

## Press Article

### GNB Sonnenschein Lithium battery passes demanding endurance test

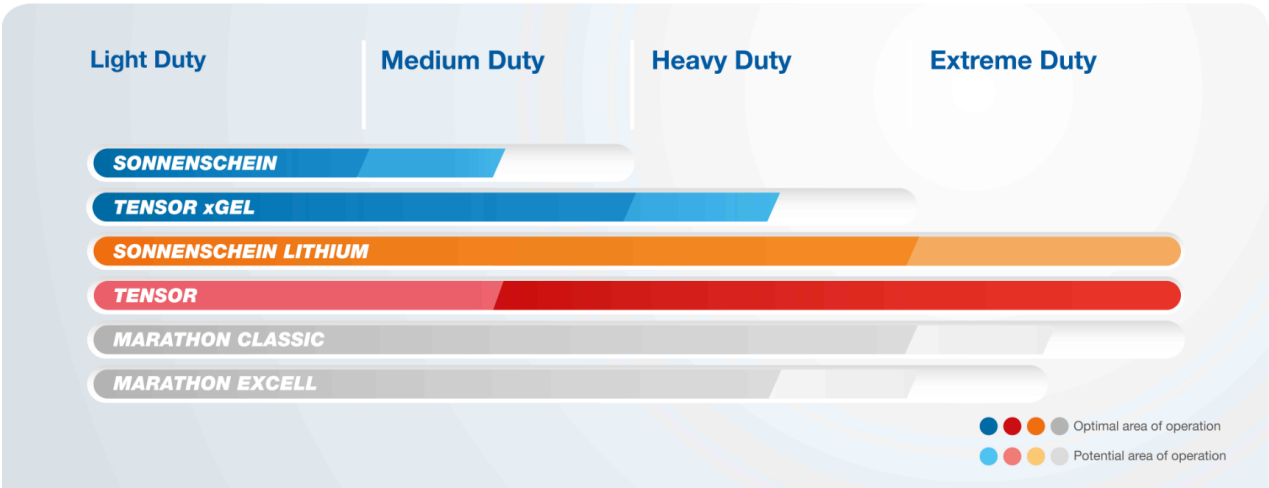
*Büdingen, Germany – 7<sup>th</sup> September 2017* – GNB Industrial Power - a division of Exide Technologies, a leading global provider of stored electrical energy solutions, has passed a series of demanding endurance tests at a large European distribution center with its Sonnenschein Lithium battery. The tests showed that a single lithium-ion battery could power a forklift around the clock, with only short bursts of recharging required while workers take breaks. This is especially valuable in three-shift operations, where battery replacement would normally be required.



The tests took place at a large distribution center for a top company in the European snack market. They were organized by GNB, a division of Exide Technologies, and Magaziner Lager- und Fördertechnik, the German custom forklift manufacturer for narrow aisle warehouses. The companies have a strong relationship spanning decades, and are now working together to explore how lithium-ion technology can benefit Magaziner's customers.

Lithium-ion is on the rise across nearly every segment of the battery market. The technology offers an exceptional range of benefits, including greater usable capacity, size and weight improvements, faster charging and low maintenance. GNB is a leading expert in lithium-ion for forklifts. It has worked on more than 100 applications across Europe, and gives its customers the know-how and consulting that ensure they take full advantage of the technology.

GNB has a world-class reputation in the forklift market, and an excellent track record of helping its customers reduce costs and optimize total cost of ownership. It has products that are specially designed for certain usage scenarios. The best choice for some businesses might be Sonnenschein Lithium, for example, while for others it might be GNB's high-performance lead-acid batteries like TENSOR or TENSOR xGEL. GNB takes the time to understand each customer's business, see how their operations work, and propose the most cost-effective solution for their needs.



### The advantages of lithium-ion technology

Lithium-ion has several advantages that make it the right choice for more and more applications. The technology is more energy efficient than traditional lead-acid. It also recharges around eight times faster, which means a single battery can be used around the clock. All that is needed are short recharging slots of 15 and 30 minutes while workers take breaks.

Lithium-ion batteries are initially more expensive to buy than traditional batteries but often reduce operating costs for the right business. They are especially useful in 24/7 operations, which would otherwise need 2–3 batteries per forklift in rotation throughout the day. Using a single battery per forklift means you can streamline operations and lower total cost of ownership.

When you switch fully to lithium-ion, charging rooms are no longer needed. This saves space, which can then be used for additional storage. Another advantage is that lithium-ion batteries require no maintenance or water refilling, and lead to much lower energy bills than with lead-acid batteries

## The choice of technology

The endurance tests were conducted using the GNB Sonnenschein Lithium battery. It has a long lifespan of up to 4,000 cycles, an integrated battery management system, and is optimized for intermittent charging. It is low maintenance, has very short charging times, and energy density is increased by 30%. The battery is designed to reduce operating costs over its entire service life, leading to impressively low total cost of ownership.

