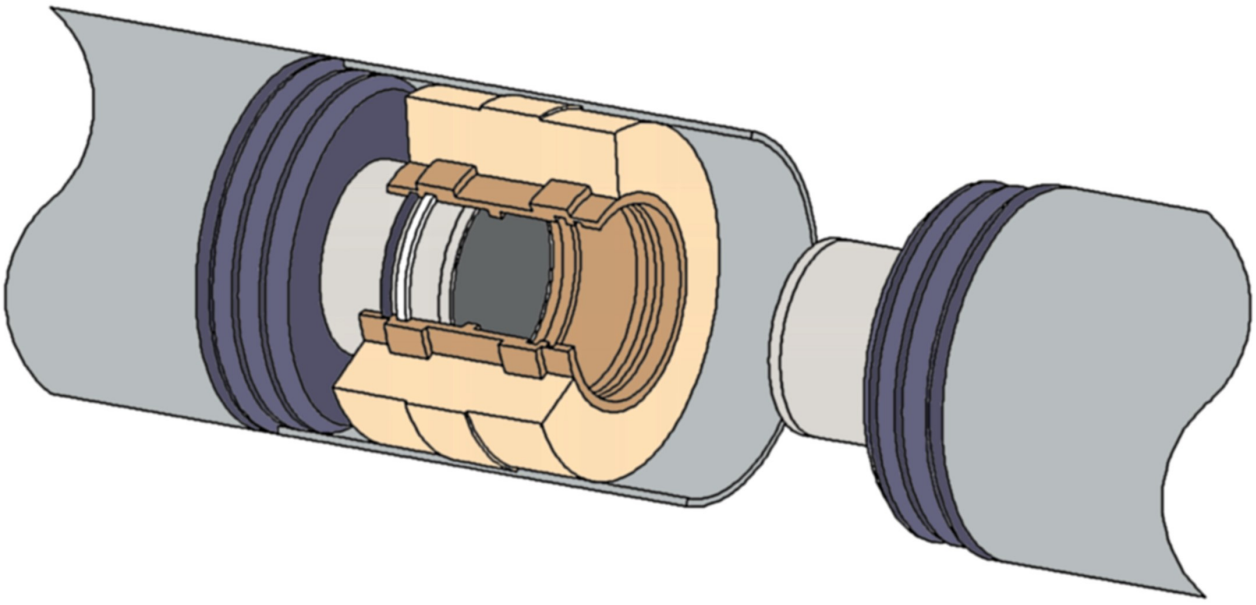
Thermal Pipe Systems, Inc.

SUPER TEMP-TITE®

SPECIFICALLY DESIGNED PIPING SYSTEM FOR
UNDERGROUND DISTRIBUTION OF HIGH-PRESSURE STEAM
(UP TO 250 PSI AND 400ºF)



CUTS ENERGY COSTS UP TO 50%

Composite insulation fills the annulus between the core pipe and casing. This combination of calcium silicate and polyurethane foam offers the best thermal efficiency available in a pre-insulated system. A computer-generated heat loss analysis will show the savings.

ELIMINATE EXTERNAL GALAVANIC CORROSION:

Non-metallic fiberglass casing eliminates corrosion from ground water, stray electrical currents, and corrosive soil. No external coating or cathodic protection required.

REDUCES INSTALLATION COST UP TO 75%:

Positive slip joint assembly requires no welding, insulating or coating of joints in the trench. Simply lubricate the spigot ends and push them into coupling. Pipe runs are straight – no digging for expansion loops. Thermal efficiency may eliminate some manholes. Save time, labor and equipment costs.

ISOLATED SECTIONS:

No through metal contact between lengths isolates carrier pipe corrosion. Annuls sealing rings and fiberglass pipe casing minimizes the probability of groundwater infiltration. Conforms to Federal “Water Spread Limiting requirements.

CONTINUOUS PIPE SUPPORT:

No internal supports needed. Insulation continuously supports carrier pipe and minimizes stress.

NO EXPANSION LOOPS OR DEVICES:

