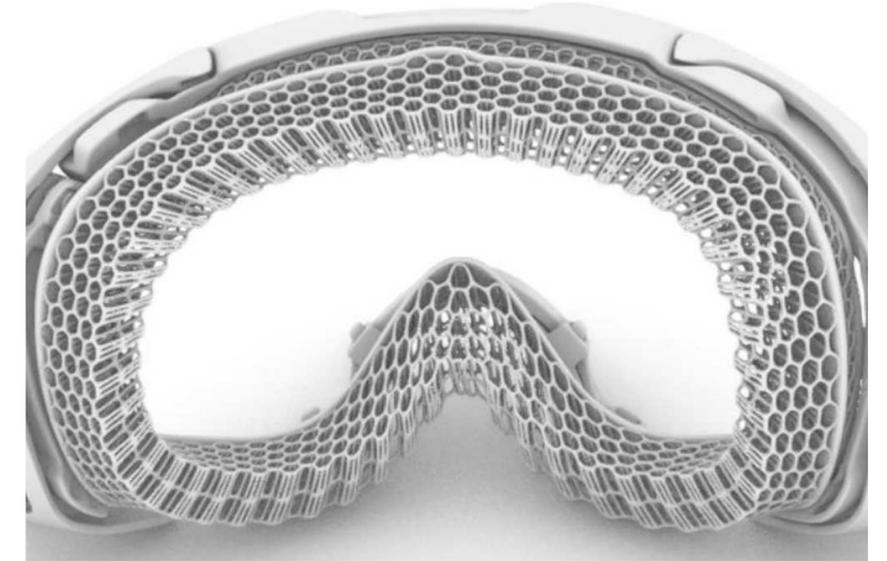
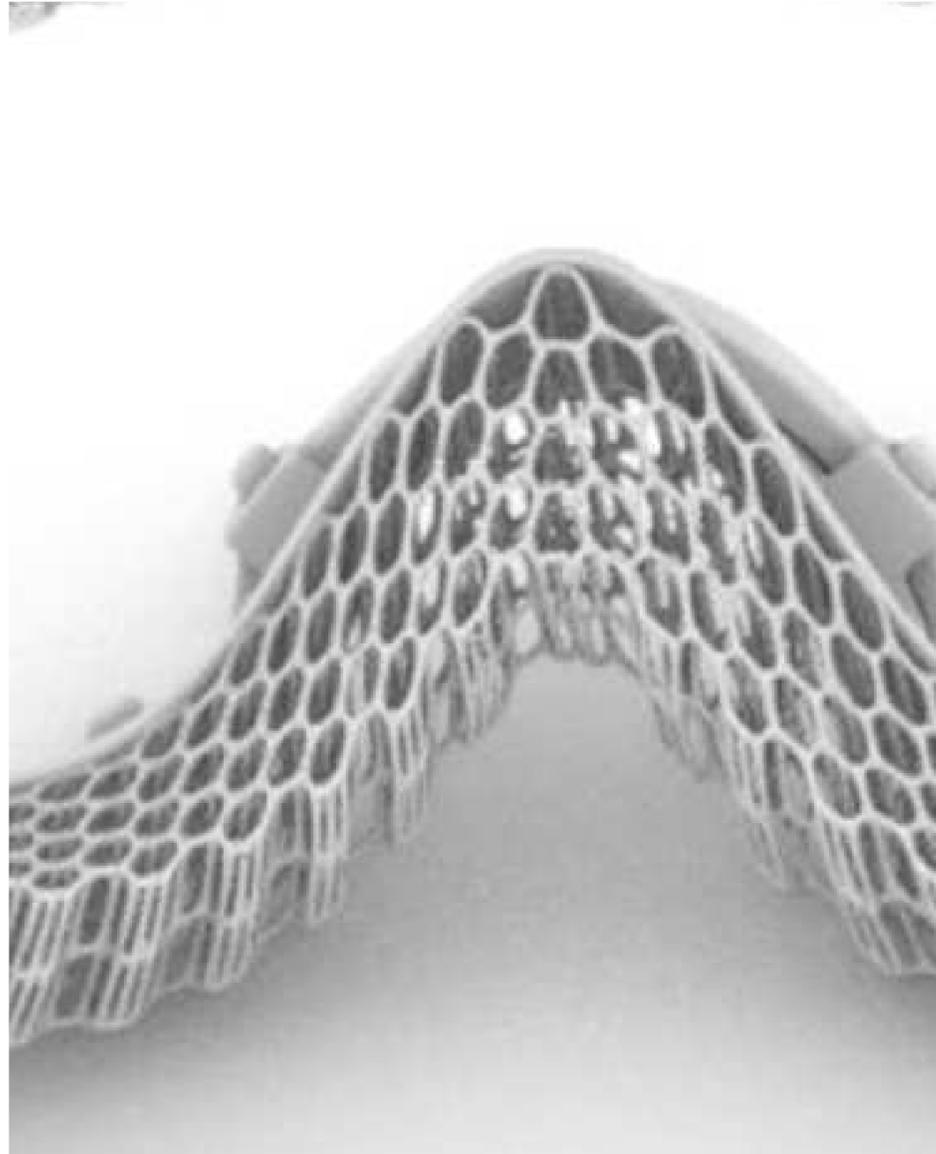


