# Contrasting Semi-Solid Lithium Ion and Lithium Polymer Batteries

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A shift is occurring between Lithium Ion (Li-ion) and Lithium Polymer (Li-po) batteries. Semi-Solid Li-ion batteries are resolving traditional Li-ion vs. Li-po tradeoffs. For decades, the simple distinction between Li-ion and Li-po was easy to distinguish; namely that Li-ion delivered greater energy density and lifetime performance while Li-po offered fast charging and flexible form factors.

With the increasing availability of Semi-Solid Lithium Ion batteries (SSB) a new future is near at hand with All-Solid-State battery development. Let's look now at some Li-ion SSB benefits over Li-po.

**1. Semi-Solid Li-ion <u>ELECTRODES</u>**

Semi-Solid Li-ion batteries (Li-ion SSB) utilize a semi-solid electrolyte that contains less liquid compared to traditional Li-ion batteries. This semi-solid electrolyte is a compromise between solid-state and liquid electrolytes, enhancing safety while maintaining reasonable ionic conductivity, moving us closer to the dry solids, gels or porous chemical compounds used in Li-po battery cells.

**2. Semi-Solid Li-ion <u>FORM FACTOR</u>**

Li-ion SSB are more rigid than Li-po but can be designed to be thinner and lighter than traditional Li-ion batteries. The semi-solid nature provides some flexibility in design but not as much as Li-Po.


**3. Semi-Solid Li-ion <u>ENERGY DENSITY</u>**

Li-ion SSB often has a higher energy density compared to Li-po batteries, providing more energy storage for the same volume or weight. The semi-solid electrolyte helps balance energy density and safety.

**4. Semi-Solid Li-ion SAFETY**

Li-ion SSB offer enhanced safety compared to traditional Li-ion batteries due to reduced liquid electrolyte, which lowers the risk of leakage and thermal runaway.

**5. Semi-Solid Li-ion APPLICATIONS**

Li-ion SSB are more suitable for applications needing higher energy density and enhanced safety, such as advanced consumer electronics, electric vehicles, and portable power tools.

**6. Semi-Solid Li-ion LIFESPAN**

Li-ion SSB are expected to offer a longer lifespan than Li-po batteries due to improved thermal stability and reduced degradation from less liquid electrolyte.

**7. Semi-Solid Li-ion CHARGING TIME**

Li-ion SSB provide improved charging time when compared for traditional Li-ion batteries. Charge time may be comparable to or slightly longer than Li-po batteries, depending on the specific design and materials used.

To be fair and in summary, Lithium Polymer batteries still have a great role to play in select applications. However with the introduction of Semi-Solid Lithium-ion batteries we now enjoy a great advancement over traditional Li-ion batteries by incorporating less liquid electrolyte, which enhances safety while maintaining high energy density. The choice between SSB Li-ion and Li-po depends on the specific requirements for energy density, safety, form factor, and cost.

Learn more about Semi-Solid Lithium-Ion Swift Pouch Cells here:
https://www.enpower-greentech.com/batteries/swift-series

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