TECHART AND OECHSLER BRING INNOVATIVE, LIGHTWEIGHT SEATING SOLUTIONS TO RACETRACKS

OECHSLER

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INTRODUCTION

Application:
Additively manufactured upholstery for car seating

Why OECHSLER & TECHART:
TECHART is the international premium brand for individualization of any Porsche model and has always been going the extra mile to realize design excellence, lightweight and customized solutions for high-performance vehicles. OECHSLER with its core competencies in Additive Manufacturing and long-lasting experience in the automotive industry provides the perfect fit to jointly develop the sports car seating experience of the future.

Material used:
BASF Forward AM Ultrasint TPU01

The result:
3D-printed comfort elements for car seats

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A car seat is not only one of the few components connecting the driver with the car but also an essential element related to comfort according to both sports car drivers and professional race drivers.

Thus, TECHART and OECHSLER enable superior design and seating comfort for high-performance cars made possible by additively manufactured upholstery.

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COLLABORATION

TECHART is an automotive company driven by technology and performance, that can look back on more than 35 years of successfully individualizing high-performance cars, while constantly pushing customer experience to the next level. For their latest seating innovation, the challenge was not only to fulfill those performance standards but enhance individualization, lightweight design,, and comfort.

Therefore, the German individualization expert joined forces with Additive Manufacturing powerhouse OECHSLER to deliver an unprecedented seating experience. TECHART and OECHSLER's engineering teams bundled their expertise and developed a car seat, that combines enhanced ventilation and breathability, a lightweight yet high-performance seating approach, and perfect damping properties to rise to the challenges of a racetrack.

Furthermore, the collaborative partnership successfully sets new standards in product development cycles and achieved a record-breaking time-to-market of four months.

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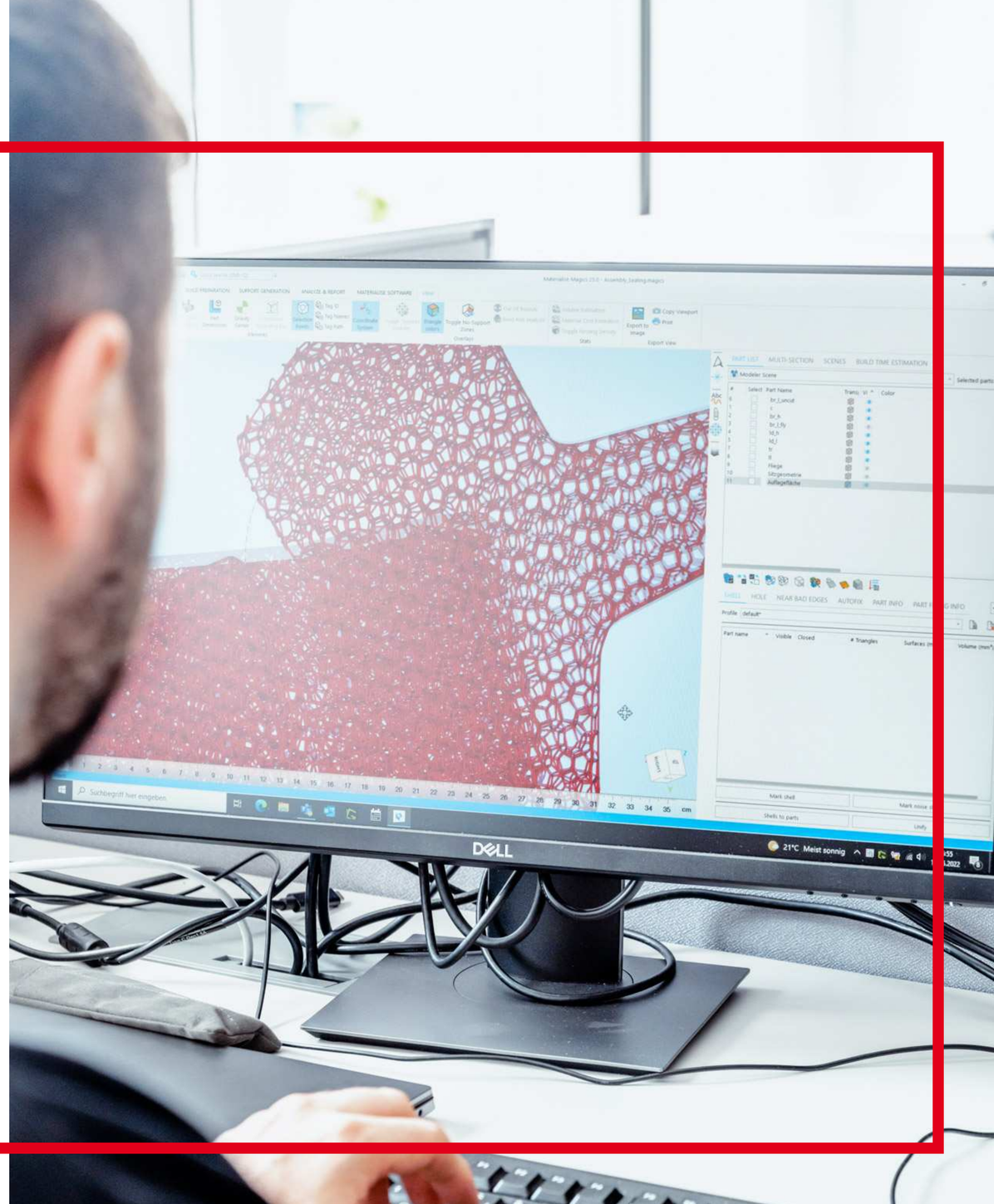
UNIQUE DESIGN EXPERIENCE

