

Li-Ion

The future is now:
Superior performance, innovative technology,
typically STILL

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first in intralogistics

STILL

STILL Li-Ion Technology

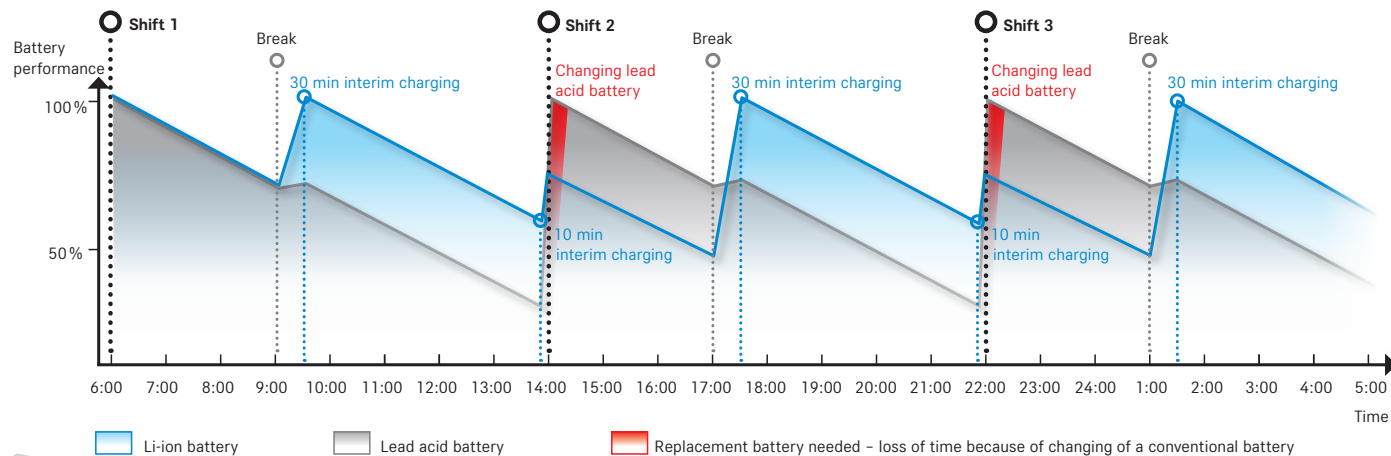
CUT YOUR OPERATING COSTS WITH LI-ION

Virtually all of us make use of this technology every day, without really being aware of it. We are talking about lithium ion batteries (Li-ion). No modern cell phone can do without it. Now this technology is conquering new fields of application and is moving into the field of industrial trucks. What exactly makes this new type of accumulator so attractive?

The benefits are evident. The Li-ion battery impresses with its high performance and is especially suitable for use in two- or three-shift operations where conventional lead-acid batteries are used and changed. It is not necessary to change Li-ion batteries. Fast opportunity charging now makes it possible to effectively use work stops such as lunch breaks. Both service time and availability of the trucks are substantially increased by opportunity charging or by installing twice the battery capacity in the truck.

The high-performance lithium-ion technology is especially suitable in cases where lead acid batteries are in use and have to be changed in two to three-shift operation. Lithium-ion batteries do not need to be replaced. By quick interim charging any downtime, such as a lunch break, can be efficiently used and the battery is recharged in a very short period of time. Interim charging does not affect the battery service life. Lithium-ion technology supplies constant voltage throughout the entire application time. Accordingly, you can work under full power through several shifts without having to change a battery or do any kind of maintenance at all.

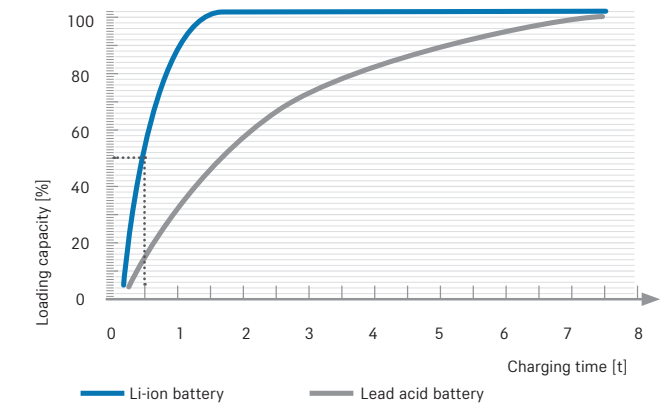
Li-Ion Technology: Full performance during several shifts thanks to effective interim charging



