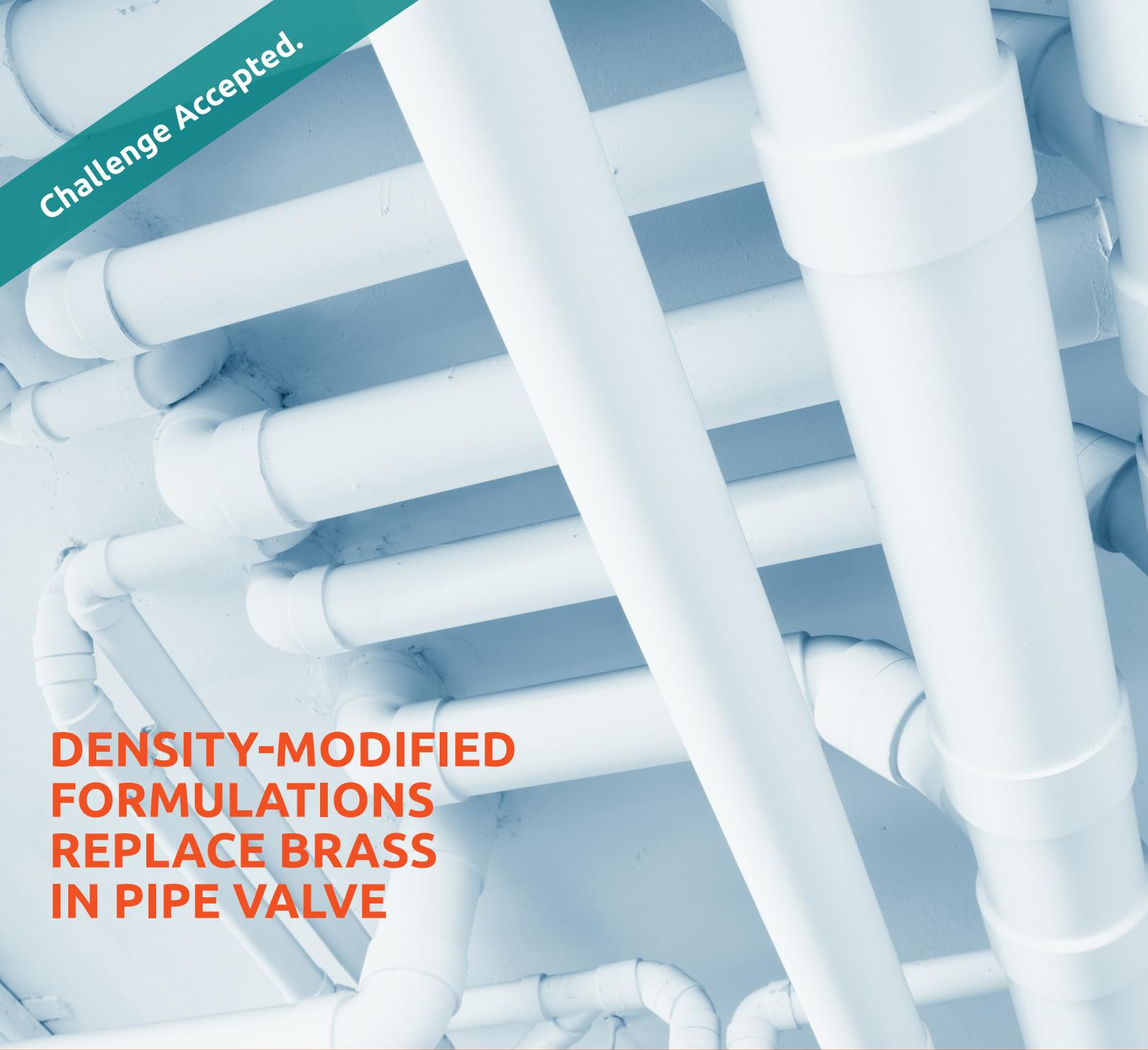


Challenge Accepted.



**DENSITY-MODIFIED  
FORMULATIONS  
REPLACE BRASS  
IN PIPE VALVE**

 **AVIENT™** » CASE STUDY: GRAVI-TECH™



# DENSITY-MODIFIED POLYMER REPLACES BRASS, ACHIEVING PERFORMANCE, ENVIRONMENTAL AND COST BENEFITS

## THE CHALLENGE

Advanced Pedestals, Inc., (API) of Gainesville, Texas, a manufacturer of plastic pipe components, saw an opportunity to design a flapper valve that could improve upon traditional brass valves and enable non-corrosive, all-plastic piping systems.

Brass valves can be problematic in several respects. They are difficult and time-consuming to install, require a number of different parts, and wear out rapidly. In addition, to make brass machinable, lead is typically added, introducing environmental and health risks.

Another issue is maintenance. Because oil contains paraffin and other residues that can build up inside pipes, a “pig” or special scraper must be run through the pipe periodically to clean it out. However, most brass flapper valves open only 25–30 percent, preventing the pig from passing through. The valves must be removed each time, which requires significant time and effort.

Don Houston of API said, “In addition to all these drawbacks, brass valves have to be joined to plastic piping with steel fittings. We wanted to make it easier for our customers to create durable piping systems by developing a plastic flapper valve that could be easily fused onto polyethylene (PE) pipe. This would not only avoid corrosion, but also eliminate weak spots.”

## THE SOLUTION

Gravi-Tech™ density-modified formulations are unique, high-density materials developed as thermoplastic-based alternatives to lead and other traditional metals. They are formulated using select metallic fillers and engineered thermoplastic resins to achieve the specific gravity of different metals, while providing the design flexibility and processing ease of conventional thermoplastics.

“We needed to achieve a specific gravity of 4, which is approximately the same as brass. This density enables the valve to fall into a closed position when fluid pressure is removed. However, we didn’t want to make the material any denser than absolutely necessary, as more fillers mean higher costs. Avient’s experts customized a Gravi-Tech formulation that met our exact requirements.”

## THE IMPACT

Gravi-Tech high-density formulations enabled API to design and mold a patented, full-opening flapper valve that is not only unique in the market, but also offers important cost, performance and environmental advantages over brass..

- **System cost reduction = competitive advantage:** The PolyChek valve featuring Gravi-Tech materials offer customers faster installation, less maintenance and longer life.
- **Design freedom = unique product offering:** The ability to injection mold Gravi-Tech materials instead of machining brass enabled API to design a cost-effective, full-opening flapper valve that is 100% pigable.
- **High performance = customer satisfaction:** The PolyChek valve gives API’s customers the ability to create all-plastic piping systems that eliminate leakage and weak spots.
- **Elimination of lead = increased safety and compliance:** Replacing brass with Gravi-Tech high-density formulations eliminates health and safety concerns about lead.
- **Use of existing tooling = lower capital costs:** API was able to use the same mold originally designed for nylon to run the Gravi-Tech materials, saving the substantial costs of retooling.

Thanks to the customized Gravi-Tech material, API was able to successfully design and mold a flapper valve that is the only one of its kind on the market—and offers a less expensive solution than traditional brass valves. The PolyChek valve gives API a critical competitive advantage today and into the future, as heavy metals such as lead become even more restricted.

Kane Whitaker, inventor of the PolyChek valve, said “Avient’s team supported us every step of the way—from material identification, through customization, testing and process optimization. Gravi-Tech materials work wonderfully in the PolyChek valve, and helped us to deliver a next-generation product for our industry.”

**To learn more about Gravi-Tech™ density-modified formulations, contact Avient at +1.844.4AVIENT (1.844.428.4368) or visit us at [avient.com](http://avient.com).**