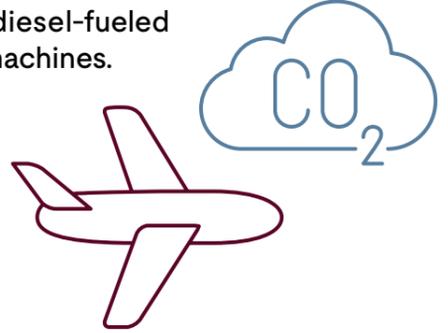


# Powering Aviation Ground Support Equipment with Lithium Batteries

UL 5840, the Standard for Electrical Systems of Battery Powered Aviation Ground Support Equipment, addresses risks to fire, electrical shock and explosion.

With dedicated objectives to reduce CO2 emissions and meet increased environmental requirements, airlines and airports are replacing diesel-fueled ground support equipment (GSE) with lithium-battery-powered machines.

- Tugs
- Tractors
- Pushbacks
- Firefighting equipment
- Freight carts
- Container loaders
- Belt loaders
- Refuelers
- Food and water
- Ground power units
- Passenger boarding stairs
- De/anti-icing vehicles

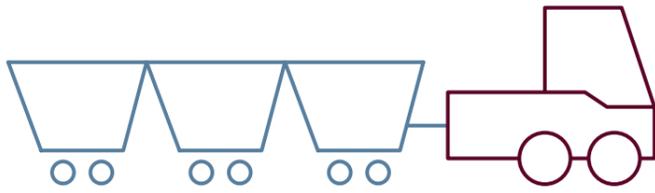


## Did you know?

At the 77th International Air Transportation Association (IATA) Annual General Meeting in Boston, USA, on Oct. 4, 2021, a resolution was passed by IATA member airlines committing them to achieve net-zero carbon emissions from operations by 2050. These member airlines represent 290 airlines in 120 countries.<sup>1</sup>

### Lithium-battery-powered GSE benefits

- Lowers carbon emissions
- Works well in cold climates
- Lightweight
- Low total cost of ownership
- Range and efficiency



### With lithium battery benefits come safety risks

Although lithium battery-powered vehicles offer many benefits, this new and evolving technology presents some risks of fire, electrical shock and explosion.

UL Solutions has launched a new service for evaluating lithium battery-powered aviation GSE. UL 5840 provides requirements that address the risk of fire, electric shock and explosion for the electrical systems of battery-powered airport GSE.

## Did you know?

The Chicago Department of Aviation awarded a \$640,000 (USD) grant toward a United Airlines joint-U.S. Environmental Protection Agency (EPA) investment of \$1.43 million (USD) to purchase 26 new zero-emission GSE vehicles, replacing older, diesel-fueled equipment.

United Airlines will save more than 1.4 million gallons of diesel fuel and reduce emissions of carbon dioxide (CO<sub>2</sub>), the primary air pollutant in the generation of greenhouse gases, by more than 16,000 tons.<sup>2</sup>



### GSE lithium battery retrofit

The aviation industry is especially concerned about the safety of lithium retrofit batteries since this portion of the industry is not closely regulated. For this concern, the Standard also addresses the retrofitting of lithium batteries into more traditional diesel-powered and lead-acid-powered equipment.



### Airport maintenance and operations

Our Standard assesses the safety of lithium battery chargers and new battery charging stations for compliance with safety requirements and their facilities for risk of fire, electric shock and explosions.



### U.S.-Canada binational recognition

As a binational U.S. and Canadian Standard, UL 5840 is nationally recognized and approved by the American National Standards Institute (ANSI) and the Standards Council of Canada (SCC), offering greater consistency in the safety of battery powered GSE across both countries and jurisdictions.

<sup>1</sup> IATA.org, Our Commitment to Fly Net Zero by 2050, <https://www.iata.org/en/programs/environment/flynetzero/>

<sup>2</sup> The Business Journals, United Airlines gets federal help to reduce diesel emissions at O'Hare, <https://www.bizjournals.com/chicago/news/2018/02/12/united-airlines-gets-federal-help-to-reduce-diesel.html>