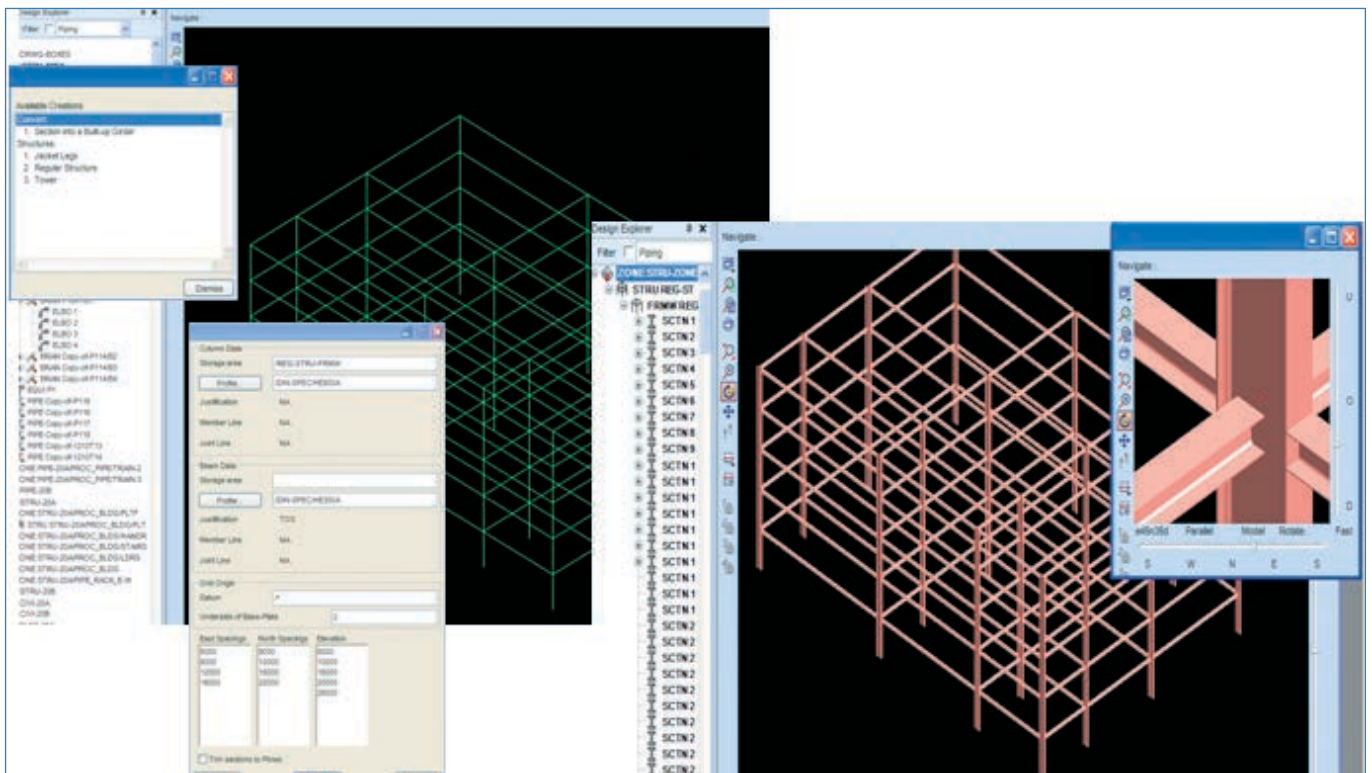


Ducting design and spool drawing

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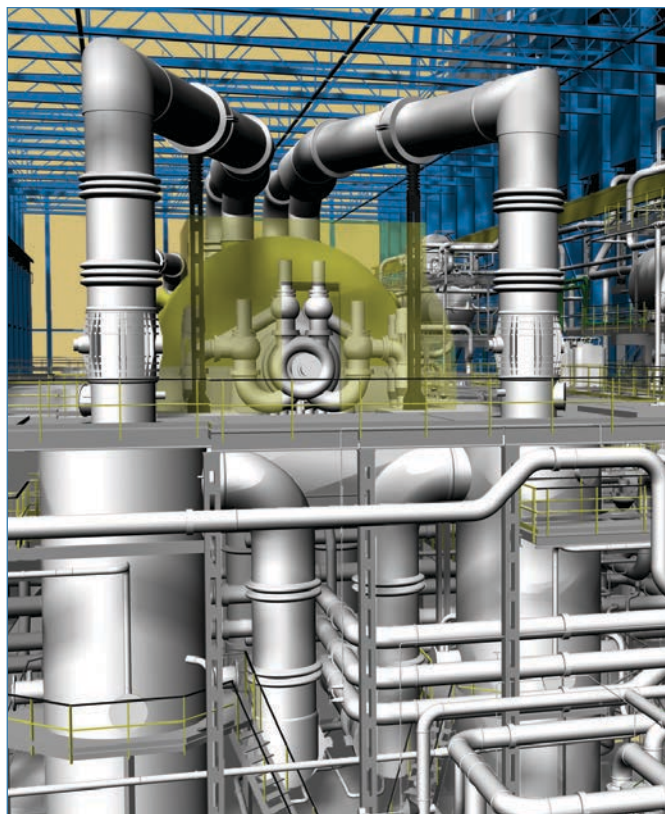
Structural and Architectural

