

HAWKER® FLEX SYSTEM

THE FUTURE OF MOTIVE POWER



FLEX Li³™

Built to the highest safety, design, and manufacturing standards, the HAWKER® FLEX Li³™ battery is the premium Lithium-ion (Li-ion) offering to power your material handling vehicles. It is offered in multiple sizes and configurations and integrated with innovative battery management technology to deliver intelligent flexible power that is not only reliable but increases productivity and profitability across lift truck operations.

HAWKER® FLEX Li³™ LITHIUM BATTERIES:

- Highest quality lithium technology and support from the world's largest industrial battery manufacturer.
- Built with the highest standards and safety redundancies.
- Designed using ISO 26262 ASIL C to be CE and UL compliant. (UL 2580 & EN1175)
- Utilizes the highest quality of cells negating the need for active balancing which other suppliers employ.
- CAN bus communication.
- Comprehensive Battery Management System to protect your asset.
- Employs a modular concept, enabling scalability for additional capacity.
- Identical modules are used in both motive and reserve applications. At the end of motive life, modules may be re-purposed as reserve power.
- Suitable for all applications.
- Ideal for all opportunity and fast charging applications.
- Outstanding cycle life.
- Virtually maintenance free.
- Audible and visible state of charge (SoC) status.
- Laser welded cells and rugged construction.
- Large format prismatic cell technology delivers higher reliability.
- Nickel Manganese Cobalt (NMC) chemistry for high volts per cell (VPC).
- AutoSar® software control design incorporates innovative electronic systems that further improve performance, safety, and sustainability.





CONVENIENCE

- Modular design enables scalability to custom power based on demand.
 - HawkerNET™ battery management system provides internet-based reporting.
 - Modular serviceability.
 - Modifyable for wireless charging.
 - Multiple options for external battery status indicator which provides critical information including state of charge.
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- The MODify™ mobile app shows data from the HAWKER® CAN communication device and allows monitoring of batteries and chargers to ensure asset protection.

FLEXIBILITY

- Choose fully populated inner trays with modules or leave room for growth.
- Easy plug-and-play charging - no need to disconnect the battery from the truck.
- App and cloud-based reporting.
- BMS ensures over discharge protection and SoC control.
- Customize and combine HAWKER® technologies to satisfy operational needs.
- Minimal downtime with optimized charging.

HAWKER® FLEX™ ELITE



PREMIUM BENEFITS

- Excellent partial state of charge Ah throughput for motive power with the new HAWKER® optimized design.
- BMS (Battery Management System) - Controls the state of charge parameters and offers better communication through CAN to the truck and charger.
- Bigger blocs with higher capacities to fulfill the market need for Class I and II TPPL with charge rates up to 70%.
- Manufactured in the USA - Allows for quicker availability and compliant with America's trade agreements.
- Provides design advantages that will increase the PSOC cycling and Ah throughput.

IDEAL APPLICATIONS

- Multi-shift operations
 - Production areas
 - Retail stores and membership warehouses
 - Provide solutions for applications with difficulty in:
 - Battery watering
 - Battery cleaning
 - Battery changing
 - Obtaining a full recharge daily
 - Environmentally conscious
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HAWKER® FLEX™ ELITE BENEFITS

- TPPL Technology is proven and tested for 7 years in Europe.
- Ideal for opportunity and fast charging where frequent plug-ins are available.
- Excellent performance in partial state of charge (PSOC) operations, managed with the HAWKER® intelligent Battery Management System.
 - Higher Ah throughput that will exceed typical flooded lead acid batteries with managed PSOC
 - Only 1 full recharge required weekly
 - Only 1- two hour equalize charge required weekly.
 - The goal is maximizing the highest state of charge daily.
- Broad line of sizes and voltages available for your operation.
- No watering ever.
- Minimal maintenance.
- No battery watering system or corrosion.
- Shock and vibration resistant.
- Minimal gassing - ideal for shops/sensitive manufacturing and public areas.
 - Less than 1% gassing of flooded product.
- Vented trays to maintain lower temperatures.
- Built-in audible low voltage alarm.
- Fast battery availability.
 - 40-80% SoC in 1 hour (using appropriately-sized HAWKER® charger).
 - .7C charge rate.
- High energy throughput.
- Higher charge acceptance due to lower resistance.
 - 1.6 throughput daily of rated capacity.
- Environmentally friendly - 99% recyclable.



*FLEX™ Elite – Available in 2020

HAWKER® FLEX™ AND FLEXPAK™

HAWKER® FLEX™ and FLEXPAK™ Thin Plate Pure Lead (TPPL) batteries represent the latest additions to part of the industry's broadest and most comprehensive line of battery solutions for your operation. Suitable for a variety of applications and virtually maintenance-free, HAWKER® FLEX™ and FLEXPAK™ batteries provide superior flexibility and allow for frequent recharging. Cycle life increases exponentially with more frequent plug-ins.

POWERFUL OPTIONS

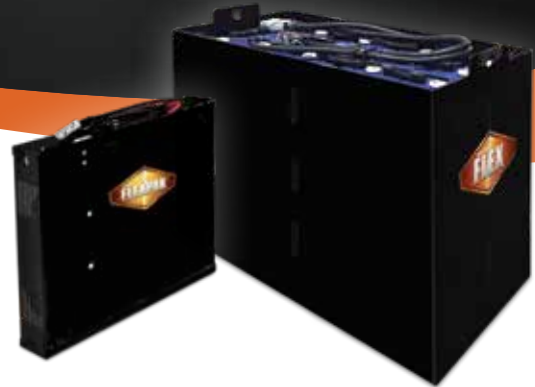
HAWKER® FLEX™ battery systems provide a range of motive power batteries (consisting of either 2 volt cells or monoblocs) that offer opportunity charging with no battery changing and virtually no maintenance. This will provide significant operational benefits at a lower cost of ownership compared to traditional flooded, gel, or air mixed batteries.