# SKIING GOGGLES: OECHSLER SETS NEW STANDARDS IN THE SPORTING GOODS MARKET



# 01

## PROJECT BREAKDOWN

**Application:**

Substitution of a conventional multi-component ski goggles frame by a single component one

**Why OECHSLER:**

Development, simulation, and production out of one hand

**Material used:**

TPU

**The result:**

All functions wrapped up in a comfortable and flexible single component frame



01

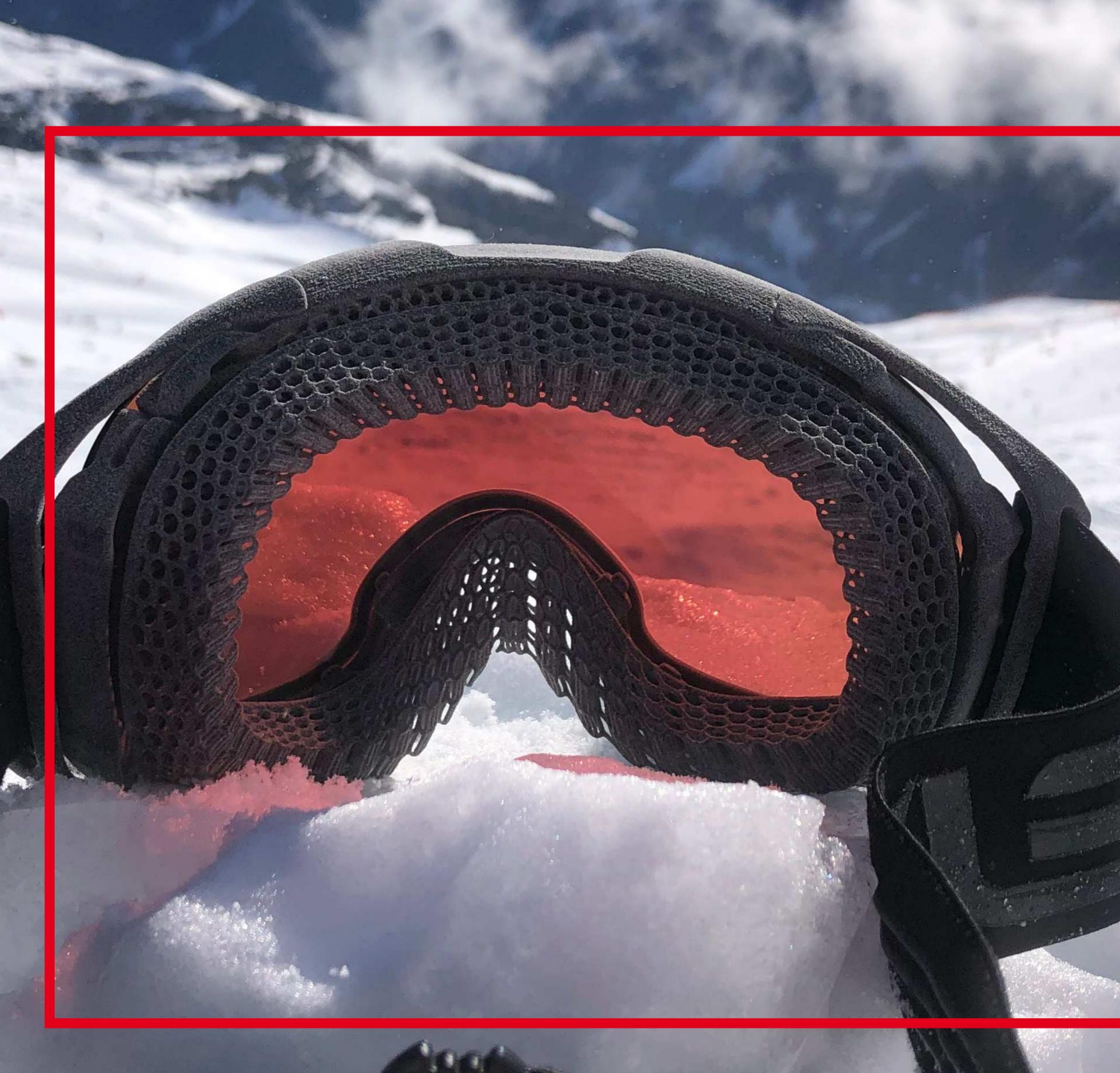
OECHSLER enables the Additive Manufacturing of multi-functional solutions, which can fulfill ambivalent material characteristics by part design to enable more comfort functionality with fewer components.



