



# Performance Improvements for Flapper Valves

## Design and Manufacturing Expertise Enable Rapid Delivery

Using Avalon® advanced-engineered thermoplastic material, our design and manufacturing expertise, and our specialized machining capabilities, Greene Tweed developed and delivered a customized flapper valve soft seal for an innovative, technology-led engineering company. This solution for the customer's new flapper type safety valve passed the stringent functional tests in a single effort, allowing the customer to meet strict delivery requirements.

### Challenge

Our customer, a leading provider of reliable, advanced completion tools for the oil & gas industry, was tasked with designing a new safety valve for their customer. This equipment is critical to the safety and integrity of the wells and must function in both high-pressure/high-temperature and low-pressure/low-temperature hydrocarbon oil & gas environments. With an initial order for 25 of these new valves, the customer was under pressure to ensure this new tool passed the API Safety Valve qualification test in a single attempt to meet their promised delivery times.

The customer turned to Greene Tweed for our ability to develop, machine, and manufacture custom solutions. Our team was tasked with designing and delivering a highly reliable flapper soft seat seal, together with recommending the customer's hardware configuration.



### Highlights

#### CUSTOMER

- An innovative, technology-led engineering company serving the oil & gas industry

#### CHALLENGE

- Required assistance designing and machining a new flapper-type safety valve
- Needed to pass stringent qualification tests in an extremely short time period to meet production schedule

#### SOLUTION

- Provided design and consulting services for the flapper soft seat seal and mating flapper
- Recommended Avalon® 09 for the seal materials
- Delivered specialty machining and manufacturing processes

#### RESULTS

- Passed safety test on first round
- Met production timelines and delivery dates
- Expanded product line based on successful prototype





## Solution

To ensure we provided the optimum solution for our customer, we generated 3D models for the highly complex geometry of the seal designs and used these to program our 5-Axis Machining Center for manufacturing and production. We worked closely with the customer to determine that our Avalon® 09, an advanced engineered thermoplastic with excellent lubricity and low friction, would be the best fit for this solution. By choosing this particular advanced PTFE compound rather than an elastomeric seal, we eliminated potential fluid compatibility and RGD issues and created an extremely reliable product which will function throughout the lifetime of the safety valve.

## Results

The flapper safety seal passed all stages of testing in a single attempt, allowing the customer to go to market with a new, qualified tool in an extremely short time frame. Since there were no required changes, the customer was able to eliminate expensive design iterations and additional testing, allowing them to bring the valve to market faster and maximize production capabilities.

This solution has been extremely successful. As a result of the benefits they have realized with our Avalon® seal solution, the customer is now planning on developing other sizes to produce a complete product line. In addition to expanding the use of our Avalon® seals, the customer intends to broaden their working relationship with Greene Tweed into other areas of their operations.

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## Greene Tweed

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