Whether it's sports cars, trucks, or passenger cars, different areas within the seating solution require distinct damping properties, whereas racing cars demand tougher structures to counteract centrifugal forces. Therefore, it was the main challenge for TECHART & OECHSLER to develop a seating application which combines the very different performance requirements and fulfills the claim of design excellence for their products.

Traditional automotive seating solutions made of foam quickly reach their technological limitations, especially when it comes to comfort, individualization, and lightweight design. To start an entirely new development process, OECHSLER's engineers created pressure maps that especially considered adjacent body geometries and converted them into lattice structures. Those are freely programmable based on geometry, thickness, and cell size. Extensive digital simulation and real-world testing lead to customized, forward-thinking seating pads, that are proven to reduce pressure points at load peaks.



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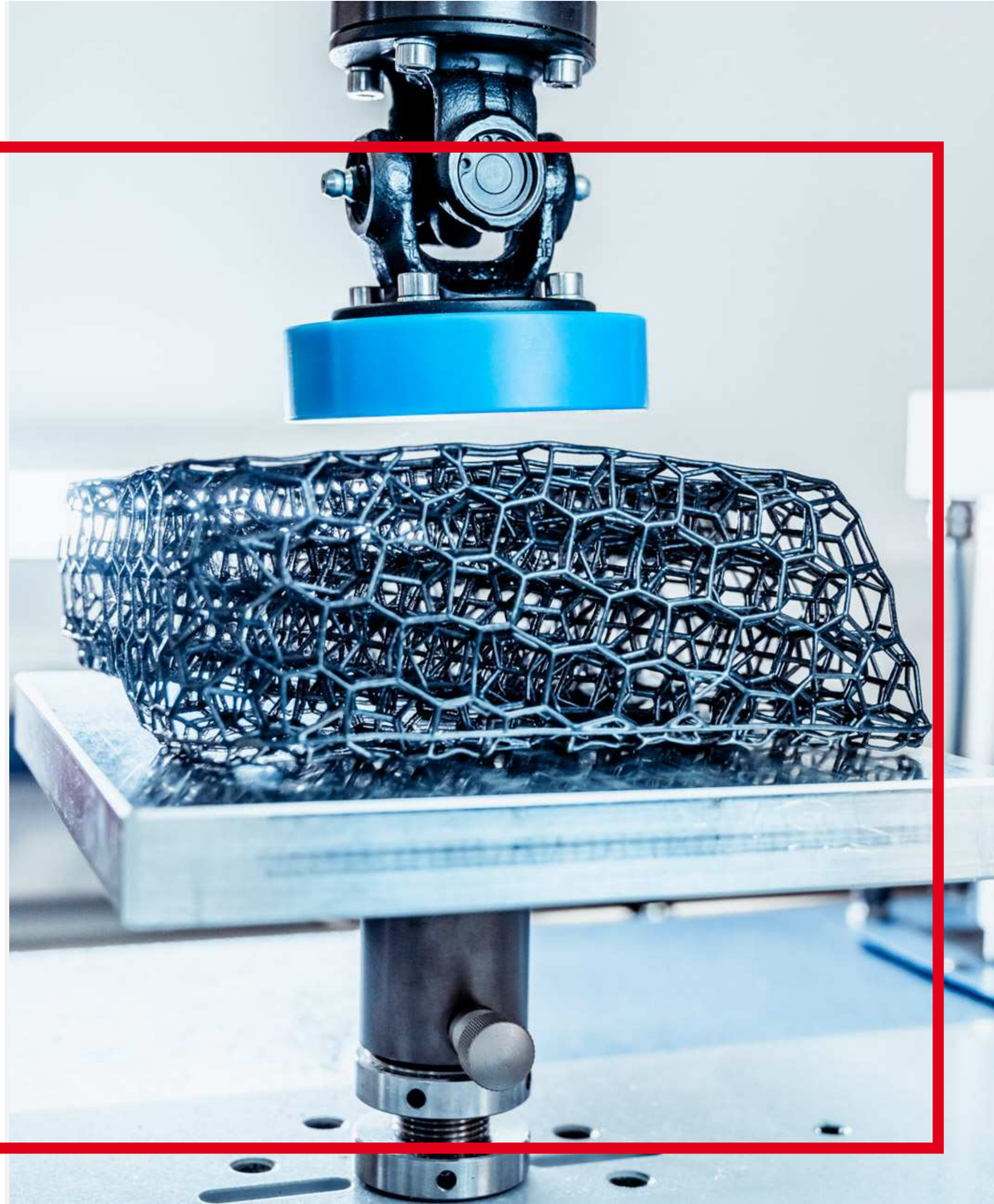
BENEFITS OF LATTICE STRUCTURES

