

HARCO

# Ductile Iron Fittings for IPS-Size PVC Pipe

For Golf Course  
Irrigation Systems,  
Commercial Turf Irrigation,  
Rural Water Systems



# Introducing Harco Push-On Joint Ductile Iron Fittings

## Fittings Designed for Ductility and Reliability

Harco's DI push-on joint fittings are designed to offer the best possible balance of strength, ductility, impact, and corrosion resistance. Fittings are manufactured of ASTM A-536, Grade 65-45-12 ductile iron with a tensile strength of 65,000 psi. These fittings are designed for use on IPS PVC pipe and steel pipe in underground water mains, irrigation systems, and sewer force mains.

## Harco Offers a Full Line of Top Quality Fittings

Ductile Iron fittings provide greater strength for underground PVC piping systems than either PVC or epoxy-coated steel fittings. Harco's DI fittings come in 2" through 12" diameters, and are available in tees, bends, reducers, plugs, service tees, flange adapters, wyes, and male thread by bell adapters. Our 28 different SEB (Small End Bell) reducers combine with 77 basic patterns to create over 800 possible configurations. Deep bell push-on joints allow quick and easy installation. They also provide extra room in the bells to allow for pipe movement always present in underground systems.

## All The Strength You Need... and Then Some

Ductile Iron is produced by adding magnesium alloy to molten iron. The magnesium causes the flake-form graphite to assume a spheroidal shape. This change in the carbon structure results in a far stronger, tougher ductile material than cast iron while retaining superior corrosion properties.

Harco fittings are pressure rated at 350 psi. They are cast of ductile iron with 65,000 psi tensile strength and a wall thickness of 0.31". The following chart illustrates how these fittings stack up against steel and PVC fittings. A Harco 6 x 6 tee withstood a pressure test of 3,000 psi without failure. This high strength capacity is vital in withstanding the critical cyclical surges and high mechanical stresses present

STRENGTH COMPARISON TABLE FOR 6" FITTINGS

MATERIAL	TENSILE STRENGTH	WALL THICKNESS	RELATIVE STRENGTH
PVC	7,000 psi	.36"	1
Epoxy-Coated Steel	49,000 psi	.08"	7
Ductile Iron	65,000 psi	.31"	9

in golf course irrigation systems. This high strength is especially important on systems utilizing the new computer controllers which can create additional surge pressures.

## Superior Corrosion Resistance Makes Ductile Cast Iron and Cast Iron Last and Last

Ductile cast iron is the standard underground material in the waterworks industry. In fact, one cast iron system has been in continuous use in a water supply line for over 325 years! Back in 1664, King Louis XIV of France ordered the construction of a cast iron pipe main extending fifteen miles from a pumping station at Marly-on-Seine to Versailles to supply water for the fountains and the town. That cast iron pipe is still functioning after more than 325 years of continuous service.

In ductile and cast iron, this corrosion resistance is created from a layer of insoluble graphite that is formed from initial corrosion that becomes a protective barrier against additional corrosion attack.

Unlike epoxy-coated fittings, rough handling will not reduce the strength or corrosion resistance of the fittings. Rusting caused by scratched or chipped epoxy coatings and interior pipe movement is completely eliminated.



*This cast iron water supply line was installed by Louis XIV of France in 1664. It's been in continuous service for over 325 years!*

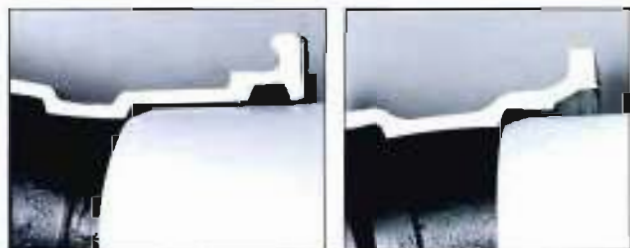


## Deep Bells with Gasketed Joints Simplify Installation and Eliminate Problems

Harco's push-on joint design provides for a deep socket bell to accommodate the expansion and contraction of a PVC piping system. The design incorporates a massive gasket in a square groove to prevent roll out and fish mouths. All fittings are designed to work directly on IPS-size pipe — without the problems of using transition gaskets.

The push-on joint allows easy, all-weather installation for bottle-type joints every time. The joint assembles exactly like pipe joints, eliminating all the potential errors that solvent cement voids, incorrect procedures, and inclement weather can cause.

The Harco deep bell was designed in 1969 specifically for PVC pipe, with bell depths equal to pipe joint bell depths. The Harco joint is 2 to 4 times deeper behind the gasket than mechanical joints. The standard MJ joint was designed in 1930 specifically for iron pipe. It wasn't designed to handle the greater expansion and contraction of modern PVC pipe.



