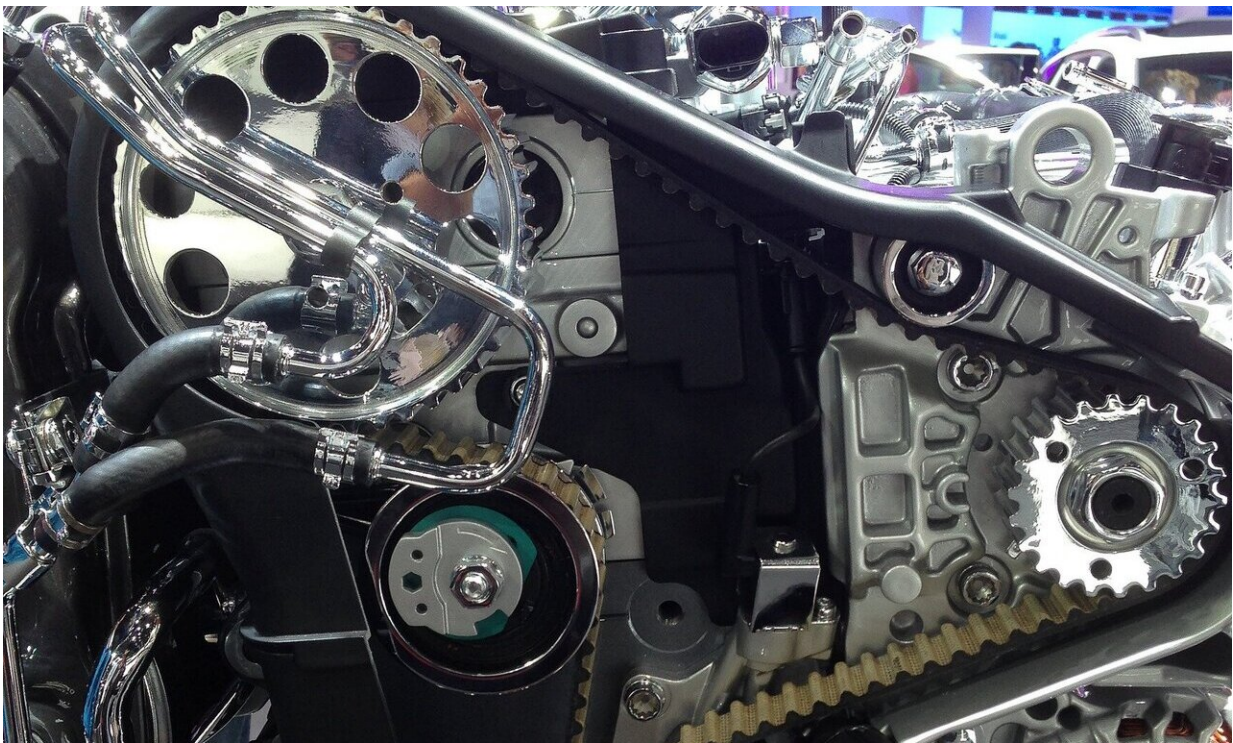


Switching from aluminum to zinc alloys could improve sustainability of automotive parts

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A new study reveals that switching from aluminum to zinc alloys in the production of automotive parts could greatly enhance their longevity and sustainability.

The study, conducted by Cranfield University's Sustainable Manufacturing Systems Centre, compared three different alloys (Aluminium-A380, Magnesium-AZ91D and Zinc-ZA8). Over recent years aluminum alloys have been favoured by the automotive manufacturing industry for their lightweight properties and lower cost.

The study, published in the *International Journal of Sustainable Manufacturing*, suggests that aluminum is frequently chosen ahead of other alloys because of a failure to fully factor the sustainability of the end-product into consideration. When examining sustainability alongside traditional factors such as time, cost and flexibility, Cranfield's research demonstrated that the zinc rather than the aluminum or magnesium alloys offered the better choice for automotive manufacturers.

The zinc alloy proved to be a more sustainable and higher performing option, when considering measures such as the [environmental impact](#) caused by the extraction of the metal and the quality of the parts it produces. Despite the [aluminum alloy](#) being a lower cost option, the study found that the zinc alloy also offered better value for money as the parts it creates are likely to have a much longer life than the other [alloys](#).

Previous Cranfield research has demonstrated that the automotive industry's focus on increasingly lighter weight cars to increase fuel efficiency, often through lightweight [aluminum](#), may not actually be a more environmentally sustainable option.

Professor Konstantinos Salonitis, Head of Sustainable Manufacturing Systems Centre at Cranfield University, said: "Aluminum has become the favoured material of the [automotive industry](#) for its lightweight properties and comparatively low cost. However, our study which looked in depth at sustainability, alongside traditional factors such as time, cost and flexibility, showed that actually a [zinc](#) alloy can be better value for money as well as being more sustainable."

Professor Mark Jolly, Director of Manufacturing at Cranfield University, added: "With the pressing climate crisis and consumers becoming ever more interested in the impact that the products they purchase have on the environment, manufacturers need to have a greater understanding of not just how they keep [costs](#) down but how they find the more sustainable option."

More information: Emanuele Pagone et al, Multi-criteria decision-making for the life cycle of sustainable high pressure die casting products, *International Journal of Sustainable Manufacturing* (2020). [DOI: 10.1504/IJSM.2020.107140](https://doi.org/10.1504/IJSM.2020.107140)

Provided by Cranfield University

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