



The Taco LoadMatch® Twin-Tee® ensures the comfort and performance of LoadMatch® single pipe hydronic systems and primary secondary two pipe hydronic systems.



HYDRONIC COMPONENTS & SYSTEMS



Features and Benefits

The Taco Twin-Tee® is a patented single pipe fitting designed to replace the two primary circuit tees used to connect a secondary piping circuit to a primary piping circuit in a hydronic system. The Twin-Tee® can be used in both single and two pipe systems.

Ensures Decoupled Secondary Piping Circuit

The distance between the two secondary circuit take-off tees in the Twin-Tee® is an absolute minimum. In addition, the take-offs to the secondary circuits are perpendicular to the primary flow, ensuring no pressure drop between the takeoffs. No flow will occur in the secondary circuit, when the secondary pump is off and the primary pump is on.

This also ensures that the flows in other circuits are not affected by the operation of a secondary circuit pump.

Internal Baffle Prevents Short Circuiting of Secondary Fluid

An internal baffle between the secondary circuit supply and return connections prevents any short circuiting of secondary fluid from the return to supply connections.

Saves on Installation and Maintenance Costs

The Twin-Tee® reduces the number and cost of fittings and field joints required to connect a secondary circuit to a primary circuit. A typical secondary circuit piping connection to a primary circuit

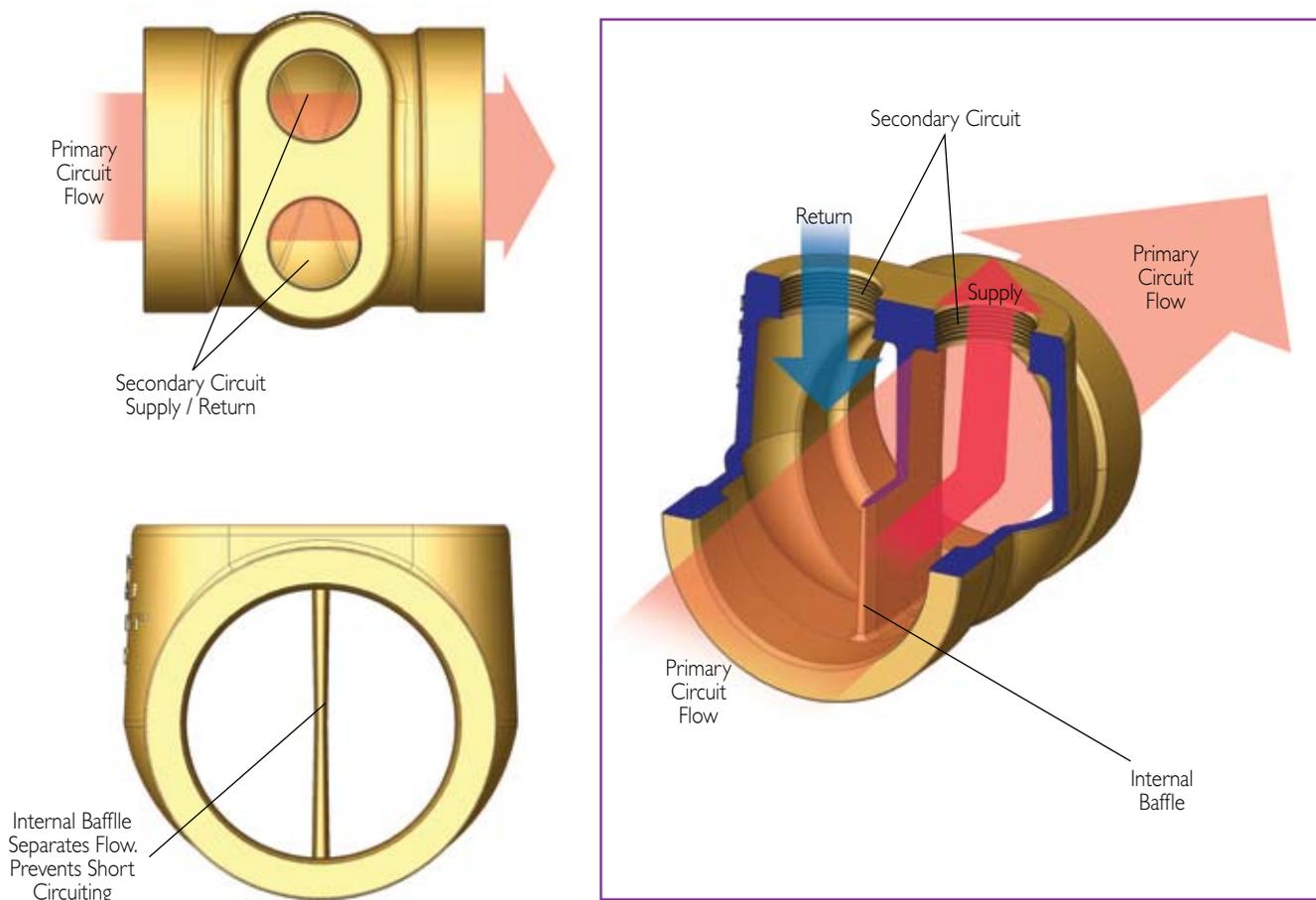
requires two tees and four field joints in the primary circuit piping. The Twin-Tee® cuts the number of fittings and primary piping circuit field joints in half, reducing installation costs.

