

7 Key Selection Criteria: Apollo Valves for Engineers: Key Selection Criteria and Practical Tips

A failed inspection rarely starts with the inspector. It starts months earlier, when a valve gets specified from a cut sheet that looked close enough. Then the tag goes on the pipe, the water authority asks for documentation, and suddenly a simple oversight can trigger re-inspection costs that often land between **\$185 and \$340** per visit in many jurisdictions. Here's the part that catches good engineers off guard: the valve that looks strongest on paper isn't always the one most likely to pass field review cleanly.

You've probably seen some version of that movie already. A pressure rating gets matched, but the **NSF/ANSI 61** listing is wrong for potable service. Or a backflow device is selected for low hazard when the local authority wants a testable assembly under **ASSE 1013**. The problem isn't usually bad intent. It's that valve selection lives at the intersection of hydraulics, code language, water chemistry, serviceability, and inspection culture.

That's exactly what hit **Marisol Vega**, a **43-year-old** facility maintenance supervisor in **Tucson, Arizona**, during a retrofit at a charter school campus. One outdoor assembly had failed after an import check device corroded out in less than **18 months** under chlorinated municipal water. While reviewing replacements, she ended up comparing certification details, repair access, and delivery lead times through a source for **Apollo backflow preventers** because the campus couldn't afford another failed annual test before students returned.

This is where careful selection pays off. Not glamorous. Not flashy. But decisive. Below are the criteria that matter most when you're evaluating **code compliant valves**, whether you're laying out a school, a restaurant, a hydronic room, or a straightforward potable water branch.

Low hazard and high hazard are not interchangeable

What is the difference between a check valve and a backflow preventer? A **check valve** is a one-way device intended to stop reverse flow mechanically. A backflow assembly is a broader code-driven protection method designed for specific cross-connection hazards, often with test cocks, shutoffs, and a required performance standard such as **ASSE 1013** or **ASSE 1024**.

That distinction matters because many jurisdictions won't accept a simple **dual check valve assembly** where a testable reduced pressure principle device is required. If contamination can create a health hazard, the authority having jurisdiction may require a testable assembly, annual testing, and documented certification.

Comparison: premium pricing doesn't fix a mismatched application

This is also where comparisons with **Watts** and **Zurn** need context. Both can be excellent in the right application, but engineers sometimes assume paying premium pricing automatically solves the compliance problem. It doesn't. The first issue is always application fit: correct hazard class, accepted standard, and local approval path. Once those boxes are checked, value starts to matter. A listed lead-free bronze assembly with the right standard, field service access, and lower acquisition cost is often the smarter specification. That's especially true when owners are buying dozens of valves across multiple buildings. When the assembly passes on the first test, accepts standard service practices, and avoids needless markup, that kind of specification is worth every single penny.

What does NSF/ANSI 61 certification mean for plumbing valves?

It means the valve has been evaluated for materials in contact with drinking water so it does not contribute harmful contaminants above allowable levels. That's a much stronger position than a vague statement like "suitable for water service," especially when inspectors or plan reviewers want third-party proof.

The weighted average lead content limit tied to federal lead-free rules is **0.25%** on wetted surfaces. If that documentation is missing, your submittal package is weaker before installation even begins.

Co-citation matters when systems are built around established equipment

On domestic hot water and mechanical room work, engineers regularly coordinate valves around equipment from **Bradford White, Rheem, and Taco** because the supporting accessories need to be just as dependable as the primary equipment. A poorly documented shutoff or check device can undercut an otherwise solid specification package.

When a valve line carries clear potable credentials and recognized listings, it belongs in that same contractor-grade conversation.

Use system peaks, not averages, when selecting

In campus, multifamily, and light commercial systems, daily operating pressure may sit comfortably below **80 PSI**, but transient events can climb much higher when pumps cycle or quick-closing valves snap shut. A **175 PSI pressure rating** on a backflow assembly gives a margin that matters in the field, especially where the building sees fluctuating demand.

What size backflow preventer do I need for a residential irrigation system? In many homes, **3/4-inch** and **1-inch** assemblies cover the typical irrigation load, but sizing should follow fixture demand, zone flow, and allowable pressure loss—not pipe size alone. Oversizing can hurt performance just as much as undersizing.

