CHARLOTTE PIPE AND FOUNDRY COMPANY

Technical Bulletin #15626

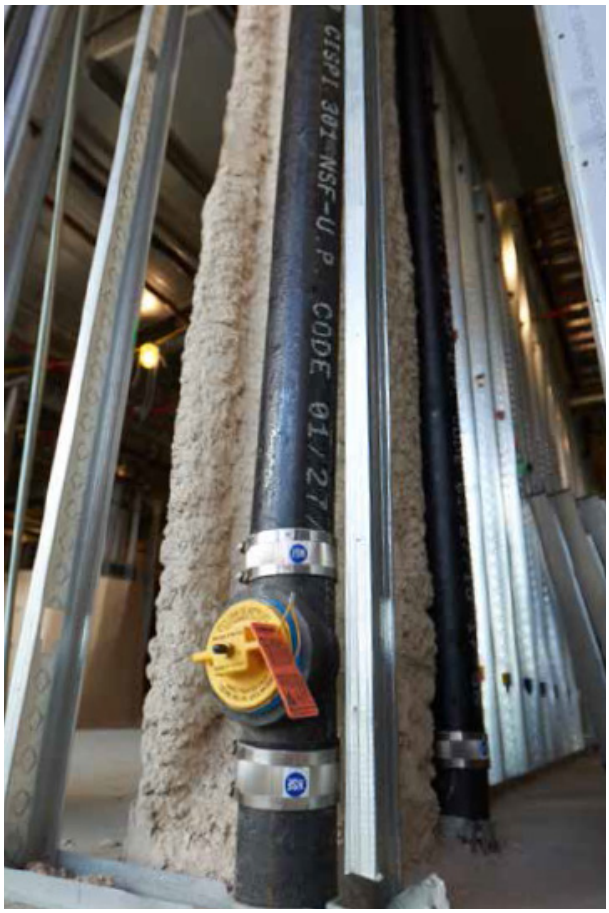
Testing Cast Iron Soil Pipe

Once a rough-in is completed on a cast iron piping project, it is important to test and inspect all piping after installation and before its use. The purpose of testing is to check the installation for leaks and to correct these prior to putting the system into service. In all installations, installers should comply with all local codes, regulations, manufacturers' instructions and architect/engineer specifications.

There are various types of tests used for installed cast iron soil pipe and fittings. Water, or hydrostatic tests and air tests are the most common methods. However, air and water are inherently different.

As a gas, air is compressible. Compressed gases store energy. This energy can release explosively. Water on the other hand, is not compressible and will not release energy explosively..

Molecules of water are much more tightly packed together than molecules of air. Because of this, the molecules of water create tension and stick together. This results in a cast iron system that is referred to as water tight, but not air tight. This fact, and the fact that air is compressible, thereby storing energy through compression, **makes air a less effective and even dangerous alternative.**



More About Water Testing

As water fills a vertical pipe, it creates hydrostatic pressure. The pressure increases as the height of the water in the vertical pipe increases. **Charlotte Pipe and Foundry recommends ten feet of hydrostatic pressure (4.3 pounds per square inch); this is consistent with most plumbing codes.** To isolate each floor or section being tested, test plugs are inserted through test tees installed in the stacks. All other openings should be plugged or capped with test plugs or test caps.

Prior to the beginning of the test, all bends, changes of direction, and ends of runs should be properly restrained. During the test, thrust forces are exerted at these locations. Thrust is equal to the hydrostatic pressure multiplied by the area inside the pipe. Thrust pressures, if not restrained, will result in joint movement or separation, causing failure of the test. All air trapped in the system should be expelled prior to beginning the tests.

Once the stack is filled to ten feet, an inspector makes a visual inspection of the section being tested to check for joint leaks. Once the system has been successfully tested, it should be drained and the next section should be prepared for test.

Water Testing Is The Most Common and Widely Accepted

A water or hydrostatic test is the most common and most widely accepted of all tests used to inspect a completed cast iron soil pipe installation. Charlotte Pipe and Foundry strongly recommends the use of water to test its cast iron pipe and fittings. This position is based on over a hundred years of industry experience, our commitment to supplying the safest, most effective practices regarding installation and testing of our pipe and fittings.

The following are examples of why a water test is superior to an air test and why Charlotte Pipe encourages the use of water.

- Molecules of air are smaller than water molecules; you should expect a cast iron system to have a reduction in air pressure during the 15-minute test period as a result of this difference. **This drop in air pressure does not indicate a failure of the system or that the system will leak water.** However it is often interpreted as such.

- Cast iron soil pipe and fittings joined with rubber compression joints or hubless mechanical couplings are expected to have a reduction in air pressure during a 15-minute test. Again, this drop in air pressure does not indicate a failure **of the system or that the system will leak water.** However it is often interpreted as such.

- A rise in ambient air temperature during an air test can mask a slow leak as the temperature rise may cause a rise in pressure within the system.

- A decrease in ambient air temperature can fail a leak free system as the temperature decrease may cause a decrease in pressure within the system.

- A leak in a system under an air test is not easily located as an air leak is not visible. Locating an air leak is a very time consuming and labor intensive task.

- Air molecules may leak at an exit point that would not allow a water leak.

- The failure of a system under test with compressed air can fail explosively causing severe injury or death.

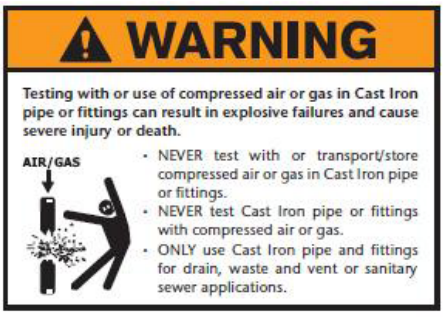
- A water test is the most representative of operating conditions of the system.

- A water test will not experience an elevation of pressure due to an increase in ambient air temperature, and therefore will not mask a slow leak.

- A water test will not experience a decrease of pressure due to a decrease in ambient air temperature, and therefore will not fail a leak-free system.

- A leak in a system under a water test is easily located as a water leak is visible. Locating a water leak is not time consuming or labor intensive.

- Water is not compressible and therefore will not store energy through compression. Failure of a system while under pressure from a water test will not cause severe injury or death.



You can't beat the system®

Charlotte Pipe and Foundry Company P.O. Box 35430, Charlotte, NC 28235 1-800-438-6091 704-348-6450
www.charlottepipe.com