



# SPIRAL-THERM

## Specification Guide

SPSG  
12.101

STANDARD SPECIFICATION

3.14.07

*Pre-insulated Spiral Metal Jacketed Steel Piping Systems suitable for Above-Ground and Trench applications for Chilled and Heating Water, Domestic Hot Water, Process Fluids, Low Pressure Steam (15 PSIG Max.), Condensate Return, and Cryogenic services.*

### **Part 1 - General**

**1.1 Pre-insulated Piping** - Furnish a complete system of factory pre-insulated steel piping for the specified service. All pre-insulated pipe, fittings, insulating materials, and technical support shall be provided by the Pre-insulated Piping System manufacturer.

**1.2 The system** shall be **SPIRAL-THERM** manufactured by **Thermacor Process Inc.** of Fort Worth, Texas.

### **Part 2 - Products**

**2.1 Carrier pipe** shall be steel ASTM A-53, Grade B., ERW (Type E) or seamless (Type S), standard weight for sizes 2" and larger, and shall be ASTM A-106/ A-53, seamless, standard weight for sizes 1-1/2" and smaller (Std. Wt. is the same as Sch. 40 through 10"). Condensate return piping shall be Extra Strong (XS is the same as Sch. 80 through 8"). When practical, piping shall be provided in 40-foot double-random lengths. All carbon steel pipe shall have ends cut square and beveled for butt-welding. Straight sections of factory insulated pipe shall have 6" of exposed pipe at each end for field joint fabrication.

**2.2 Insulation** shall be polyurethane foam high pressure injected with one shot into the annular space between carrier pipe and jacket. Insulation shall be rigid, 90-95% closed cell polyurethane with a 2.0 to 3.0 pounds per cubic foot density and coefficient of thermal conductivity (K- Factor) of 0.14 and shall conform to ASTM C-591. Maximum operating temperature shall not exceed 250 °F. Insulation thickness shall be specified by the Engineer with a minimum of 1-1/2".

**2.3 Jacketing material** shall be internal lock seal, 22 gauge, spiral wound, galvanized steel with a rubber "o" ring formed in the seam, formed into steel tubes. (*At the Engineer's option*, spiral wound, lock seamed aluminum jacket .032" thick or stainless steel 24 gauge may be used.)

**2.4 Straight run joints** are insulated using poured urethane or sectional urethane foam to the thickness specified, covered with a metal sleeve, sealed with mastic or silicon, and held in place with two 1/2" stainless steel bands. Victaulic couplings are insulated with similar materials.

**2.5 Fittings** are factory pre-fabricated and pre-insulated jacketed with a metal fitting cover and insulated with injected urethane to the specified thickness. Carrier pipe fittings shall be butt-welded, except sizes smaller than 2" shall be socket-welded. If required by project specifications, welds shall be radiographically inspected. Fittings include expansion loops, elbows, tees, reducers, and anchors. (*At the Engineer's option*, fittings may be field insulated with liquid urethane foam insulation, jacketed with a metal fitting cover after being sealed with mastic.) Grooved-end systems may be joined with Victaulic fittings and couplings.

**2.6 Expansion/ contraction compensation** will be accomplished utilizing factory pre-fabricated and pre-insulated expansion elbows, Z-bends, expansion loops, and anchors specifically designed for the intended application.

### **Part 3 - Execution**

**3.1 Pre-fabricated systems** shall be provided as SC (standard components) fittings and factory insulated straight pipe sections for field engineering per the contract drawings. (*At the Engineer's option*, fittings may be field insulated with liquid urethane foam insulation, jacketed with a metal fitting cover after being sealed with mastic.)

(Continued)