Since the number of field joints is reduced the number of potential leak paths is also reduced, which reduces potential operational problems and maintenance costs.

Multiple Connection Types

The Twin-Tee® is available in bronze or ductile iron construction. The supply and return connections to the secondary circuits are threaded. The connections to the primary circuit are available in the following types:

- Sweat
- Threaded
- Grooved



Applications

The patented Twin-Tee® is a result of the Stethem Bridge, named in memory of Walter Stethem, a pioneering hydronic engineer, who was instrumental in development of the single pipe LoadMatch® system. Walter devoted his career to innovations in the hydronic industry and improvement in the performance of hydronic systems. At the same time Walter also looked for ways to improve the life cycle costs of hydronic systems by reducing the design, installation, and operating and maintenance

costs of these same systems. Taco LoadMatch® systems and the Twin-Tee® are the culmination of a lifetime of Walter's work.

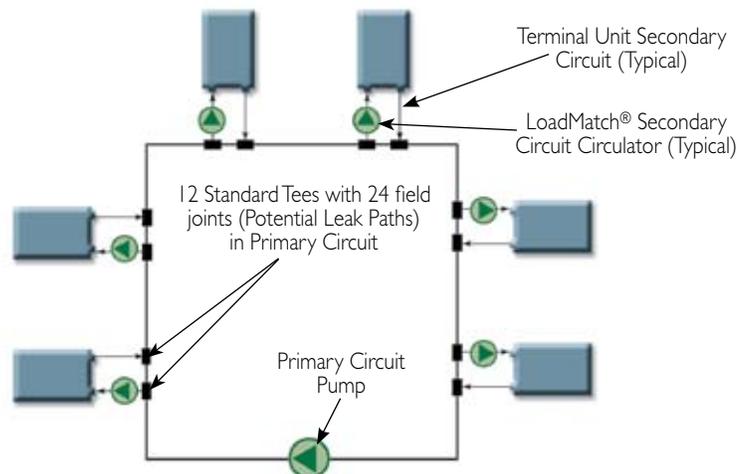
Single Pipe LoadMatch® Systems

The Twin-Tee Tee® is used in a single pipe LoadMatch® hydronic system to connect terminal unit secondary piping circuits to their primary piping circuits. The Twin-Tee will ensure the performance and comfort of a LoadMatch® system. In addition, the use of the Twin-Tee® will reduce installation

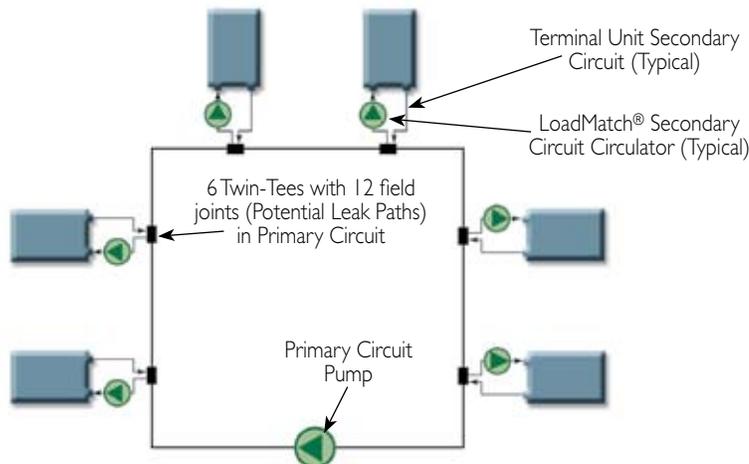
and maintenance costs, as well as save space in the installation of the piping distribution system.