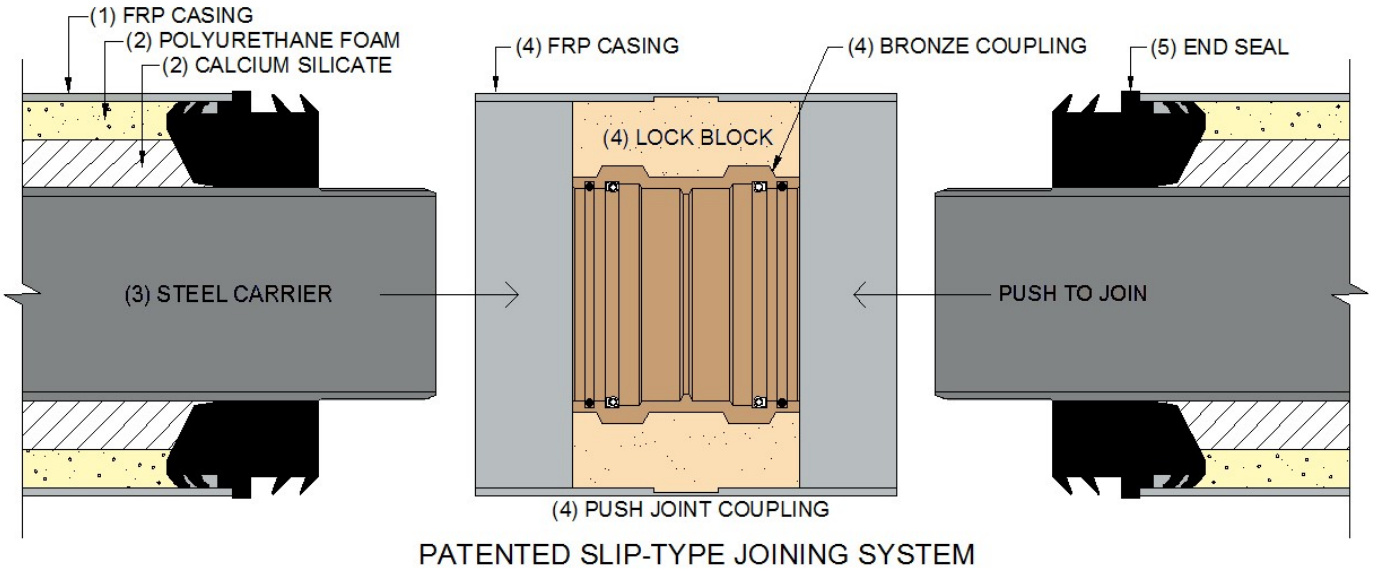
Expansion and contraction automatically provides for in each coupling. Relieves pipe stress as well as expansion anchors and guides.

MEETS FEDERAL SPECIFICATIONS:

Complies with Army Corps of Engineers CEGS 02552. Meets Power Piping code ANSI/ASME B31.1.

TECHNICAL DATA SUPER TEMP-TITE® PIPE

SUPER TEMP-TITE®



PATENTED SLIP-TYPE JOINING SYSTEM

(1) **OUTSIDE CASING**: Heavy wall fiberglass pipe to protect the insulation from ground water and earth loads.

(2) **INSULATION:**
Primary insulation is high temperature calcium silicate rated a 1200ºF.

Secondary insulation is polyurethane foam to provide highly efficient insulation and support for the carrier pipe along the entire length.

Insulation in the coupling is refractory cement.

(3) **CARRIER PIPE:** Carbon steel with metalized ends to convey saturated steam.

(4) **PUSH JOINT COUPLING:**
Casing: Heavy wall FRP pipe to stabilize coupling during expansion and to protect the lock block and coupling area from earth loads.

Lock Block: Reinforced refractory composite to lock bronze coupling into casing and provide insulation to the coupling.

Bronze Coupling: Machined bronze casting to join two sections of carrier pipe with sealing rings contained in grooves.

(5) **SEALS:**
End Seal: High temperature elastomer at each end of the pipe lengths to protect insulation from ground water infiltration.

Primary Seals: Teflon V-Ring supported by stainless steel to provide seal between carrier pipe and bronze coupling.

Secondary Seal: High temperature elastomer o-ring on the bronze coupling to align pipe and provide backup pressure seal.

External Seal: 30 mil High Temperature Tape applied circumferentially around the pipe and coupling casing joint as an additional seal where ground water is severe. Tape not shown.

NOMINAL PIPE SIZE (IN.)	CARRIER O.D. (IN.)	CASING O.D. (IN.)	THICKNESS			WEIGHT (LBS./20 FT.)
			CALCIUM SILICATE (IN.)	FOAM (IN.)	CASING (IN.)	
3	3.50	8.38	1.00	1.25	0.185	268
4	4.50	9.38	1.00	1.25	0.185	358
6	6.63	12.50	1.50	1.19	0.250	638
8	8.63	16.50	2.00	1.69	0.250	930
10	10.75	18.50	2.50	1.13	0.250	1286
12	12.75	20.50	2.50	1.13	0.250	1554

NOTE: All dimensions are in inches unless otherwise noted. Standard lengths are 20'-0", special lengths are available. Weights are approximate.

SUPER TEMP-TITE®

Super Temp-Tite® is a pre-insulated piping system for conveying high pressure steam underground. It may be used in steam distribution at temperatures to 400ºF and pressures to 250 psi.