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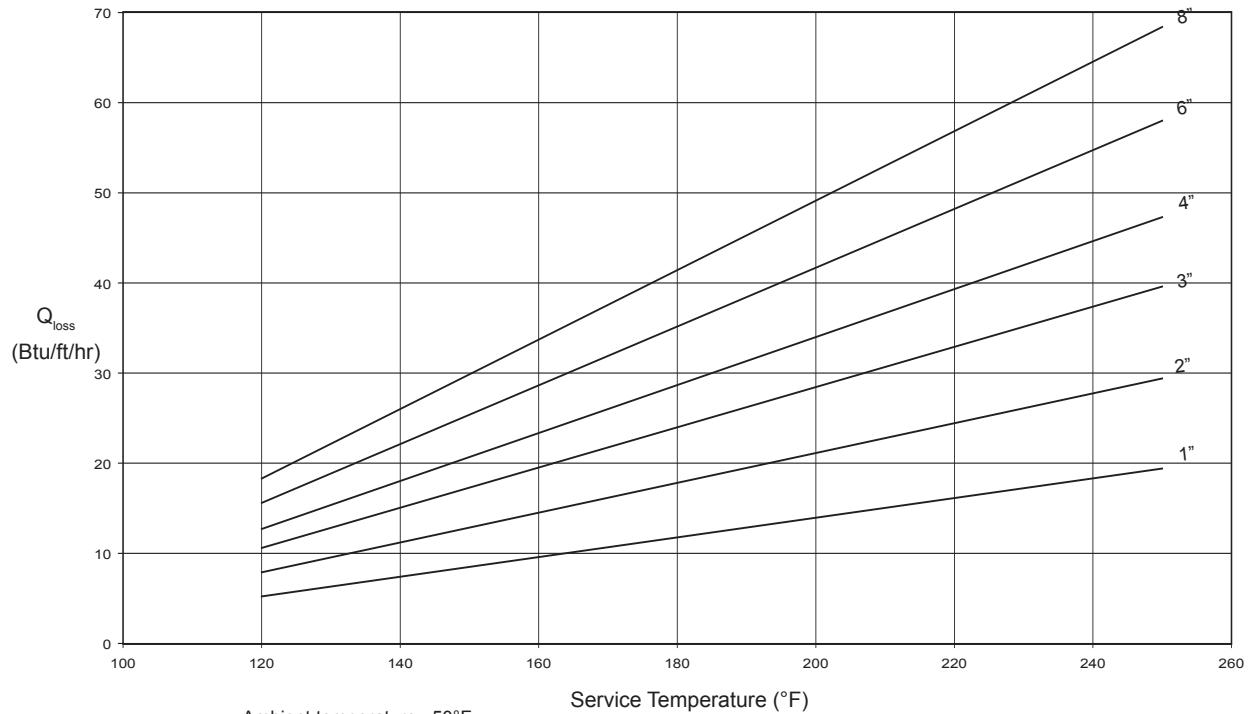
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**3.2 A hydrostatic pressure test** of the carrier pipe shall be performed per the engineer's specification with a factory recommendation of one and one-half times the normal system operating pressure for not less than two hours. Care shall be taken to insure all trapped air is removed from the system prior to the test. *Appropriate safety precautions shall be taken to guard against possible injury to personnel in the event of a failure.*

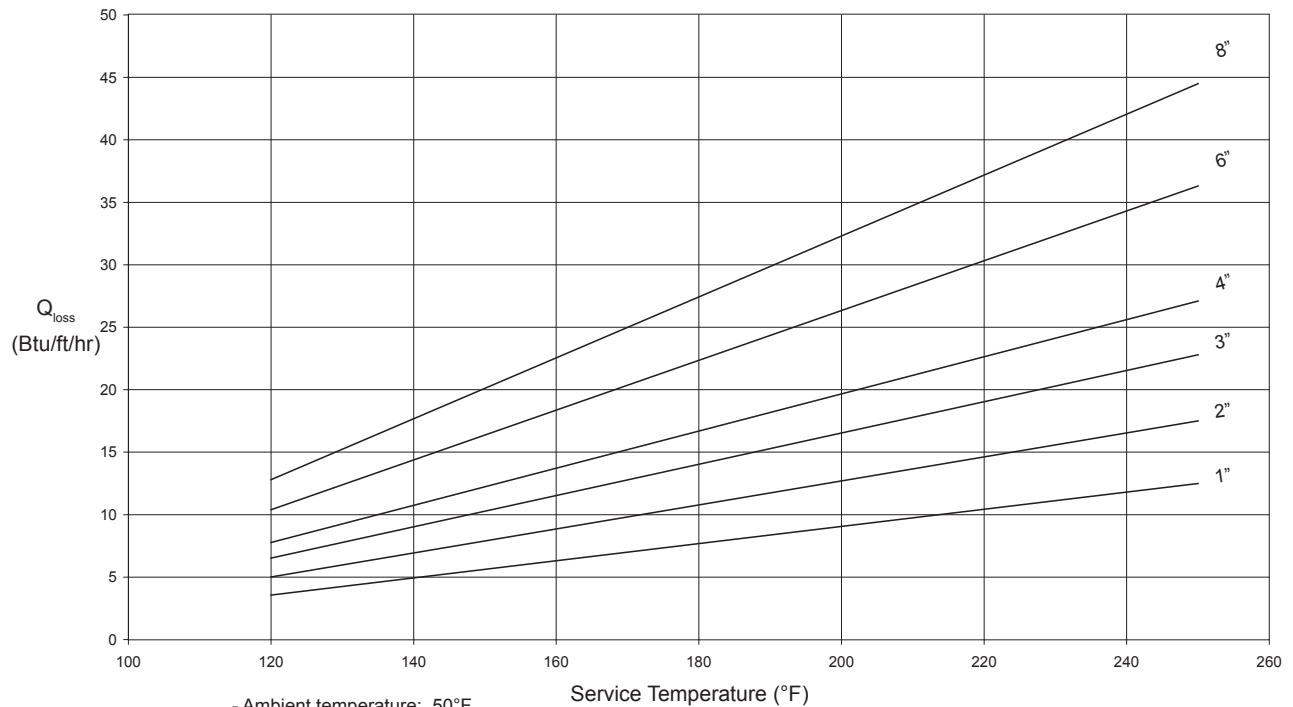
**3.3 Field service**, if required by project specifications, will be provided by a certified manufacturer's representative or company field service technician. The technician will be available at the job to check unloading, storing, and handling of pipe, joint installation, pressure testing, and backfilling techniques.