Horizontal Distribution

The use of a Twin-Tee® in a typical LoadMatch® horizontal distribution system significantly reduces the quantity of fittings and field joints in the primary circuit, thus reducing installation costs. Fewer potential leak paths further reduces maintenance costs and performance problems.



LoadMatch® Horizontal Distribution System — Using Standard Tees

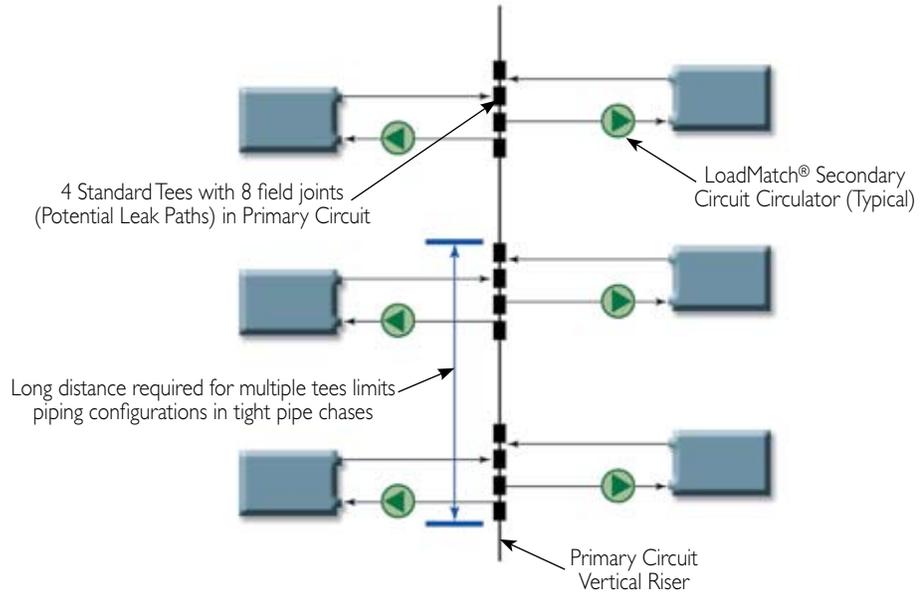


LoadMatch® Horizontal Distribution System — Using Twin-Tee®

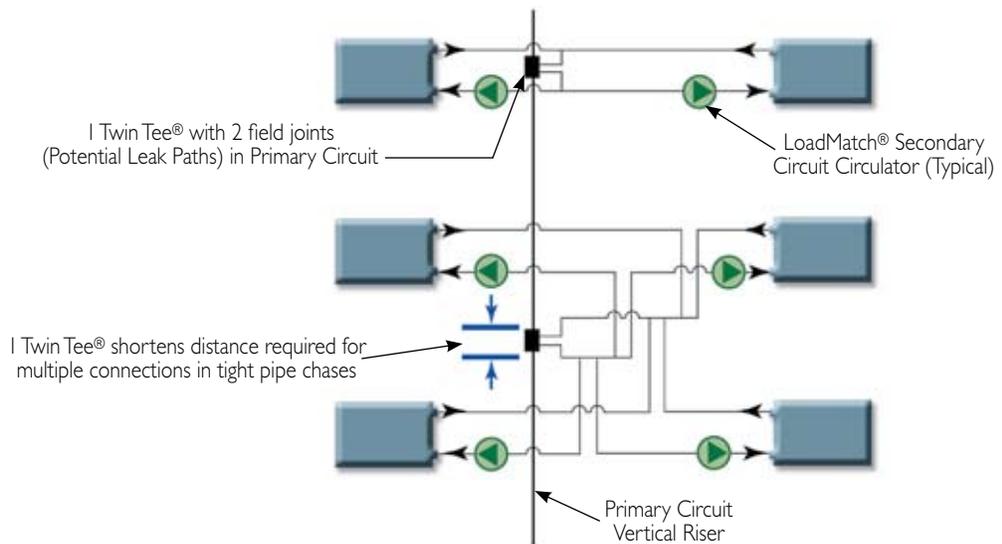
Applications

Vertical Distribution

As in horizontal distribution systems, Twin-Tee®s will significantly cut installation and maintenance costs. Potential performance problems are prevented by reducing the quantity of fittings and field joints in the primary circuit of a LoadMatch® vertical distribution system. In a vertical distribution system, where space to install piping and fittings in chases, overhead ceilings, etc. is a premium, the use of Twin-Tee®s will simplify installation problems and costs.



