

Wits Solar Car 18650 Batteries: Powering Solar Mobility

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Why 18650 Cells Dominate Solar Car Design

You know, when the Wits Solar Car team first considered battery options in 2023, they faced a \$64,000 question: Why use 18mm-diameter cylindrical cells when newer pouch-style batteries offer higher capacity? The answer lies in a perfect storm of energy density (250-300 Wh/kg), proven thermal stability, and modular repairability - crucial when racing across Australia's 3,000km solar challenge.

Recent data from the World Solar Challenge shows 78% of top competitors still use 18650 lithium-ion cells, despite newer alternatives. Why? Well, these standardized cells enable teams to replace individual units costing \$5-\$8 instead of entire \$1,200+ battery packs. During the 2023 race, the Dutch Nuon team demonstrated this advantage by swapping 14 faulty cells mid-race without losing podium contention.

The Lithium-Ion Edge in Solar Applications

Let's break down what makes these batteries tick. Each 18650 cell contains:

- Lithium cobalt oxide cathode (60% energy efficiency)
- Graphite anode with silicon additives (15% capacity boost)
- Flame-retardant electrolyte (self-extinguishing in

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