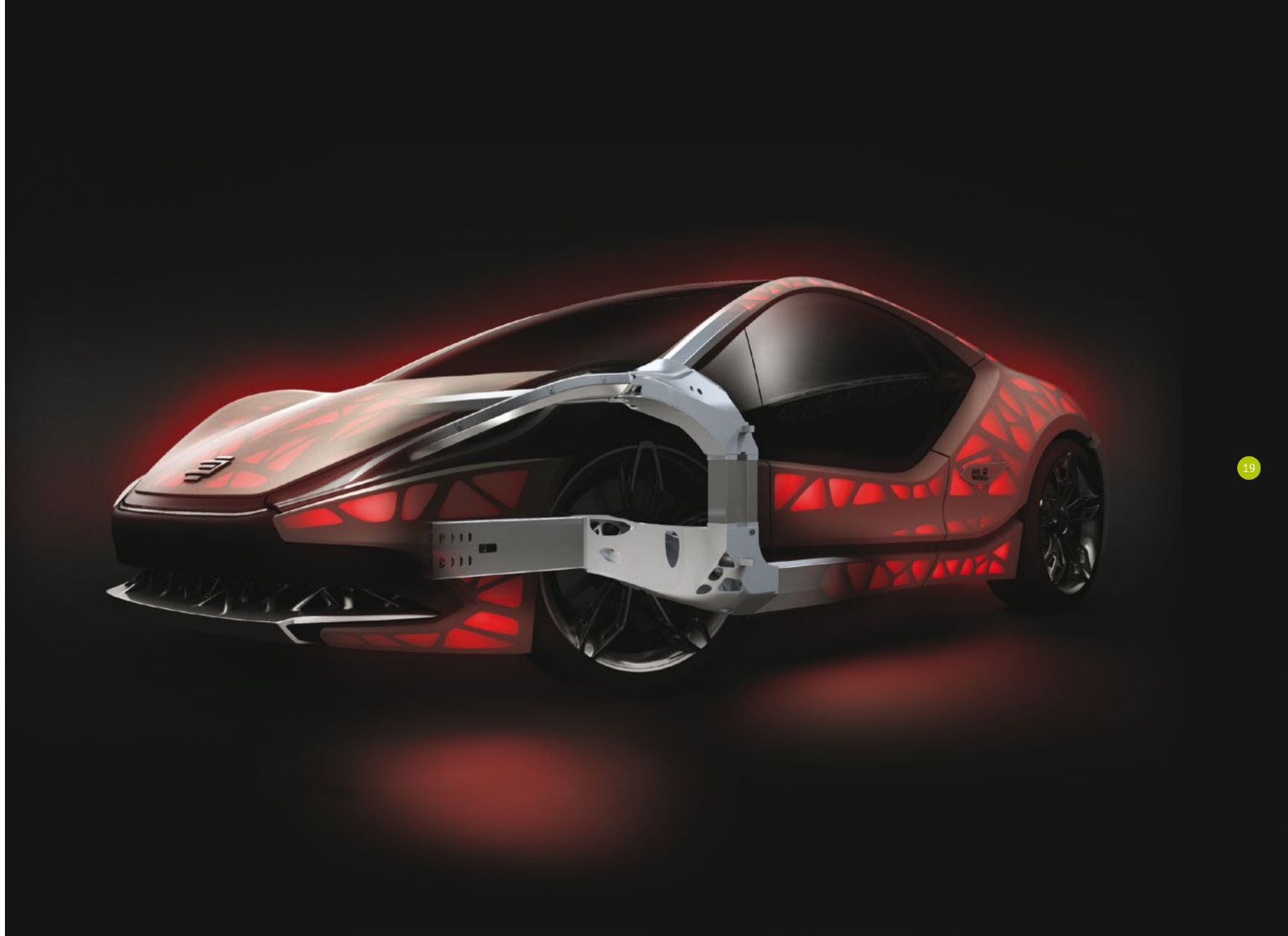
INNOVATION

CHASSIS AND FRAME OF A FUTURISTIC CAR: INTERESTING AND FASCINATING

Interesting: a car that presents big innovations. Employs light, hybrid and reconfigurable products.

Fascinating: Attractive design and tubular framework – Really eye-catching.

BLM Group was one of the partners along with EDAG, Concept Laser and Laser Zentrum North, all from Germany in an international research project. Here is the story about this new concept car and what makes it so amazing!



It is always a pleasure to come across an innovation that surprises you.