FAST PERFORMANCE FOR FLEXIBLE APPLICATIONS

During an assumed 30-minute lunch break, the Li-ion battery can be charged up to 50% of its capacity. The full capacity is reached after a charging time of 1.5 hours, compared to the seven to nine hours conventional batteries require for charging. It is also possible to opportunity charge Li-ion batteries without impairing the battery capacity. Lead-acid batteries, in contrast, partly lose unused capacity over time. Li-ion batteries are widely unaffected by this effect. Savings in operation and handling costs, resulting from the use of conventional lead-acid batteries, make the acquisition of Li-ion batteries rapidly profitable.

COMPARING BATTERY CHARGING TIMES



LI-ION TECHNOLOGY PROVES WELL IN APPLICATION

The Li-ion battery is an efficient and compact energy pack featuring high availability. Up to 95% of the power in the battery can be used, compared to 80% of conventional lead-acid batteries. The Li-ion battery allows about twice as many charging cycles. With an identical volume as a lead-acid battery, the Li-ion battery contains twice as much energy. This saves on battery replacement effort and infrastructure. A further significant advantage is the maintenance-free and carefree operation. Maintenance work as required by lead-acid batteries is not necessary for Li-ion batteries.

STILL Simply Efficient

HOW DOES THE LI-ION TECHNOLOGY BENEFIT YOUR BUSINESS?

What are the features of optimal battery technology? We at STILL are firmly convinced that the answer goes beyond high performance. Only the perfect coordination of characteristics such as power, precision, ergonomics, compactness, safety and ecologic responsibility results in a technology that is the optimum solution for the customer.

Simply Efficient



Simply easy

Maintenance free operation: no need to refill water or check the acid level

User friendly: potentially no need to change batteries

Li-ion batteries maintain their performance level also at temperatures below freezing making them **ideal for use in cold areas**



Simply powerful

The high energy density of the Li-ion battery ensures long operating times and increases the high availability of the truck
High availability by quick opportunity charging without the need to change the battery

Longer truck performance thanks to stable voltage supply throughout the discharging process



Simply safe

Intelligent battery management: all important functions are monitored

Less physical strain: potentially no need to change batteries

Increased user safety: thanks to acid-free operation

No emission of battery gasses



Simply flexible

Opportunity charging at any mains wall outlet:

no charging station required

Higher energy density for **compact battery dimensions**

Less organisational effort: pre-work checks and providing water are not needed



Simply connected

Communication between vehicle and intelligent battery control: a perfectly coordinated energy system (industrial truck, Li-ion battery and intelligent battery management) enables a long service life and efficient use of the truck

Intelligent charge management: protects the battery and extends the operating and service life



STILL Li-Ion Fleet


INNOVATIVE TRUCK PORTFOLIO - READY FOR YOUR TASK

STILL started to work with Li-ion batteries early on and was able to develop a large number of trucks with this technology. Today we are ready to offer you a complete fleet of Li-ion trucks. Low lift or high lift pallet trucks, order pickers, reach trucks, tractors or counterbalanced trucks - our portfolio is constantly growing. Find out more about the innovative Li-ion family from STILL.



STILL LI-ION COUNTERBALANCE TRUCKS

The RX 20 and RX 60 power packs ensure quick transport of goods. They can easily be used for long distances and are perfectly fit for indoor and outdoor use. Due to the high power density of the Li-ion technology, the Li-ion electric forklift trucks are particularly well-suited for tough applications. The lithium-ion batteries can be charged to 50% in only 30 minutes and allow for easy interim charging of the truck, while the charging process itself is approximately an hour faster than for conventional lead acid batteries. In addition, the lithium-ion battery lasts around twice as long as a lead acid battery, is maintenance free and can be used in a cold store. And it breaks new ground when it comes to safety too: every battery cell is monitored in real time. The RX 20 and RX 60 Li-ion are the ideal electric forklift trucks for extended periods of operation in industrial, trade and logistics applications.