LoadMatch® Vertical Distribution System — Using Standard Tees



LoadMatch® Vertical Distribution System — Using Twin-Tee®

Applications

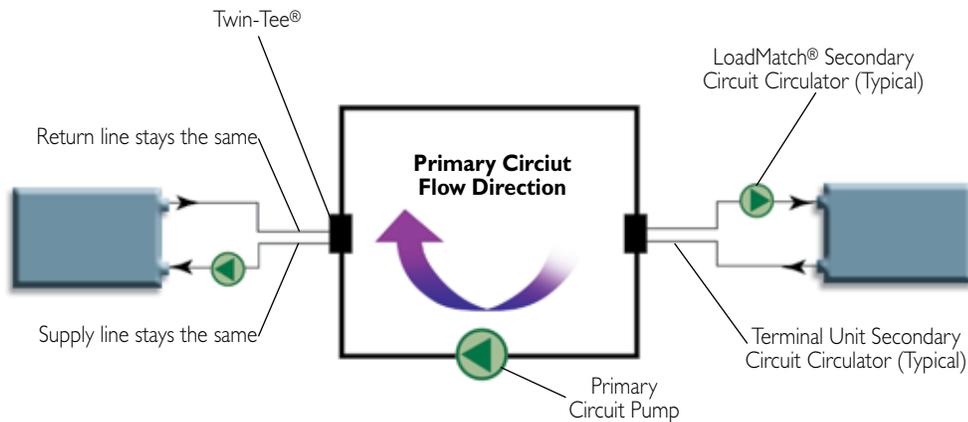
Reverse Flow Systems

In any single pipe heating or cooling system, the water temperature will change depending on its location in the system. For a heating system, the temperature will decrease in direction of flow. In a cooling system, the temperature will increase in direction of flow.

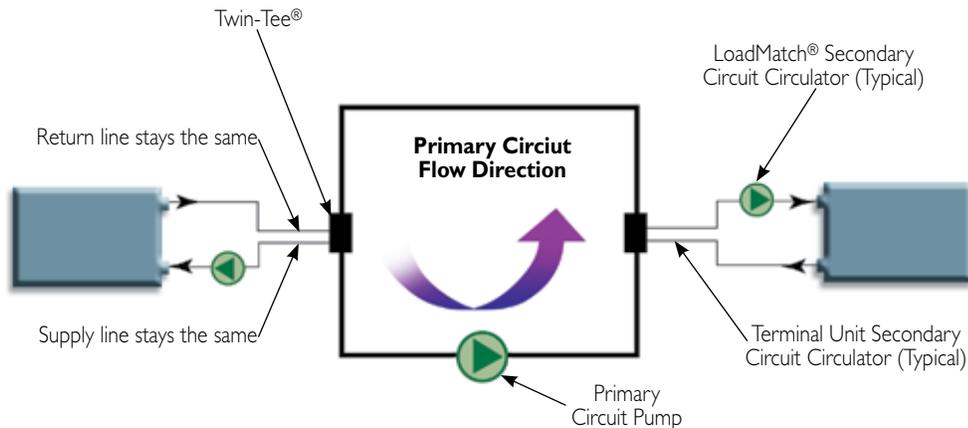
In some humid climates, higher chilled water temperature entering the LoadMatch® single pipe system may require a larger terminal unit

to satisfy the latent load. As an alternative, the patented Taco Reverse Flow system will permit use of a standard sized unit. This system periodically reverses flow direction so that the highest entering chilled water temperature unit at the end of the system becomes the lowest entering chilled water temperature unit at the beginning of the system. For example, in a chilled water system using design temperatures of 40° F to 50° F, the terminal units can be sized at the average of 45° F.