**Harco Deep Bell**

vs

**Mechanical Joint**

*The Harco joint is 2-4 times deeper than conventional mechanical joints to accommodate expansion and contraction, and prevent roll out and fish mouths.*

## Gaskets Are Made by Us to Meet Our Own High Standards

Harco manufactures its own gaskets to assure the highest quality and compatible tolerances for gaskets and bells. The gaskets are molded from SBR rubber and are the Chemidur "Z" style of gasket. These gaskets have been used trouble free in hundreds of thousands of pipe and fitting joints since the mid 60's.

## Harco's Patented Restraint Lug System Keeps Fittings Together (Patent No. 5,183,298)

Harco developed a special patented system of lugs and restraint rings. Restraint lugs designed to withstand over 10,000 pounds pull per lug are cast on the bells on the horizontal centerline of all fittings. The system provides positive restraint of Small End Bell (SEB) reducers, flange adapters and plugs to other fittings, and prevents separation of the assembled fittings.

The restraint rings are also designed to carry the extreme full load of a restrained plug at 350 psi pressure. Lugs allow fittings to be tied to valves and hydrants with the use of Harco restraint rods. Lugs on the bends provide pinch bar points for quick and easy push-on assembly.



*These lugs are designed to withstand over 10,000 pounds pull per lug.*

## Modular Configurations Make Repairs Easier and Less Costly

Harco's patented system of 28 different SEB (Small End Bell) reducers combines with 77 basic patterns to create over 800 possible configurations for golf course irrigation systems. Restraint lugs on all fittings allow reducers to be positively attached to the basic fittings, so separation is never a concern. All configurations can either be assembled in the factory or in the field by contractors using standard fittings. This means your job won't be delayed waiting for special order fittings to be manufactured and shipped. *(continued on next page)*



*Spigot end of reducers insert into the bells of all other Harco fittings. Restraint rings "lock" reducers to main fitting. Patent Pending.*

## Modular Configurations

(continued from previous page)

If a particular configuration doesn't get used, no problem. It can be disassembled into standard fittings for use elsewhere. This flexibility is a real plus for designers, contractors and suppliers because changes in the field become easier than ever. You also reduce the stock you need on hand as well as long lead times for special orders.

Shown is an assembled 4 x 2 x 4 tee. The 4 x 2 SEB reducer is installed and restraint rings have been latched over the lugs to create an assembled fitting.



service and protect the main line from service line or sprinkler head shocks. Harco service tees eliminate the variety of problems associated with incorrectly installed saddles and incorrect drilling procedures. Iron threads also provide large safety factors for installation — no more cracked PVC threaded fittings from overtorquing and improper assembly. By using a service tee, the main line pipe wall structural integrity is maintained, eliminating the combined stresses formed when a hole is drilled into the pipe.

All Harco tapped tee outlets come furnished with female NPT threads in sizes you require.



Service Tee.  
Gasket Joints on each end provide added degrees of freedom.

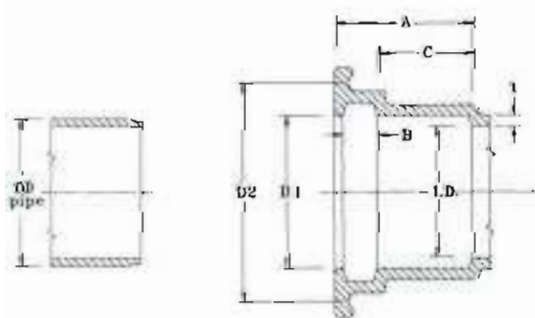
## Install Services Easily with Harco Service Tees

Ductile iron service tees are the ideal solution for attaching services or irrigation swing joints onto the main. The gasketed joints of service tees provide added freedom for the

## Suggested Specification

Fittings shall be manufactured of ductile iron, Grade 65-45-12 in accordance with ASTM A-536. Fittings shall have deep bell push-on joints with gaskets meeting ASTM F-477. Fittings shall be HARCO DEEP BELL as manufactured by The Harrington Corporation of Lynchburg, VA. Transition gaskets are not allowed.

## Weights and Dimensions



### STANDARD JOINT DIMENSIONS

SIZE	A	B	C	D1	D2	ID	OD	T
2"	3.5	0.7	2.5	2.45	3.95	2.15	2.375	0.25
2 1/2"	3.5	0.7	2.5	2.96	4.45	2.60	2.875	0.25
3"	3.8	0.9	2.5	3.59	5.49	3.23	3.500	0.25*
3 1/2"	3.0	0.9	2.0	3.59	5.49	3.10	3.500	0.25*
4"	4.1	0.8	2.8	4.59	6.49	4.10	4.500	0.31
6"	4.7	0.9	3.2	6.72	8.79	6.10	6.625	0.31
8"	5.2	1.0	3.6	8.72	10.95	8.10	8.625	0.31
10"	6.1	1.1	4.3	10.86	13.37	10.10	10.750	0.31
12"	6.4	1.4	4.4	12.86	15.50	12.10	12.750	0.31

\* SEB Reducers, † Tee, Bends, Tap Tee