[RX 20](#)  1.4 1.6 1.8 2.0 [RX 60](#)  2.5 3.0 3.5 4.0 4.5 5.0 6.0 7.0 8.0



STILL LI-ION REACH TRUCKS

The FM-X is always more than just a fork ahead of the rest. Thanks to active load stabilisation (ALS)* you can deal with the next goods transport while others would still be waiting for the mast to stop vibrating. An automatic equalising pulse provides a fast and effective way of stopping the vibrations from occurring at great heights, reducing the waiting time at the shelf by up to 80 per cent. The result is a significant increase in turnaround speed. The powerful Li-ion technology makes it possible to use the FM-X even more efficiently in multi-shift operation. Due to the higher energy density of the battery the FM-X reaches longer operating times and increases the availability of the truck. At the same time, due to the stable voltage curve, the vehicle constantly performs at full capacity.

[FM-X](#)  1.0 1.2 1.4 1.7 2.0 2.5 [FM-X SE](#)  1.4 1.7 2.0

STILL LI-ION HIGH LIFT PALLET TRUCKS

Efficient stacking is always a question of level - in this case the highest of all! The STILL high lift pallet truck is master of its trade. From perfect racking service up to the efficient loading and unloading of lorries. Even difficult application conditions do not become a burden. Now with Li-ion technology STILL offers another plus in flexibility. The Li-ion high lift pallet trucks are always available when speed is of the essence thanks to opportunity charging.



[EXV](#)  1.0 1.2 1.4 1.6 [EXV-SF](#)  1.4 1.6 [FXV/N](#)  1.4 1.6

* Not available for FM-X SE

STILL Li-Ion Fleet

INNOVATIVE TRUCK PORTFOLIO - READY FOR YOUR TASK



STILL LI-ION LOW LIFT PALLET TRUCKS

Now even more efficient! The new Li-ion low lift pallet trucks are the perfect solution for flexible operation thanks to diversity, truck dependability and quickness. In pedestrian mode low lift pallet trucks are usually tiller operated. For rider mode we offer a huge range of low lift pallet trucks with either fixed or foldable stand-on platforms. During short breaks Li-ion low lift pallet trucks can be charged quickly. The operator loses no time due to long charging times and can act flexibly.

[ECH](#) 1.2 1.5 [EXU/EXH](#) 1.6 1.8 2.0 2.5 3.0 [EXU-H](#) 2.0

[EXH-SF](#) 2.0 2.5 [EXH-S](#) 2.0 2.5 [SXH](#) 2.0 [FXH/N](#) 2.0 2.5



STILL LI-ION HIGH LIFT PALLET TRUCKS FOR DOUBLE DECK OPERATION

The Li-ion high lift pallet trucks for double deck operation can flexibly transport two pallets at once. This saves precious time when loading and unloading lorries. For rider mode, a fold-out standing platform is available for the EXD-SF. If you are more interested in fixed stand-on platforms STILL provides the EXD-S and SXD with Li-ion power. The FXD offers even more comfort on longer distances with its driver's seat. During downtimes, the vehicles can be recharged in a very short time.

[EXD](#) 1.8 2.0 [EXD-SF](#) 2.0 [EXD-S](#) 2.0 [SXD](#) 2.0 [FXD/N](#) 2.0



STILL LI-ION ORDER PICKERS AND TRACTOR

The "all-round talent" when it comes to the horizontal transport of goods weighing up to 2,500 kg. Thanks to the modular design, STILL offers the optimum horizontal order picker for any warehouse requirement with the versatile model variants of the OPX series. Safety, comfort and high handling performance are fixed characteristics of this efficient warehouse helper. In multi-shift operation, STILL Li-ion order pickers offer high cost savings potential. Also part of the portfolio is our fast, powerful electric tractor LTX 50. The efficient tractor can be used flexibly and is therefore ideal for internal transport on medium and long distances.

[OPX](#) 2.0 2.5 [OPX-L S](#) 2.0 [OPX-L](#) 1.2 1.6 2.0 [OPX-D](#) 2.0 [OXV](#) 0.7 0.8 1.0 [LTX](#) 5.0

STILL LI-ION VERTICAL ORDER PICKER AND NARROW-AISLE TRUCK

Do you want to make optimum use of your storage space? The EK-X vertical order picker sets new standards with its performance-optimised technology. A picking height of up to 12 meters, a driving speed of up to 13 km/h, as well as maximum safety and ergonomics for the driver speak for themselves. If you want to go even further, STILL offers the innovative MX-X. The narrow-aisle truck sets new standards in terms of performance and user-friendliness. Driving speeds of up to 14 km/h, a lifting height of 18 meters and the highest residual load capacity on the market make the MX-X the handling champion in highly dense storage environments.



