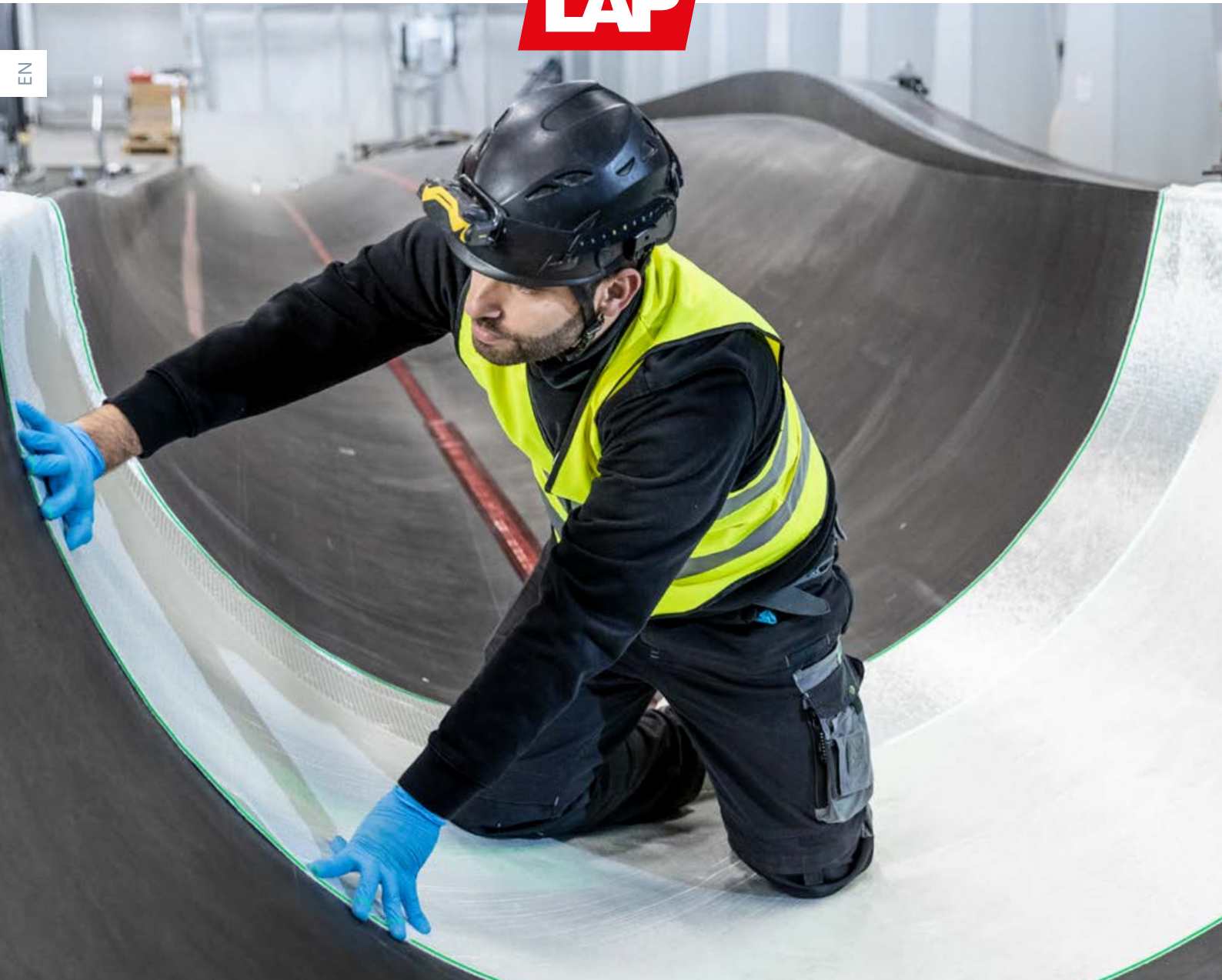




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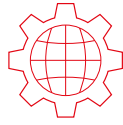
# Laser projection for wind turbine production

Fast and accurate positioning

Simply  
Precise

LAP's laser projection systems reduce the build time of wind turbine shells, helping to achieve production goals and ensure optimum quality.





**2.200+**  
Projectors  
in use



**30+**  
Countries  
equipped



**2012**  
First market  
experience

# Higher efficiency for your production

LAP produces high-quality laser projection systems for the global manufacturing of fiber-reinforced rotor blades and parts assembly of wind turbine nacelles.

Leading manufacturers of onshore and offshore wind turbines use LAP's laser projection systems in their production lines.

LAP has worked closely with customers for more than 15 years to ensure the quality of their products and reduce process costs.

Today, more than 200 laser projection systems are installed worldwide. They contribute to the efficient production of light and stable rotor blades of all lengths, enabling wind turbines to achieve higher power.