Utilizing Additive Manufacturing technology provided key benefits which are especially relevant to car seating applications. Since the spatial distribution in race cars is already limited, combining different lattice layers with various damping properties into one part enabled a reduction of the overall pad volume.

Furthermore, the lattice structure consists of several apertures in between cells and layers, facilitating an innovative lightweight approach. Compared to conventional car seating in which the upholstery is made of foam, the project team achieved a weight reduction of 20 percent. Open lattice structures by OECHSLER always feature an air-permeable comfort layer that increases breathability and ventilation. Extensive passive cooling tests at OECHSLER's quality center have proven, that a TPU-based lattice pad dissipates heat seven times better than conventional automotive foam. This allows not only a more comfortable drive but also reduces relative humidity rise on the back.The individualized lightweight seat on a Recaro Podium base puts together a shell and six 3D-printed pads including headrest, backrests, thighpad, and cushioning. At TECHART's saddlery in Germany, the pads will be upholstered with high-performance perforated leather that can easily be assembled.

In contrast to conventional seating assembly, pads can easily be exchanged, allowing the seat to be adapted for various conditions. The covers have been equipped with windows to highlight the futuristic design of the lattice structures available in several colors.



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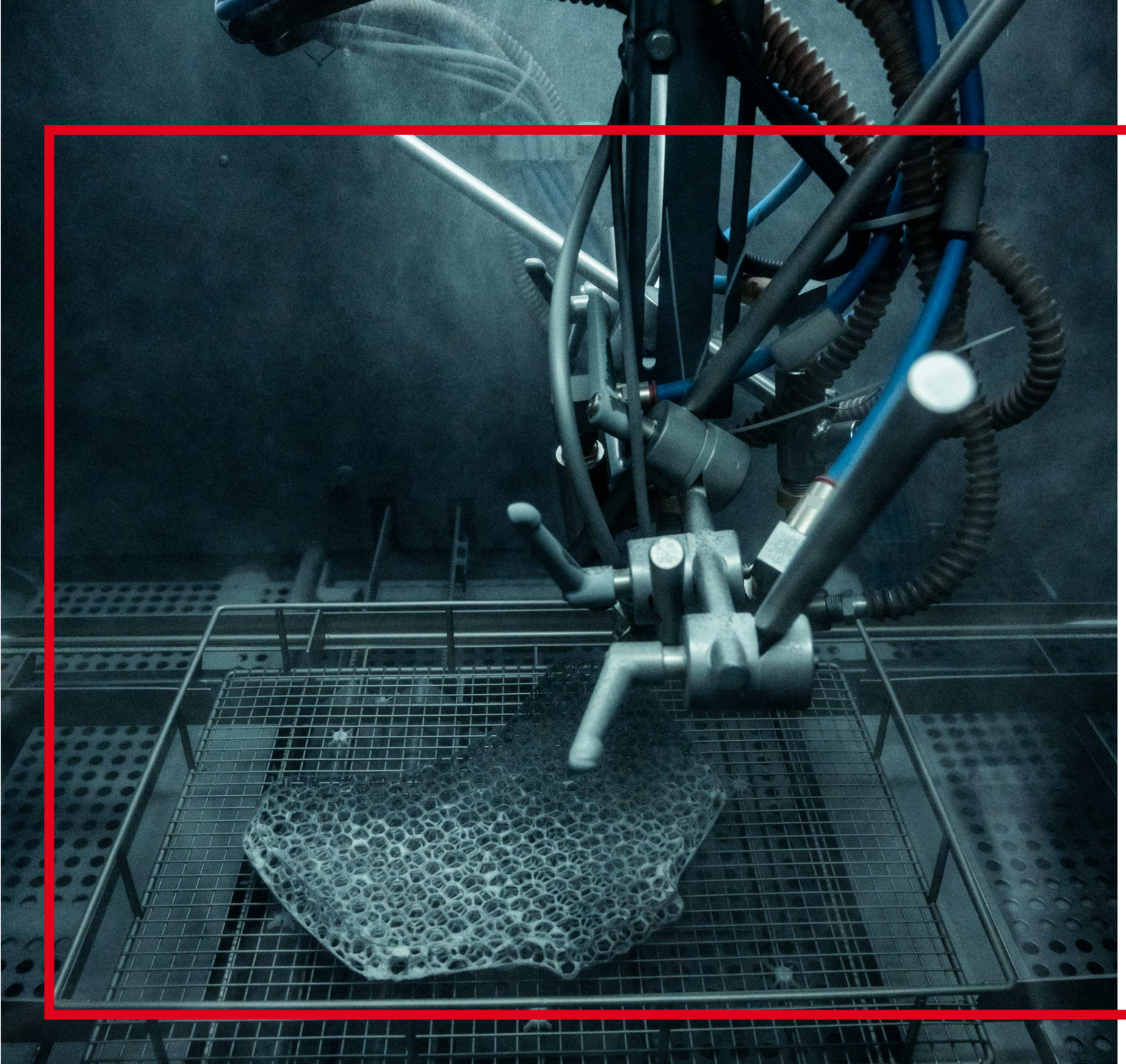
SETTING STANDARDS FOR SERIAL PRODUCTION

The seat padding is completely engineered and produced at OECHSLER's global Additive Manufacturing hub in Germany utilizing a powder printing process based on HP Multijet Fusion technology and BASF Forward AM Ultrasint TPU01 material, which is fully recyclable in uncolored condition.