## THE SOLUTION

As a partner of innovation, OECHSLER is continuously striving for creative solutions to increase the function, comfort, and production effectiveness of products. The project "skiing goggles" was facing a multitude of challenges: the used PU foam should be replaced by an additively manufactured lattice structure, the number of parts should be minimized to the bare minimum and the wearing comfort increased.

To reach this goal the development team used a reverseengineering approach: This meant dismantling standard skiing goggles to gain a detailed understanding of every single component and its function. In the first dismantling step the team disassembled the lens swap including the rotatable element for lens removal. This element is necessary in case the lenses need to be changed either due to weather conditions or simply due to renewal.



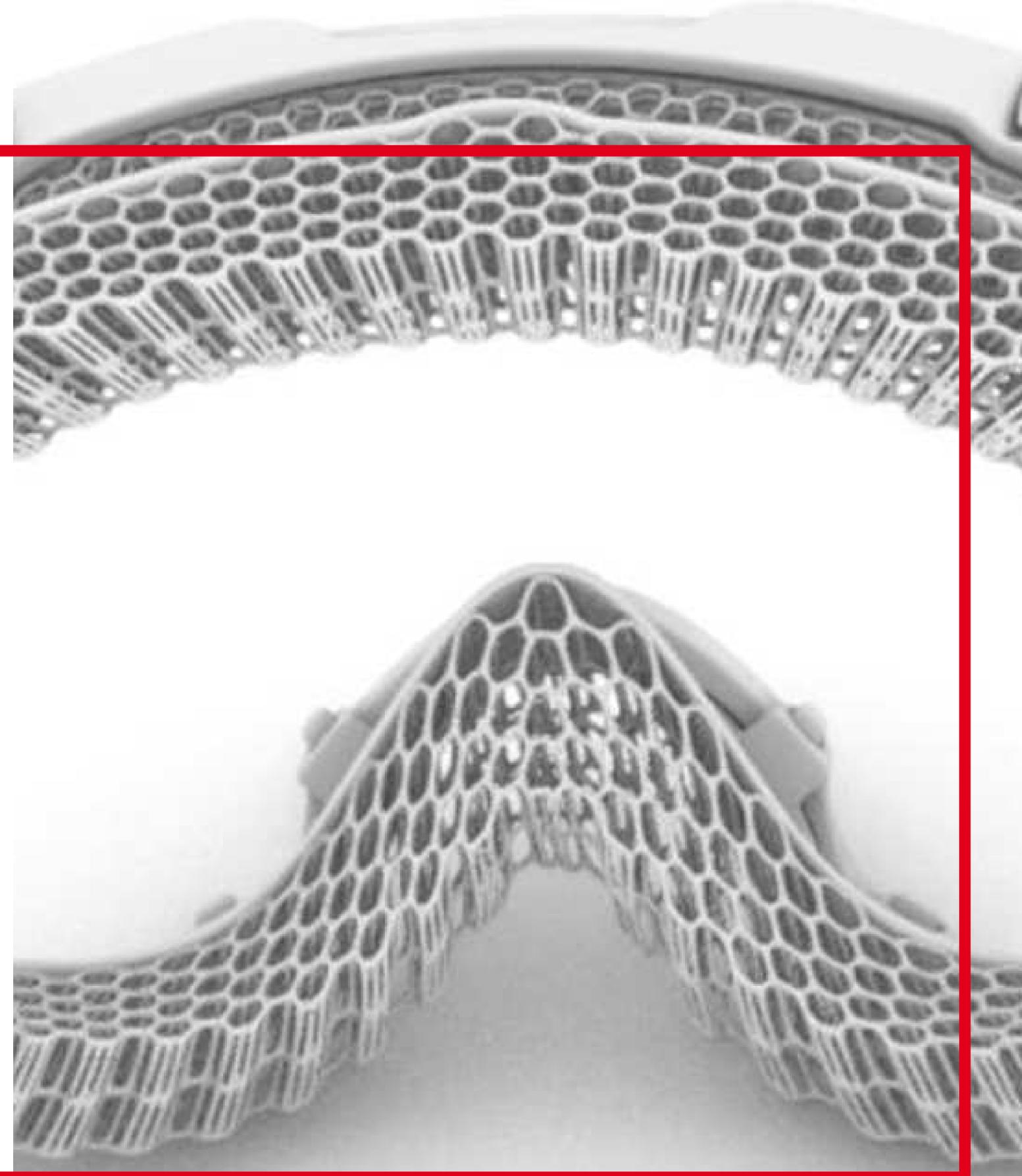
Of course, this is a basic need new glasses must fulfill. Afterwards, the outer frame, which is held by clips, was dismantled. This uncovered the foam as well as the inner layers of the goggle revealing that the foams are glued together – a production step OECHSLER intends to eliminate. In the last step, the buckets holding the elastic band were removed. With fresh insights about the product,

