How Engineers Can Lead the Way on Water Infrastructure through Sound Supplier Selection

SIGMA™

Quality – Service – Commitment – Delivered.



WWW.SIGMACO.COM

Overview

Water infrastructure underpins every essential sector and service required for survival: water supply, food, agriculture, energy, and transportation. Further, access to water affects construction, municipal planning, manufacturing, mining—it touches virtually every segment of the global economy.

As infrastructure in North America ages, water systems across the continent urgently require upgrades and maintenance. This has generated significant demand for funding, materials, innovation, and labor.

At the same time, the demand for water is growing; data centers are popping up across the US and beyond, and they require vast amounts of water for cooling.

The Current State of Play

- US water system infrastructure is at the end of its life expectancy, prompting a critical need for investment. The aging infrastructure results in 20% of water loss, which translates into 2 trillion gallons wasted. This costs utilities $6.4 billion annually. [i]
- Water system upgrades could require more than $1 trillion over the next 20 years. [ii]
- In the past year, 80% of organizations encountered at least one disruption to their supply chain, with many encountering multiple breakdowns. [iii]
- 71% of US CEOs plan to alter their supply chains over the next three to five years, partly due to trade uncertainties. [iv]

The Challenge for Engineers

Tasked with upgrading crumbling water systems, engineers have a challenging job ahead of them. Many municipalities are replacing older materials such as cast iron and concrete, which are degraded, with more durable materials such as PVC, HDPE, or ductile iron. But the current systems are still needed to supply water, and they are becoming more fragile by the day. Further, the water systems do not generate nearly enough revenue to cover replacement costs, so state and federal aid is essential, and in the current political climate, elusive.

Add to this the supply chain disruptions caused by everything from tariffs to geopolitical tensions, local and global shortages, natural disasters, and labor issues, all of which can make sourcing product difficult. And without an ample inventory of materials such as pipe restraints and fittings, the upgrades will stall.

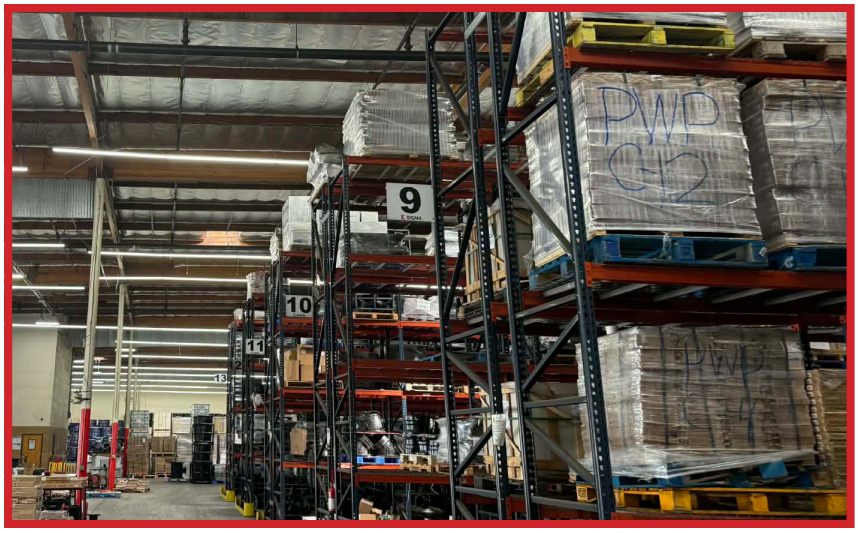
Prioritizing Pipe Restraints

Pipe restraint products are critical components for water systems. They prevent leaks and shutdowns, and ensure pipeline integrity, especially at junctures where flow changes occur such as bends, valves, ground shifts and hydrants. When pipe restraints are substandard, catastrophic consequences may occur—systems risk water main breaks, contamination, backflow, and sediment infiltration.

The Good News

While the current climate presents significant challenges, solutions exist. Reputable manufacturers of restraint products deliver quality product that can help ensure water security over the long term. It is essential to select a supplier with a proven track record of quality, service and innovation who can provide the critical products needed to maintain these complex systems.