Use of the Twin-Tee® permits reversing the direction of flow in the primary circuit while still maintaining the same direction of flow in the secondary terminal unit circuits. Therefore, the LoadMatch® secondary circuit circulator does not have to reverse its flow, simplifying the control and installation of the secondary circuit piping and circulator.



LoadMatch® Reverse Flow System — Clockwise Flow

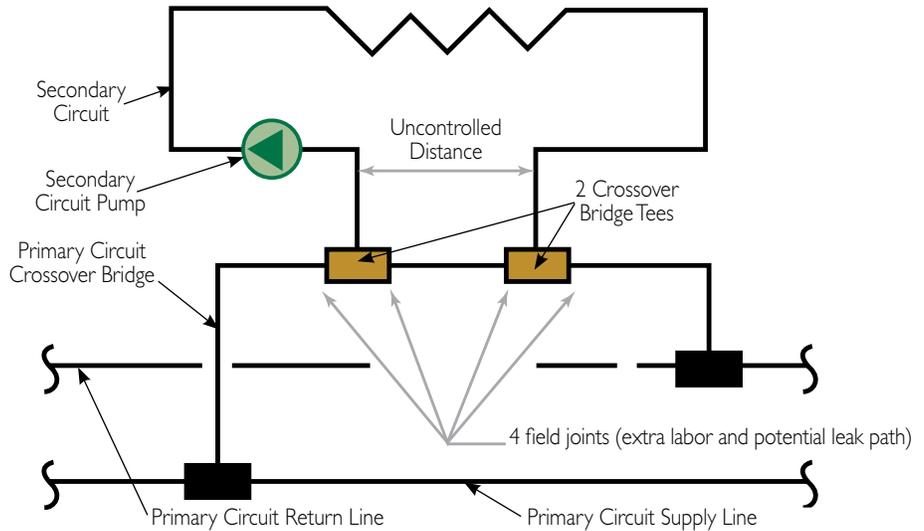


LoadMatch® Reverse Flow System — Counterclockwise Flow

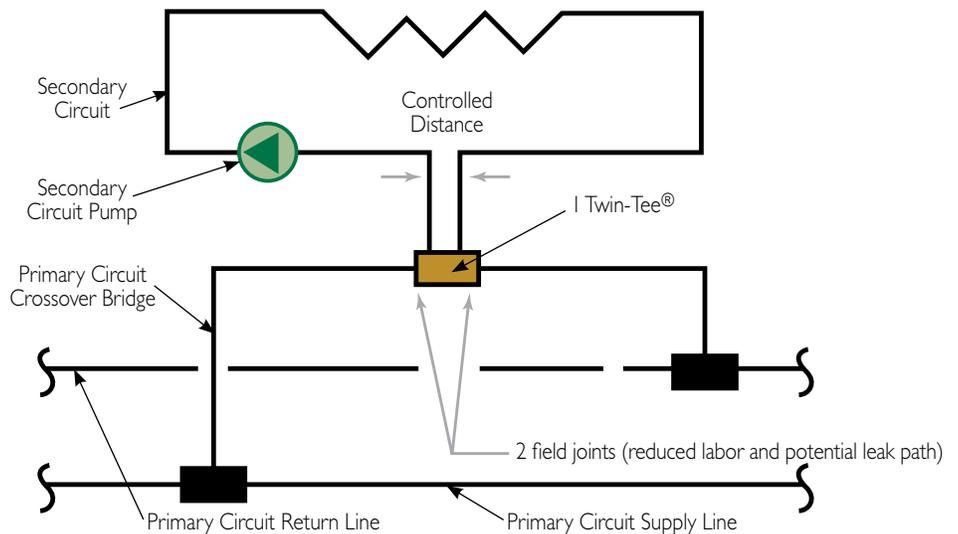
Applications

Two Pipe Systems – Primary Secondary Connections

The location of secondary circuit take-off tees in the primary circuit is critical to ensuring a decoupled secondary circuit. A properly decoupled secondary circuit prevents flow in the circuit when the primary pump is on. What's more, it ensures that the flows in other circuits are not affected by the operation of the secondary circuit pump. All this adds up to the improved performance and comfort.



Primary / Secondary Piping — Standard Tee



Primary / Secondary Piping — Twin-Tee®

Selection Procedure

Selection Examples

Example 1:

Problem:

Select a Twin-Tee® to serve 1 secondary circuit VAV box reheat coil in a LoadMatch® single pipe heating water system.