OECHSLER started the redesign process. Two options were evaluated: Either create an All-in-One product and eliminate all mounting steps. In this case, OECHSLER would have to reconstruct foams by lattice, reduce the design to one frame by full TPU print, as well as integrate rotatable parts into the TPU printed frame. Or reduce elements so just the foams would be replaced with a 3D-printed lattice.

## THE CHALLENGE

As a pioneer of new technologies and striving for innovation OECHSLER aimed to realize option one: The creation of an all-in-one product by eliminating all mounting steps. For this approach the team had to have a deep understanding of the standard goggles to enable a onecomponent printable solution: the lattice may not be too thin otherwise it could break easily and the kinematics would not be guaranteed. If it were too thick the comfort would be reduced. After dismantling all components, the development team scanned all parts via CT to gain deeper insights into the component dimensions. Afterwards the components have been reconstructed in

a vector-based program to generate a suitable print file for the solid and lattice parts. Even though OECHSLER has lots of experience in creating new print files the first attempt is rarely right. The first prints were too stiff so that the handles were not flexible enough. Contrary to the initial assumption, this was not caused by the print file but by the post-processing steps in production. The lattice structure needed a different and more intense cleaning of the lattice structures to remove more of the printing residue. Even though optimizing the print file has been quite fast, the adjustment of the post-processing to increase the flexibility of the lattice structure was challenging.



## OUTCOME

The additive manufacturing lattice technology enables a variety of comfort and design applications that have not been possible before. Additionally, the rapid development and production process enables a start-to-finish product timeline of around four weeks. The example of the additive manufactured skiing goggles shows the following advantages that can be applied to multiple products as well:

- Increased wearing comfort and integrated damping function in case of an accidents
- Combination of rigid and soft elements in one component
- Movable joints instead of extra parts like clips
- Reduction of material variety leading to easier recycling at the end of the product life cycle
- Reduction of production costs due to the elimination of mounting steps
- Foam replaced by 3D printed lattice structure: adjustable hardness – the existing multi-layer foams can be replaced



**ARE YOU INTERESTED IN OUR AM-PRODUCTION?  
DO NOT HESITATE TO CONTACT US AT  
[3DPRINTING@OECHSLER.COM](mailto:3DPRINTING@OECHSLER.COM)**