



## Idea

Simon Freedman an osteopath and designer had a vision to improve the way we sit with the focus of our body's structure as paramount. The initial concept and design was developed, the challenge was to engineer this into a dynamic design using as little material as possible to achieve the lowest weight and carbon footprint, as well as considering the ease of manufacture.

## Background

After successfully completing the detailed design stage JNDC started work on the final prototype of the 'Freedman Chair'.

## Design Development

JNDC identified the most cost effective manufacturing method to mimic the final manufacturing process to not only look like but also to structurally behave as the final product.

The process involved:

**Investment Casting:** Specific parts were designed so as to be best suited to casting therefore reducing the cost of the parts as well as increasing the ease of assembly in the long term. Investment casting was selected as the most appropriate process for the final production prototype as the finish and structural properties matched the high volume production process of pressure die casting.

**Machining Extrusions:** Several parts required the design to be extruded and cut to size. The extrusion process offered an ideal solution to parts with relatively complex profiles. To avoid investing in an extrusion die for the prototype JNDC developed jiggling to hold a biller of aluminium in a 3 axis CNC mill creating machined parts that looked extruded.

**Finishing:** The parts were heat treated to meet the structural requirements determined from the analysis stage of the project. All parts were then sand blasted and hand polished to achieve the replicating surface finish of the final design.



**Comfort:** Adding comfort to an aluminium casting is traditionally achieved by adding a thick layer of foam. The specifications called for an extremely thin seat pad, therefore a specialist closed cell polymer foam that offered the same level of comfort as a standard thicker seat pad was chosen. Leather was selected to finish the pad as it is breathable, comfortable and adds a high quality look and feel. The leather was laser etched with a bespoke thumb print then trimmed and fitted for both the pads and the back balls.