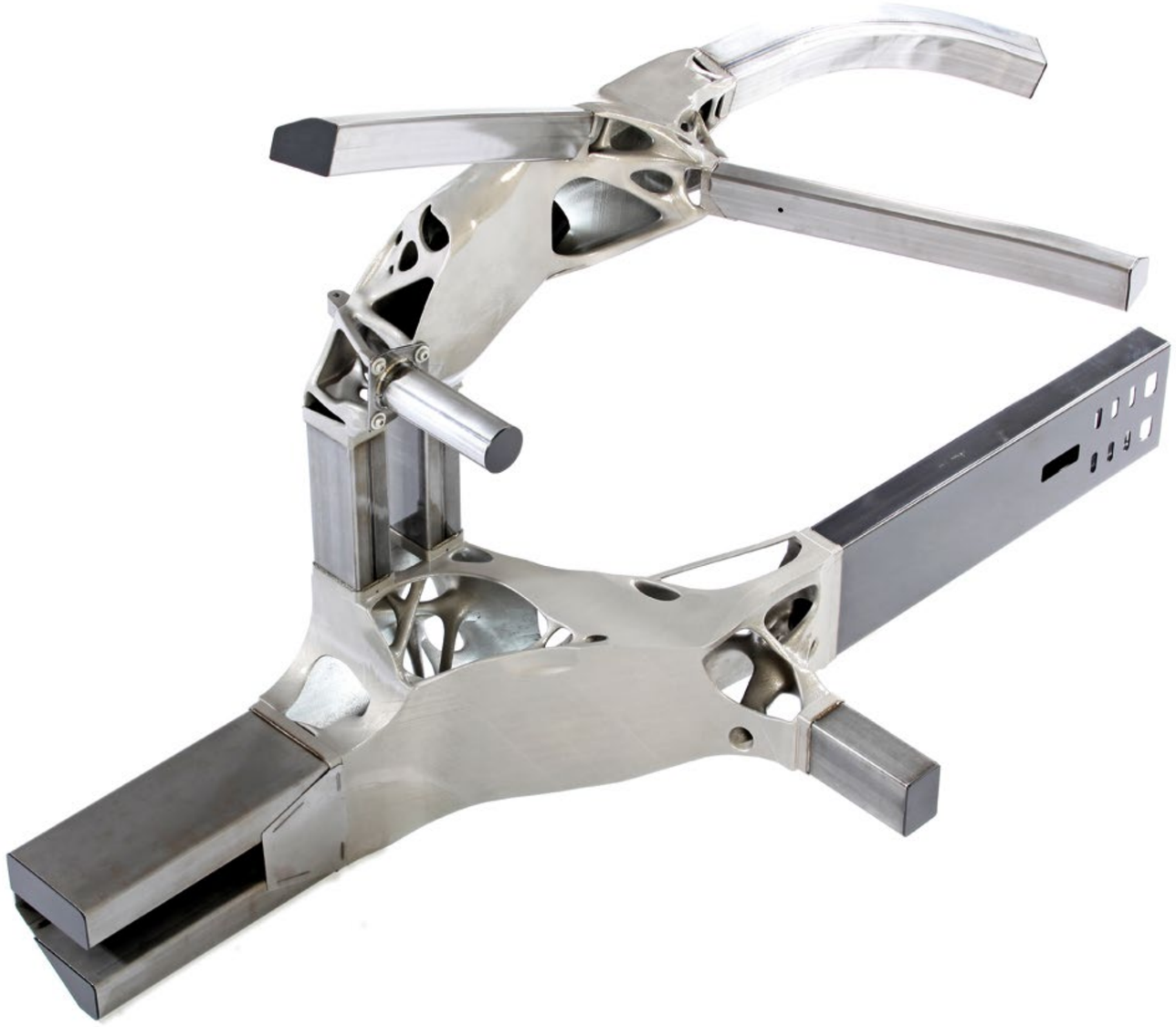
This was the case of Light Cocoon, the compact sports coupé (4.18m long) presented by EDAG in the Geneva motor show. EDAG with its base in Wiesbaden is well-known for its innovative automotive engineering solutions.

There are more than one reason why the EDAG's Light Cocoon catches your eye, but the most important one is the transparent body work thru' which you can see the chassis and upper framework. Equally important are other characteristics like 3D printed chassis, skin work in Jack Wolfskin techno-fabric and custom configurable "make-up" with LEDs.

The EDAG Light Cocoon has a tubular chassis frame that serves as the stable base on which the 3D printer deposits the material, in minimum required, measured quantities.

The tubular structure was fabricated using high tensile strength profiles bent and laser cut (BLM GROUP), which was then connected to nodes made out of selective laser sintering of Nickel based metallic powders (Concept Laser). The nodes and the structure were later on laser welded (Laser Zentrum North).

All these materials and processes were selected considering well defined design objectives.
Use of profiles offer ample flexibility in shape and wall thickness selection to satisfy mechanical properties of the chassis. Use of close profiles permit weight reduction without compromising the rigidity and hence ensuring better performance with reduced fuel consumption.
Use of selective laser sintering for nodes allowed the generation of complex geometric shapes that were not possible with conventional machining process. Building up a component layer by layer means freedom of design, no limitations on fixturing. Thus the designer can optimize the design to have both; lightweight and rigidity.



The laser cutting process was used to cut profiles in such a way that it ensured controlled deformation in case of a crash, thus making the car safe to drive.

Let us see how BLM GROUP fabricated this tubular structure which is the cornerstone of this new concept and will take us to the mobility solutions of the future. These profiles were processed in three stages.

To start with, these profiles were cut on a Lasertube LT8 machine and then were bent on the multi-stack tube bender ELECT XL. Finally the bent profiles were again cut to obtain the final component with desired shape and precision on the 5 axis laser cutting machine LT FREE.

Complete control of both the processes described above allowed us to foresee and solve the problems encountered in such a process.

Our ability to calculate the effect of one process on the other one and to automatically generate machine programs for each of the processes by applying the required corrections in advance, guarantees a geometrically perfect component.

The advantages are clear: "First piece right", no material wastage, automatic program generation for the total manufacturing process, its de-skilling and no wastage of time and material for fine-tuning the programs.

This experience highlights the potential offered by the laser cutting technology; it is not only "digital" with lower defect rates but also allows complete automation of the manufacturing process. This method allows rapid proto-typing and small series production of tubular structures without the need of time consuming fabrication of complex fixtures.

There is no dearth of ideas and applications.
More in the next issue!