Local engineering and manufacturing supplemented by a strong collaboration of the development and manufacturing teams disrupted supply chains and development cycles.

Thus, a time to market of record-breaking four months was achieved. OECHSLER operates a manufacturer-independent industrialized high-volume series production of 150 printers with capabilities of 1.3 million parts per year.

To offer manufacturing processes alongside the complete value chain, OECHSLER is building an infrastructure of automated post-production solutions including unpacking, powder removal, blasting and vapor smoothing.



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"Additive Manufacturing complements our conventional production technologies to enable product features in seating applications that have not been possible yet and sets new time to market standards throughout various supply chains."

Max Lehnert, AM-Seating Program Manager at OECHSLER

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A GLANCE INTO THE FUTURE

As a production technology, Additive Manufacturing enables almost unlimited opportunities for individualization – not only for seating solutions but the entire vehicle. Thus, 3D printing is advancing to a new technology pillar at TECHART with more high-performance products to come. TECHART and OECHSLER will therefore intensify their AM collaboration and work on disruptive innovations for high-performance vehicles.

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“Together with OECHSLER, we are researching and developing new ways to enhance the sports car seating experience of the future. 3D-printing technology in our sports car seats enables maximum TECHART individuality and comfort encapsulated in a lightweight structure – a perfect match for performance-oriented Porsche drivers.”

Tobias Beyer
CEO TECHART Automobildesign GmbH

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ARE YOU INTERESTED IN OUR AM-PRODUCTION?
DO NOT HESITATE TO CONTACT US AT
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