CHARLOTTE
PIPE AND FOUNDRY COMPANY®

The Value and Efficiency of Starter Fittings in Commercial Construction

A White Paper for The Commercial Plumbing Industry

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History and Origin

Vertical cast iron starter fittings were originally developed to save on installation labor costs of conventional plumbing fittings in multi-story construction. The need for these fittings began when a vast number of Americans flocked to what we now know as super cities in search of work and better opportunities. This pursuit of the American dream ignited the demand for multi-family housing and high-rise buildings, such as apartments and condominiums.

Originally known as "Stringer Fittings," the manufacturing concept was simple; create one fitting to be used as the starting point for the DWV system in a bathroom by picking up all the fixtures when the layout is repeated on consecutive floors. This one cast iron fitting, originally only available in hub and spigot configurations, took the place of three or more different fittings and provided plumbing contractors with a quick and sensible solution to high-rise DWV installation.

Purpose

Today, cast iron starter fittings are manufactured for the exact same applications that they were originally manufactured for many years ago, sanitary waste drainage in high rise construction. Although originally only available for above the floor applications, starter fittings are now manufactured for use above, below or in the floor. In addition, they can be used in conjunction with back outlet floor or back outlet wall mounted water closets. Although their purpose is primarily for water closet connections, the diverse configurations of these fittings allow for easy installation of lavatories, shower and tub drain lines for almost any bathroom layout.

Types of Cast Iron Starter Fittings

While cast iron starter fittings were originally available in hub and spigot configurations only, today many manufacturers offer both hubless and hub and spigot starter fittings. Hub and spigot starter fittings are designed with both hubbed and tapped inlets. Hubless fittings, just as the name implies, do not have hubs. These fittings are available with tapped inlets as well as inlets that are joined to pipe using hubless couplings. These fittings are available in right hand, left hand and double configurations.

So what is the difference? Right and left hand are single starter fittings and refer to the position of the water closet inlet. These fittings are designed for single bathrooms in floor plans that are repeated vertically. Double starter fittings are designed for floor plans where back to back bathrooms are planned and repeated floor to floor. Normally double starter fittings are equipped with a baffle, or a partition, to prevent any back flushing in the adjacent water closet.

Advantages of Cast Iron Starter Fittings

Fewer Fittings and Materials

A starter fitting combines many different fittings into a single compact fitting. The result of this design is fewer fittings and joints for the installing contractor. As noted in the illustration below, it would take one fixture fitting, one sanitary tee, one wye, and a section of pipe all joined together to constitute a typical starter fitting. In the case of hubless cast iron starter fittings, each of these joints also requires the use of a hubless coupling. This adds up to be a considerable material and labor cost to the contractor.

If a contractor has a high rise project with 600 bathrooms, he is essentially saving material cost for 1,800 couplings simply by incorporating starter fittings into the building design! In addition, there is the tremendous labor savings on making 1,800 less joints and installing 1200 fewer fittings over the course of the project.

Also, since starter fittings are manufactured from cast iron, a non-combustible material, fire compartment penetrations only have to be sealed back to their original integrity with the use of a fire caulk.

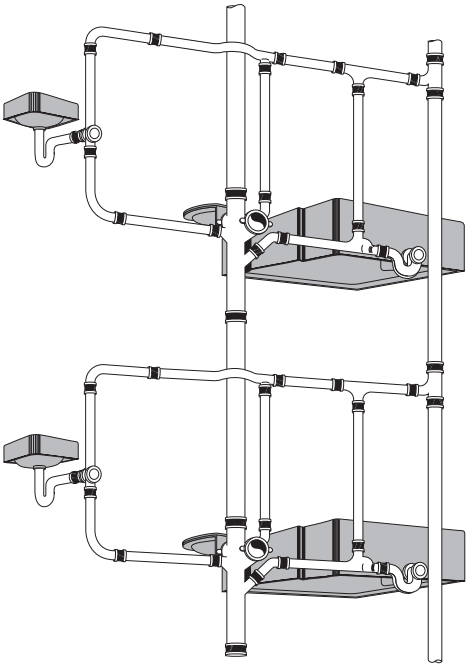
1 Fixture Fitting
+
Hubless Coupling
+
2 Sanitary Tee
+
Hubless Coupling
+
3 Wye
+
Hubless Coupling
+
4 Pipe

Equals

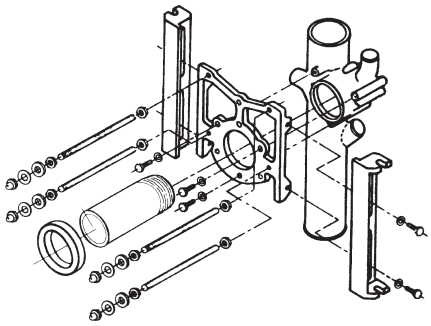
On the other hand, when combustible piping systems like PVC pipe penetrate fire-rated assemblies, listed fire stop devices or collars must be installed around the PVC pipe on both sides of the fire-rated wall.

Easier Installation

Although at first glance it seems complicated, most contractors will agree that the use of starter fittings on multi-family residential projects is actually quite simple. In some markets, plumbing contractors use starter fittings that are designed for installation in the floor. These installations typically require slab penetrations to be boxed out to accommodate the starter fittings. This method reduces or eliminates any core drilling through the slab. Although these fittings are designed to be installed in line with the main soil stack, the positioning of the inlets and the vent "direct" the entire bathroom installation. As shown in the illustration, these installations are repeated floor to floor making installation easier for the contractor.

