Burning Questions: Unpacking EV Battery Safety

Can EV Batteries Spontaneously Ignite?

No. EV batteries do not ignite spontaneously under normal conditions. Triggers generally include:

- Severe physical damage (e.g., crashes)
- Exposure to fire or extreme temperatures
- Manufacturing defects (rare and typically caught in QA testing)

What is Thermal Runaway?

Thermal runaway occurs when a battery cell overheats uncontrollably, triggering a chain reaction in adjacent cells. This can cause fires or explosions if not contained. EV batteries are designed with:

- Thermal barriers between cells
- Pressure release valves
- Software that limits overcharging/overheating

Is Charging Indoors Safe?

Yes, if done properly.

Certified chargers, code-compliant outlets, and ventilation make home and garage charging very safe.

In fact, many EV fires start after a collision or due to damaged battery packs, not while charging.

How likely is a fire to occur during charging?

Fires during EV charging are extremely rare, with studies showing incident rates of less than 0.03% per year per charging station.

Most EV fires occur due to battery damage, thermal runaway, or manufacturing defects—not the charging process itself. When fires do occur during charging, they are typically linked to poor installation, lack of thermal monitoring, or use of unapproved equipment. Properly installed and certified charging infrastructure greatly minimizes this risk.

Sources

- **UL Research Institutes-** What Is Thermal Runaway? - UL Research Institutes

- **Gasmet-** What is thermal runaway in lithium-ion batteries

- **U.S. Department of Energy (DOE)-** Alternative Fuels Data Center: Electric Vehicle Charging Stations