PRESS RELEASE
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RENAULT GROUP AND THE CEA CONTINUE TO INNOVATE TOGETHER FOR THE CAR OF TOMORROW

- **Renault Group and the CEA have created a novel material architecture that combines groundbreaking digital design with additive manufacturing (3D printing).**
- **This innovation could make it possible to design components with exceptional properties and adaptable, customisable behaviour.**
- **The potential applications for the automotive industry are promising, with on-board comfort for example.**

Boulogne-Billancourt and Saclay, 26 March 2024 – Renault Group and the CEA are continuing to innovate together. After the bi-directional high-efficiency charger for electric vehicles announced for 2023, it is now the turn of on-board comfort to combine the technical expertise and creativity of the two partners.

After 2 years of research and testing, resulting in the filing of around ten patents, Renault Group and the CEA have developed a complex mesh structure. Using a single material, and in a single 3D printing additive manufacturing stage, the structure produces components with adaptive mechanical behaviour and enhanced performance.

More powerful, lighter, and customisable, the components created with this innovation could replace others that are usually made up of a combination of several materials, such as seat seats and backrests, armrests, the centre console, etc.

A unique lattice structure

The innovation lies in the use of ground-breaking digital methods and tools to design a strategically organised structure. Each of the strands making up the mesh of this lattice structure can be parameterised three-dimensionally, to form multi-layer networks of cells in which each stratum has a unique function and characteristics.

Although more complex in their design, the resulting monolithic and monomaterial parts are simpler to produce, in a single 3D printing operation and without any assembly, minimising the carbon footprint and generating no scrap.

Made from TPU (Thermoplastic Polyurethane), these innovative structures are recyclable. Research is continuing to assess the compatibility of other materials, particularly bio-sourced materials.

For customisation down to the millimetre

Applied to seats, for example, this innovation should make it possible, while making them lighter (by around 30%) and thinner, to use a single material to achieve levels of comfort, cushioning and support that cannot be achieved with the usual materials used (fabrics, foams, reinforcements, etc.).

The seat could even be modelled on the morphology of its driver and its different zones configured with specific properties to respond to individualised pressure efforts and thus offer unique levels of comfort and cushioning.

The design is not to be outdone either, with additive 3D-printing also offering a wide choice of shapes, textures, and customisation options.

The promise of additive manufacturing

Used for some years now at Renault Group's industrial sites for tooling parts, additive manufacturing has also made its entry into design for prototype parts. The process is known as additive manufacturing because it is based on the superimposition of thin layers of material, one by one, from a more or less complex digital file.

The structure developed by Renault Group and the CEA opens the way to new applications including areas with which vehicle occupants come into contact, such as front seats, door armrests, the centre console, the rear bench seat, the steering wheel, etc.

" *This innovation is the result of combining the R&D expertise of two major players in innovation, the CEA and Renault Group. It could enable us to offer customers a truly differentiating driving experience. We are continuing to explore its full potential, with a view to achieving even greater personalisation, but also to deriving new benefits for different areas of the vehicle* " said Jean-François Salessy, Senior Vice President, Vehicle Synthesis and Upstream Technology, Renault Group Engineering.

"*The almost total freedom of design, the savings in materials and weight, the integration of functions and the reduction in manufacturing times all mean that additive manufacturing is a sector strongly supported by the CEA. This project with Renault Group confirms the strength of this discipline, which focuses on the development of new materials architected through design, their characterisation, and their integration into applications*" said François Legalland, CEO of CEA-Liten.

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About CEA

The CEA is a major research organisation working in the best interests of the French State, its economy and citizens. Thanks to its strong roots in fundamental research, it is able to provide tangible solutions to meet their needs in four key fields: low-carbon energy, digital technologies, technologies for medicine of the future, defence and national security.
As the world's leading innovator among public research organisations (Clarivate 2024), the CEA acts as a catalyst and accelerator of innovation for French industry. It helps businesses in all sectors be more competitive, creating high-performance products that stand out from the crowd and developing trail-blazing solutions that lead to changes in society. The CEA deploys this dynamic in all regions of France aiding local partners to innovate themselves, thus helping to create sustainable value and jobs nationwide, tailored to meet actual industry needs. At the same time, it supports the development of its 250 start-ups, agile vectors for transferring the disruptive technology and knowledge developed at CEA laboratories to industry.

More information: cea.fr/english

About Renault Group

Renault Group is at the forefront of a mobility that is reinventing itself. Strengthened by its alliance with Nissan and Mitsubishi Motors, and its unique expertise in electrification, Renault Group comprises 4 complementary brands - Renault, Dacia, Alpine and Mobilize - offering sustainable and innovative mobility solutions to its customers. Established in more than 130 countries, the Group has sold more than 2.235 million vehicles in 2023. It employs nearly 106,000 people who embody its Purpose every day, so that mobility brings people closer.

Ready to pursue challenges both on the road and in competition, Renault Group is committed to an ambitious transformation that will generate value. This is centred on the development of new technologies and services, and a new range of even more competitive, balanced, and electrified vehicles. In line with environmental challenges, the Group's ambition is to achieve carbon neutrality in Europe by 2040.

More information: renaultgroup.com