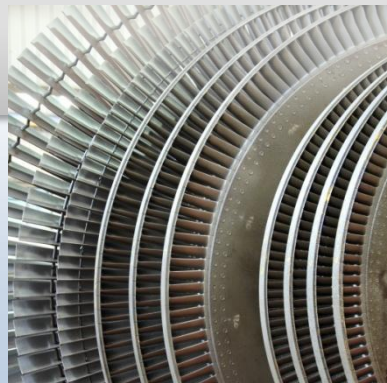
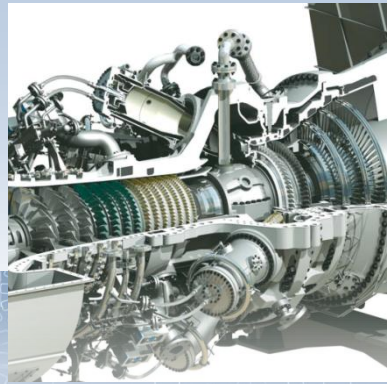




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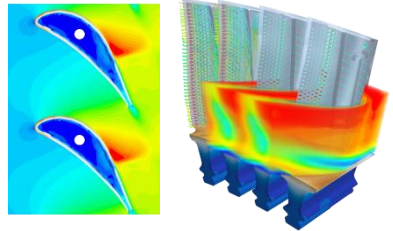
RESEARCH & DEVELOPMENT DESIGN TOOLS FOR ENGINEERING

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DESIGN & TECHNOLOGY

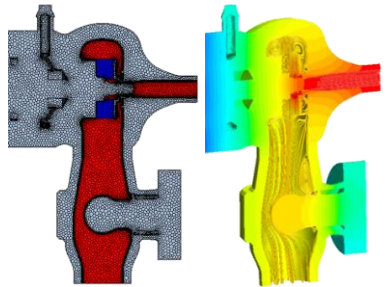
□ Turbomachinery Design

1D, 2D and 3D design and calculation of the flow path for gas turbines, steam turbines and compressors based on modern development tools



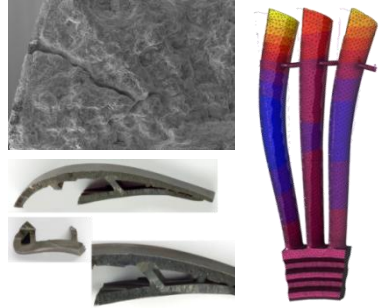
□ Flow & Structure Analyses

Accurate calculation of component cyclic thermal loading based on comprehensive Conjugate Heat Transfer and flow analyses. Reliable life assessment and design optimization based on knowledge of thermal and mechanical loading.



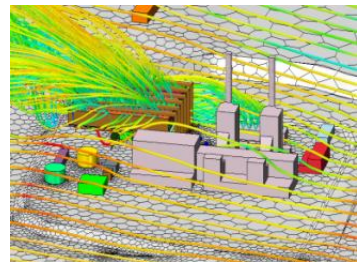
□ FEM & Failure Analyses

Mechanical integrity analyses (static and dynamic) of highly loaded parts based on modern numerical methods. Comprehensive failure analyses based on modern engineering software and forensic metallic investigations.



□ Power Plant Aero-Thermodynamics

Integrated simulation and analyses of power plant aerodynamic and thermodynamic physics, performance evaluation and development of design improvement concepts.



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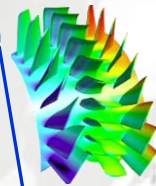
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Gas Turbine Technologies

- ❑ Upgrade concepts for increased GT power output, efficiency and lifetime.
- ❑ Technical feasibility studies on potentials of gas turbines.
- ❑ Development of modern technology, e.g. advanced film cooling technology.
- ❑ Modern design of axial compressors.
- ❑ Expert know-how for design and development, upgrade, reverse engineering and failure analyses of hot gas path components.

