WE’RE ALWAYS AT THE CORE OF YOUR WIND ENERGY
Diab was founded in Sweden in 1950. Ever since the beginning, and throughout our steady development into a global company, we have been dedicated to constant innovation and promoting a widespread adoption of structural core materials.

Our products and solutions have been used in applications for marine, wind, aerospace, and industry for decades and are qualified according to relevant industry standards. With a complete range of high-performance core materials, numerous finishing options and kit operations in combination with engineering services and expertise, we present presumably the widest and most valuable offering in the sandwich composite industry.

Core is one of the primary materials used to construct composite wind blades, nacelles, and spinners. With the wind market focusing ever-more on the Levelized Cost of Energy (LCoE), manufacturers are continuously looking to reduce their operating costs and increase efficiency. Applying Diab’s core knowledge and products can help you achieve this. Ultimately, the right core, finishing and/or kit, effectively integrated into the manufacturer’s process, can increase and optimize production capacity by reducing cost of materials and process time.

With decades of experience in wind energy solutions, Diab has gained invaluable insights into market needs. As a strategic and reliable partner, we have very long experience working globally with all major players within the supply chain, from the WTG OEMs to the designers, blade manufacturers (in-house, sub-contract or build-to-print) and kitters.

We are also adapting to the rapidly evolving needs of the ever-growing wind market, with high flexibility. We are a strong, long-established, and reputable global supplier, delivering solutions, in the region, to the region, to the highest quality and customer service standards. In short, we have the technical knowledge needed and the ability to apply it.
MORE SUSTAINABLE IN EVERY WAY

SUSTAINABILITY IS IN OUR CORE
Our products contribute to energy savings and a lower carbon footprint. They will help you boost energy efficiency, reduce emissions, conserve natural resources and create a longer life cycle for your product. Simultaneously, our customers in the wind market are setting increased demands for suppliers in terms of quality, safety and environmental issues. At Diab we work hard to make a difference when it comes to sustainability. We are strongly committed to making your solution more sustainable in every way.

A PART OF THE RENEWABLE ENERGY SUPPLY CHAIN
Sustainability is one of our top business priorities. We are adopting to the responsible framework of UN Global Compact; our Sustainability report is publicly available, and we have gotten approval of our CO2-reduction targets from the Science Based Targets Initiative. We strive to be a part of the renewable energy supply chain, and we also believe that such approach drives long-term profitability and competitiveness.

MAKE THE MOST OF YOUR APPLICATION

THE SANDWICH TECHNOLOGY
Composite materials are made from two or more materials with significantly different physical or chemical properties, that when combined, form an overall structure with characteristics different from the individual components.

The basic idea is simple; the execution is a bit more advanced. Two thin, strong and stiff skins, of fiber reinforced plastics or solid material, are attached to a lightweight core by press-bonding or lamination. By doing so each element forming the composite panel can be designed to minimize weight and maximize strength and stiffness, or other desired features. The result is a component with a very high stiffness-to-weight and high bending strength-to-weight ratio. A Diab sandwich has all the advantages of conventional materials, such as steel or wood, but none of the disadvantages, such as heavy weight, corrosion, or design limitations.

MASTERS OF SANDWICH CORE
In a sandwich typically the skins are taking tension and compression loads, and the core shear forces. Our PVC and PET cores are engineered foams fit for the sandwich purpose to absorb and distribute the loads exposed to the sandwich, static or repeating. They have a stable closed cell structure resistant to water ingress, corrosion and decay, an important characteristic in harsh environments.

A variety of grades is used to give the final product additional desired features, such as fatigue and impact resistance, fire resistance, insulation, radar transmittance and many more. Diab offers the widest range of high-quality sandwich cores, but our true strength goes beyond the material. You can draw from our knowledge when it comes to anything from sandwich design to efficient production methods. With our experience and expertise you can make the most of your application, existing or new.
THE RIGHT CORE MATERIAL FOR YOUR NEEDS

Every application and manufacturing method has its special demand on the material used. To be able to get the most out of your product, Diab offers the widest range of core materials and grades with unique properties that will suit the needs of your wind applications today and tomorrow.

PET FOAMS
All our PET foams have excellent thermal stability and impressive physical properties.