Conditions:

Primary circuit flow = 60 gpm.

Primary circuit piping material is copper.

Secondary circuit VAV reheat box flow = 5 gpm.

Secondary circuit piping material is copper.

Selection Procedure:

1. Determine the size of the primary circuit pipe. Using a nominal pressure drop of 4'/100' the primary circuit pipe is 2-1/2".
2. Determine the size of the secondary circuit pipe. At a nominal pressure drop of 4'/100' the secondary circuit pipe connection is 1".
3. Determine the Twin-Tee® model number for a 2-1/2" primary circuit line size connections and 1" secondary circuit line size connections. This is a model TT250SB, bronze construction with 2-1/2" primary line size sweat connections and 1" Twin-Tee® secondary line size NPT connections.

Selection Examples

Example 2:

Problem:

Select a Twin-Tee® to serve 4 secondary circuit fan coil units in a LoadMatch® single pipe chilled water system.

Conditions:

Primary circuit flow = 200 gpm.

Primary circuit piping material is grooved end iron.

Secondary circuit fan coil flow = 5 gpm ea.

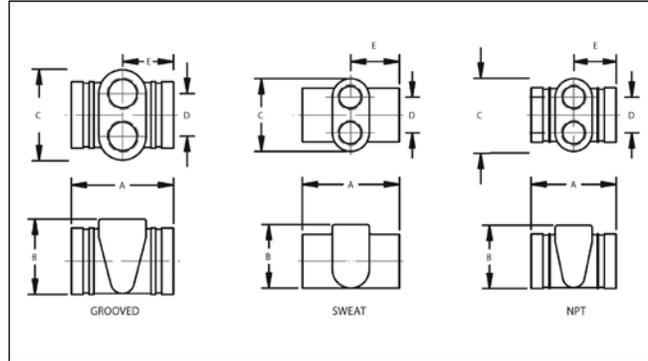
Secondary circuit piping material is iron.

Selection Procedure:

1. Determine the size of the primary circuit pipe. Using a nominal pressure drop of 4'/100' the primary circuit pipe is 4".
2. Determine the size of the secondary circuit pipe. At a nominal pressure drop of 4'/100' the secondary circuit pipe is 1-1/2" (total flow for one connection serving 4 fan coil units is 20 gpm).
3. Determine the Twin-Tee® model number for a 4" primary circuit line size connections and 1-1/2" secondary circuit line size connections. This is a model TT400G, ductile iron construction with 4" primary line size grooved end connections and 1-1/2" Twin-Tee® secondary line size NPT connections.

Typical Specifications

Furnish and install Twin-Tee® fittings for secondary circuit piping connections to primary circuit piping as shown on the plans. Twin-Tee® shall be Taco or approved equal. The Twin-Tee® fitting shall permit the connection of both secondary circuit supply and return piping connections to the same fitting. An internal baffle shall permit the supply and return connections and flow direction of the secondary circuit piping connections to remain the same, independent of the direction of flow in the primary circuit piping, without mixing of the secondary circuit supply and return water flows.



