

## Optimising product performance with rapid prototyping | Chemfix

**Chemfix worked with the 3M BIC's design and technology team to produce a product that would optimise its chemical injection system to enhance performance and usability. 3D printing enabled rapid prototyping of multiple design variations, accelerating development and ensuring the most, low-cost, cost-effective solution within a short timeframe.**

### Challenge

The objective of the project was to develop a product that would maximise the efficiency of Chemfix's chemical injection system. To achieve this, a mathematical optimisation model was created, allowing the team to determine the optimal geometry for performance, usability and cost-effectiveness.

This required the production and testing of multiple design variations, each with slight modifications, to understand how specific design features influenced overall performance. Traditional manufacturing methods were unsuitable due to the need for rapid iteration, low-volume production and short lead times. The only viable approach was additive manufacturing (3D printing) using rapid prototyping techniques.

### Solution

3M BIC supported Chemfix by producing over 150 3D-printed test samples, with up to 40 different designs being created and tested throughout the project. The team provided expert guidance on selecting the most suitable additive manufacturing technologies for the required volumes, as well as design recommendations to optimise the geometry for rapid prototyping, such as increasing wall thickness in key areas.

By leveraging 3M BIC's advanced 3D printing capabilities, Chemfix was able to significantly accelerate the product development process. The rapid production of high-quality prototypes reduced project lead times and enabled comprehensive testing that would not have been possible with conventional manufacturing techniques.

### Outcome

While the product has not yet been launched, the project successfully resulted in the development of a mathematical optimisation system that guided the product's design to achieve maximum performance and usability.

### Client testimonial

*"Unlike a normal supplier of 3D printed components, 3M BIC provides an extensive service beyond just production, offering advice on the most suitable technology, design alternations to enhance compatibility with 3D printing and post processing techniques to more closely emulate injection-moulded parts. Working with 3M BIC is not like working with a supplier but a project partner that offers support from start to finish, allowing us to fully utilise its new and innovative technologies at our disposal."*

**Freddie Marris, Packaging Engineer, Chemfix**