Divinycell PN
A structurally strong PET sandwich core material perfectly suited in a variety of applications in the wind energy segment. Its excellent mechanical properties and good processing characteristics make it highly suitable for both blades, from the shoulder to the tip (PN115) and nacelles (PN80). PN200 and PN2501 has been developed for the root sections of blades, as an alternative to balsa, to meet the increasing demand of tougher and stronger core materials.

Divinycell PY
This is our latest addition to our PET portfolio and it provides high shear strain and a very low resin consumption. It has been designed to meet blade designs in an optimal manner. PY105 is typically used in shoulder tip areas of the blades and PY250 in the root section of blades, as an alternative to balsa.

PVC FOAMS
The unique composition of our PVC foams yields impressive mechanical performance to a very low weight.

Divinycell H
Divinycell H provides excellent mechanical properties and low weight. It has a proven track record in virtually every application area where sandwich composites are employed. It is compatible with most wet resin and infusion systems. It has been (and still is) one of the original core materials used in wind blades (and nacelles). It is typically used in the shoulder to tip section of a wind blade.

Divinycell Matrix 10-8
Similar in density to H60, Divinycell Matrix 10-8 is an enhanced grade with high strength-to-weight ratio and improved temperature performance during the composite curing process, providing an extra degree of security when curing with faster and higher exotherm resin systems. The unique PVC formulation yields impressive mechanical performance to a low weight. High mechanical properties at lower weight bring many crucial benefits. Like Divinycell H60, it is typically used in the shoulder to tip section of a wind blade.

Divinycell HP
Divinycell HP is developed to meet demands in high temperature systems and low temperature prepreg systems. It features high strength and stiffness to weight ratio, even when exposed to high ambient temperatures. It also has excellent chemical resistance, low water absorption and good thermal acoustic insulating properties. It has been (and still is) one of the original core materials used in prepreg wind blades. It is typically used in the shoulder to tip section of a wind blade.

Probalsa
Probalsa is a high-quality organic core material made from end grain balsa wood and is available in several densities, most typically 150 kg/m³. Featuring exceptional compressive strength, it is used in a wide range of applications and can also be combined with PET and PVC core materials in wind blades. Probalsa is compatible with most resin and manufacturing processes and suitable for elevated temperature cure systems. It has traditionally been used in the root sections of a blade due to its properties, but has increasingly been replaced by PET foams in new blade designs.

Balsa
Balsa materials are particularly easy to work using conventional woodworking tools. They can be drilled, milled, turned and sawn to close tolerances.

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RESOURCES TO ENHANCE YOUR PRODUCT

WITH THE OPTIMAL FINISHING YOU CAN GET A COMPETITIVE EDGE

Our cores can be finished with a wide selection of perforations, cuts, and grooves. Each finishing option is tailored to specific lamination processes and to formability requirements. The right combination of core material, laminate and finishing allows you to save time, money, and resources, and affects the characteristics of your product. Diab has a long experience in finishing for structural core materials, and together, we can find the optimal solution to fit your needs.

OUR FINISHING OPTIONS:

Flow
Using a plain sheet is the most effective way to utilize a core. It can be perforated, grooved, or slitted through machining to make it as functional as possible for the application. To distribute resin, there are several options. Perforations avoid air from being trapped under the core, ensuring proper wet-out and bonding to the laminate. Grooved and perforated cores remove the need for additional distribution medium within the laminate or above it.

Form
To create curves, you have formable finishing options. Grid-scored finish makes the core conform easily to the mold for complex shapes. One-direction cut finish is similar to Grid-scored finish but with cuts in one direction only, creating strips of core. Double-cut finish allows curvature into panels without applying a scrim.

Flow & Form
A combination of above where you have a need for both adapting to the shape of your product as well as distribute resin in your production process.

KITS TO BOOST YOUR PERFORMANCE

You can significantly improve the manufacturing process and quality of composite components with pre-cut core parts (kitting). A Diab kit is a tailor-shaped set of core elements. By eliminating the on-site cutting of sheets, you can reduce manufacturing time, save labor and material cost. In addition, with the easy assembly and exact fit, you can consistently achieve high quality in less time.

OUR KITTING OPTIONS

Industrial kitting
A rational, high quality kitting that meets your needs of speed and efficiency. We use a well-defined kit process that enables us to provide the most competitive offering, top service, and quick turn-around times. Depending on the requirement, we can choose among multiple solutions to optimize weight or cost.

