



Southwest Airlines[®] saves big with NexSys[®] PURE battery-powered baggage tractors

In 2015, Southwest Airlines[®] began powering 70 new electric baggage tractors with NexSys[®] PURE Thin Plate Pure Lead (TPPL) batteries at Chicago's Midway International Airport. The carrier had just started using them in its baggage tractors station-wide, after a multi-city trial demonstrated that the TPPL batteries would eliminate the watering maintenance and acid spills associated with flooded lead acid batteries.

Ironically, Southwest Midway was already enjoying those benefits, as the station had been using watering-free gel batteries in its baggage tractors for years. Unfortunately, the performance of the gel batteries was less than ideal.

Gel battery limitations

Unlike TPPL batteries, gel batteries are not especially robust – they are prone to drying out and losing capacity in cold weather, and don't respond well to the opportunity charging that airport applications demand. Plus, Midway is cold for much of the year and it's Southwest's busiest hub, all of which impacted battery reliability and lifecycle.

Southwest was getting up to four years of service out of the gel batteries, but that involved sending them out frequently for repairs. Attempting such services in-house was impractical and would have required additional training, but sending the batteries out took tractors out of service, slowed operations, and added to overall battery power costs. NexSys PURE batteries provided a better solution.

TPPL technology advantages

Initially developed for military applications, NexSys PURE batteries can withstand shock, vibration and extreme temperatures. Their TPPL design delivers high energy throughput and optimized cycling, making them ideal for efficient opportunity charging.

To help ensure that performance at Midway, EnerSys[®] worked closely with Southwest before the TPPL batteries went into service. As Southwest Midway Station Manager Tom Amato explains, "A critical reason for our success with NexSys PURE batteries is because EnerSys helped us confirm that our charger and tractor settings were properly calibrated from the very beginning. Then, we made sure to charge them frequently, just as the specs advise."

“The NexSys PURE batteries are also slashing expenses — over five years, they've cut battery costs by about 46%, or \$634,550.”

Tom Amato
Southwest Midway Station
Manager

TPPL design-enabled PM

Robust TPPL design and frequent charging helped the batteries reach their anticipated three-year lifecycle. Southwest was able to extend it even further by adding battery voltage checks and on-site repairs to their quarterly Preventative Maintenance (PM) routines. Two TPPL design features made it easy.

Each NexSys® PURE battery contains 12 modular “blocs”, and each can be easily removed and replaced if a voltage shortage is detected in one of them. The blocs also have a much longer shelf life than flooded or gel lead acid batteries, which allowed Southwest to keep a small inventory of spare blocs on-hand. If Southwest detected a bloc with voltage issues during a PM check, the carrier simply replaced it immediately.

“This was another really important factor in our success,” says Amato. “Instead of waiting weeks to get a tractor back in service while we waited for a gel battery to be fixed, we could swap out a NexSys bloc ourselves in minutes and avoid any tractor downtime and delays in our operation.”

Five years of service and savings

As of mid-2020, the full fleet of 70 NexSys PURE batteries is still in service. Many of them have already exceeded five years of life, and battery operating data shows that they are all on track to deliver at least a 25% lifecycle increase vs. the gel batteries.

The NexSys PURE batteries are also slashing expenses – over five years, they’ve cut battery costs by about 46%, or \$634,550. Amato adds, “the NexSys PURE battery has been such an overwhelming success that we nominated it for Product of the Year at our annual GSE Leadership Conference.”

Thin Plate Pure Lead (TPPL) Design

Robust connections

Cell connectors are casted and bonded to the plates to resist vibration.

Pure lead plates

Pure lead plates are extremely thin, so more of them fit into the battery. More plates mean more power.

Compressed AGM separators

Absorbed Glass Mat (AGM) design prevents spills and delivers extreme vibration resistance.



Lifecycle Battery Costs/Savings

Gel Batteries:

\$3,375 (purchase) + \$500 (repairs) = \$3,875 X
5 years = \$19,375
X 70 tractors = **\$1,356,250**

NexSys® PURE batteries:

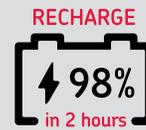
\$2,000 (purchase) + \$62 (repairs) = \$2,062
X 5 years = \$10,310
X 70 tractors = **\$721,700**

**TOTAL FIVE-YEAR
SAVINGS:
\$634,550**

Features and Benefits



No watering, battery cleaning or long equalize charges



Fast charge in less than 2 hours; plug-in during breaks



Cell connectors are cast and bonded to the plates



Optimized cycling performance and high energy throughput



Very low internal resistance means more power when you need it most

* with appropriately sized charger

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