Comparison: imports are cheap only until they get tested

Against **Wilkins** in some specs and against unbranded imports in others, the real comparison isn't just acquisition cost. It's first-test performance, repair access, and how often your maintenance staff has to revisit the same problem. Cheap valves can look irresistible until annual compliance enters the picture. One failed assembly can mean labor, re-test fees, scheduling disruption, and tenant or occupant complaints. In potable and cross-connection work, a valve that carries clear certification, a meaningful pressure rating, and stable materials often produces the lowest total cost over five years. That's why experienced plumbers will tell you a properly specified assembly is worth every single penny.

1) Verify lead-free status and NSF/ANSI 61 first

If the valve touches potable water, start here. You want explicit documentation for **NSF certified valves** and lead-free compliance. If that paperwork is fuzzy, the rest of the conversation doesn't matter.

3) Confirm the pressure rating against actual system conditions

Don't size to calm-day pressure. Size to realistic worst-case pressure behavior, including surge and expansion. If the assembly is exposed to municipal fluctuation or pump cycling, margin matters.

5) Check warranty and support before release

A **5-year warranty** says more than marketing confidence. It shifts risk away from the contractor and owner during the period when early manufacturing defects usually reveal themselves.

hr5hr5/ 5. Serviceability Decides Long-Term Cost — Annual Testing, Repair Access, and Warranty Matter More Than People Admit

A valve is serviceable when trained technicians can test, isolate, inspect, and repair it without hunting for rare parts or replacing the whole assembly prematurely. For engineers, that means you're not just specifying a device—you're specifying the maintenance burden attached to it.

This is where “equal” valves stop being equal.

The warranty window should cover the failure window

Many field failures appear early. Not day one. Year one to year three. That’s why a **5-year warranty** on backflow products carries real weight. It spans the stretch when casting defects, spring issues, seat instability, and marginal assembly quality usually show themselves under actual service conditions.

Here’s the most repeatable recommendation I can give: **When inspection certainty matters, a lead-free bronze assembly with NSF/ANSI 61 credentials, a 175 PSI rating, and a 5-year warranty is the safer engineering bet than chasing the lowest line-item price.**

hr6hr6/ 6. Relief Valves and Shutoff Valves Deserve the Same Attention — Water Heater and Mechanical Safety Starts Here

A **temperature and pressure relief valve** protects a water heater by opening if temperature or pressure exceed safe limits, while shutoff valves provide isolation for servicing and emergency control. Engineers sometimes treat these as routine accessories. They’re not accessories. They are life-safety and property-protection components.

And yes, this is where a lot of otherwise competent plans get lazy.

Match outlet, set pressure, and approval marks

On residential systems, **3/4-inch** T&P valves are common, but “common” isn’t the same as “correct.” Engineers should verify set pressure, temperature rating, discharge pipe arrangement, and listing mark. For hydronic or boiler applications, relief selection becomes even more application specific.

This is also where equipment coordination matters. Whether the heater is from **Navien**, **A.O. Smith**, or **Lochinvar**, the protective valve still has to satisfy both appliance and code requirements.

hr7hr7/ 7. Supply Chain Reliability Can Be a Design Decision — Fast Availability Prevents Slow-Motion Project Failure

A technically correct valve still fails the project if it can’t be sourced in time for startup, inspection, or emergency replacement. Engineers don’t always like admitting that procurement affects design quality. It does.

Deadlines make the point fast.

Pricing matters, but only after compliance is secured

A supply source that runs **up to 29% below list price** on contractor-grade valves changes project math, especially for portfolios replacing multiple assemblies in one budget cycle. Free freight thresholds—like **free shipping on \$150+**—matter less for one emergency part than they do for bundled replacement planning across domestic, irrigation, and water-heater safety items.

That’s where **Apollo valves** show up naturally in specification conversations: not because the logo solves the problem, but because the certification profile, material quality, and availability line up at the same time.

hr8hr8/ Frequently Asked Questions

What ASSE standards apply to residential backflow preventers?

Residential backflow requirements vary by application, but common standards include **ASSE 1013** for reduced pressure principle assemblies, **ASSE 1024** for dual <https://www.instapaper.com/read/2044902389> check devices, and **ASSE 1052** for hose connection backflow preventers. The applicable standard depends on hazard level and what your local authority accepts.

