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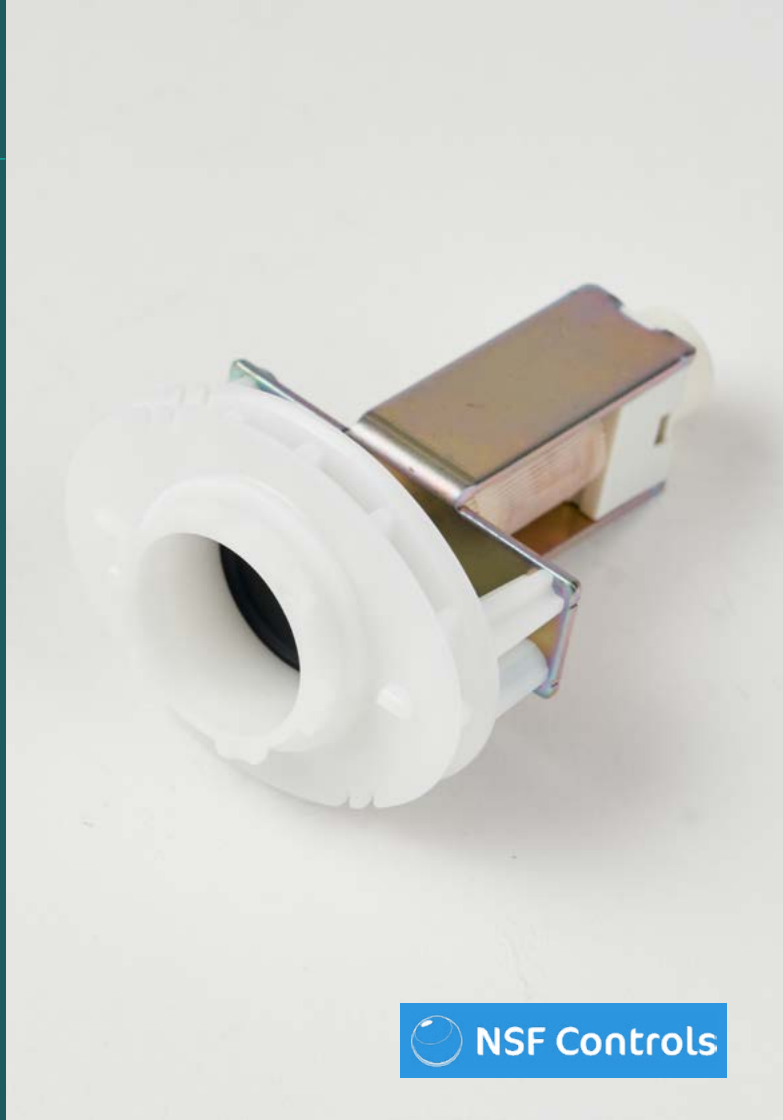
innovation

Troubleshooting a new solenoid product design

NSF Controls

Expertise and domain knowledge

- Industrial
- Product development
- Electromechanical systems
- Fluid dynamics
- Tolerance analysis
- Simulation



Our client asked:

NSF Controls makes a range of solenoids and switches. It began developing a new shut-off valve for smart gas meters which was smaller, lighter and more efficient than anything available. Over the next four years, the regulatory requirement for maximum operating pressure steadily increased from 25 millibars to 200 millibars, pushing the design to the point where the valve would not operate reliably.

The project story:

Sagentia Innovation developed a mathematical model of the valve dynamics, taking into account spring forces, electromechanical forces, fluid forces and stiction/friction. The model was validated using high-speed video analysis and electrical data.

The model was subject to a tolerance analysis to identify the variations most likely to account for the issue. This identified a critical component, and our recommended design modification resolved the issue.

The work also identified the following:

- Ways to improve the efficiency of the solenoid, making it better suited to applications requiring a long battery life
- A method for assessing performance on the production line

Contact us

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Results: deliverables and outcomes

Our solution was implemented quickly by NSF Controls, and the product was very successful, reaching a total of 12 million. No performance issues have been reported from the field.

> “By working with Sagentia Innovation, a solution was quickly found, saving NSF valuable resource and time, allowing us to take it to market much sooner, meeting all our customers’ time scales and requirements”.

Doug Priestley, Sales Director, NSF Controls