

Case Study:

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## Optimizing Electric Forklifts with Heavy-Duty Amphenol Connectors



# A 48-volt electric forklift featuring a 700-AH battery capacity saves about **7 metric tons of CO2** per year.

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**T**he electrification of transportation and heavy machinery is affecting all industries, with warehouses being no exception. In recent years, there has been substantial growth in the development of electric forklifts, which offer greater sustainability, cost-effectiveness, and working conditions than conventional solutions.

[PEI-Genesis](#) works with numerous customers who are transitioning towards electric forklifts. However, the transition is not always smooth, as with most new technologies. In this case study, we'll examine a customer's challenges as they adopted electric forklifts and how the PEI-Genesis team worked with them to resolve these issues.

## Market Background: Electrifying Forklifts

Electric forklifts are becoming an increasingly integral part of modern material handling solutions, particularly in indoor and warehouse environments. Designed to safely and efficiently load and unload large goods, electric forklifts offer a unique combination of compactness, maneuverability, and sustainability to the warehouse.

An advantage of electric forklifts is their use of lithium-ion batteries, which provide several operational and environmental benefits. These batteries offer extended operational time, charge forklifts during shift breaks, maximize productivity, and minimize downtime. Additionally, lithium-ion batteries have a longer lifespan than conventional lead-acid batteries, reducing the frequency and cost of replacements.

From an environmental standpoint, electric forklifts reduce CO2 emissions, as they don't rely on fossil fuels. This makes them a greener alternative to internal combustion engine (ICE) forklifts, aligning with global efforts to reduce carbon footprints. Moreover, the absence of fuel combustion means that electric forklifts can operate with less noise and reduced fuel costs associated with ICE forklifts.



## Customer Challenges

The customer faced many challenges when optimizing their electric forklift's performance and reliability.

A primary issue revolved around finding [reliable connectors](#) suited for the demanding operational environment of electric forklifts. Given the role connectors play in ensuring the seamless transmission of power and signals, any compromise in their quality could lead to operational inefficiencies and increased downtime.

Therefore, the challenge was finding high-quality connectors with [stock availability](#) and realistic lead times. The customer needed to procure large quantities of connectors to meet their production and maintenance schedules simultaneously. However, they needed help sourcing these components in the required amounts and within acceptable time frames. This difficulty in securing a steady supply of connectors threatened to disrupt their operational workflows, potentially causing delays in production and affecting their overall efficiency.

In addition, the fluctuating availability of these critical components posed a risk to the reliability and performance of the electric forklifts. Any delay in acquiring connectors could lead to extended downtimes, adversely affecting the customer's ability to meet their logistical and operational targets.

## PEI's Solution: Amphenol SurLok Plus™ and Bonded Inventory

To address the customer's challenges, we provided a comprehensive solution, both technically and logistically, tailored to their needs.

The chosen product for the lithium battery electric forklifts was [Amphenol's SurLok Plus™](#) connectors. These connectors are known for their robust qualities and are ideal for demanding industrial applications like electric forklifts. Some of the key features of the SurLok Plus™ connectors include:

- **Field installable compression lugs: These allow for easy and secure installation**
- **Heavy-duty power connectors: Ensuring reliable and efficient power transmission**
- **IP67 & IP6K9K protection and touch-proof design: Offering excellent environmental resistance and safety**
- **RoHS compliance: Adhering to strict environmental standards**
- **RADSOK contact technology: Providing low mating forces over a larger portion of the mating surface for enhanced conductivity and performance**

Given the selected products, PEI worked closely with the customer to develop a forecast model, agreeing to maintain a certain amount of stock, including stock buffers, to ensure availability for call-offs. This collaboration required regular communication and meticulous behind-the-scenes work to keep stock levels above a certain minimum while also supporting future demand.



To achieve this, PEI's product team collaborated with the Amphenol Industrial team to manage stock levels effectively and provide seamless service to the customer. We prepared for potential production increases by expediting part numbers and setting up an agreement to hold specific stock levels, allowing the customer to pull inventory as needed. The buffer stock, which equated to having 4-5 months of usage at any time, was an advantage for the customer.

Additionally, PEI leveraged its [bonded inventory program](#) to make the process smoother for the customer. This program ensured inventory was allocated specifically for the customer based on forecasts, not from a shared pool. The approved design registration with [Amphenol Industrial](#) allowed the parts to be offered at an exclusive price, enabling PEI to schedule large quantities over an extended period without large cost fluctuations.

## The Outcome

Since 2020, PEI-Genesis' partnership with the customer has proven highly successful. Thanks to the strategic implementation of Amphenol SurLok Plus connectors and the bonded inventory program, PEI has ensured consistent stock availability, allowing the customer to maintain efficient and uninterrupted production schedules. This collaboration has met the immediate needs and set a precedent for future innovation and resilience in their supply chain.

As industries increasingly prioritize sustainability and efficiency, PEI-Genesis remains committed to driving forward-thinking solutions that enhance operational capabilities and sustainability in industrial environments.