The standard carrier pipe is schedule 40, ASTM A-53 steel pipe. Other grades of steel are available if specified. The sealing surface is metalized with a nickel alloy to prevent corrosion. Composite insulation consists of an inner layer of high temperature calcium silicate and an outer layer of energy-efficient polyurethane foam. This combination cuts energy cost up to 50% over conventional conduit insulations.

The fiberglass casing eliminates external galvanic corrosion, the principal cause of failure in metallic conduits.

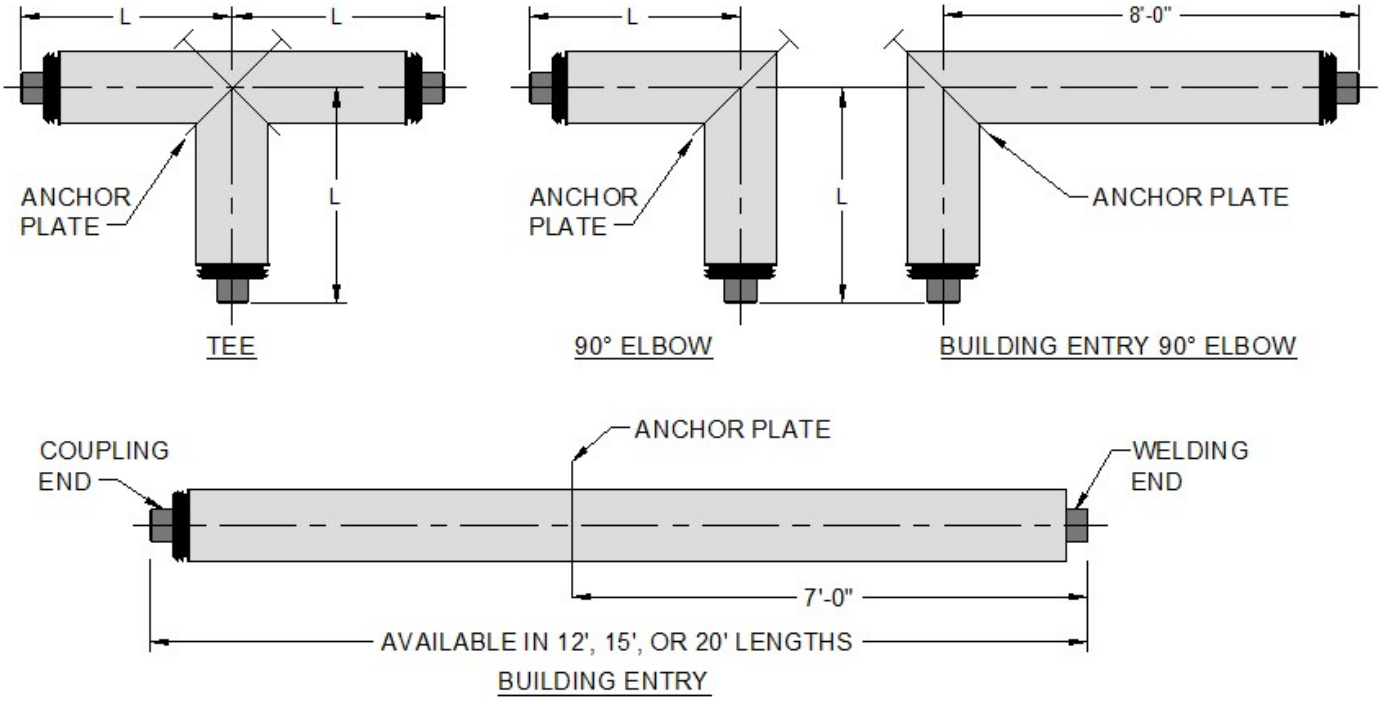
Fittings manufactured in the same fashion as the pipe. Any fitting configuration is available, making changes in directions and adaptations to existing systems simple.

The Super Temp-Tite® system is joined by a bronze coupling containing a Teflon seal and a high temperature elastomer o-ring. The seals and rings are restrained in machined grooves on both sides of the coupling. A refractory composite block, bonded to the casing, locks the coupling into place.

Expansion or contraction is automatically provided for at each coupling, eliminating the need for loops and other expansion devices.

The heavy wall non-corrosive casing pipe and high temperature heavy-duty elastomer annulus seals prevent infiltration of ground water. These seals have proven tight in over 20 feet of water.