### HEAT LOSS FOR 1" OF POLYURETHANE FOAM\*



- Ambient temperature: 50°F  
 - Relative humidity: 50%  
 - Wind speed: 0 mph

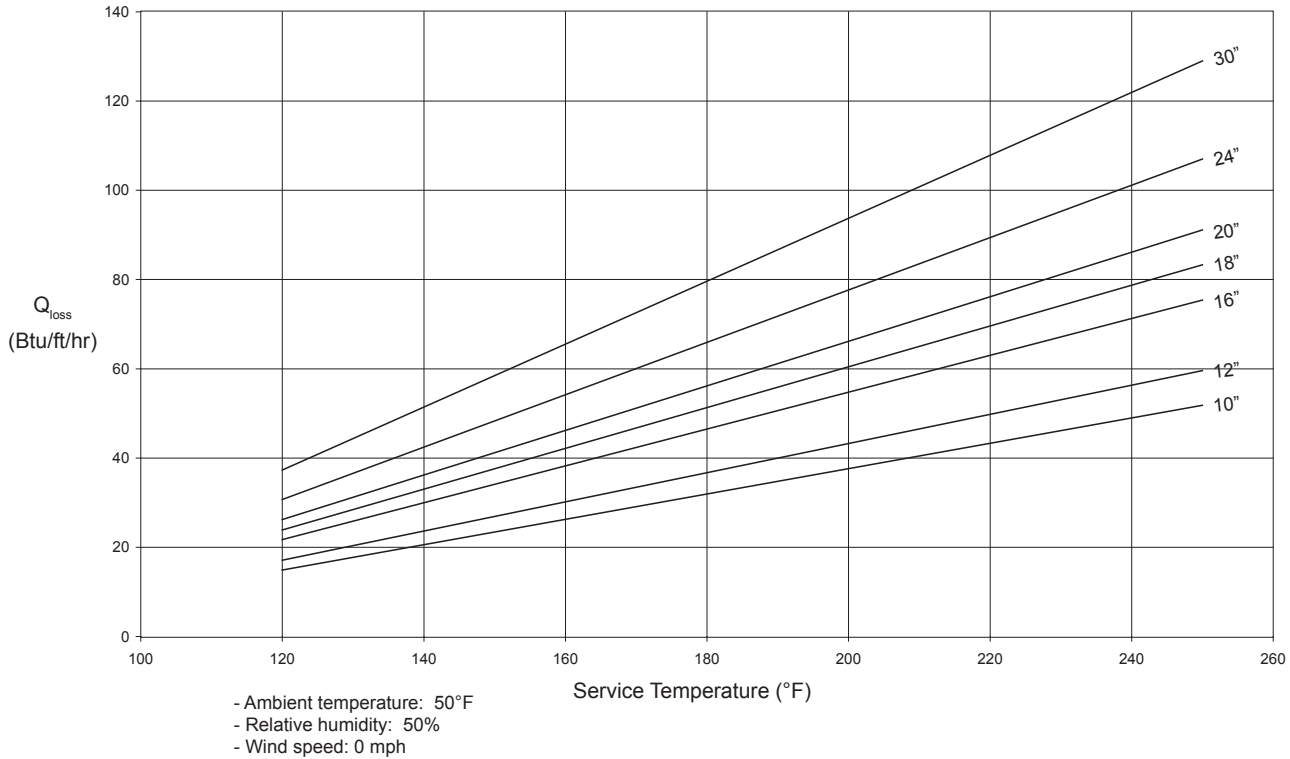
### HEAT LOSS FOR 2" OF POLYURETHANE FOAM\*