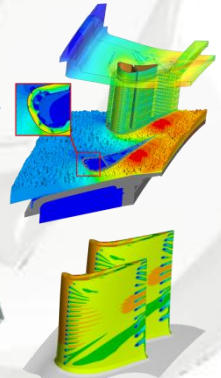
Compressor Design:

Example: Compressor performance prediction with ACF

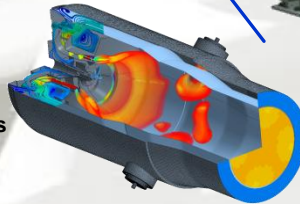
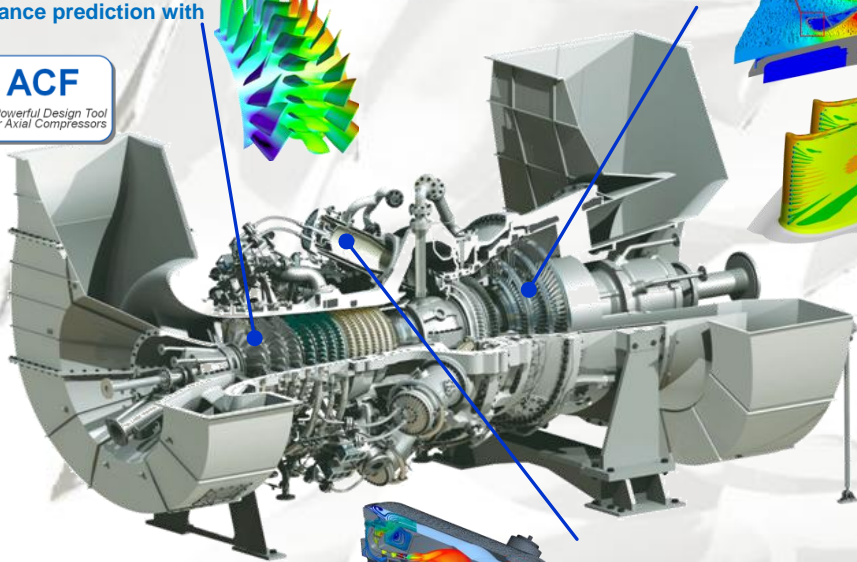


Turbine Design:

Example: CFD & CHT analysis of cooled vanes & blades



Industrial gas turbine L30A
Courtesy of Kawasaki Heavy Industries



Combustor Design:

Example: CFD analysis of DLN combustor emissions

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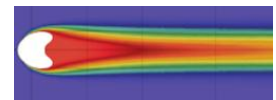
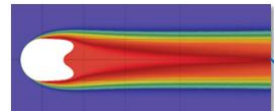
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Topics of Research

Based on strong and continuous cooperation with University and Industrial partners, advanced technologies for gas turbine and power plant application are investigated by B&B-AGEMA. Thus, B&B-AGEMA assists their partners with the transfer of highly innovative technology from research into application.

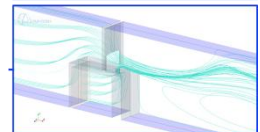
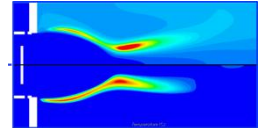
❑ Advanced Film Cooling Technologies

For the protection of gas turbine parts in the hot gas path, B&B-AGEMA holds a patent for the innovative NEKOMIMI film cooling technology. Due to the specialized shape of the NEKOMIMI holes, anti-counter-rotating vortices are generated, which increase the film cooling effectiveness significantly.



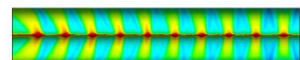
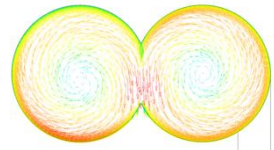
❑ Dry Low NOx (DLN) Combustion

The DLN Micromix principle is based on cross-flow mixing of air and gaseous hydrogen, which react in multiple miniaturized diffusion-type flames. Its major advantage is a safe and low emission combustion of up to 100 vol.% hydrogen in gas turbines.



