

THOR™ HYPERFLOW™ TECHNOLOGY

Modern Engineering Plus Classic Physics Equals a New Method for Charging Batteries

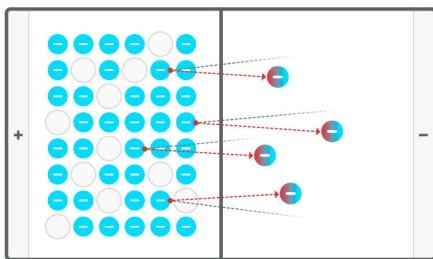


Figure 1
Traditional "Brute Force" Charging

- ⊖ Today's chargers use electronics to force negatively charged particles to one side of a battery – a "brute force" method.
- ↶ This method is slow and creates lots of electrical resistance, because many of these particles (electrons) bounce back when they don't immediately fit into the shell of an available atom (reduced rate of charging).
- ⚠ Heat is the byproduct of all this resistance – making standard charging not only inefficient, but in some cases, dangerous.
- ⚡ Standard charging systems must carefully manage the voltage and current levels throughout the process, which further contributes to heat output.
- 🔋 Charging too quickly causes dendrites ("metal whiskers") to cross the electrolyte barrier, short circuiting the battery.**
- 🔥 Fires and explosions (as seen with the Galaxy Note 7, among other electronics devices) are the direct result of short circuits and overheating.
- 🔌 Even "normal" heat associated with charging causes batteries to degrade faster than they otherwise might.

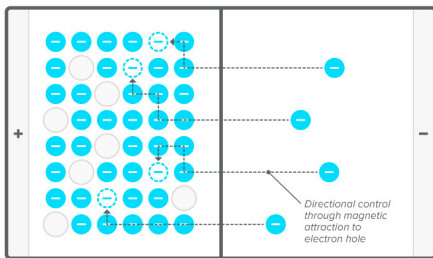


Figure 2
Hyperflow™ Charging

- 🔄 Hyperflow™ Technology uses magnetics to passively recharge batteries with almost no resistance, so there's no need to precisely manage the current and voltage.
- 🔋 With magnetics, available electron holes* are automatically sensed and filled, eliminating the bounce-back effect that causes so many problems.
- ⚡ Subtracting the bounce-back effects means that electrical resistance and heat byproduct are negligible.
- ⌚ Because heat is no longer a limiting factor, Hyperflow™ Technology can charge batteries as fast as physically possible.
- 🚫 The risk of fire or explosion from battery overheating is reduced to zero.
- 🚗 Speedier, safer charging will empower even more robust growth of emerging technologies like electric vehicles – and pave the way for new technologies that have until now been impractical.
- 🔋 Hyperflow™ Technology works with any battery chemistry that exists now or might exist *in the future*, including the revolutionary solid-state batteries now being engineered at UT-Austin.

* In physics, chemistry, and electronic engineering, an electron hole is the lack of an electron at a position where one could exist in an atom or atomic lattice.
Source: https://en.wikipedia.org/wiki/Electron_hole

** <https://news.utexas.edu/2017/02/28/goodenough-introduces-new-battery-technology>