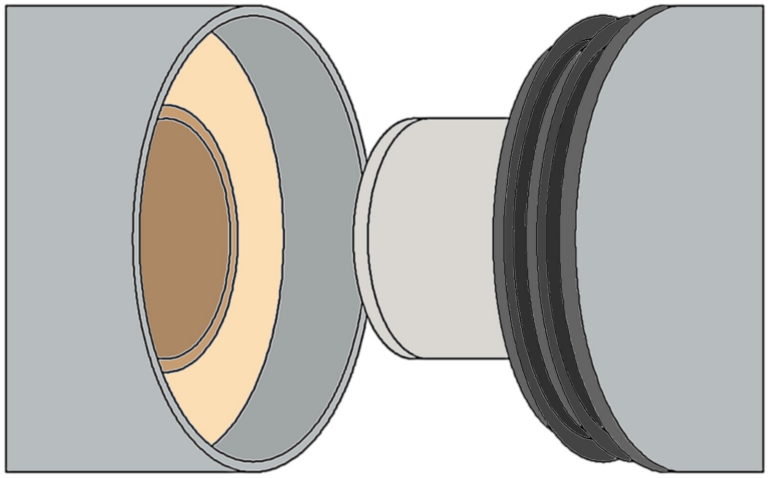
Super Temp-Tite® is the answer to your underground high temperature steam requirements. It is in full compliance with the Army Corps of Engineers CEGS 02552 and meets the Power Piping Code ANSI/ASME B31.1.



FITTING \ SIZE	3"	4"	6"	8"	10"	12"
90º Elbow (L dim.)	29"	30"	33"	36"	39"	42"
45º Elbow (L dim.)	26"	27"	28"	29"	30"	32"
Tee (L dim.)	27"	26"	30"	31"	33"	34"

NOTE: These lengths are nominal. Fittings above are standard, special fittings are available.

SUPER TEMP-TITE®



A factory fabricated, insulated piping system for conveying high pressure saturated steam up to 250 psi and 400ºF.

SHORT FORM SPECIFICATIONS

1.1 All underground pre-insulated steam pipe 3" – 12" shall be Thermal Pipe Systems, Inc. Super Temp-Tite® piping with Ring-Tite joints.

1.2 Steel carrier pipe shall meet the requirements of ASTM A-53 or A-106, Grade B. Each end of the carrier pipe shall be machined and metalized to provide a non-corrosive surface for the sealing rings. The metalizing shall be high nickel alloy applied to an excess thickness and then machined to the required outside diameter.

1.3 Each joint shall automatically provide for expansion and contraction through the sealing rings in the grooves of the bronze joining coupling. The sealing rings shall be stainless steel spring loaded molded and machined Teflon. Pipe must be assembled with the lubricant supplied by Thermal Pipe Systems, Inc.

1.4 Casing pipe shall be fiberglass Reinforced Thermosetting Resin Pipe (RTRP) manufactured by a filament winding process. The pipe shall be wound to meet ASTM D2310 classified RTRP-12E.

1.5 The composite insulation shall be a two-component system. The initial insulation shall be Calcium Silicate satisfactory for temperatures to 1200ºF and shall conform to ASTM C-533 and MIL SPEC Mil-1-2781. The secondary insulation shall be polyurethane foam completely filling the void between the Calcium Silicate and casing.

1.6 The rubber end seals shall be a Highly Saturated Hitrile (HSN) or Ethylene Propylene Diene Monomer (EPDM) heat resistant compound.

1.7 Fittings shall be pre-insulated by Thermal Pipe Systems, Inc. using the same carrier pipe, insulation thickness, and casing as the straight lengths of pipe.

Warranty

We warrant that our products are manufactured with the applicable material specifications and are free from defects in the workmanship and material using our specifications as a standard. Every claim under this warranty shall be deemed waved unless in writing received by Thermal Pipe systems, Inc. within (30) days of the date the defect was discovered and within (1) year of the date of shipment of the product. Thermal Pipe Systems, Inc. MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESSED OR IMPLIED, IN FACT OR IN LAW, INCLUDING WITHOUT LIMITATION THE WARRANTY OF MERCHANTABILITY OR THE WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, OTHER THAN THE LIMITED WARRANTY SET FORTH ABOVE.

LIMITATIONS AND LIABILTY

It is expressly understood and agreed that the limit of Thermal Pipe Systems, Inc. liability shall be the resupply of a like quantity of nondefective product and that Thermal Pipe Systems, Inc. shall have no such liability except where the damage or claim results solely from the breach of the Thermal Pipe Systems, Inc. warranty. IT IS ALSO AGREED THAT THERMAL PIPE SYSTEMS, INC. SHALL NOT BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL, OR OTHER DAMAGES FOR ANY ALLEGED NEGLIGENCE, BREACH OF WARRANTY, STRICT LIABILTY OR ANY OTHER THEORY, OTHER THAN THE LIMITED LIABILTY SET FORTH.

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