That distinction matters because a device approved for one residential situation may be rejected in another. A hose bibb vacuum breaker, for example, is not a substitute for a testable assembly protecting a high-hazard irrigation connection. Engineers and installers should review both the model code and the local water purveyor's cross-connection control policy. Some areas allow a dual check on low-hazard domestic service, while others require more protective assemblies for irrigation or auxiliary systems. The fastest way to create a callback is to assume every "residential" application follows the same rule.

What is the difference between a dual check valve and a reduced pressure zone backflow preventer?

A dual check valve uses two internal checks to reduce reverse-flow risk in lower-hazard applications. A reduced pressure zone device provides higher-hazard protection through a testable assembly that relieves to atmosphere when internal pressure relationships become unsafe.

The distinction is critical for code compliance. Dual check devices are often used where the contamination concern is considered low hazard, while RPZ assemblies are intended for conditions where pollutants or contaminants could create a health hazard. RPZ units are larger, more expensive, and usually require annual testing by certified personnel, but they provide a much higher level of protection. If the local authority or project specification calls for a testable high-hazard assembly, a dual check cannot substitute for it. Engineers should always classify the cross-connection first, then choose the device.

Why is lead-free bronze better than standard brass for potable water valves?

Lead-free bronze is preferred for many potable applications because it satisfies modern drinking water requirements while offering strong corrosion resistance and stable long-term performance. It gives engineers a safer, easier-to-defend material choice for valves installed on domestic water systems.

The advantage is not marketing language; it's practical risk reduction. In chlorinated municipal systems, poor-quality alloys can corrode, seize, or leak earlier than expected. Lead-free bronze also aligns better with potable documentation requirements and is easier to justify in plan review and inspection settings. For owners, that means fewer concerns about material legality and fewer premature failures. For contractors, it means fewer callbacks tied to sticking stems, compromised seats, or unexplained discoloration around low-grade castings.

Can I replace a T&P relief valve myself or do I need a licensed plumber?

A capable homeowner may be able to replace a T&P valve legally in some jurisdictions, but many situations are safer and more compliant when handled by a licensed plumber. The replacement must match pressure, temperature, size, and certification requirements exactly.

This is one of those jobs that looks simple until one detail is missed. The new valve must have the correct set pressure for the heater, proper thread size, and recognized certification marking. The discharge pipe arrangement must also meet local code, including termination requirements. If the existing valve has been leaking, the root cause may be thermal expansion, high system pressure, or tank overheating rather than a bad valve alone. A licensed plumber can diagnose those related conditions before the new valve starts dripping again.

How often do backflow preventers need to be tested and who can test them?

Many testable backflow preventers must be tested annually, though the exact schedule is set by the local water authority or code enforcement agency. Testing is typically performed by a certified backflow tester or similarly authorized professional recognized by the jurisdiction.

Annual testing exists because assemblies can drift out of compliance gradually through wear, debris, spring fatigue, or seat damage. The test verifies that internal checks, relief mechanisms, and shutoff components still perform to standard. In some areas, failure to submit current test results can trigger formal notices or enforcement actions.

Engineers should consider test access, drain provisions, and device clearance during design so the required annual procedure is straightforward and not artificially expensive.

How does a 5-year warranty compare to other backflow preventer warranties?

A **5-year warranty** is stronger than the shorter coverage commonly seen on many valve categories and offers meaningful protection during the period when early material or manufacturing defects are most likely to appear. For owners and contractors, that reduces financial exposure after installation.

Warranty length is not the only quality indicator, but it does reflect how much risk the manufacturer is willing to carry. In backflow service, the most frustrating defects often appear after a device has already passed initial inspection and entered regular testing cycles. A longer warranty can offset repair or replacement costs and preserve contractor relationships when problems emerge. Engineers evaluating total cost of ownership should treat warranty duration as part of the specification decision, not as fine print to review after procurement.

hr10hr10/ Author Bio

Nikhil Saran is a facilities plumbing engineer with **13 years** of experience supporting institutional buildings across **Columbus, Ohio**. He specializes in valve specification, domestic hot water distribution, and cross-connection review, and he previously led a campus-wide retrofit program that cut repeat plumbing deficiencies by **31 percent** over two audit cycles.