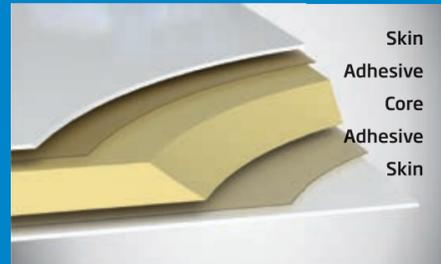


# The sandwich principle

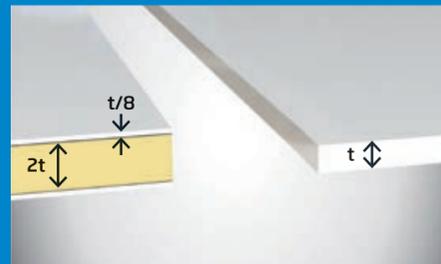
## Benefits:

Sandwich materials provide excellent mechanical properties at much lower weight than traditional designs. The sandwich solution has a very high stiffness-to-weight and strength-to-weight ratio.



A typical sandwich solution has skins that are thin, strong and stiff. The core is a light high-performance material that has the strength to transfer the loads between the skins.

The high stiffness and strength of the sandwich solution are achieved by separating the skins from each other. The further apart the more efficiently the material is used. As a result, sandwich components achieve the same structural performance as conventional designs, at much lower weight.



A solid design can be replaced by a sandwich solution that is twice as thick. Only a fourth of the original material is needed for the skins, to get the same strength and twice the stiffness. The weight of the sandwich is reduced to approximately a third. Since less material is used, cost is also reduced.

	Sandwich (2t)	Solid (t)
Bending strength	100%	100%
Bending stiffness	260%	100%
Weight	33%	100%
Material cost	58%*	100%

\*If cost of core is 5 times the cost of skin per kg

Sandwich solutions can be manufactured into virtually any shape, offering full design freedom. In addition, sandwich solutions provide thermal insulation, thus saving insulation materials.

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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, finishing and in-depth knowledge on composites. Diab also provides engineering services for composite technology through Composites Consulting Group (CCG). Diab is a participant of UN Global Compact.

# Sandwich solutions

## Stronger, Lighter, Smarter

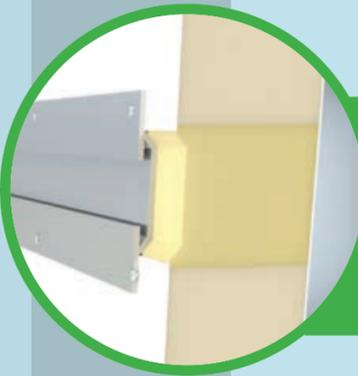
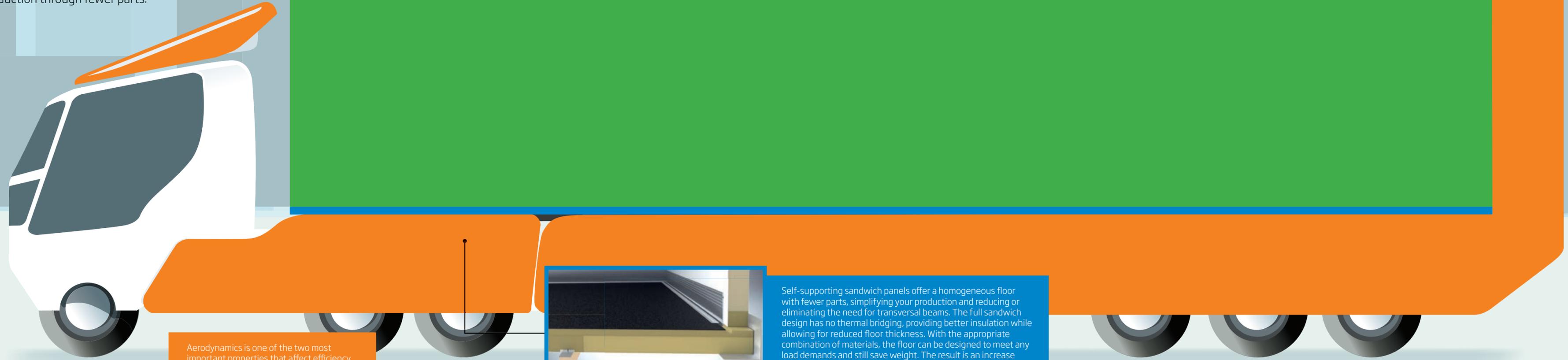
What if your truck could take a higher payload, have better durability, consume less energy and be manufactured fast and efficiently?



# Predict the future - Design it

The transportation industry is facing a paradigm shift. Sustainability demands and autonomous electrical vehicles are changing the market, but whether a new or traditional vehicle, the key to reduced carbon footprint is weight and aerodynamics. Lower weight reduces resistance and allows for increased payload while an aerodynamic design reduces energy consumption, especially at high speed.

Sandwich materials are the solution, offering higher payload, improved energy economy, increased design freedom and enhanced durability. Easily implemented, they simplify your production through fewer parts.

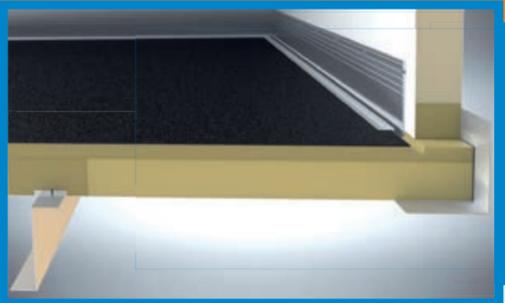


A modern truck or trailer body often demands a high degree of customization and adaption. Rails for intermediate floor, internal wall dividers, doors, hooks and extra equipment all require a sturdy and secure fixation to the lightweight walls and roof. The most efficient way to handle this is to use structural core in these areas.



To achieve the desired overall structural integrity of the box, the assembly of the corners is very important. High density structural core is used in combination with aluminum profiles to strengthen the most stressed areas. The assembly is simplified through the use of screws into the structural core for fixation while bonding. The structural core is insensitive to rot or decay and provides consistent screw retention properties.

Aerodynamics is one of the two most important properties that affect efficiency. Sandwich solutions offer freedom of design while providing stiff and robust parts with long life time at a low weight. The stiffness of the parts gives the opportunity to have integrated functionality rather than additional cover panels.



Self-supporting sandwich panels offer a homogeneous floor with fewer parts, simplifying your production and reducing or eliminating the need for transversal beams. The full sandwich design has no thermal bridging, providing better insulation while allowing for reduced floor thickness. With the appropriate combination of materials, the floor can be designed to meet any load demands and still save weight. The result is an increase in possible payload and improved energy economy. In addition, sandwich materials are insensitive to rot or decay.