HAWKER® FLEXPAK™ batteries include an on-board charger for light-duty applications.

VIRTUALLY MAINTENANCE-FREE

HAWKER® FLEX™ and FLEXPAK™ batteries can eliminate routine maintenance and improve your bottom line:

- Forget about watering – forever.
- Forget about corrosion – forever.
- Faster battery availability due to short recharge times.
- Only one full charge and equalization for partial state of charge or opportunity charge applications per week.
- Stratification and sulphation problems are virtually eliminated.
- Elimination of battery changing.
- Lower internal resistance resulting in higher charge acceptance.



FLEXIBILITY

HAWKER® FLEX™ and FLEXPAK™ batteries provide exceptional flexibility. Use them whenever you want, and recharge them whenever you can – during breaks or at the end of the shift. HAWKER® FLEX™ and FLEXPAK™ batteries can even be put back into service before they are fully charged. They are the perfect power source for opportunity and fast charge applications and will go from 40-80% state of charge within one hour with the appropriately sized HAWKER® charger with TPPL charge profile. All HAWKER® FLEX™ and FLEXPAK™ batteries are equipped with low voltage alarms (LVA) to automatically assist by alerting you when your battery should be charged.

Combining advanced battery design technology with robust materials and construction, HAWKER® FLEX™ and FLEXPAK™ batteries provide the flexibility you need to reduce operating costs associated with standard flooded batteries by being virtually maintenance-free. HAWKER® FLEX™ and FLEXPAK™ batteries are highly resistant to shock and vibration. They will literally change the way you work.

HAWKER® FLEX™ AND FLEXPAK™ BENEFITS

HAWKER® FLEX™ and FLEXPAK™ batteries feature a superior quality, microporous glass mat separator with high electrolyte absorption and stability to enhance cyclic capability. Positive and negative plates are low impedance, high corrosion-resistant thin plate grids manufactured from pure lead in a unique process.



Light-Duty and Medium-Duty Applications

HAWKER® FLEX™ AND FLEXPAK™ THE POWER OF PRODUCTIVITY

HAWKER® FLEX™ batteries are suitable for all types of light-duty and medium-duty applications:

- pallet trucks
- industrial utility vehicles
- automated guided vehicles (AGV)
- floor care/cleaning machines
- shuttle personnel carriers
- narrow aisle fork trucks



HAWKER® FLEX™ and FLEXPAK™ batteries offer optimized cycling performance and rapid recharging that conventional lead acid batteries – gel and flooded – simply cannot. When used with a HAWKER® approved charger, HAWKER® FLEX™ and FLEXPAK™ batteries offer a wide range of benefits:

- High energy throughput – up to 180% of C₆ per 24 hours for monoblocs and 160% for 2 volt cells.
- Long maintenance-free life cycle – up to 1,200 cycles at 60% DoD for monoblocs and up to 1,500 cycles for 2 volt cells at 60% DoD.
- Extreme shock and vibration resistance
- Environmentally friendly
- Minimum gassing: ideal for use in shops, public areas, and sensitive manufacturing areas.
- Recyclable
- Ideal for multi-shift operations
- Short recharge times – 40-80% state of charge in 35 minutes for monoblocs and 40-80% state of charge in 1 hour for 2 volt cells (with a HAWKER® approved charger).
- Ideal for partial state of charge operations with one full charge and equalization per week.
- Ideal for opportunity charging.
- Long shelf life (up to 2 years at 68°F).

IDEAL CHARGING PARTNERS

The HAWKER® LifePlus™ MOD3, PTO™ MOD3, and LifeTech™ MOD1C chargers can utilize the TPPL battery profiles to optimize cycling performance and reduce charging times. HAWKER® modular high-frequency, smart chargers with TPPL profiles are ideal for use with the HAWKER® FLEX™ and FLEXPAK™ batteries:



LIFEPLUS™ MOD3 CHARGER

The LifePlus™ MOD3 high-frequency switch-mode IONIC smart charger offers six different charge profile options for operational flexibility. This charger allows the customer to choose between 2 factory set charging options:

- (1) IONIC, opportunity, cold storage, and EVOLUTION (VRLA) profiles.
- (2) TPPL 2V fast and TPPL Bloc profiles



PTO™ MOD3 CHARGER

The PTO™ MOD3 high-frequency charger allows the user to choose between 2 factory set charging options:

- (1) Conventional I-U-I, opportunity, and cold storage profiles.
- (2) TPPL 2V standard and TPPL Bloc profiles.



LIFETECH™ MOD1C CHARGER

The LIFETECH™ MOD1C modular high-frequency, smart chargers provide optimum charging, peak efficiency, maximum reliability, and non-stop power to meet the growing demands of our customers.

HAWKER® FLEX™ and FLEXPAK™ batteries must be charged with a HAWKER® approved charger.

For the right HAWKER® power solution to meet your needs, please call 1-877-7HAWKER for a HAWKER® representative in your area.



HAWKER[®]

LEADING EDGE MOTIVE POWER SOLUTIONS

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