



World's first hybrid aircraft towbarless tractor cuts fuel consumption with Saft SLFP™ Li-ion battery system

Kalmar Motor AB is a world leading specialist designer and manufacturer of tractors that move aircraft between hangars and passenger gates at airports. In early 2015, the company's new generation TBL 800 electric hybrid towbarless tractor for extra wide body aircraft commenced its real-world test programme with Lufthansa LEOS at Germany's Frankfurt Airport. This development is part of the airport's 'E-PORT on' initiative focused on electro-mobility. www.e-port-on.com/project

The challenge – reliability and sustainability

Reliability is vital in ground handling operations. Tractors may be required to operate 24/7 and any breakdown has the potential to disrupt flight schedules.

At the same time, airports are now facing ever stricter limits regarding greenhouse gas emissions and many now even pay for emission rights. Kalmar Motor has developed the new TBL 800 to enable airports to reduce their reliance on diesel-driven tractors,

helping reduce environmental emissions while significantly reducing running costs. It integrates a diesel genset and a state-of-the-art Saft lithium-ion (Li-ion) battery in a hybrid power system. As well as quiet and emission-free running during maintenance towing and push-back operations, the hybrid tractor also offers interesting new possibilities for operating inside aircraft hangars. The hybrid system consists in an electric motor powered by the battery and a small diesel engine, only used for battery charging. Operating with 95% electrical power and 5% diesel power, it enables 24/7 operation and ensures that the battery is never fully discharged.

Case study



SAFT

The solution – Saft SLFP™ Li-ion battery system

Kalmar Motor selected Saft's patented iron phosphate technology (SLFP™) Li-ion batteries that deliver the required electrical performance and power to maintenance tow a fully laden wide body aircraft with the weight of 580 tonnes over a distance up to 10 km.

Saft Li-ion 740 V battery key features

- Excellent energy storage capacity of 180 kWh with continuous power capability as high as 100 kW in charge and 400 kW in discharge
- Full power available all the time – regardless of the level of battery charge
- Fast charging capabilities which facilitate regenerative braking and charging during break periods
- A long service life estimated at 8 years

Results – significant reduction in operating costs and emissions in silent operations

The TBL 800 is the world's first hybrid tractor for wide body aircraft. It has been in operation at Frankfurt Airport since January 2015 and is being tested in various roles to establish its real-world performance.

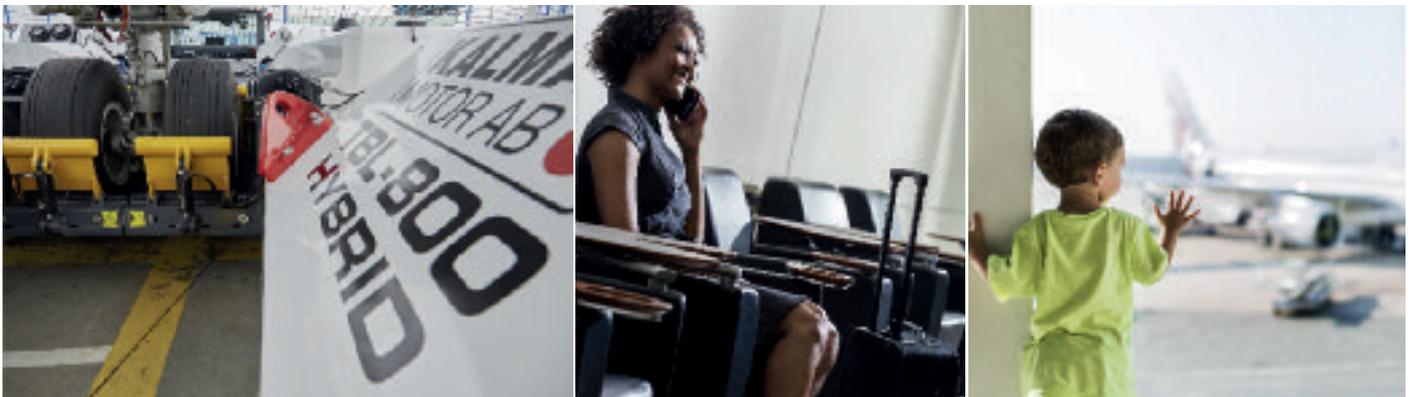
“It is absolutely critical for our airport tractors to deliver the total reliability and full availability that keeps life cycle costs to a minimum, even when running around the clock in extremely hot or cold temperatures. There could be no compromise on any aspect of the quality and robustness of the components and subsystems for our new generation hybrid TBL 800. That's why we specified Saft Li-ion batteries that have a field-proven track record for reliability and long service life.

Magnus Johansson,
Sales Director, Kalmar Motor AB



Key benefits

- Quiet and emission-free operation when electrically powered
- Reduced diesel engine runtime cuts greenhouse gas emissions by more than half
- Fuel costs are more than halved (17 € per hour estimated compared with 40 € per hour for a conventional tractor) – helping offset the purchase price of the battery system
- Maintenance costs down by 25% against a conventional tractor, even allowing for scheduled battery replacements



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