[EK-X](#) [MX-X](#)

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Mission: Zero Emission

Innovative forklifts by STILL: powerful, efficient and environmentally friendly

Changing intralogistics - Europe becomes electric!

Environmental responsibility plays an ever more important role in our society. The role environmental responsibility plays becomes evident by the rapidly growing megatrends such as the spreading of renewable energies and e-mobility as well as in ever more strict emission standards for vehicles with IC engines. The overarching goal is to avoid emissions that are harmful to the climate.

In combination with the issue of energy efficiency, reducing emissions is at the top of the agenda. With respect to means of transport, both topics are closely associated with both types of drives (electric and combustion engines) and therefore also play a major role in intralogistics. In intralogistics, both truck types with electric and combustion engines are widely spread and both have seen major technological developments over the past years.

Market development: Electric forklift trucks are more in demand than ever.

The figures speak for themselves: since 2009 all across Europe the demand for electric trucks was greater than for IC trucks. The reasons for this trend are manifold. Overall, IC trucks tend to be a little less expensive to purchase than electric trucks, in the long run the latter clearly convince with substantially lower energy and service costs which quickly compensate the higher purchase price.

However, the purchase price for IC trucks is constantly rising as ever stricter emission standards require the deployment of more elaborate

Market development in Europe¹

Year	Electric forklift trucks (pcs. x 10,000)	Diesel and LPG trucks (pcs. x 10,000)
2011	10	40
2012	12	38
2013	15	35
2014	18	32
2015	22	30
2016	28	28
2017	35	25
2018	45	22
2019	80	20

¹ In accordance with order intake WITS (World Industrial Truck Statistics)

² In accordance with VDI 2695, medium application 1100 hours/year - 6 year average net price for diesel = 1.00 €/l (EU Commission: Oil Bulletin Prices)

³ Electric forklift truck incl. battery and charger

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technologies to reduce emissions. Considering the Total Cost of Ownership (TCO), the long-term benefits of electric forklift trucks are readily apparent.

Electric mobility keeps the world going round.

E-mobility is becoming an increasingly important part of our everyday lives. Experts agree that the future is geared towards pollutant-free means of transport based on electric motors. Even today, the pulse of our modern society would come to a halt without this type of drive. In addition to electric means of transport that have been tried and tested for decades, such as trains or underground and suburban railways, electric cars, buses, trucks and bicycles herald the next milestone of electric mobility in our modern society. Against the background of ever scarcer and more expensive fossil fuels, estimates are that this trend will accelerate in the future. **The future of mobility is electric.**

Calculation of service and energy costs²

Year	RX 70-30 Diesel (€)	RX 60-30 Electric (€)	Best competitor (€)
1 year	~20,000	~15,000	~30,000
2 years	~25,000	~20,000	~35,000
3 years	~30,000	~25,000	~40,000
4 years	~35,000	~30,000	~45,000
5 years	~40,000	~45,000	~60,000

Legend:

- RX 70-30 Diesel: Diesel consumption: 2.9 l/h, Diesel price: 1.00 €/l
- RX 60-30 Electric: Electricity consumption: 7.5 kWh/h, Electricity price: 0.14 €/kWh
- Best competitor: Diesel consumption: 3.2 l/h, Diesel price: 1.00 €/l

STILL – Electricity competence developed over 100 years.

From the very beginning of STILL's company history one of the major social issues of the future is already in place: electrical efficiency. The company had its first major success with electric generators. The expert knowledge and experience gained in this area was later transferred to innovative transport vehicles propelled by electric motors. Already back in 1946, the electric cart EK 2000 reliably moved up to 2 tons of load for renowned customers such as the German railway. Only a little while later, in 1949, the first electric counterbalance truck, the STILL EGS 1000, moved the growing flow of materials into the right direction. Since then STILL has been one of the most sought-after experts for electric mobility in logistics. Innovations by STILL covering the whole industry have made the electric counterbalance trucks more and more attractive over the years. Meanwhile electric counterbalance trucks have grown powerful enough to replace IC engine trucks with ease even in heavy applications such as in the beverage industry.

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