

## CASE STUDY | RAPID PROTOTYPING



### Rapid Prototyping a Silicon Bronze Investment Casting for the Melina Pendant.

#### CUSTOMER

Hand & Eye Studio, London, designed by Mentsen.

#### PRODUCT

The Melina Pendant, originally designed by Mentsen with Hand & Eye as a manufacturing partner, available as a series of modular pendants.

#### MANUFACTURER

Due to the complex shape, the designers realised that their new parts had to be either investment cast, or 3D metal printed. After extensive research and some testing, they realised that the 3D metal printed parts required additional surface finishing, due to the printing 'build lines'. The company then focussed their attention on the investment casting process, which would eliminate these issues and was a less expensive option.

Mentesen & Hand & Eye (based in London) wanted to work with a company based in the UK, which could offer flexibility in volume of production. They contacted Lestercast Investment Casting Services on recommendation....

#### MATERIAL

Mentsen chose silicon bronze, purely for aesthetics. The Melina Pendant is a statement piece, of quality, style and simplicity. A high-quality surface finish was an extremely important aspect of the design.

#### THE PROCESS

When Lestercast received the first design drawings from Mentsen, the component design had a wall thickness of 1.5mm. At this point, Lestercast engineers recommended that this was increased to 2mm. This alteration would allow easier liquid metal flow during the investment casting process and help to eliminate any casting defects. Due to the nature of the part, the increase in wall thickness would not affect the performance (as the component is not weight restrictive) and after consultation, it was agreed to modify the design.

MAGMASOFT® simulation software was used to confirm the best feed technique, enabling the correct directional solidification and eliminate shrinkage.

#### 3D PRINTING OF WAX PATTERNS

Mentsen & Hand & Eye decided to use our Rapid Prototyping services. Wax patterns were produced using 3D printing. This offers many advantages over traditional tooling, such as reducing lead times, lower start up costs and the option to modify the design indefinitely - before committing to production tooling. If the customer only wishes to produce low quantities of their component, this process is cheaper, but gives the option to produce tooling for higher quantities at a later date.



#### THE BENEFITS OF USING RAPID PROTOTYPING

- INITIAL LOW COST - WITH THE OPTION OF TOOLING AT A LATER DATE.
- FASTER PRODUCTION TIME.
- DESIGN MODIFICATIONS WITHOUT THE NEED FOR RE-TOOLING.

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In regards to the investment casting process - the printed waxes are attached to the 'tree' and the entire investment casting process remains the same.

### MACHINING

After the component had been cast, it required two tapped holes with M6 threads. The threads were required enable screw attachment to the cable.

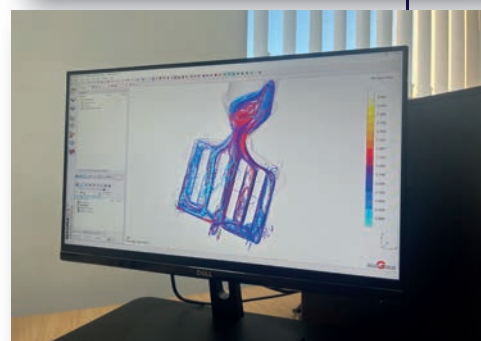
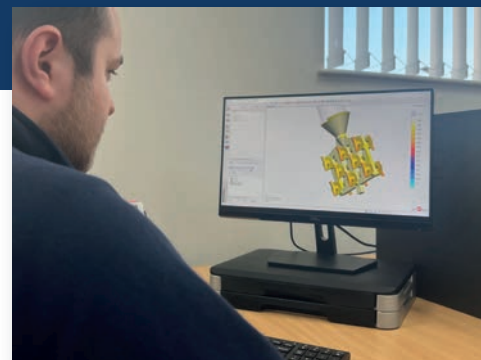
### DELIVERY

Lestercast manufactured the part within 4-5 weeks, including the time required for machining.

The tolerance achieved using silicon bronze was  $\pm 0.25$  for every 25mm.

### QUANTITY

Lestercast produced a batch of 50 for the customer, followed by a further 90.



### WANT TO KNOW MORE?

If you would like to find out more about how Rapid Prototyping can benefit your company, please call Lestercast on **+44 (0)116 276 7284** to speak to one of our engineers.