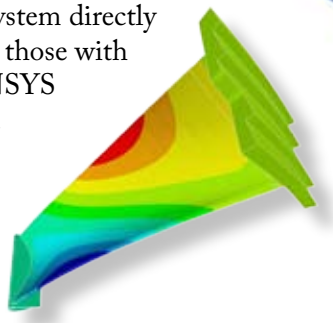
BladePro-AF ™

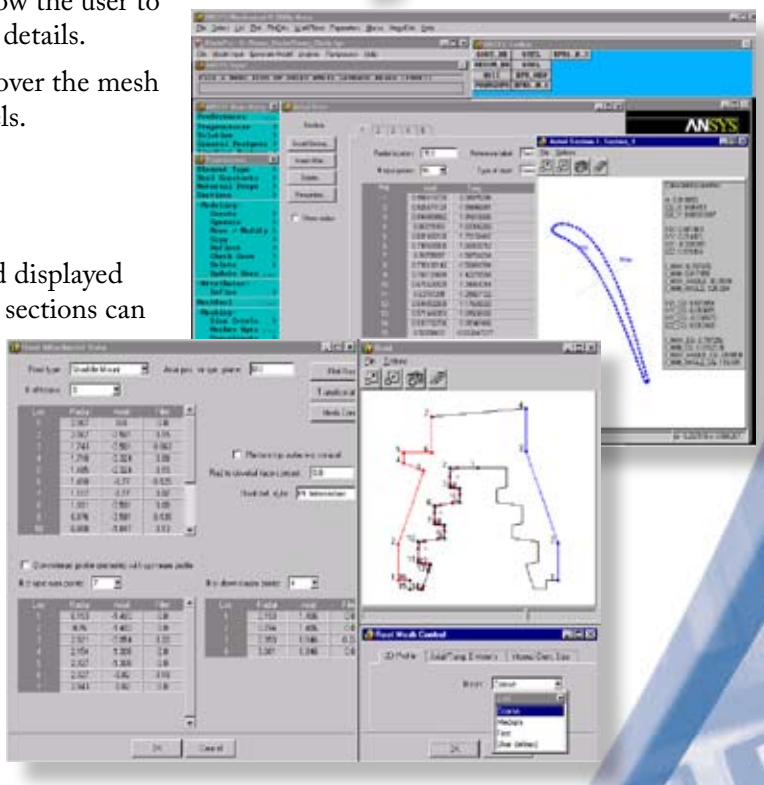
By utilizing the FEA power of ANSYS®, BladePro-AF™ significantly reduces the time required for performing structural analysis of turbine blades. By acting as a companion product to ANSYS, the program assists the user in all aspects of turbine blade analysis: model generation, boundary condition application, analysis options, job submission, post-processing, and life assessment. Designed and written by engineers with years of experience in performing turbine blade analysis using ANSYS, BladePro-AF's menu system directly interacts with the ANSYS interface in a fashion that allows it to be used by those with no FEA experience, and by ANSYS experts alike. Even for experienced ANSYS users, the time it takes to produce results can be reduced by more than 50%.



Parametric Geometry Templates

By providing geometry templates for different components of a blade model (airfoil, shroud, dovetail, disk), BladePro-AF is able to exploit the solid modeling capabilities of ANSYS and allow the user to focus on analysis results rather than modeling details.

Through the GUI, the user has direct control over the mesh refinement at both global and component levels.



Airfoil Input

Airfoil sections can be viewed individually and displayed with section property calculations, or multiple sections can be stacked and viewed together. The Open Architecture file system allows for import of data from other CAD systems.

A full set of algebraic operations allow for the scaling of one design to another.

Blade Attachments

Multiple templates exist for various blade attachments (dovetails). The figure below illustrates the dialog boxes and graphical display of one such attachment type. The user has a variety of controls for mesh refinement that will influence both analysis time and results accuracy.