### GNB Sonnenschein Lithium

Nominal voltage: 76.8 V

Nominal capacity: 552 Ah

Battery dimensions: 852 × 1,025 × 784 mm

Battery weight: 769 kg

Tare weight of trough: 176 kg

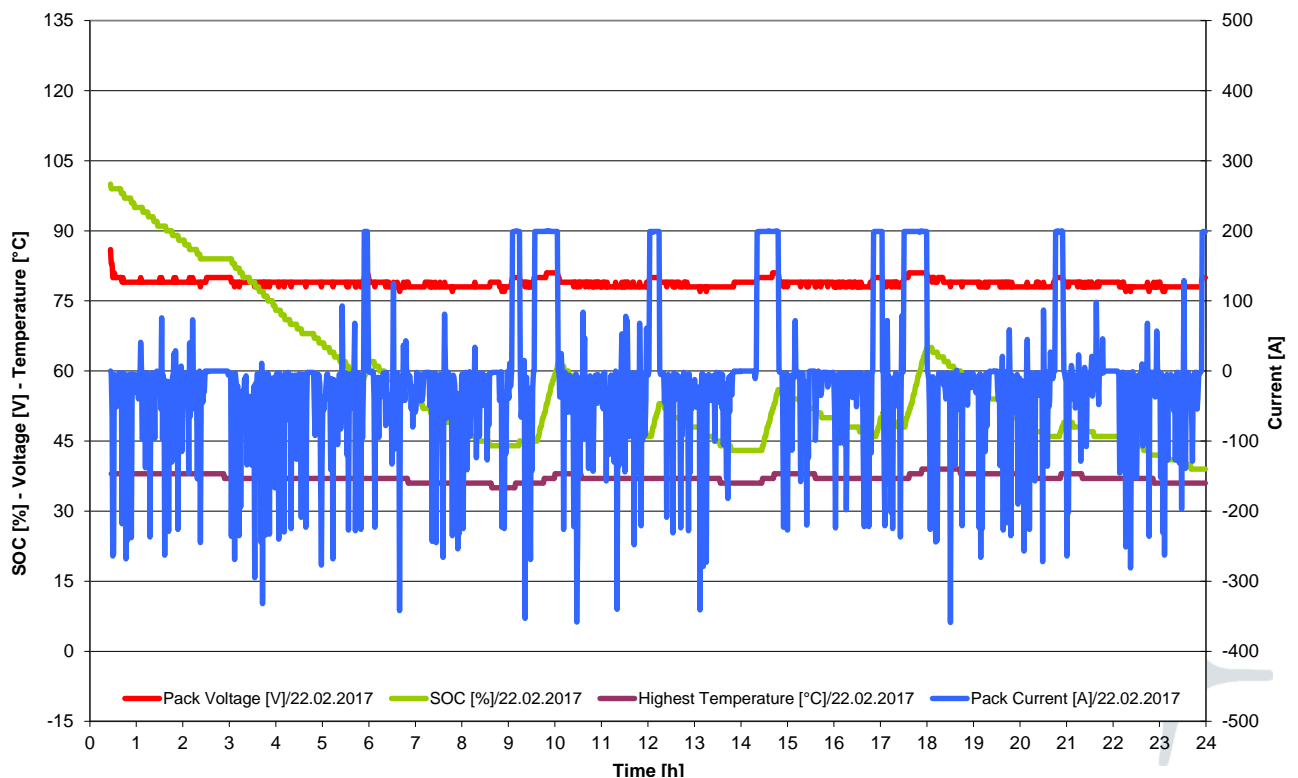
Ballast weight: 935 kg\*

\* To reach the specified total weight of 1,880 kg

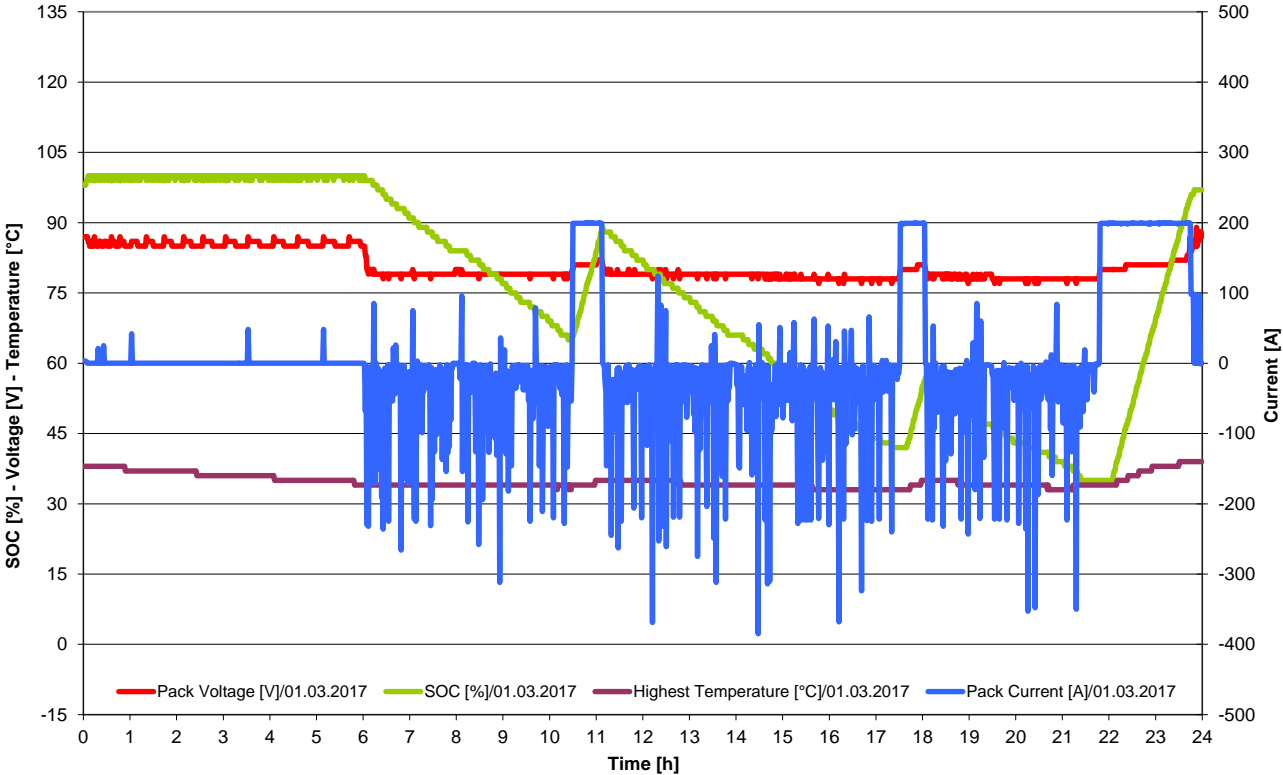
The GNB 2100 HP Lithium 78 V 200 A charger was selected. It has a full charge cycle of 2 hours. It supports seamless 2- or 3-shift operation via intermittent charging, and is optimized to get maximum performance out of a GNB Sonnenschein Lithium battery.

## The results of the endurance test

Sonnenschein Lithium successfully handled a range of challenging conditions. The endurance test validated that the forklift could operate for three continuous shifts in a 24-hour period on a single battery. Charging took place when the forklift was idle or the worker was taking a break, ensuring that driver time was optimized. The battery could operate with just nine charging slots: six of 15 minutes and three of 30 minutes. The chart below plots a three-shift operation.



Running a two-shift operation was also tested, and Sonnenschein Lithium handled this scenario comfortably. Under this setup, the forklift was in operation from 6am until 10pm. The battery was charged overnight, and during the day it was charged twice for 30 minutes each. The chart below plots a two-shift operation.



The battery was able to handle two-shift and three-shift operations. Depending on a company's requirements, another intermittent charging cycle could easily be added during the morning break or other downtime.

The charger should be placed next to where the forklift is usually parked. This means no time is wasted transporting the battery to and from a central charging unit. This approach allows you to get rid of charging rooms and free up space for more storage. And for new distribution centers, lithium means you can avoid the capital expenditure of fitting charging rooms.

In the future, charging could take the approach used for automated guided vehicles (AGVs), with a bus bar plus charging contacts, and applying that to forklifts. This approach would need to be considered at the facility planning stage, with the end customer, forklift manufacturer, battery and charger manufacturer all working together on the optimal solution.



