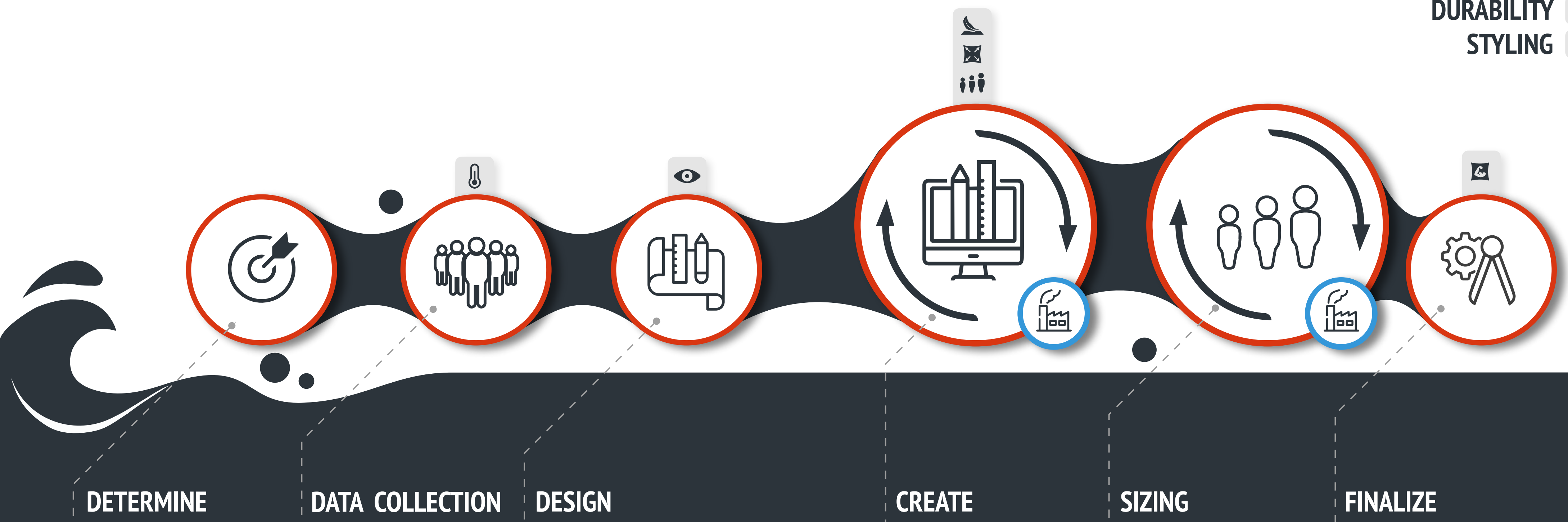


WETSUIT DESIGN

WITH A FOCUS ON METHODOLOGY

- FIT
- INSULATION
- PERFORMANCE
- COMFORT
- DURABILITY
- STYLING



The assignment was to design a science based methodology for the creation of SRFACE wetsuits. The current design process is still almost entirely based on trial and error. A product designer draws seam lines on a 2D body outline, based on his knowledge about fit, insulation and performance. The production company creates and grades the pattern based on this design. A sample is made and adjusted based on the feedback of customers. This report investigates the opportunities of modern day technologies such as 3D body scanning to generate a new methodology.

