3D functional lattices to reduce pollution

Applications of 3D printing in automotive

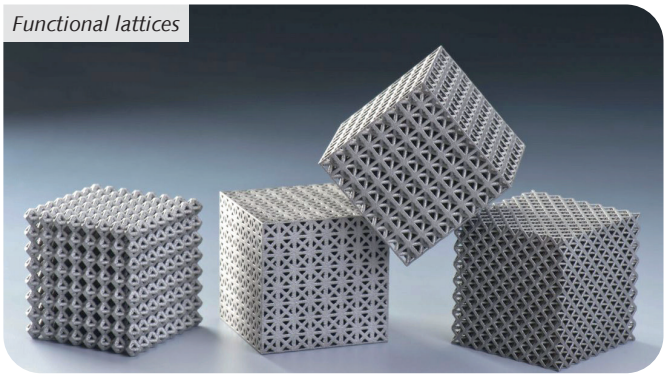
Cars which pollute less are a crucial component in the fight to reduce air pollution and fossil fuel consumption. One of the major aspects of fuel-efficient design is a reduction in weight. It seems an obvious solution because the lighter a vehicle is, the less fuel it needs, however it is not easy to create lighter cars which are still efficient and safe. The solution to making lighter, more affordable, efficient and more environmentally friendly vehicles lies in 3D printing.

New projects

Over the past few years, the University of Nottingham's Additive Manufacturing and 3D Printing Research Group, has been working to develop new processes that not only make cars more fuel-efficient, but also reduce both noise and CO_2 emissions; they have achieved some good results that let us have hope for future improvements.

In 2013, the Nottingham Centre was one of the main partners in the ALSAM (Aluminum Lattice Structures via Additive Manufacturing) project, which created latticed components made from aluminum alloys. The group was able to completely redesign an engine component and part of a fuel pump and reduce the weight of the component by 80%.

Functional lattices



Functional lattices

In 2017, the group started working with several other organisations on a larger project called Functional Lattices for Automotive Components (FLAC). They have been able to produce a new class of advanced car components, which are manufactured with 3D printing, are lighter and have an increased thermal performance, by using new alloys and some new software – called *Flatt Pack* –which was developed by the research group.

FLAC's aim is to reduce the weight of new vehicle components by up to 80%, and to demonstrate that the project will not only benefit the environment through better fuel efficiency, but that it will also minimise waste and costs by eliminating special tooling and the dangerous materials required in conventional manufacturing techniques.

to achieve: *raggiungere* | **fuel:** *carburante* | **pollution:** *inquinamento*
alloy: *lega* | **lattice:** *reticolo* | **waste:** *scarto*

1 **Decide if the sentences are true or false. Correct the false sentences.**

	T	F
1. Vehicle weight does not have any impact on fuel efficiency.	☐	☐
2. 3D printing has been used in the automotive field for a long time.	☐	☐
3. The University of Nottingham was one of the partners in the ALSAM project.	☐	☐
4. Functional lattices will increase the weight of certain car components by up to 80%.	☐	☐
5. FLAC will reduce waste but it will not affect costs.	☐	☐
6. The research group is using new metals.	☐	☐

Batmobile