GNB's market-leading range of forklift batteries are optimized to reduce total cost of ownership. Each is designed for particular applications, and GNB helps customers make the right selection for their needs. The company believes in offering a complete solution, and gives businesses the know-how and consulting to get the most out of the technology. Its range of chargers and accessories help to maximize the performance and lifespan of its batteries.

## Trademark notice

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GNB, TENSOR and Sonnenschein are registered trademarks of Exide Technologies.

## About Exide Technologies

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Exide Technologies (<http://www.exide.com>) is a global provider of stored electrical energy solutions—batteries and associated equipment and services for transportation and industrial markets. With 127 years of industry experience and operating in more than 80 countries, Exide produces and recycles a broad range of products that keep customers and their businesses powering forward.

The Exide Transportation business manufactures and markets starting, deep-cycle, and micro-hybrid batteries for automotive, light and heavy-duty truck, agricultural, marine, military, powersport, and other specialty applications, along with battery diagnostic equipment and charging systems.

Exide serves the Industrial Power markets with its GNB®-branded efficient energy storage systems for both Motive Power and Network Power customers. Motive Power applications include materials handling (power for lift trucks, airside assistance vehicles, and automatic guided vehicles); cleaning machines; railroads; military and mining vehicles; and other commercial electric vehicles. Network Power installations include standby power for electric utilities; telecommunications systems; alarm/security systems; renewable energy systems; railway systems; uninterruptible power supply (UPS); and defense industry equipment.

Exide Technologies is Powering the World Forward. History and scale, combined with a start-up mentality, make Exide the right choice for customers who want more than simply a battery supplier.

## Contact

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