❑ Double Swirl Chambers (DSC)

The continuously increasing gas turbine inlet temperatures demand more advanced internal cooling configurations. The DSC technology establishes a significant enhancement of the local internal heat transfer due to the generation of counter-rotating swirls.



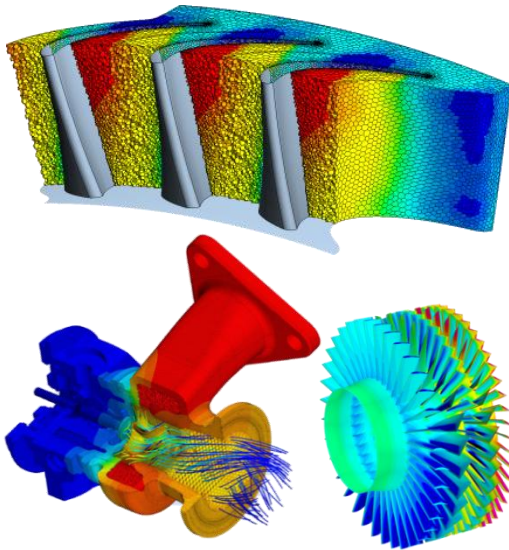
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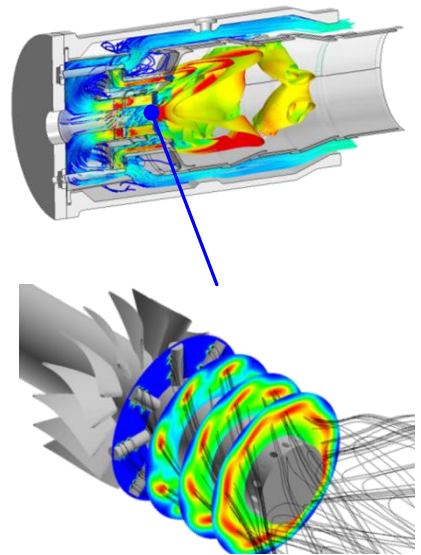
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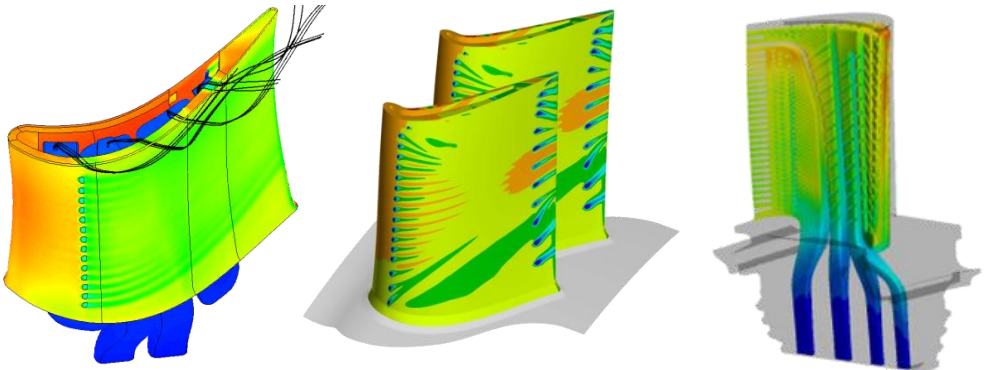
Aerodynamics



Combustor Analyses



Turbine Cooling



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B&B-AGEMA GmbH is an independent service provider for professional power plant engineering and turbo machinery design. Since its foundation in 1995, the company provides its services for the benefit of its national and international clients.

A special focus is laid on the advanced design of gas turbine components (e.g. compressor, combustor, turbine).

Another main focus is related to the design and improvement of power plant components by application of modern computational tools.

B&B-AGEMA develops user-specific calculation and simulation software.



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