



CASE STUDY



## 1 | Challenge:

# The electrification of heavy-duty forklifts with the aim of a zero-emissions future

**Kalmar, who is internationally recognised as a leading provider of cargo handling solutions and services for ports, terminals, distribution centers and heavy industry – approached HOPPECKE at the beginning of 2020 with an inquiry for the supply of four 120V traction batteries, each weighing 4500kg, as part of the electrification of its forklift truck product portfolio.**

The heavy goods handling industry still runs mostly on combustion engines. For some time now, heavy-duty forklifts have become increasingly electrified, with the aim of a zero-Emissions future. The majority of Kalmar vehicles are also built with the aim of zero emissions, which makes the use of batteries essential.

The trend to move away from combustion engines towards electric motors is currently one of the most important developments in the industry. Industrial trucks are becoming more and more powerful and with ever greater load lifting capacities, they are moving into areas of applications that were previously reserved for forklift trucks with combustion engines.

Peak energy loads, costs, weight and charging time are the focus, so that the forklift trucks are operationally ready at all times at ports, terminals, distribution centres and heavy industries such as the timber and steel industry.

Due to the high investment costs for a battery pack, the batteries must have a long service life and corresponding energy availability.

HOPPECKE took up this challenge, and together with production and its customer Kalmar, produced a battery solution which met the requirements of the customer's extensive product portfolio.

**Demanding environment in heavy industries** such as ports and terminals

**Handling for battery changing** due to battery size and weight

**Fluctuating fleet utilisation** due to unavailable spare batteries

**Zero-emissions** through the electrification of the forklift truck range



*“By using trak | uplift air batteries our customer reduced his energy costs by 30% and was able to reduce his water consumption by up to 65%. And all this while maintaining maximum availability of his motive power batteries”.*

Sebastian Hoffman  
HOPPECKE Motive Power

**Cost advantages**  
through savings of  
investment and  
operating costs

**Increase of  
productivity**  
through optimising  
battery changing

**Increased truck  
availability**  
through intermediate  
charging

**Reduced  
environmental  
impact**  
through optimising  
energy use

## 2 | Solution:

### Low energy costs with high energy availability

**In view of the application demands, HOPPECKE recommended its trak | uplift air battery system to the heavy forklift truck manufacturer, which adapts precisely to the needs and requirements of the forklift truck and saves operational costs.**

After the complete clarification of the specification by purchasing, design and production, HOPPECKE showed that it is possible to meet the challenge and build four batteries for the vehicle. However, this was only possible because HOPPECKE was in constant consultation with its tray-supplier and the production plant. The requirements for a battery in a heavy duty application range from basic parameters such as voltage and capacity, to peak energy loads and charging duration. The battery voltage, required capacity and minimum weight were factors which posed the greatest challenges.

The HOPPECKE trak | air electrolyte circulation system prevents acid layering by means of air being blown into each cell, thus eliminating the need for potentially necessary weekend equalisation charges.

This means a sustainable reduction in energy and water consumption as well as charging time, thus reducing the number of replacement batteries required and generally extending battery life. By reducing energy consumption, Kalmar was able to save operating costs and ensure greater battery availability. With the possibility of intermediate charging, even short breaks are effectively used for charging, so that each truck can perform at its full capacity. Downtimes are optimised and logistics can be better planned.

In order to utilise the available battery space on the truck, the batteries have been equipped with one-sided fork pockets, this allows the customer to carry out a sideways battery change with the help of another forklift truck, allowing the battery change process to be carried out in a quicker and more efficient way.

In heavy lifting applications such as the wood industry, dust and dirt created by wood processing, can be problematic. For this reason, the traction batteries have been fitted with a cover to reduce the contamination of the battery by dust and dirt, especially in outdoor use in poor weather conditions. Because of this, battery downtimes are significantly reduced and the service life is extended.

#### Key Benefits

- Optimum use of the battery in demanding environments such as heavy industrial applications
- Increased productivity through optimised processes: batteries can be changed quickly and efficiently
- Reduced number of battery changes during the shift
- Extended service life – lower investment costs
- Reduction of energy consumption by up to 30%
- Reduced water consumption by up to 65%

## 3 | Products :

- ▶ **Batteries: trak | uplift**
- ▶ **Electrolyte circulation: trak | air**



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