OPTIMAS

COLD FORGED SOLUTION FOR BESPOKE HIGH-HARDNESS STEEL COMPONENT

CASE STUDY: **Manufacturing**

Barton Cold-Form, an Optimas company, produced a bespoke, small component from a high-hardness grade material in-house using a repeatable process for high-volume orders.

Real Results, Real Impact

Bespoke & Small **Designed Component**	420 Stainless Steel **Heat Treated Above 50HRC**	5 Million Parts **Highly Repeatable & Zero Waste**

CASE STUDY: Manufacturing

BACKGROUND

The goal of this project was to explore the feasibility of producing a very small component from 420 stainless steel—a high-hardness grade that is typically unsuitable for cold forging.

The component also needed to be heat treated to above 50HRC, a hardness level that adds complexity to forming and tooling durability. The existing component was previously sintered from ceramic material and imported into the UK.

Optimas aimed to prove theviability of cold forging this material while ensuring cost-effective, repeatable production for high-volume orders by utilising it's in-house manufacturing capabilities.

CHALLENGE

Several key challenges needed to be addressed in this project. One of the primary concerns was material suitability. 420 stainless steel is renowned for its hardness, which makes it particularly difficult to cold forge without causing excessive wear or failure of the tooling. This posed a significant obstacle in achieving a reliable and cost-effective manufacturing process.

Another challenge was the component's size and complexity. The design featured a small knurled roller, requiring precise cutting and accurate transfer during the forging process. Ensuring consistency and maintaining the intricate details of the component added to the difficulty of production.

Additionally, tooling durability was a major consideration. The high work-hardening properties of 420 stainless steel increased the risk of premature tool failure, necessitating careful selection of materials and processes to extend tool life and maintain production efficiency.

ACTION

To test feasibility, Barton Cold Form conducted an initial trial run to assess the repeatability and success of the cold forging process on this challenging material. The first order was placed for a trial production run of 2 million parts. The full production run was completed successfully, proving 420 stainless steel could be cold forged at high volume, with quality ensured across production. Furthermore, tooling durability was managed effectively allowing us to scale up to fulfil an order of 5 million parts.

RESULTS

- **Demonstrated the feasibility of cold forging 420 stainless steel at high hardness levels.**
- **Developed a scalable process for producing small, precision components with complex features.**
- **Proved the durability and efficiency of our cold forging tooling for challenging materials.**
- **Successfully delivered 5 million parts, reinforcing our commitment to quality and innovation in metal forming.**

ABOUT OPTIMAS

Optimas is the leading global industrial distributor and service provider specialising in fastening and supply chain solutions for manufacturers seeking to improve efficiency and profitability. We take care of the details so you can focus on manufacturing cutting-edge products—giving you an unparalleled competitive edge.

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