CASE STUDY

INNOVATIVE VACUUM TECHNOLOGY FOR TRANSPORTING ROTOR BLADES IN CHINA

With the growing demand for renewable energies and political efforts to promote wind power, manufacturers and service providers are increasingly facing challenges in the handling and logistics of large components such as rotor blades. Due to their enormous dimensions and weight, the transport of rotor blades requires specialized solutions in the field of lifting technology.

A company in China needed a reliable and safe handling system for the horizontal transport of 90 meter long rotor blades weighing 40,000 kilograms. This challenge was the starting point for a new product development at AERO-LIFT. In view of the growing demand for wind turbines, it is crucial to develop efficient and safe transport solutions that enable both the lifting and precise positioning of the rotor blades.

The manufacturer-specific design presents vacuum lifting devices with the challenge of surface structure and a spherical shape. The engineers at AERO-LIFT met this challenge by developing certain rubber compounds and special suction plate suspensions, both spring-loaded and oscillating, which nevertheless stabilize and are suitable for precise positioning.

In several intensive tests in the AERO-LIFT application technology department, a customized solution was developed that offers both the required high load capacity and the necessary flexibility. The vacuum lifting device specially designed for this application is ergonomically designed and enables easy and comfortable handling by just one person.

The solid rubber seals used for the suction plates are quick and easy to replace and offer a high level of robustness and durability - ideal for the specific requirements of rotor blade transport.

With 15 individually adjustable suction plates that can be flexibly adapted to the rotor blades, the device achieves a load capacity of up to 20,000 kilograms at a vacuum of 80 %.

The intelligent safety functions of the AERO-LIFT device include vacuum monitoring and an acoustic warning signal that is activated in the event of a vacuum drop or power failure. This ensures that the load can be lowered in good time.

AERO-LIFT vacuum lifting devices are designed and manufactured to the highest safety standards in accordance with EN 13155 and ASME B30. In addition, the devices are tested and documented in accordance with the applicable accident prevention regulations BGR 500 and the Machinery Directive 2006/42/EC.

The final acceptance test of the appliances was carried out in accordance with VDE 0113 and EN 60204. These comprehensive tests guarantee the safety and reliability of the products.

The project was rounded off with an all-round service, including installation on site in China and operator training. The operator can individually adjust the working vacuum to optimally meet his specific requirements for transporting the rotor blades. With this innovation, AERO-LIFT is helping to increase efficiency in the wind power industry and making an important contribution to the sustainable use of energy. The solution created is now being used successfully on all continents worldwide.