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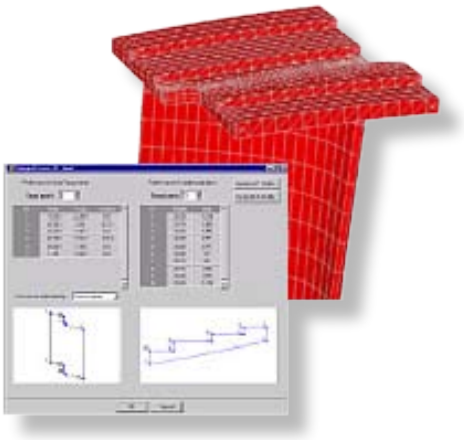
BladePro-AF - *Better Results FASTER*

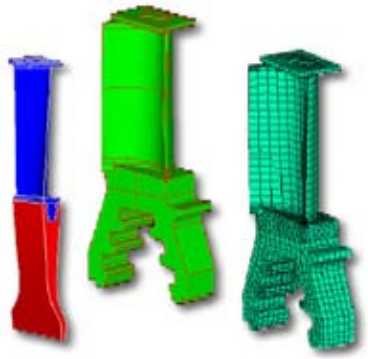
Shroud Configurations

Both integral shrouds and those attached with tenons can be modeled. The figure to the botttom-right illustrates an integral shroud being defined in two different planes. The figure on the top-right shows a sample mesh for an integral cover configuration. All blade-to-blade connectivity information is handled automatically, and various blade group configurations can be analyzed.



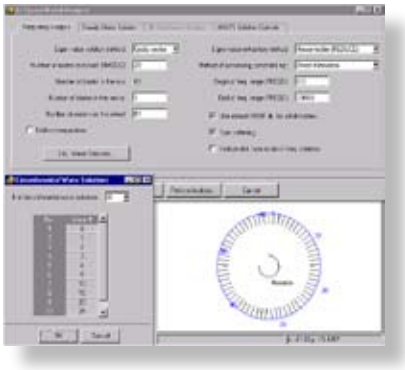
Model Generation

FEA models are generated by exploiting the power of the ANSYS Parametric Design Language (APDL), giving the user options of producing only a solid model, or a full mesh complete with boundary conditions.



Analysis Options

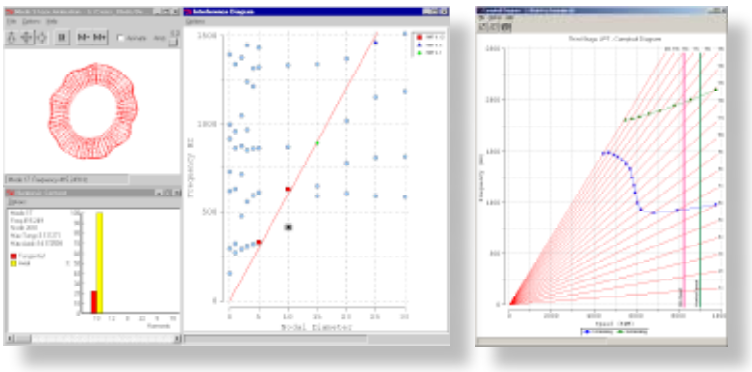
The program supports steady stress analysis, natural frequency analysis, harmonic response, and dynamic stress calculations. For the expert user, the full set of ANSYS solution capabilities is available. A user-configurable material database provides for temperature dependent mechanical and fatigue properties.



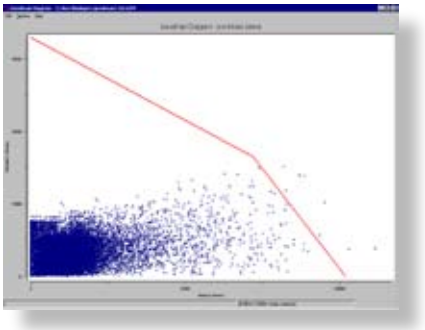
Dedicated Post-Processing

BladePro-AF provides automated tools for taking the results of a modal analysis and creating Campbell and Interference Diagrams.

Combining these results with those from a static analysis and harmonic response analysis directly leads to the creation of a Goodman diagram.



By utilizing cross-platform toolkits, BladePro-AF supports both Windows PC's and Unix workstations.



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