Lithium iron phosphate batteries for electric cars

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Rivian will deliver its first vehicles with lithium iron phosphate (LFP) battery packs in early 2024. But while most recent EV battery-related headlines focus on next-gen technology, LFP batteries have been around for decades. So why introduce them now? And why are carmakers so reluctant to talk about them?

LFP batteries are cheaper but still hit or exceed the EPA range estimates of nickel cobalt manganese (NCM) batteries, the current standard LFPs are replacing, the Wall Street Journal reports. That"s why Tesla uses LFP batteries in the base Tesla Model 3, and why Ford switched to the same in its base Mustang Mach-E in May.

It"s an industry-wide trend, as automakers push to turn a profit on EVs despite rising materials costs. (Rivian had a particularly rocky road with pandemic supply chain challenges.) In theory, manufacturing cost savings could result in more affordable cars, leading to wider EV adoption.

But LFP batteries are not a one-to-one replacement for NCM. It is widely understood in the industry that they have distinct pros and cons, driven by a unique mix of metals that alter how they store and dispense electricity.

NCM batteries perform better than LFPs in cold weather and on high-intensity activities like towing due to their higher energy density.

As one PCMag reader with an LFP-based Tesla Model 3 tells me: "In the cold weather you can"t get in the car and drive 240 miles in one shot. It"s more like 175." For him, the convenience of charging at home outweighs any downsides, though: "No biggie to me. If EVs are going to be widely adopted, we need to accept that they don"t work like gas cars do."

Manufacturers are also improving LFP technology. Chinese battery behemoth CATL"s says it has an LFP that can charge up to 250 miles in just 10 minutes.

Yet any time I ask an automaker questions about LFP battery performance, it"s a conversation killer. "Regarding commentary on the LFP battery, we don’t have anything to share at this point," a Rivian spokesperson said this week. She would only concede that LFPs will open up an "entry-level price point" for its R1 EVs in early 2024.

A conversation with Ford, meanwhile, about testing two Mustang Mach-Es—one with an LFP battery and one with an NCM—started out enthusiastically in person but mysteriously died over email, even

after three follow-ups to arrange the test.

This curious caginess—shared by multiple automakers—raises an uncomfortable question: Are they hiding something? The cynical take is yes, an automaker like Rivian is reluctant to publicize any downsides that could hamper sales of already pricey vehicle; the R1T starts at $73,000. A more positive interpretation: The company is simply communicating the baseline metrics the EPA requires, and doesn"t think the public needs more specific information.

Tesla has been selling LFPs in at least half of its EVs to reduce costs without specifying the battery type on the online ordering page. Instead of saying "LFP" and "NCM," Tesla and Rivian opt for "performance" or "long range" (code for NCM) and "standard" (code for LFP).