

Case Study

# Custom parts for a major food manufacturer



## Overview

- Design and manufacture of a bespoke dispensing nozzle in a food-safe grade of stainless steel
- Increased efficiency and consistency of the condiment section of the manufacturing process
- Customisable solution for range of different sandwich condiments
- Modern additive manufacture (3D printing in metal) combined with precision finishing to ensure that the final assembly exceeded customer expectations

## The Challenge

With over 11 billion sandwiches being consumed across the UK every year, keeping up with demand can be incredibly difficult. Sandwich-making is still largely a manual process, even for the mass-produced market.

A major provider of pre-prepared sandwiches turned to Frazer-Nash, wanting to automate part of the preparation process, specifically targeting the condiment portion. Each sandwich may be dosed with one or more condiments, varying from mayonnaise and mustard, through to relishes and chutneys. With different consistencies across the range of possible condiments, there are potential issues with particles blocking the flow and causing a line stop. With many sandwich fillings being seasonal, it is

important to have nozzles that work with a wide range of different condiments. With time being critical to the throughput of manufacturing, another challenge is that any nozzle needs to be quick and easy to service should any issues occur.

The sandwich manufacturer consulted Frazer-Nash to find a more agile and cost-effective way to create the required variety and supply of dosing nozzles for their production lines.



## The Frazer-Nash Solution

Nozzle assemblies are usually quite complex in their design, due to the physical nature of the materials they dispense. Maintaining flow during operation is incredibly important, as a breakdown can be extremely costly, and

have a major knock-on effect on the output. The challenge becomes more difficult when sugar-based products are being dispensed, as there is potential for sugar crystals to form around the edge of the nozzle where the temperatures cool. These crystals can eventually build up and stop the flow altogether.

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Working closely with our customer, we designed a completely bespoke solution. With serviceability very high up on their requirements, we ensured that the nozzle could be serviced completely tool-free and cleaned quickly.

This optimised design was then used to produce the nozzle in metal by additive manufacture (AM), specifically using the process of Selective Laser Melting (SLM).

## Additive Manufacture Meets Precision Engineering

When it comes to producing components for the food industry, a specific range of high-grade and hygienic materials are preferred. With our extensive experience within this sector, we opted to use 316L food-grade stainless steel for the main contact areas. Once we had settled on the material, we loaded the digital design of the new nozzle into our Renishaw AM machine and started the build. A day later, we had two nozzle assemblies that were 75% complete.

Whilst additive manufacture is very good for realising freeform designs quickly, to achieve the extremely high accuracy required for precision-engineered parts (better than  $\pm 0.2\text{mm}$ ) requires additional precision finishing. This is where Frazer-Nash's deep expertise in CNC machining comes into play. Our expert machinists enabled us to ensure that the fitment was precise between the components within the assembly.

Using AM for applications like this allows for problem areas to be resolved quicker, cheaper and more precisely compared to traditional methods. The potential of producing several different variations of the nozzle on a single platform also offers a significant potential for bespoke designs, whilst maintaining cost-effective production.

The nozzle assembly we produced for our customer increased the efficiency and consistency of their line dramatically – to the extent that they have subsequently ordered additional sets for their other production lines.

**Talk to Frazer-Nash Manufacturing to learn more about how our services and solutions can help your business.**

