

# AVEVA Mechanical Equipment Interface

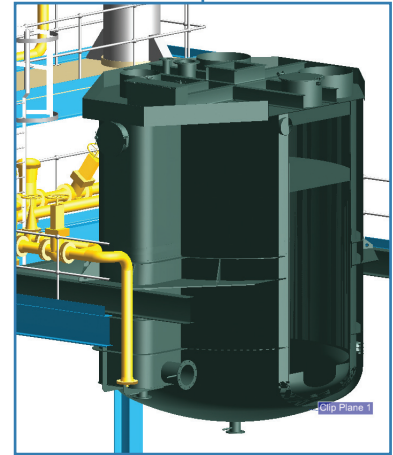


## Your Questions Answered

This document answers a number of questions you may have about the AVEVA Mechanical Equipment Interface. If you have any further queries, please don't hesitate to ask your AVEVA representative or contact us online via: [www.aveva.com/contact](http://www.aveva.com/contact)

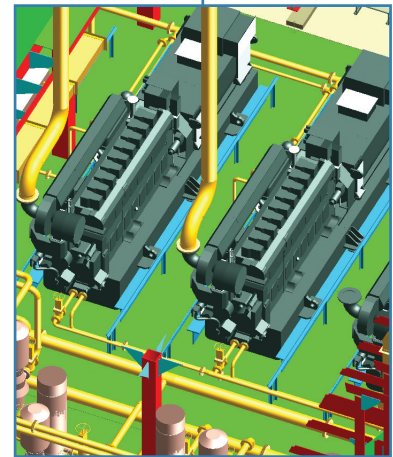
### Q1. What is AVEVA Mechanical Equipment Interface?

- A. AVEVA Mechanical Equipment Interface is a new product from AVEVA. It allows customers to import 3D models of equipment items created in other Mechanical CAD (MCAD) systems directly into AVEVA PDMS or AVEVA Outfitting. Imported equipment items are first inspected and validated in an intermediate holding area in the database before being inserted into the topical design database. These items behave in exactly the same way as other AVEVA PDMS/Outfitting objects.



### Q2. How does it work?

- A. Model import uses the STEP AP203 protocol. All of the imported parts of a 3D model become individual PDMS/Outfitting parts. Using Mechanical Equipment Interface users are able to:
- select the STEP file of the MCAD model
  - sort and filter individual parts of the model for manipulation
  - specify the appropriate Display Levels and Obstruction Volumes
  - graphically replace the display representation of the parts with simple primitives
  - specify connection points and nozzles on the model to be used for connecting pipes and electrical cables



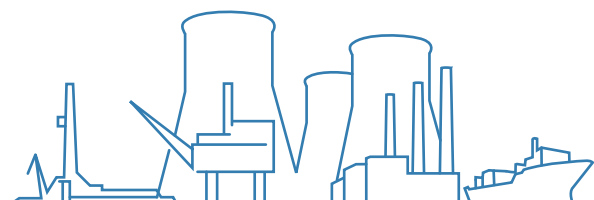
### Q3. Is Mechanical Equipment Interface part of the standard PDMS or Outfitting products or is it an additional product?

- A. Mechanical Equipment Interface is a separate add-on product for both AVEVA PDMS and AVEVA Outfitting. It is sold as two separate modules, one for importing models and one for exporting models. The import and export modules are licensed and priced individually, to enable customers to select their required degree of functionality.



Version 1 - Published November 2009

Image 1 courtesy of ANDRITZ OY. Image 3 courtesy of Howden.



# AVEVA Mechanical Equipment Interface



## Your Questions Answered

### Q4. Why was Mechanical Equipment Interface developed?

- A. There has for many years been considerable customer demand for a robust means of importing 3D models of mechanical equipment into the AVEVA Plant and AVEVA Marine 3D design environments. To meet this demand, however, required overcoming a major technological barrier.

The 3D MCAD applications used for designing equipment items represent solid objects by defining surfaces, a technique known as Boundary Representation (B-Rep). In contrast, design applications like AVEVA PDMS and AVEVA Outfitting model 3D objects as aggregations of solid geometric 'primitives' such as spheres, cones, cylinders and blocks. Each technique is optimal for its particular purpose, but the two are mutually incompatible at the deepest level.

