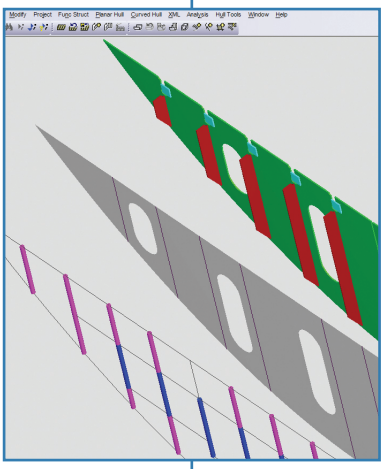
AVEVA **Hull Finite Element Modeller**

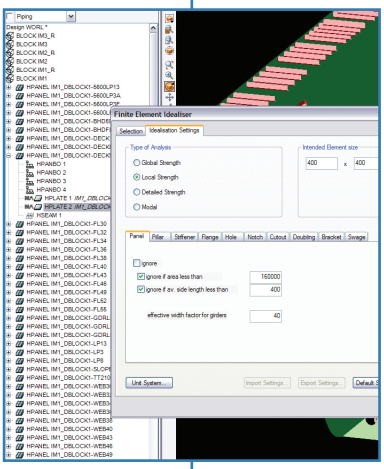
Your Questions Answered



This document answers a number of questions you may have about the AVEVA Hull Finite Element Modeller. If you have any further queries, please don't hesitate to ask your AVEVA representative or contact us online via: www.aveva.com/contact

Q1. What is AVEVA Hull Finite Element Modeller?

A. AVEVA Hull Finite Element Modeller is a new product within the AVEVA Marine portfolio. It allows customers designing a ship using AVEVA Hull Structural Design to perform a pre-mesh of the steel structure and to export this mesh in various formats to third-party Finite Element Analysis software for stress analysis.



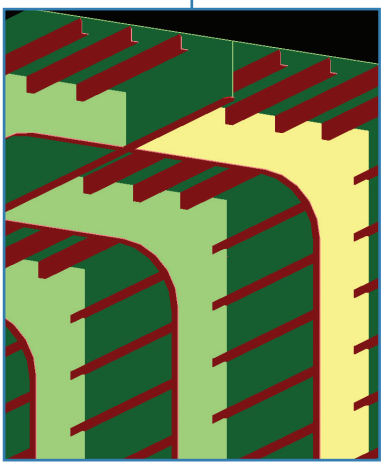
Q2. How does it work?

A. Hull Structural Design has been enhanced with additional tools and facilities to idealise the 3D model of the ship's hull in order to prepare it for Finite Element Analysis. The user is offered a number of control menus enabling him to define the ways in which the idealisation is performed (how to simplify the various configurations of holes, stiffeners, brackets, and so on). Default parameters are preprogrammed for ease of use.

Once this is done, the program automatically generates a simplified 3D model, which is stored in the Dabacon database alongside the actual 3D structure model.

The user can then invoke the pre-mesh tool to generate a full FEA-compatible model of its design using plate, truss and/or beam elements. Both coarse and fine mesh idealisations are available.

Finally, this FEM model can be exported, either in XML format for generic use in various FEA systems, or directly into the ANSYS® ADPL format.



Q3. Is Hull Finite Element Modeller part of an existing AVEVA Marine product or is it a new add-on product with an additional price?

A. Hull Finite Element Modeller is an add-on product to AVEVA Marine Hull Structural Design. It is licensed and priced separately.

Q4. In which version of AVEVA Marine is Hull Finite Element Modeller available?

A. The first version of Hull Finite Element Modeller will be released with AVEVA Marine (12 series SP5).

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Q5. Why was the Hull Finite Element Modeller developed?

A. Generating a finite element model from a CAD model has long been a tedious and labour-intensive task. Many of our customers asked for a solution to make this as automatic as possible. AVEVA made a first step towards this a few years ago by providing a basic idealiser that would generate an output which could be translated and exported to selected FEA packages. But the demand for more powerful and sophisticated tools remained.

AVEVA developed Hull Finite Element Modeller's powerful idealisation and meshing capabilities in collaboration with a consortium of leading German shipbuilding companies (ThyssenKrupp Marine Systems, Nordic Yards, and SMK Ingenieurbüro) to meet their specifications.

Q6. What output formats are supported?

A. The XML format is supported by Hull Finite Element Modeller to produce a neutral description of the generated finite elements and nodes which can then be used as input to a number of popular FEA programs.

The ANSYS® native file format ADPL is also supported, as the ANSYS® mechanical analysis application is widely used in shipbuilding. Other proprietary formats will be available in future releases.

Q7. How do the Hull Finite Element Modeller objects coexist with the hull panels in Hull Structural Design? Do those objects remain linked to the hull panels they were generated from?

A. Both the idealised 3D model and the finite elements generated by Hull Finite Element Modeller are stored in the Dabacon database and contain references back to the 3D design model.

Q8. What size of hull model can I export?

A. There is no practical limitation on the size of model which can be handled by Hull Finite Element Modeller.

Q9. Can I view the finite element model in the graphical window of AVEVA Marine?

A. Yes.

Q10. Does AVEVA currently have customers using this product?

A. Yes. Its development has been carried out in collaboration with a consortium of German shipbuilding companies (see Q5). These companies were closely involved in the testing programme prior to AVEVA's release of the production version. SMK and TKMS are already using this product on live projects.

Q11. Can I manually edit the idealised model or the finite element model in Hull Structural Design?

A. To ensure consistency at all times between the design hull model and the finite element model, once the finite element mesh is generated it is not possible to manually edit its nodes or elements. Large modifications must be made to the design model itself; only minor adjustments can be made to the idealised model. The finite element model is then fully regenerated automatically.