

# Clamping Down On Bell-Joint Leaks

When one considers all the press-fit bell joints in a water distribution or wastewater collection system, and all the stresses to which they are subjected, it is a wonder there are not more leaks. Fortunately, bell-joint-leak clamps provide a reliable and relatively easy-to-install solution — if they are properly specified and installed. Here are some key points to consider when trying to remedy bell-joint leaks.

Whatever the type of pipe material or the cause of the leak, bell-joint-leak clamps (BJLCs) are the simplest, most cost-effective means of replacing a failed seal on a pipe bell joint. The critical requirements to use this type of repair are a square, uniform bell face for the gasket to seal against, a smooth adequate pipe surface for the gasket to seal, and adequate space to install the clamp.

BJLCs have a split body design that encircles already-joined sections of pipe and gently increases pressure on a wedge-shaped gasket that seals against the face of the bell and the pipe to provide a new or secondary seal.

The clamps do not move the pipe; they only compress the gasket into the gap causing the leak. They can also serve as leak-prevention insurance for an older pipe that is uncovered or disturbed during other pipeline maintenance.

## Know Where To Anticipate Bell-Joint-Leak Problems

Stocking bell-joint-leak clamps in the right styles and sizes for the types of pipe used throughout a utility's infrastructure is good preparation for solving small leak problems before they grow into more expensive issues. Here is a list of factors for anticipating where and why those leaks might occur:

- **Aging Infrastructure.** Whatever the pipeline material — cast iron, ductile iron, concrete asbestos, etc. — bell joints can leak over



time due to aging gasket material and other causes.

- **Vibration.** Pipelines located in high-traffic locations — urban highways, airports, railway tunnels, etc. — or in areas exposed to vibration from pile-driving construction are often at higher risk for leaks due to the cumulative effects of that vibration.
- **Shifting Soil.** Areas with unstable soils or soils subject to repetitive freeze-thaw cycles can spring leaks even if the pipeline is in an early phase of its lifecycle.
- **Change Of Flow Direction.** In areas where the predominant direction of flow in a distribution or collection system has changed — contrary to the male-into-female flow direction in which the pipe was initially installed — that change in flow can have a

negative impact on the original bell-joint gaskets.

- **Pipeline Repair Disturbances.** Sometimes, disturbances caused by excavation or repair work on adjacent pipelines can cause leaks to occur in nearby bell joints.
- **Threaded Joints.** Actual bell joints are not the only pipeline junctions that can benefit from bell-joint-leak clamps. Often, threaded pipe that is leaking on one side of a coupling can be repaired by using a bell-joint-leak clamp to force the wedged gasket into the gap at the pipe/fitting juncture.

## Plugging The Gap

Whatever the cause of a leak, bell-joint-leak clamps offer a relatively quick, easy, and secure solution due to the nature of their gaskets and the way they compress those gaskets in the areas of the leaks without putting undue stress on the pipeline.

- **PVC Pipe.** PVC pipe with rubber-joint bells or solvent-weld joints, as well as steel pipe with threaded couplings, can benefit from quick, dependable repairs or reinforcement with off-the-shelf designs for pipe in nominal sizes of 8" or less (Figure 1).
- **Cast Iron/Ductile Iron/C-900 PVC.** Split interlocking rings and precut gaskets provide maximum gasket compression for easy field installation and quick repairs on pipe sizes up to 12". (Figure 2).
- **Large-Diameter Pipe.** For pipe ranging from 4" in diameter to 60" and larger in diameter, special fabricated clamps with split, bolt-on designs provide a positive seal for large-diameter, ductile-iron, cast-iron, and PVC-pipe bell joints (Figure 3). They are available for undersized, standard size, and oversized pipe.
- **HDPE Pipe.** Sometimes, fused couplings do not form a perfect seal and develop a leak over time. Rather than removing and reassembling the joint, which is not always possible, if the coupling has a shoulder, crews can install an appropriately sized bell-joint-leak clamp, saving a shutdown and draining of the pipe.
- **Asbestos-Cement (A-C) Pipe.** If the end of an A-C coupling and the pipe itself have not suffered extensive undercutting, BJLCs have been effectively used in repairing 12" and larger A-C coupling leaks. Of special note is that a restrainer is available for working on or around A-C pipe couplings where there is the potential that the excavation will cause pipe movement, resulting in a leak.

### Key Considerations For Bell-Joint-Leak-Clamp Specification

In addition to oversized and undersized



Figure 1.



Figure 2.



Figure 3.

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**Figures 1, 2, 3.** Bell-joint-leak clamps come in a variety of designs and sizes, each tailored to fit a specific range of pipe materials and sizes.

pipe dimensions, some of the more frequently cited variables in specifying a proper bell-joint-leak clamp are tight clearances for installation, finish coatings, and special bolt requirements. It is important to note that as pipe diameters get larger, **fabricated bell-joint-leak clamps** make it easier to accommodate oversized or undersized pipe that is not as uniform as it should be. Cast bell-joint-leak clamps that are too tight for an oversized pipe can require hours of trial-and-error grinding to fit. Those that are too big for undersized pipe and do not encapsulate the gasket will leave a gap that does not apply sufficient pressure across the full face of the gasket.

Consider all the requirements of a bell-joint-leak-clamp fitting for the specific application — type of pipe, nominal pipe size, actual pipe O.D., maximum bell length and O.D., line pressure, line content, and any special coating, bolt, or gasket requirements. Many bell-joint-leak-clamp gaskets are made of nitrile rubber (Buna-N), but some applications might call for an ethylene-propylene-diene-monomer (EPDM) gasket to accommodate specific application or environmental conditions.

One important consideration for bell-joint-leak-clamp specification can be accessibility — the 'fourth dimension' of the available space (or limited space) around the bell joint in which the repair crew must install the fitting. In particularly

tight spaces, custom O.D. and length dimensions might be critical.

### Don't Overlook An Ounce Of Prevention

For problematic installations in poor soil conditions or high-vibration areas, bell-joint-leak clamps or restrainer fittings (Figure 4) can be added to assure a firm connection even where there are no leaks. They can also be used to reinforce joints in areas where bell-joint piping was excavated to perform other work. This is an important consideration for stretches of pipeline that are expected to be under stress due to the nature of the location where they are deployed. ■

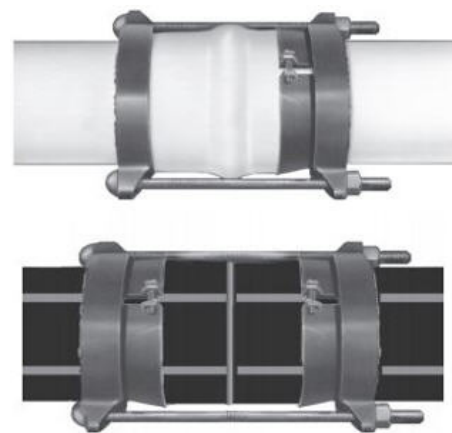


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**Figure 4.** Fitting restrainers can be used to reinforce joints against shifting in problematic soils or high-vibration locations, as well as during repair efforts that expose pipe joints to new stresses from excavation or backfilling.