SoftInWay *incorporated*

AxSTREAM

Turbomachinery Conceptual Design and Optimization.

Axial turbines

Axial compressors
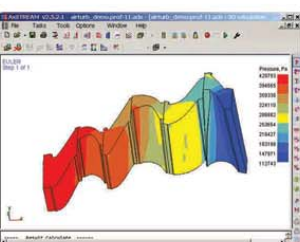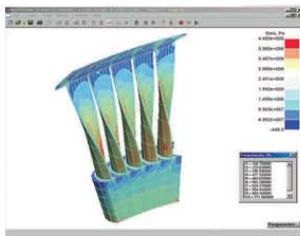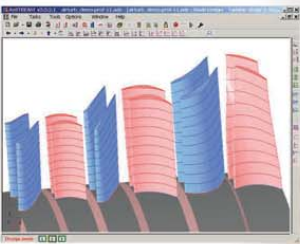
- The scope of design and analysis: flow path with normal (rotor-stator) and single row stages, mixed flow (axial-radial) flow path, multi-section flow path, flow path with counter-rotating rotors.
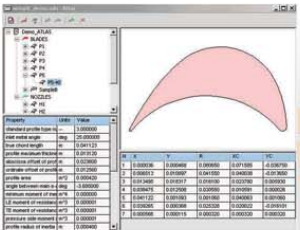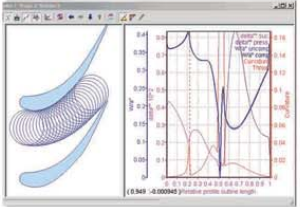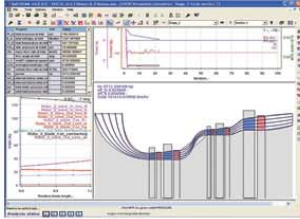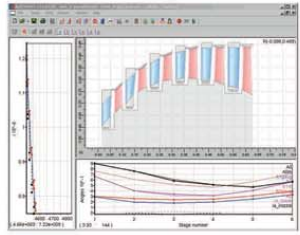
- Calculation model may include different elements: blade, nozzle, stage, duct, valve, plenum, heat exchanger etc.

- Suitable for new design, analysis of existing design, analysis and optimization for retrofit/upgrades.

- A standardized interface for turbine and compressor design. Uniform set of modules for design, optimization and export.

- Preliminary flow path design and sizing with functionality to pre-screen and visualize hundreds of designs. Capability to choose an optimal number of stages, blades and flow path dimensions.

- Multistage flow path meanline and throughflow analysis and optimization which supports "as-designed" and "off-design" operational conditions.

- Performance maps generation including flow path of variable geometry: vanes/blades rotating schedules.

- Design and analysis of cooled gas turbines.

- Meanline and throughflow analysis of mixed type compressors with axial and radial stages.

- Integrated multidisciplinary optimizer based on design-of-experiment (DoE) methodology capable of building characteristics curves and searching for optimal solution of multi-criteria problems.

- Blades and nozzles twist law optimization.

- Generation of cascades with interactive editing and optimization. Flow, boundary layer, and heat-transfer coefficient calculation on the profile.

- 3D airfoil design in "hands off" and interactive modes with geometric and strength criteria monitoring. 3D blade design with custom lean and sweep. Embedded system for express 3D structural and modal analysis with automatic mesh generation.

- Embedded system for 3D CFD calculation in blade channel with automatic building of the designed models.

- Corporate-value features: Turbine/stage/profile/material databases generation and access over company IT network.

- Loadable custom-defined fluid models and loss models and material databases.

- Easy and versatile copy and paste function to add, delete and import stage designs from one project to another.

- Custom profiles database support.

- Reusable stages libraries support. Experimentally confirmed empiric and custom loss models utilization.

- Embedded fluids library. Export 3D blade geometry for detailed CFD analysis to NUMECA, CFX and Fluent solvers.