



CRESLOW ENERGY
SOLUTIONS



Industrial Lithium Battery Solutions

Lithium batteries have become an increasingly popular power source. Lithium batteries deliver maximum power all the time, regardless of how much charge is left, unlike lead-acid batteries where less charge affects speed and lifting capacity.

Four reasons to choose lithium batteries for your forklift



Efficiency

Means lower costs and lower emissions. Utilize up to 90% of the charge in lithium battery compared to 50% from Lead-acid battery. A major advantage over other batteries is their ability to store a high energy density in a small space. We use Lithium phosphate Cells (LiFePO₄). This ensures our lithium batteries can contain more energy in the same volume. We can provide more energy for longer working times.



Productivity

Are your forklifts running as effectively and efficiently as they could? We know the costs and issues surrounded with unplanned downtime. Lithium batteries are an excellent choice for keeping this to a minimum. They generate less heat and improve the ability to deliver stable voltage no matter what level of charge they have. This allows an efficiency improvement of up to 30% over traditional lead-acid batteries.



Safety

Lithium Cells are maintenance free, there is no acid to be refilled and therefore no acid spills. No hazardous fumes and eliminates battery changes at each shift (compared to Lead-acid)

Superior DoD (Depth of discharge) means better utilization of stored energy. Cleaner & Greener for the environment.



Modular

Because we work with individual Lithium Cells to build our packs, we can connect several packs in series to form a battery system. Each battery system is customized to the machine and application, we work on a modular concept combining the right number of packs to deliver the required power without adding unnecessary Cells and weight. Packs can be added in future if working conditions change, adding packs is simple and quick.

Other Benefits:

- **Opportunity Charging**
Can be recharged at any time and level without affecting battery life.
- **Rapid Charging**
Depending on power supply at site, our battery can charge from 50Ah to 400Ah.
- **Batteries that last**
The useful life of the lithium battery is (4,000 cycles) equivalent to the useful life of the truck, without the need for new investments to maintain the equipment or the need for second sets of batteries.
- **No charging rooms**
Chargers can be located anywhere in the facility rather than needing a dedicated charging room.

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Customised lithium battery solutions
for Home ESS, Forklifts, Golfcarts & E-bike



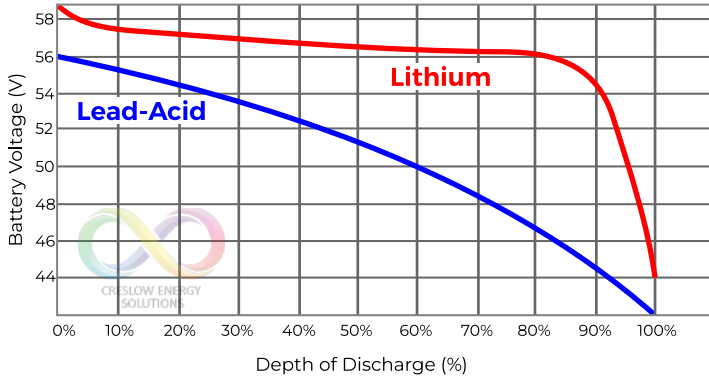
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B-BBEE**
135% CONTRIBUTOR

Locally Manufactured & Locally Supported

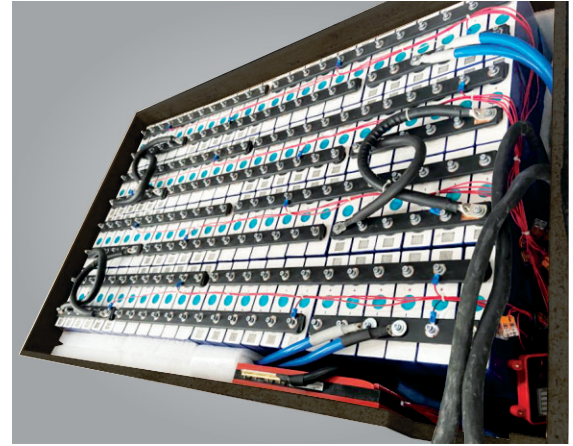
Battery system with 16 x 6 Battery packs. Each battery pack delivers 630A. 16 Battery packs are connected in series to provide 52V 630AH. We are always working to advance our technology and provide even more productivity benefits. Our new 630Ah capacity battery will enable a Forklift to work for more than a full eight-hour shift (lifting and driving), from a single charge.



Discharge Curve: Lithium vs Lead Acid



We limit our Cells to 80% DoD (Recommended) – This ensures the full 4,000 cycles of our Lithium Cells is achieved.



The cost per cycle, measured in ZAR / kWh / Cycle, is the key figure to understand the business model. To calculate it, we consider the sum of the cost of batteries + transportation and installation costs (multiplied by the number of times the battery is replaced to equalize the number of cycles). The sum of these costs is divided by the net consumption of the system (40kWh per cycle, 4000 cycles of use). The result is summarized in the table below:

	LEAD-ACID	LITHIUM
Installed capacity	80 KWh	50 KWh
Usable capacity	40 KWh (50% utilization of Lead-Acid)	40 KWh (80% utilization - CES recommendation)
Lifespan	1000 cycles at 50% DoD (Depth of Discharge)	4,000 cycles at 80% DoD (Depth of Discharge)
Number of installations	4 (1 + 3 replacements)	1
Battery cost	ZAR 720,000 (180K per battery x 4) ***	ZAR 250,000 (250K per battery x 1) ***
Installation cost	ZAR 40,000 (10K per install x 4)	ZAR 10,000 (10K per install x 1)
Transportation cost	ZAR 20,000 (5K per transport x 4)	ZAR 5,000 (5K per transport x 1)
TOTAL COST	ZAR 780,000	ZAR 265,000
Cost per usable KWh per cycle	ZAR 4.87 Usable KWh (780,000 / 4,000 / 40)	ZAR 1.65 Usable KWh (265,000 / 4,000 / 40)
*** Based on market retail price per KWh at 1st November 2021.		
NOTE: Electricity cost for charging batteries has been excluded. Due to Lithium batteries achieving a higher utilization (80% vs 50%) there will be a saving on actual Eskom costs related to battery charging.		

In summary, the total cost of ownership per usable kWh is about 2.9 times cheaper for a lithium-based solution compared to a lead acid solution. We note that despite the higher initial cost of Lithium technology, the cost per stored and supplied kWh remains much lower than for Lead-Acid technology. The reason is related to the intrinsic qualities of lithium batteries but also linked to lower installation & transport cost.

Our Range

- 12V to 120V and bigger depending on specific requirements
- 100A to 1,000A depending on specific requirement
- Our designs are based on single Lithium Cells which allows us build customized solutions as required

Creslow Energy Solutions use Tier 1, Grade A Cells for all our battery packs and we are direct importers of Lithium phosphate Cells. All other components are sourced from local manufacturers & suppliers.

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