Model #	Line Size in. (mm)	Line Connections	Branch Size NPT* in. (mm)	Dimensions					Cv	Ship Weight (lbs.)
				A in. (mm)	B in. (mm)	C in. (mm)	D in. (mm)	E in. (mm)		
DUCTILE IRON										
TT150G	1-1/2 (38)	Grooved	3/4 (19)	3-3/4 (95)	2-1/8 (54)	2-3/4 (70)	1-3/8 (35)	1-7/8 (48)	102	2.0
TT200G	2 (51)	Grooved	3/4 (19)	4-3/8 (111)	2-3/4 (70)	3 (76)	1-1/2 (38)	2-1/8 (54)	166	3.0
TT250G	2-1/2 (64)	Grooved	1 (25)	4-1/2 (114)	3-3/8 (86)	3-7/8 (98)	1-3/4 (44)	2-1/4 (57)	252	4.0
TT300G	3 (76)	Grooved	1-1/4 (32)	5-3/8 (137)	4 (102)	3-7/8 (98)	2-1/4 (57)	2-3/4 (70)	379	5.0
TT400G	4 (102)	Grooved	1-1/2 (38)	6-1/8 (156)	5 (127)	5-1/8 (130)	2-1/2 (64)	3 (76)	714	8.0
TT500G	5 (127)	Grooved	2 (51)	6-3/4 (171)	6 (152)	6-3/8 (162)	3 (76)	3-3/8 (86)	1094	11.0
TT600G	6 (152)	Grooved	2-1/2 (64)	7-3/4 (197)	7-1/4 (184)	7-7/8 (200)	3-3/4 (95)	3-7/8 (98)	1670	16.5
TT125T	1-1/4 (32)	NPT	3/4 (19)	3-3/8 (86)	2-1/2 (64)	3 (76)	1-1/2 (38)	1-5/8 (41)	74	2.0
TT150T	1-1/2 (38)	NPT	3/4 (19)	4-3/8 (111)	2-3/4 (70)	3 (76)	1-1/2 (38)	2-1/8 (54)	102	2.5
TT200T	2 (51)	NPT	3/4 (19)	4-1/2 (114)	3-3/8 (86)	3-7/8 (98)	1-7/8 (48)	2-1/4 (57)	166	3.5
TT250T	2-1/2 (64)	NPT	1 (25)	5-3/8 (137)	4 (102)	3-7/8 (98)	2-1/4 (57)	2-3/4 (70)	252	6.0
TT300T	3 (76)	NPT	1-1/4 (32)	6-1/8 (156)	5 (127)	5-1/8 (130)	2-1/2 (64)	3 (76)	379	9.0
TT400T	4 (102)	NPT	1-1/2 (38)	6-7/8 (175)	5-7/8 (149)	6-3/8 (162)	3 (76)	3-3/8 (86)	714	15.0
BRONZE										
TT125TB	1-1/4 (32)	NPT	1/2 (13)	3-3/8 (86)	2-1/4 (57)	2-3/4 (70)	1-3/8 (35)	1-5/8 (41)	74	2.0
TT125TB-I	1-1/4 (32)	NPT	3/4 (19)	3-3/8 (86)	2-1/2 (64)	3 (76)	1-1/2 (38)	1-5/8 (41)	74	2.0
TT150TB	1-1/2 (38)	NPT	1/2 (13)	3-5/8 (92)	2-5/8 (67)	3 (76)	1-3/8 (35)	1-7/8 (48)	102	3.0
TT150TB-I	1-1/2 (38)	NPT	3/4 (19)	3-5/8 (92)	2-3/4 (70)	3 (76)	1-1/2 (38)	1-7/8 (48)	102	3.0
TT200TB	2 (51)	NPT	3/4 (19)	4-1/2 (114)	3-1/4 (83)	3-1/2 (89)	1-1/2 (38)	2-1/4 (57)	166	3.5
TT250TB	2-1/2 (64)	NPT	1 (25)	5-3/8 (137)	3-3/4 (95)	4-1/4 (108)	1-7/8 (48)	2-3/4 (70)	252	6.0
TT125SB	1-1/4 (32)	Sweat	1/2 (13)	4 (102)	1-7/8 (48)	2-3/4 (70)	1-3/8 (35)	2 (51)	74	1.0
TT125SB-I	1-1/4 (32)	Sweat	3/4 (19)	4 (102)	2-1/4 (57)	3 (76)	1-1/2 (38)	2 (51)	74	1.0
TT150SB	1-1/2 (38)	Sweat	1/2 (13)	4-1/8 (105)	2 (51)	2-3/4 (70)	1-3/8 (35)	2 (51)	102	1.5
TT150SB-I	1-1/2 (38)	Sweat	3/4 (19)	4-1/8 (105)	2-1/2 (64)	3 (76)	1-1/2 (38)	2 (51)	102	1.5
TT200SB	2 (51)	Sweat	3/4 (19)	4-5/8 (117)	2-5/8 (67)	3 (76)	1-1/2 (38)	2-3/8 (60)	166	2.0
TT250SB	2-1/2 (64)	Sweat	1 (25)	5-1/8 (130)	3-3/8 (86)	3-7/8 (98)	1-7/8 (48)	2-1/2 (64)	252	4.5

All dimensions are nominal. +/- 1/16"

*Branch connections only available in US NPT dimensions

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Do it once.
Do it right.® **Taco**

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