AVEVA has now overcome this incompatibility in an innovative and unique way by incorporating B-Rep capability to define equipment items in the AVEVA PDMS/Outfitting design database. Users will now be able to quickly and easily import accurate and detailed equipment models and expose them to the full capabilities of the AVEVA solution set. This will save direct man-hours in the design stage, eliminate many potential sources of error and rework, and improve productivity across an entire project.

### Q5. Does Mechanical Equipment Interface work just one-way or is it two-way?

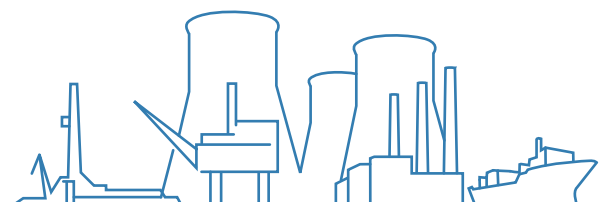
- A. Mechanical Equipment Interface provides an efficient and intuitive Graphical User Interface (GUI) for importing STEP AP203 models, as this will be the predominant need of its users. Users can also export items in AP203 format from the PDMS/Outfitting command line.

### Q6. From which 3D MCAD applications does Mechanical Equipment Interface support the import of STEP AP203 data?

- A. Mechanical Equipment Interface has been thoroughly tested to support the import of 3D models in the form of high-quality STEP AP203 data from all the major 3D MCAD applications. These include CATIA V5, SolidWorks 2009, UGS-NX V4, Inventor, Pro/ENGINEER and CADD5. AVEVA does not support the import of any STEP AP203 data if it has not originated in one of the major MCAD applications. Prospective users should check with their AVEVA software support engineer for further details.

### Q7. Can I import a complete plant or ship model designed in an MCAD system using the Mechanical Equipment Interface?

- A. Mechanical Equipment Interface has been designed and configured to enable the efficient import and export of Mechanical Equipment items to and from AVEVA PDMS or AVEVA Outfitting. This only imports the geometric description of the item and a few properties, not all of the data properties associated with it. In theory a complete plant or ship model could be imported in this manner but it is likely there would be performance problems in PDMS and the resulting model would consist only of geometry data. For these reasons AVEVA neither recommends nor supports the import or export of such complete plant models via the Mechanical Equipment Interface.



# AVEVA Mechanical Equipment Interface



## Your Questions Answered

### Q8. Can I replace my 3D MCAD application with AVEVA PDMS/Outfitting?

- A. The simple answer is almost certainly 'No'. As explained previously, PDMS/Outfitting and 3D MCAD applications are each optimal for their specific, and quite different, purposes. AVEVA would no more recommend using its applications for equipment design than it would recommend using 3D MCAD for plant or ship outfitting design. The increased flexibility that Mechanical Equipment Interface provides will no doubt result in imaginative use to overcome particular problems; but in normal project execution the 'master' design of an equipment item will remain with its originating MCAD application, while its integration into a project will be performed using PDMS or Outfitting.

### Q9. How do imported items of mechanical equipment coexist with equipment modelled directly in AVEVA PDMS/Outfitting?

- A. Items of equipment imported via Mechanical Equipment Interface are stored in the design database hierarchy and may be manipulated just as if they had been created within AVEVA PDMS/Outfitting. You can import any number of mechanical equipment items. Once imported, you can replicate an item any number of times in the design database.

It is also possible to have two different representations of the same equipment item, one imported via the Mechanical Equipment Interface and the other created conventionally using cylinders, boxes, cones, etc. within AVEVA PDMS/Outfitting. This enables a designer to work efficiently with simple representations of equipment during the early stages of design and to use the fully detailed models later for design refinement and verification. The detailed models would be used for design review and communication with Operations specialists, who will thus be able to better appreciate issues such as maintenance accessibility.

### Q10. What file formats are supported? What about SAT and IGES?

- A. STEP AP203 is the only file format supported by Mechanical Equipment Interface. Other STEP formats such as AP214 use AP203 as a geometry subset. AVEVA does not currently support file transfer using SAT or IGES formats, but AVEVA software support engineers may be able to provide consultancy and advice in relation to data migration using other STEP formats and/or other file formats.