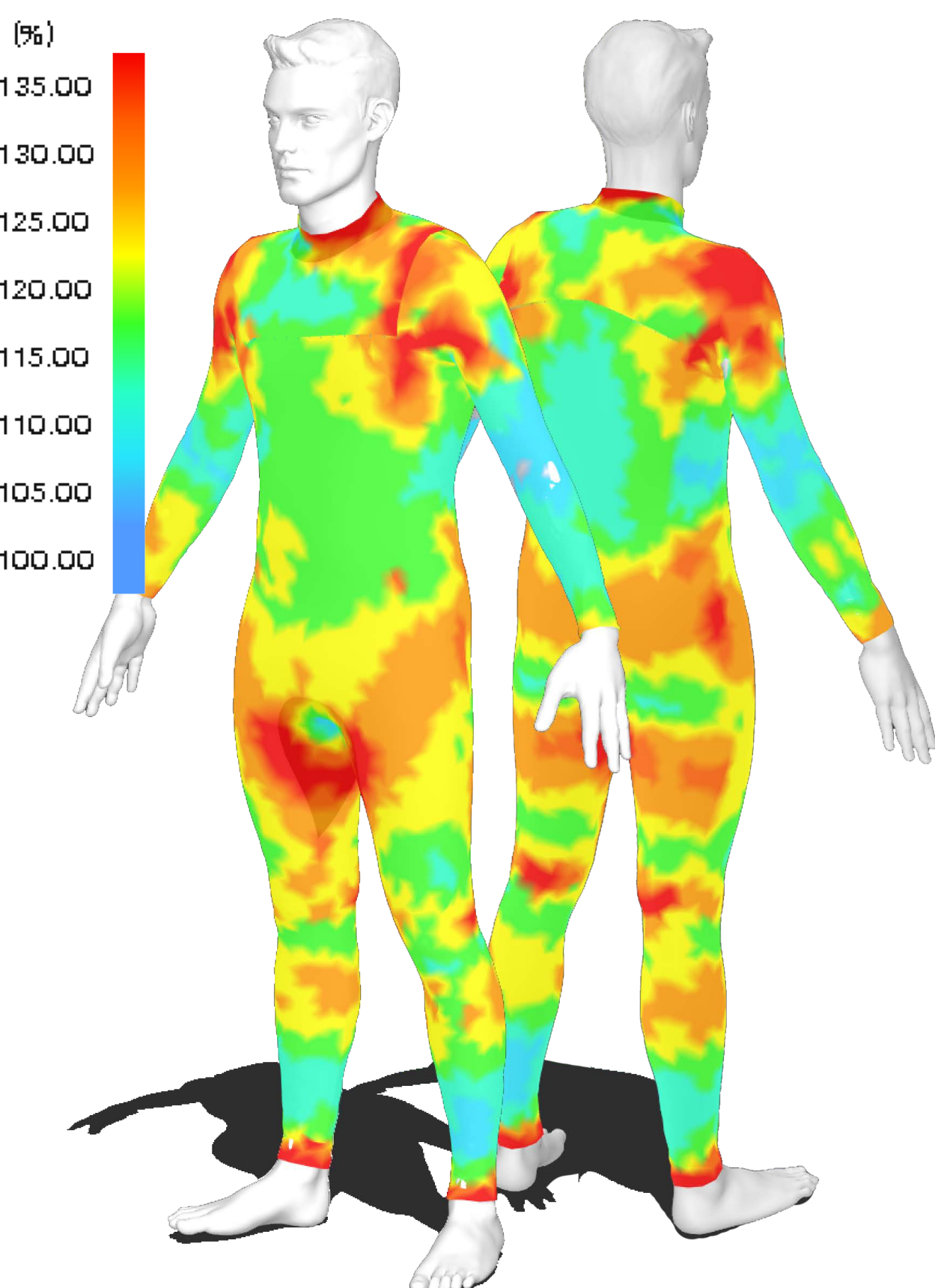
The analysis phase resulted in the following main goals for the new methodology. It should incorporate:

- The creation and grading of wetsuit patterns
- Design for fit approach with the use of 3D body scans
- Digital prototyping

Research was performed into the anthropometry for the creation of a sizing chart. The 3D body scan database CAESAR has been used as representation of European population. The scans of more than 1800 individuals have been filtered and classified into sizing groups using the height and chest circumference. In this process a new method is proposed for the creation of a new sizing system using the DINED Ellipse tool. This resulted in the creation of digital mannequins that represent average body types for every wetsuit size. These mannequins were then used as basis for the creation and testing of wetsuit patterns.

The current SRFACE wetsuit pattern and materials were digitized and simulated in pattern design software Clo3D. The tightness during static and dynamic fit were assessed and used as reference for future wetsuit design. A new workflow is investigated that uses 3D digital pattern drawing with the 3D mannequins as basis. The resulting pattern was optimized using the stress and strain simulations and graded. A prototype is created of the base pattern to validate the design workflow.

As a result a new methodology is proposed that incorporates a 3D wetsuit design workflow and digital prototyping. This new methodology gives SRFACE more control in optimization and reduces the amount of physical prototyping. Assessment of the prototype has shown that the new methodology is able to produce feasible pattern designs with a good fit. But further optimization is required. Using this methodology over time will increase its accuracy and build on gained knowledge. Multiple prototypes are still required but will decrease over time.



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