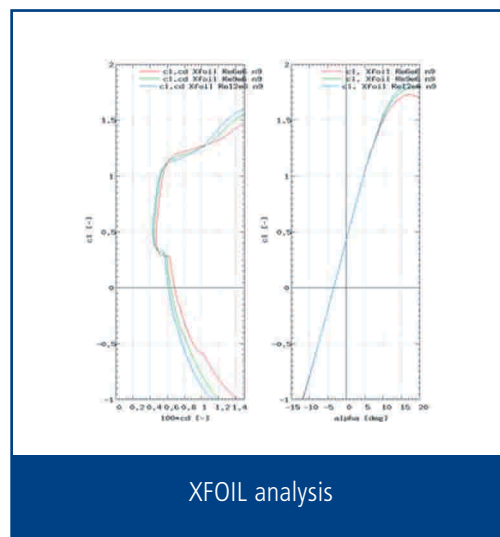
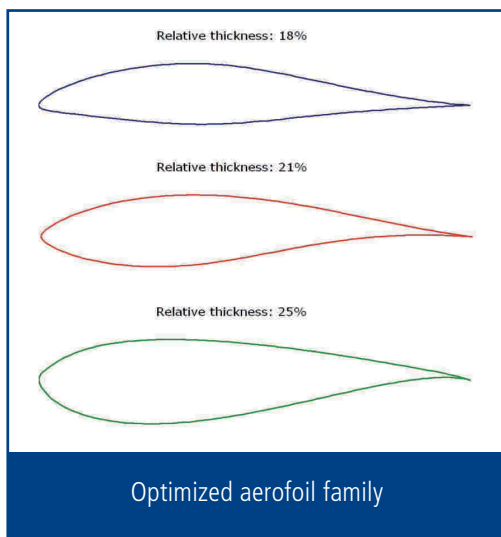


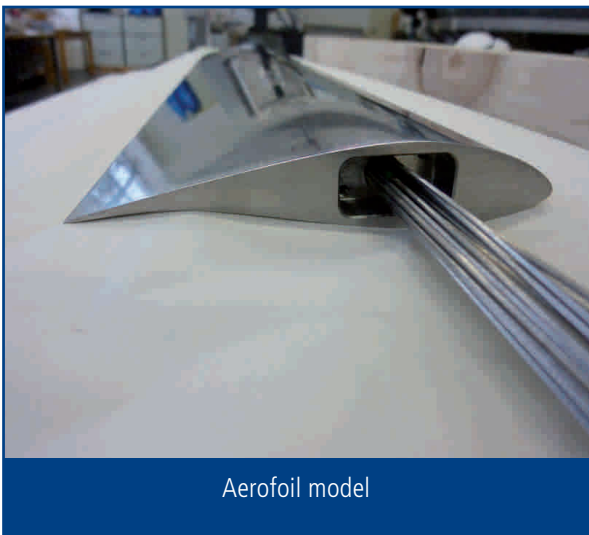


1.-Aerofoil Design: Aerodynamics + Aeroacustics + Blade Design



Aerofoil Design with Aerodynamic and Aeroacoustic Optimization.

2.-Aerofoil Wind Tunnel Test: Test design and execution



High Reynolds Number 2D Aerofoil Wind Tunnel Tests

CENER has developed a specific tool to design aerofoils, in such a way that they can be optimized for any particular type of wind turbine. The tool and designing procedure allows feedback for the development of the aerofoils with information from the blade on successive iterations.

Different parameters can be analysed:

Aerodynamics

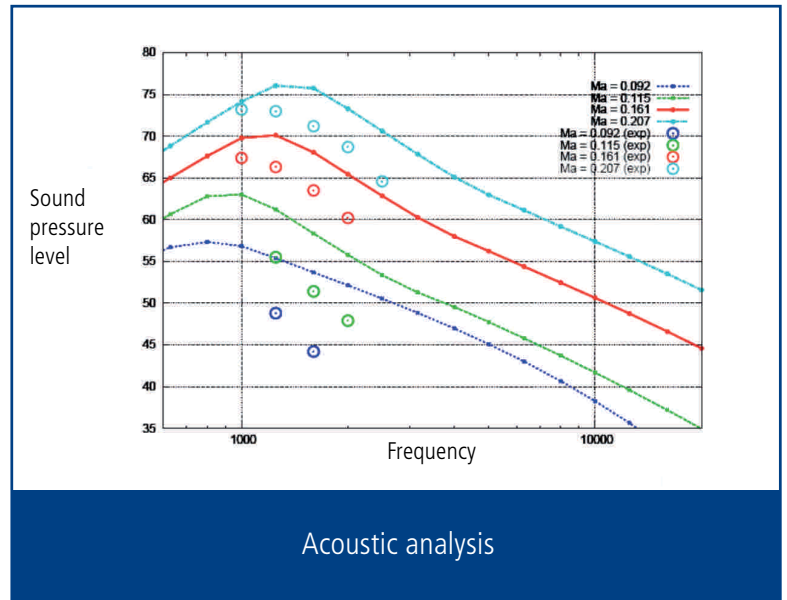
- Production
- Loads
- Surface roughness insensibility

Aeroacustics

- Noise footprint

Functionality

- Blade compatibility
- Structural behaviour



The experimental aerodynamic characterization of the aerofoils enables realistic blade designs. The compressibility effects found in large blade tips or in high rotational speed rotors must be considered during the design phase to ensure optimal behaviour of the wind turbine when operating at real wind site.

Developed activities:

- Wind tunnel selection
- Specification of the wind tunnel models
- Design of the test program
- Supervision of the test process
- Post processing experimental data
- Results assessment

Objectives:

- Select the appropriate test facility and define the test program in order to achieve pertinent data for the specific requirements.
- Control of the models specifications, instrumentation and test procedures in order to obtain the most reliable data.