

# Design of a measurement system to measure airfoil polares

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## Introduction

The laboratory for windtunnel and flow measurement of the University of Applied Sciences in Regensburg was reequipped with a new windtunnel with a Goettinger design in January 2006. In contrast to the old windtunnel, trials in the open and in the closed test section can be executed.

The main topic of this diploma thesis is the design and the assembling of a measurement system for the closed test section in the new windtunnel RWT (Regensburg Wind Tunnel). With this system lift, drag and torque of an airfoil in airflow can be measured. Starting with the methodic solution searching with a detailed morphological box, via the CAD-design with the software Pro/Engineer Wildfire 2 the diploma thesis conducted to the manufacturing and purchase of the required components, their assembling and the accomplishment of functionality tests.

## Methodic solution searching and CAD-design

With a detailed morphological box possible partial solutions discussed and evaluated.

After a decision was reached which components should be used, a CAD-model of the later measurement system based on hand made drafts was made.

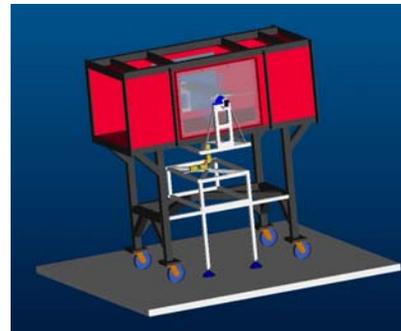


Figure 1: the completed CAD-model of the closed test section and the measurement system

## Manufacturing of the aluminum airfoils

With the profile PK-121/3, the coordinates of a new developed airfoil profile were available for the LWS. The firm Dr. Hagen in Hainsacker manufactured two aluminum airfoils based on the new profile.



Figure 2: One airfoil at the milling act at Dr. Hagen

## Assembling and functionality tests

After all parts had been arrived and manufactured, the measurement system was assembled and a functionality test of the equipment in the windtunnel was executed.



Figure 3: The closed test section with assembled measurement system in the windtunnel

- References:**
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