

Researchers explore vehicle use of cellulose nanofiber-based parts

October 1 2017, by Nancy Owano



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(Tech Xplore)—The US Department of Energy says "Reducing a vehicle's weight by just 10 percent can improve the fuel economy by 6 to 8 [percent](#)."

Scientists in Japan are busy working on the role of wood pulp as a potential ingredient in lightening up cars.

Virginia Harrison reported on their work on Friday for BBC News.

"[Researchers](#) in Japan are working to create a strong material out of wood pulp that could replace steel parts in vehicles within a decade," she wrote.

The researchers are from Kyoto University, and they are working on a material from wood pulp that could hold up with strength of steel yet lighter. The research team said it could replace steel in auto parts. Prof. Hiroyuki Yano leads the work at the university, said the BBC. He said the material could be used to make door panels, fenders and car bonnets.

Specifically, they are working with "a material made from wood pulp weighs just one fifth of steel and can be five times stronger," said Reuters.

How do they do that? Harrison: "The team chemically treats wood pulp, which consists of millions of cellulose nanofibers (CNFs), and disperses these CNFs into plastic."

(CNFs are used in products, from ink to transparent displays.)

The hybrid material is the result of this CNF blend with plastics.

Naomi Tajitsu and Maki Shiraki in Reuters said the university, along with auto parts suppliers, are developing a prototype car using cellulose nanofiber-based parts. They said the expected completion date is 2020.

An automotive analyst saw the bigger picture.

Paolo Martino, principal automotive components analyst at IHS Markit, said in the BBC article that the rush was on "to try and cut as much weight as possible, especially on cars which will pollute more," like pick-up trucks and SUVs.

As mentioned, "Reducing a vehicle's weight by 10 percent can improve the [fuel economy](#) of the vehicle by 6 to 8 percent." Also, "Magnesium and carbon fiber have the potential to reduce the weight of some vehicle [components](#) by 75 percent."

Martino, meanwhile, pointed out manufacturers also seek to lighten their electric models, for an ability to travel further on a single charge.

Tajitsu and Shiraki in Reuters said that "a reduction in car weight will mean fewer batteries will be needed to power the vehicle, saving on costs." They quoted Masanori Matsushiro, a project manager overseeing [body](#) design at Toyota Motor Corp. "Lightweighting is a constant issue for us."

Nonetheless, as Reuters also pointed out, their material faces "competition from carbon-based materials, and remains a long way from being commercially viable."

The BBC quoted Vivek Vaidya, [senior vice president](#) at Frost & Sullivan, who said parts manufacturers might struggle to keep pace with auto production lines. "Most components are supplied on-demand, [so] whether a wood or organic material can be made available in a just-in-time way is definitely a question mark."

"Analysts say high-tensile steel and aluminum will be the more popular alternative for many years to come, said Reuters, "considering parts makers would need to overhaul production lines and figure out ways to fasten new [materials](#) like cellulose nanofiber onto other car parts."

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Citation: Researchers explore vehicle use of cellulose nanofiber-based parts (2017, October 1)
retrieved 2 May 2024 from

<https://techxplore.com/news/2017-10-explore-vehicle-cellulose-nanofiber-based.html>

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