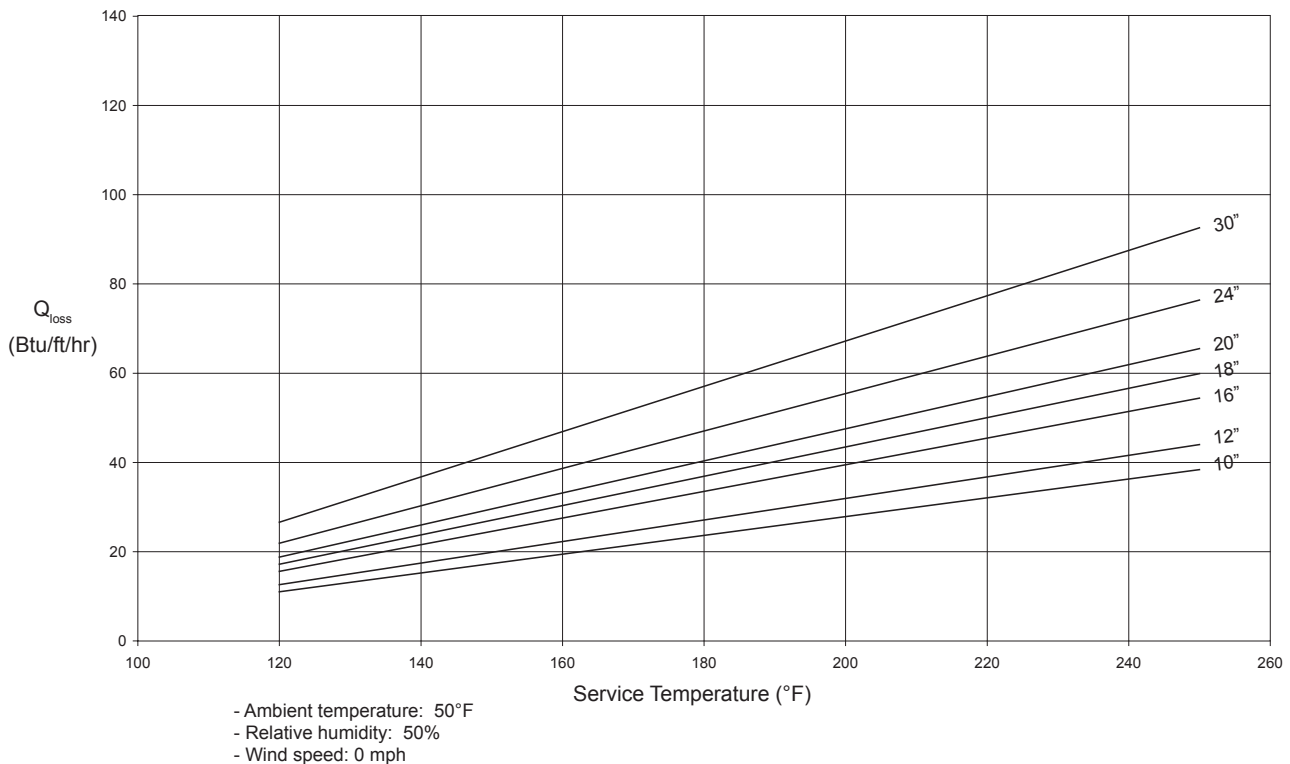
- Ambient temperature: 50°F  
 - Relative humidity: 50%  
 - Wind speed: 0 mph

\* Values are calculated using 3E Plus in accordance with ASTM C680 and are subject to the terms and limitations stated in the software. Actual heat loss may vary.

### HEAT LOSS FOR 2" OF POLYURETHANE FOAM\*



### HEAT LOSS FOR 3" OF POLYURETHANE FOAM\*



\* Values are calculated using 3E Plus in accordance with ASTM C680 and are subject to the terms and limitations stated in the software. Actual heat loss may vary.