The ideal manufacturer offers both imported and domestic product in a wide range of sizes, applications, and materials to meet all specifications.



Pipe Restraint Products: The Essentials

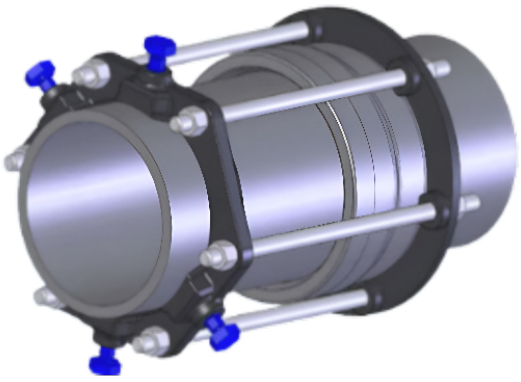
For Ductile Iron pipe to fittings and valves:

The SIGMA ONE-LOK Series SLDE is a mechanical joint restraining gland featuring independently activated wedge segments and bolts that securely lock onto ductile iron pipe walls, providing reliable restraint across all thicknesses and pressure classes from 3 to 64 inches. Constructed from A536 ductile iron with hardened wedge segments and high-strength T-head bolts, it combines precision-contoured wedges that minimize pipe-wall damage during installation with a cam-action mechanism that increases grip as joint thrust rises, enhancing resistance to subsidence and seismic movement within AWWA standards. A visual torque indicator and breakaway bolts ensure correct engagement without special tools, and proprietary manufacturing tolerances guarantee proper activation torque.



For Ductile Iron pipe-to-pipe connections:

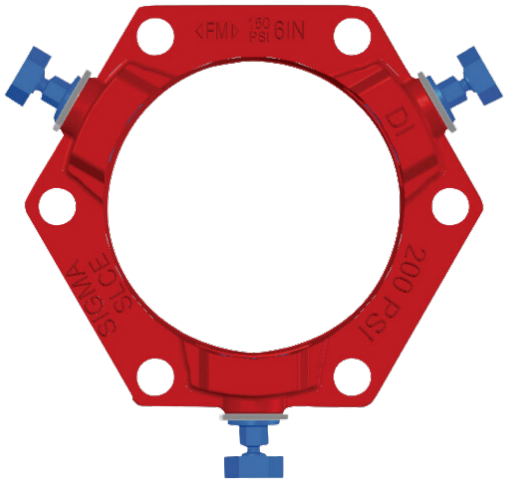
The SIGMA ONE-LOK Series SLDEH is a mechanical joint restraining gland assembly that combines independently activated wedge segments with high-strength, low-alloy restrainer rods and a two-piece back-up ring SG to accommodate varying ductile iron pipe bell diameters. Each wedge segment, actuated by a bolt with a visual torque indicator and breakaway top, locks onto the pipe wall to grip and restrain all DI classifications. The wedges feature precision elongated contours that precisely match nominal pipe diameters, ensuring even contact and protecting both the pipe wall and interior cement mortar lining from point loading, even on thinner classes. A proprietary quality-control system guarantees correct torque activation, and the design eliminates the need for special tools, providing reliable, installation-friendly restraint across a wide range of DI pipe sizes.



Pipe Restraint Products: The Essentials

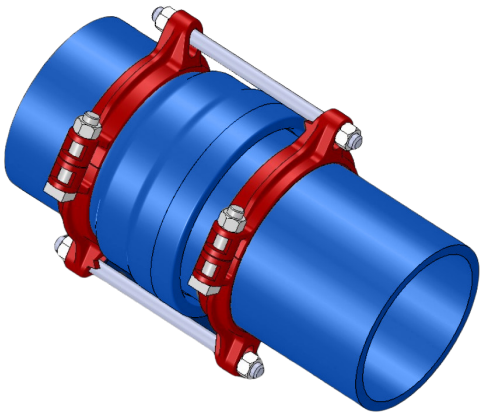
For PVC pipe to fittings and valves:

The SIGMA ONE-LOK Series SLCE is a mechanical joint restraining gland with independently activated wedge segments and bolts that securely lock onto PVC pipe walls, providing reliable restraint across all thicknesses and pressure classes from 3 to 60 inches. Its precision-contoured wedges ensure gentle, damage-free contact with the pipe surface, even for thinner pressure classes, while a cam-action design increases grip as joint thrust rises to resist subsidence and seismic movement within AWWA standards. A visual torque indicator on the breakaway bolts guides correct engagement without special tools, and a proprietary quality-control system guarantees activation at the correct torque. This installation-friendly design delivers robust restraint across all PVC pipe applications.