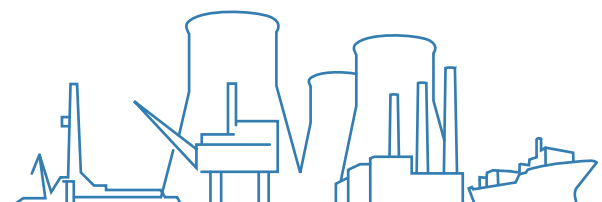
### Q11. Is batch-mode import or export supported?

- A. No. Models must be imported or exported one at a time. This is not normally a limitation in a typical project.

### Q12. What size of Mechanical Equipment models can I bring in?

- A. In theory, Mechanical Equipment Interface can import extremely large model files into the AVEVA PDMS/Outfitting database. However, this may lead to a reduction in performance and there are likely to be few occasions when this might be necessary. (Users will appreciate that this is no different from creating native PDMS or Outfitting equipment items using a very large number of polyhedral facets.)

For optimum productivity and system performance, best practice is to simplify mechanical equipment models during import to the greatest extent consistent with the needs of the design. Under these circumstances users are unlikely to experience any impairment of system performance.



# AVEVA Mechanical Equipment Interface



## Your Questions Answered

### Q13. Can I incorporate nozzles and attachment points to the imported models to facilitate pipe routing?

- A. Certainly. This is an important requirement for any effective model import capability. The GUI provides users with a number of options for placing and defining nozzles, specifying the display levels, obstruction volumes, and so on.

### Q14. How does this affect other AVEVA products such as AVEVA Review or AVEVA Global?

- A. Models which are imported via Mechanical Equipment Interface can be exposed to the full functionality of all relevant AVEVA applications. They may be exported to AVEVA Review for visualisation, shared across multi-site project teams using AVEVA Global and they will, of course, appear in all relevant project deliverables such as drawings, Bills of Materials, and so on.

### Q15. Can I edit the shape of the imported equipment model in AVEVA PDMS/Outfitting?

- A. No. It is not possible to edit the shape of a 3D model imported via the Mechanical Equipment Interface; this must be carried out in the originating MCAD application and the model re-imported. Attributes can (and generally would) be assigned to the model and it can be rotated and moved just like any PDMS or Outfitting component.

For the purposes suggested under Q9, it is possible to create a separate (graphical level) representation of the same item under the same design instance, as you would do conventionally in AVEVA PDMS/Outfitting.

### Q16. Can I perform clipping planes and sections of imported models?

- A. Yes. Models can be clipped, and sectioned drawings can be produced in Draft. Where included in the imported model, the internals of the equipment can be shown by applying a clipping plane in the modelling environment.

### Q17. Do imported models work out-of-the box immediately after import into AVEVA PDMS/Outfitting?

- A. The importation process stores equipment models in an intermediate storage area of the AVEVA PDMS/Outfitting database. This enables the user to inspect and validate the imported model, and to add connection/tie-in points such as nozzles before allowing it to be used in the design. Once satisfied with the suitability of the model, the user can then insert this equipment item into the topical AVEVA PDMS/Outfitting design database from where it becomes fully exposed to all relevant AVEVA functionalities.

### Q18. If I have lots of design instances of, say, a particular type of pump, can I use the imported equipment a number of times in the design database?

- A. Once an individual instance of an imported item of equipment has been validated in the intermediate database holding area, it can be copied a number of times in the design database. Like conventional AVEVA PDMS/Outfitting Equipment items, imported equipment items are not catalogue items and need to be replicated in full.

### Q19. Can Mechanical Equipment Interface repair problems with the STEP file or corrupted files?

- A. Mechanical Equipment Interface has been developed and tested to support model import in the form of high-quality STEP AP203 data from the major 3D MCAD applications. It cannot 'repair' or 'heal' STEP AP203 data of sub-optimal quality.

Nevertheless it does contain a wide range of error messages to highlight translation issues during import. AVEVA may be in a position to provide consultancy or advice to help resolve problematic imports. If you encounter such difficulties please contact your AVEVA software support engineer.

AVEVA believes the information in this publication is correct as of its publication date. As part of continued product development, such information is subject to change without prior notice and is related to the current software release. AVEVA is not responsible for any inadvertent errors. All product names mentioned are the trademarks of their respective holders.

© Copyright 2009 AVEVA Group plc. All rights reserved. MEI/YQA/1209

