

MacTaggart Scott

Boosting efficiency in its production process

Customer challenge

MacTaggart Scott has spent over 100 years supplying the naval defence and marine industries. It approached the AFRC looking to improve the manufacturing of its cam ring, one of the core components in its main hydraulic motor product.

Cam rings are machined from metal and used in a wide variety of marine drive applications. The firm wanted to gain a greater understanding of historical issues with the components, such as cam rings cracking during manufacturing. It also wanted to improve efficiency and control in the overall manufacturing process.

The company's production process involved various heat treatments, manufacturing and grinding processes and so a diverse range of testing and examination expertise was required.

How did the AFRC help?

Residual stress is a common but frequently misunderstood issue in manufacturing that can result in distortions, such as the cracking cam rings experienced by MacTaggart Scott.

An area of expertise for us here at the AFRC, our engineers and researchers provided close examination and testing of the customer's materials and processes.

Machining induced stresses, which could lead to cracking, were first measured during the manufacturing process. The generation and evolution of any stresses were then identified, before evaluating cutting conditions and stress-relief heat treatments.

At the project's conclusion, the AFRC made a series of recommendations on how to reduce the stresses induced during manufacturing, which were based on the customer's choice of heat treatments and cutting conditions.

A number of ways to further optimise the overall cam ring manufacturing process were also proposed. These included the removal of unnecessary heat treatments, consequently speeding up production time and cutting costs.

Business impact

Based on the AFRC's recommendations, MacTaggart Scott will benefit from improved and consistent cam ring output through reduced cracking.

By streamlining its manufacturing process, it would also enjoy reduced production time and less energy consumption, resulting in additional savings and enhanced productivity.

- **3+ day reduction in lead time**
- **Reduction in energy consumption**
- **2 day reduction in production time**

"Working with the AFRC provided us with feedback and information on our products that we have embedded at the design stage, allowing for continuous optimisation of manufacturing. The project ran incredibly smoothly; it kept well aligned with initial plans, but allowed for flexibility when necessary."

Lee Baines, Development Manager (Research and Development), MacTaggart Scott



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