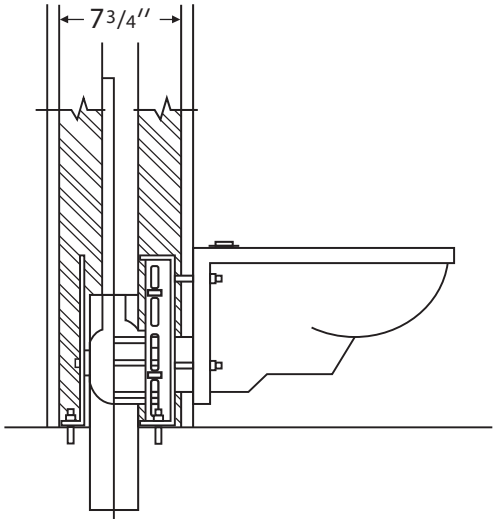


In addition, unlike conventional plastic installations, cast iron systems in general and starter fittings specifically do not require set times and cure times. For example, if 4" PVC is installed in 38 degree F temperature at 60% relative humidity, it could take as much as 2 days for the joint to fully cure before you could test the system. Cast iron systems incorporating the use of starter fittings can be tested once the plumbing installation on the floor is complete. Supporting starter fittings is rather simple as well. Starter fitting patterns that are designed for use in the floor are generally supported with riser clamps, while other configurations for use above the floor require the use of a support frame and trim package. These support frames are normally adjustable and bolt directly to the starter fitting. The trim packages offered by most manufacturers are tailored to two different applications: wall-hung back outlet, and floor-mounted back outlet water closet assemblies. Trim packages consist of a bowl gasket, a threaded nipple and thread rods. Thread rod size is dependent on the intended application.



Faster Installation

One of the major advantages of starter fittings in high-rise construction is that they more readily avail themselves to fabrication than conventional fittings. Today, many contractors preassemble as much of the installation as possible prior to the materials arriving at the jobsite. At a minimum, the repetitive installation design makes it easy to pre-cut pipe for soil stacks and vent stacks so that assemblies can be quickly installed at the job site with minimum labor. Through the use of fabrication, distribution complexity is minimized since each installation can be crated up, set in place via cranes, and then quickly roughed in.



Uses Less Space

Space requirements have long been a concern of engineers and designers. Space is a premium in any project, but exponentially so in high-rise construction. Today engineers and designers are using a variety of ways to maximize square footage, and unfortunately this does not leave a lot of room for contractors to install plumbing within the walls. Starter fittings provide the functionality of conventional plumbing, but in a compact design that uses less space between walls or in the slab. Although this may vary depending on the manufacturer, some left- or right-hand hubless starter fittings installed with a support frame are actually less than 8" in width. In addition, as noted in the accompanying picture, the height of some vertical starter fittings is reduced significantly over conventional fittings to accommodate the positioning of the inlets in relation to the slab on each floor. All of this equates to a building that has more usable, livable and functional space.

Reliability

The fact that cast iron starter fittings eliminate an exorbitant number of fittings in high-rise construction also translates into substantially fewer joints as compared to conventional DWV systems. With fewer joints present in the system, there are fewer opportunities for problems.

Also, cast iron pipe and fittings have been used in sanitary and storm drainage applications for centuries. The earliest recorded use of cast iron pipe was at Langensalza, Germany, circa 1562. Cast iron is still widely regarded as the premier choice for non-pressure sanitary and storm applications due to its longevity and durability. In fact, Louis XIV installed cast iron pipe at the Palace of Versailles in 1664, and after 348 years this pipe is still in use.

The Quiet Pipe®

The density of iron makes for a remarkably quiet system, which is an important quality for any multi-family high rise project. As more and more engineers and designers look for innovative ways to incorporate sustainability in their designs, it is important to remember that cast iron is a sustainable product. Starter fittings and cast iron pipe are manufactured from at least 96% post-consumer recycled material, and are 100% recyclable.

True Value Engineering

One of the greatest thrills in construction used to be in the extras. Unfortunately, the extras have been replaced by the thrill of the percentage discount from the previous price. Much of the driving force behind value engineering is the worst U.S. economy in 70 years. On the surface, value engineering is a sound process for evaluating the value of a given material or feature. If you define value as the ratio of function to cost, then you can logically conclude that there are two ways to increase value: by improving the function or by reducing the cost. Rarely, if ever, is there a chance to improve function and reduce the cost. However, starter fittings present contractors, engineers and building owners with this very opportunity. What could be more functional than combining three fittings, three couplings and a piece of pipe into a single fitting? Starter fittings have a lower total installed cost due to the material and labor savings they present, not because they offer less functionality or quality.

What does this means for the Plumbing Contractor?

Many starter fitting patterns have remained surprisingly unchanged. However, innovations in high-rise construction have inevitably brought about some changes in product offerings today. Cast iron starter fittings have adapted and survived the tides of change in the construction industry.

Cast iron products vary slightly from territory to territory. Markets such as New York primarily use hubless cast iron starter fittings, while markets like Chicago still prefer hub and spigot starter fittings. The commonality is that for generations both configurations have provided silent, reliable service in some of America's mightiest structures.

But what does this mean for the plumbing contractor today? The answer to this question is quite simple. Starter fittings boast the unmatched reliability of cast iron. Installation of these fittings coupled with thoughtful plumbing design will reduce the total number of fittings and reduce the number of joints. They also minimize the complexity of distributing fittings on a job site, fit better within confined plumbing walls and improve the overall quality of a project.

All of these factors save contractors time and money associated with procurement and installation. Ultimately, this maximizes the profitability of the plumbing contractors who wisely choose to use starter fittings. In a word, cast iron starter fittings add value to today's high rise construction projects.

You can't beat the system.®

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