- *Benefit from our experience as a long-standing system provider for the wind energy industry.*
- *With our laser systems you can accelerate assembly processes and manual composite layup.*



Reliable and repeatable

# Laser templates for blade mold layup

CAD-PRO laser projection systems from LAP project precise laser lines for the positioning of glass fiber plies and molded parts in the manufacturing of wind turbine blades. Using CAD data, our laser projectors display the contours onto the mold's curved surfaces with millimeter accuracy. This allows exact placement of the

GFRP-plies along the displayed laser lines. The projectors can also indicate positions of other molded parts introduced into the blade for reinforcement. Our laser projection systems cover all common 3D-shaped blades including pre-styled winglets, and produced lengths of more than 100 meters.



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## Precise

LAP's laser projection systems eliminate the need for manual measurements and markings. CAD-PRO laser projectors ensure the positioning of composite parts with the highest precision and repeatability.

## 30% faster

Production time is significantly reduced using laser projection systems. You can increase your production rate with 30% faster work.

## Zero defects

Clearly visible laser contours minimize errors during the layup process down to zero. This enhances your ability to increase process reliability and product quality.

## Easy to operate

Minimal training is needed to operate the laser projection system, which also means faster onboarding of new operators.



# Nacelle assembly

## Precise positioning of parts

Nacelles are critical structural components of highly efficient wind turbines. LAP's laser projection systems contribute to more accurate and faster layup processes for nacelle housings, often made with resin-infused glass fiber composites.

CAD-PRO laser projectors can also support part assembly of wind turbine nacelle housings. Laser projectors can exactly indicate drill holes or welding points and display mounting positions for electrical components or various other parts.



# Glass fiber kitting

## Faster stacking of pre-cut plies

CAD-PRO laser projection systems are the solution to rely on when it comes to glass fiber kitting. At the assembly table multiple layers of glass fiber sheets of varying shapes and sizes need to be stacked and sewn together. CAD-PRO laser projectors simplify this process by clearly showing the shape, position, and orientation of

every single pre-cut ply. Operators just need to follow the laser lines and can easily place the pieces in the correct positions. The system also indicates the sequence in which the various layers should be stacked. This allows for error-free and faster working, resulting in considerable time savings and higher product quality.





# Why laser projection systems from LAP?

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## Precision

Precision in a millimeter range combined with the repeatability of the laser projection ensures that all parts are placed exactly where they should be. This results in high-quality products.

## Reliability

Our CAD-PRO laser projectors feature laser diodes with at least 30,000 operating hours. This means high investment security for you and high reliability of your processes.

## Scalability

The overall system is scalable to cover all lengths of rotor blades. We configure the system to your individual requirements to achieve maximum flexibility and optimum adaptation for your production processes.

## Multitasking

The multitasking feature of the PRO-SOFT software allows teams to work completely independently of each other. This accelerates manufacturing processes of large components and increases production throughput.

## Fast data input

The PRO-SOFT software supports a variety of CAD data formats, including DXF, IGES, HPGL, LPD and PLY, in addition to the direct use of the projection data from leading CAD programs.

## Secure workflows

The PRO-SOFT software efficiently manages all projection steps. The user-friendly interface, remote control and multicolored projections make operation easy and secure.



# Our solution for the wind industry

Our system solution comprises laser projectors, accessories, and software that has been specially optimized for the requirements of the wind energy industry.



Visit our website for more information

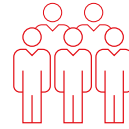
- CAD-PRO laser projection systems for true-to-scale projections based on CAD data
- PRO-SOFT operating software to organize workflows and streamline production processes
- DTEC-PRO camera system for process optimization and quality assurance

# About us

LAP is one of the world's leading suppliers of systems that increase quality and efficiency through laser projection, laser measurement, and other processes. Every year, LAP supplies 15,000 units to customers in industries as diverse as radiation therapy, steel production, and composite processing. LAP employs 300 people at locations in Europe, America, and Asia.



**90+**  
Partners



**300**  
Employees



**7**  
Locations



## Quality

We work to uniform standards and with certified processes. For us, "Made in Germany" means the highest precision in manufacturing and quality inspection of each device. For our customers, this means planning and process certainty.

All our worldwide locations use a quality management system according to EN ISO 13485 or EN ISO 9001. Our products have all the necessary approvals and registrations almost everywhere in the world.

## Service

We ensure the maximum availability of your equipment so you can concentrate on your core process. Wherever you need us, our certified service technicians are quickly on site in any time zone. We support you from installation and commissioning, through user training, up to maintenance, repair, or unit replacement.

Our efficient logistics ensure the fast availability of spare parts worldwide. For technical questions and support, our helpdesk is at your disposal by telephone, via e-mail, or remote diagnosis.



More about our  
global QM system



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**[www.lap-laser.com/wind-power](http://www.lap-laser.com/wind-power)**