Advanced kitting
Diab’s innovative advanced kits offer optimized fit in the mould, reduced resin consumption, and improved cosmetics for infusion and high-end applications. Combining Diab knowledge of kits and infusion and creating a custom software specifically created for the task, we can optimize the cuts required in the core to allow it to perfectly fit the local curvature of your mould, while minimizing the resin uptake.
KNOWLEDGE THAT OPTIMIZES YOUR SOLUTION

MAKE THE MOST OF YOUR APPLICATION WITH OUR EXPERTISE.
Diab Technical Services have thorough knowledge of sandwich design, finishing and kitting and our skills cover everything from hand lay-up to resin infusion. We help you choose the most appropriate design procedure for each case and when necessary, validate the findings with in-house testing. We can also provide both theoretical and practical training of personnel and then directly assist your team with prototyping and infusion trials.

SPECIALIZED ENGINEERING SERVICES TO FURTHER IMPROVE YOUR PRODUCT.
Our Composite Consulting Group provide specialized composite technology services. With broad competence including everything from design and engineering to testing, tooling, process optimization and training, we ensure that you can realize the full value of composite designs. Contact our consultants in CCG for more information.
The blade is considered a key technological component of a wind turbine generator (WTG) as its design, and how it captures the wind, significantly contributes to the effectiveness of the overall WTG. Nacelles are either structural or non-structural, but in either case they provide an aerodynamic lightweight cover and in the former case, also structural properties, while the spinner provides an aerodynamic lightweight cover.

**CORE MATERIAL SIGNIFICANTLY BOOST EFFECTIVENESS**

Blades made of core materials significantly contribute to the effectiveness of wind turbine generators. PVC and balsa have been the original design materials, with PET more recently and now firmly established as a third option. Due to the design flexibility available, blade bom’s (bill of materials), can feature 1, 2 or all 3 material types. Typically, designers will use higher density (e.g., Probalsa 150, PN200, PY250) and lower density (H60, H80, PY105, PN115) grades in various areas of the blade shell and spar/web.

As a building block, Diab offers the designer PET and PVC grades in various densities, as well as balsa.

**CORE MATERIALS ARE IDEAL FOR NACELLE ROOFS, FLOORS, AND WALLS**

Core materials with excellent strength-to-weight ratio are ideal for nacelle roofs, floors, and walls. Whilst there are some structural nacelle designs demanding structural properties and using some of the grades used to build blades, most designs are non-structural. In this case, the designer, OEM and nacelle builder is building a housing to cover the generator and from the weather and looks for the lowest-cost solution. Typically, low density PVC (H45, H60) and PET (PN65, PY80) are used.

As a building block, Diab offers the designer PET and PVC grades in various densities. As with blades, as well as providing design properties, the core is also used as a processing aid during the nacelle infusion process, which is the primary technology used today.
DIAB AT A GLANCE

WORLDWIDE SUPPLY AND SUPPORT
Ensuring security of supply, cost efficiency, flexibility, and local support, Diab combines a global manufacturing, sales, and engineering presence with local know-how. We follow our customers and anticipate their needs, positioning ourselves in locations to best support them. Our seven manufacturing sites and fourteen sales companies in strategic locations around the world offer our full range of materials and services.

Take advantage of our knowledge!
At www.diabgroup.com you can get exclusive access to our expertise via MyDiab. And with our interactive Core Selection Guide it’s easy to find the best core for your application.

FOUNDED 1950 IN SWEDEN

1300 EMPLOYEES

7 MANUFACTURING SITES

14 SALES COMPANIES

40 DISTRIBUTORS

OUR FOCUS AREAS:
MARINE
WIND
INDUSTRY
AEROSPACE

Member of UN Global Compact
Approved CO₂-reduction targets from the Science Based Targets Initiative
Diab is a world leader in sandwich composite solutions that make customers’ products stronger, lighter and smarter. Diab provides a range of core materials, cost-effective kits and finishings, along with in-depth knowledge on composites. Diab also provides engineering services for composite technology through Composites Consulting Group (CCG). Diab is a participant in the UN Global Compact.

Subject to possible printing errors and changes.
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