For PVC Pipe to Pipe connections:

The PV-LOK Series PWP restraint system engages PVC pipe walls with machined serrations to provide positive joint security and full pipe-wall support. Its directional gripping action enhances restraint during surges and water hammer. The system comprises two PV-LOK clamping rings tied together by restraining rods and nuts to secure the PVC bell and spigot joint. Available in sizes 4” through 48”, it offers consistent, installation-friendly restraint for PVC pipe connections.



A reliable supply of these essential products is crucial for maintaining and upgrading water infrastructure, and selecting the right vendor is key.

Choosing the Right Vendor

When considering a pipe restraint supplier, it is important to ask the following questions:

1. Do you meet spec on the full range of sizes, including large diameters, up to 64”?

Providing a wide range of sizes typically indicates a substantial operation, which signals security and stability. A smaller selection will require multiple vendors for different products, creating a paperwork and logistical headache for the purchaser, not to mention a breeding ground for errors and glitches.

2. Do you offer products for DI and PVC?

These are the most common specs and materials used in current and future systems. If a supplier can only supply the old school materials, they may not be around in the short or long term.

3. Do you provide engineering and technical support?

Providing up-front resources like a restraint calculator and a restraint selection tool demonstrate full-service, comprehensive expertise that optimizes the customer experience and increases the likelihood of success. Even more importantly, ongoing technical support is essential. Few installations and jobsites are seamless. Be sure your supplier is available for installation assistance throughout the process, troubleshooting and/or boots-on-the-ground support in the event of a problem.

4. Is your supply chain diversified?

Supply chain diversification is a strategy that mitigates risk by reducing reliance on a single source or region. By creating a range of potential suppliers, businesses can protect themselves from many of the factors that can negatively impact their ability to maintain a reliable inventory. When a supplier demonstrates a diversified portfolio of sources, this is a good indication of reliability.

5. Do you have long-standing experience in the industry?

There is no substitute for a well-established, proven manufacturer. Companies that have led the market and stood the test of time, particularly in the challenging world of global manufacturing, have done so for a reason—they can be trusted and relied upon to deliver for their customers.

If your prospective supplier responded “**no**” to any of these questions, you should consider an alternative.

The Takeaway

As water infrastructure ages and the need for upgrades and demand for water continues to grow, engineering professionals will be called upon to address this looming crisis. They will need reliable suppliers of quality restraint products to ensure safe, ample water supply for the US.

SIGMA Corporation has been a leading pipe restraint supplier in quality, service, and innovation since 1985. Their well-established global manufacturing and logistics network ensures optimal efficiency, fair pricing, and boots-on-the-ground in all of their factories worldwide, and their domestic production is responding to meet market demands.



Citations

i National Association of Water Companies (NAWC). "Water Infrastructure in the United States – NAWC." National Association of Water Companies (NAWC), 9 Sept. 2025, nawc.org/water-industry/infrastructure-investment/.

ii Mills, Mollie, and Aleena Oberthur. "Water System Upgrades Could Require More than $1Trillion over next 20 Years." The Pew Charitable Trusts, 5 Sept. 2024, www.pew.org/en/research-and-analysys/articles/2024/09/05/water-system-upgrades-could-require-more-than-$1-trillion-over-next-20-years.

iii BCI, The. "Latest BCI Report Reveals Escalating Supply Chain Disruptions Drive Increased Tier Mapping and Insurance." The Business Continuity Institute (BCI), www.thebci.org/news/supply-chain-disruptions-drive-increased-tier-mapping-and-insurance-uptake.html. Accessed 9 July 2025.

iv Ibid.