- PDMS contains a number of specialist functions for the design of steel and concrete structures found in typical process and power plants. A wide range of layout/arrangement and detail component drawings can be produced, together with accurate weight and MTO information.
- The Beams and Columns function defines and maintains a fully connected nodal network of structural sections including all joint and fitting details. A simple regular structure can be created in a single step. The nodal network, coupled with the ability to define loads in the model, supports integration with analysis software.
- Standard bracing configurations are available and can be customised as required.
- Curved, tapered and built-up beams are all available.
- The Panels and Plates function defines and maintains flat panels of any shape.
- The Walls and Floors function enables designers to define and maintain walls and floors of standard shapes.
- Fittings can be added to all types of beams, plates, walls, floors and so on, to apply items such as doors, windows, intelligent piping penetrations, stiffeners, lifting lugs and fire-proofing.
- Access Platforms, Stairs, Ladders can all be included in the 3D model.
- Intelligent, parametric penetrations can be defined (together with full details such as kick plates), and connected to the structure and the penetrating item (for example, pipe or duct) so that alignment and other checks can be carried out.
- Structural modelling makes extensive use of parameterised catalogues for components such as section profiles, joints, and fittings. These catalogues can be added to by the user to suit particular project or other requirements.
- Profile catalogues cover the leading international and national profile standards, including angles, channels and I-beams.
- Joint catalogues contain standard types of joints including cleats, end plates and sniped end preparations. Joint definitions are parameterised so that, if a section related to a joint is resized, the joint can be resized automatically.
- Fitting catalogues contain a selection of parameterised structural and industrial fittings including lifting lugs, stiffeners, windows and doors.
- A range of interfacing options is available to link to specialist analysis software and specialist structural fabrication systems.



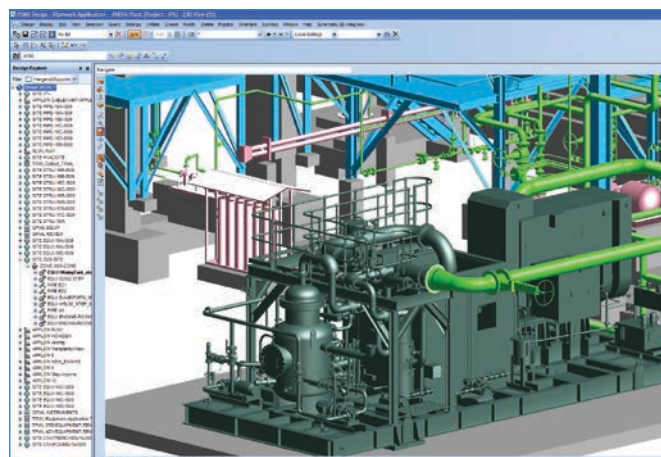
Regular structures can be designed from a single input form

Key Features (continued)



PDMS 3D model visualised in AVEVA Review™

Courtesy of Paks
Nuclear Power Plant



Mechanical Equipment Models can be imported into PDMS using specialised interfaces

Customisation and Configuration

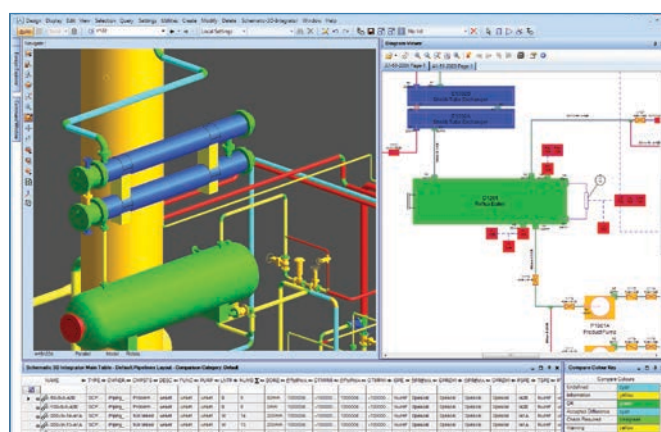
- There is a customisable graphical user interface, and powerful object-oriented macro language for customising the operation of the system to fit the needs of any particular project, industry or workflow, to add custom automation functions or to create interfaces with in-house or third-party applications.
- An open programming environment allows customers to develop their own applications on top of the standard PDMS. The .NET technology means that these applications can be written in any compatible .NET language, such as C or C++, as well as in PDMS's programmable macro language (PML).

Localisation

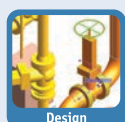
- PDMS supports Unicode throughout so that an extensive range of international character sets can be used for data, catalogues, drawings, reports and user interfaces, including many multi-byte (Asian) and single-byte (European) character sets.
- Feet/inches and metric units are available throughout.

Integration and Interfacing

- PDMS is fully compatible with AVEVA E3D™ and the two products can be used together on the same project data at the same time.
- PDMS integrates with AVEVA Bocad™ for structural design detailing and fabrication.
- A variety of interfaces to analysis systems (eg for pipe and structural stress) & third party design systems (eg for import of mechanical equipment models) are available.
- A wide variety of data exchange formats is supported, including DWG, DXF, DGN, SDNF, CSV.



Adding AVEVA Schematic 3D Integrator to PDMS allows P&ID/3D comparison



AVEVA PDMS is one of AVEVA's Design products, which create 3D models for detailed design and produce all associated deliverables

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