

Quality requirements for energy storage battery production



Overview

The purpose of this quality requirements specification (QRS) is to specify quality management requirements and the proposed extent of purchaser intervention activities for the procurement of battery energy storage systems (BESSs) in accordance with IOGP S-753 for application in the petroleum and natural gas industries. Are quality concerns a problem in battery manufacturing?

Given the thin profit margins (often 2-3%)⁸⁶ with which battery factories operate, quality concerns are often in tension with these manufacturing performance indicators. For instance, the decision of what to do with a batch of cells with marginal failures might be heavily debated between production and quality teams.

What is battery quality?

We now consider a second definition of battery quality: conformance. Conformance refers to how well a manufactured product conforms to its design²⁵. The battery industry often refers to nonconformance as “cell-to-cell variability”^{22, 55, 56, 80}.

How sustainable is battery production?

Finally, we mention that the sustainability of battery production is becoming an increasingly important manufacturing performance metric. For instance, an estimated 30–65 kWh are consumed in the factory for every kWh of cells produced^{45, 87}.

What is Quality Management in lithium ion battery production?

Quality management for complex process chains Due to the complexity of the production chain for lithium- ion battery production, classical tools of quality management in production, such as statistical process control (SPC), process capability indices and design of experiments (DoE) soon reach their limits of applicability .

Is battery quality a determinant of battery failure?

In summary, both senses of battery quality (defectiveness and conformance) are critical determinants of battery failure and thus the financial success of cell and EV production endeavors. We revisit battery quality in the “Managing battery quality in production” section.

What is the best form factor for a battery?

The battery industry is currently pursuing three primary form factors: cylindrical, pouch, and prismatic. While many design criteria influence the optimum form factor for a given application, we propose that both quality and “quality inspectability” are also important.

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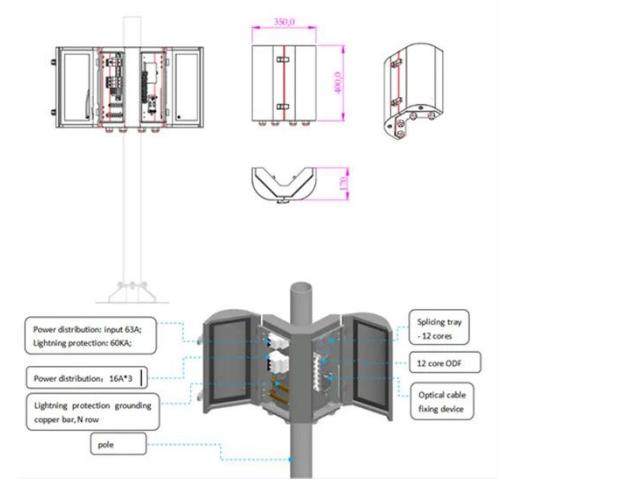
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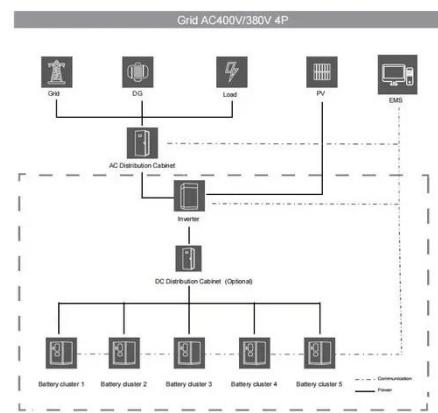
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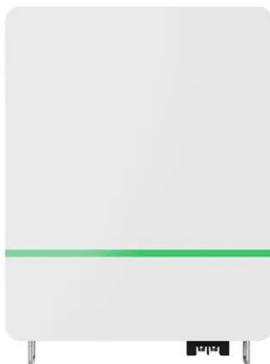
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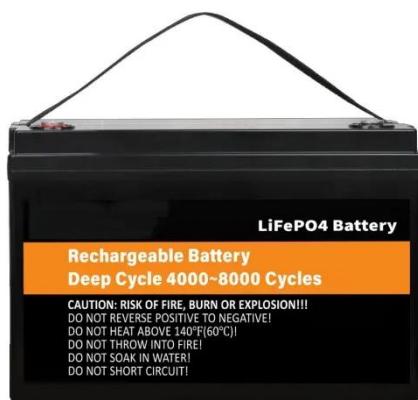


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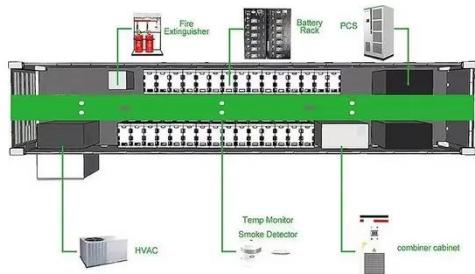
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