



# FIBER-THERM

## Specification Guide

FISG  
9.101

STANDARD SPECIFICATION

3.04.08

*Pre-insulated FRP Piping Systems suitable for Chilled Water, Heating Water, Domestic Hot Water, Process Fluids, and Condensate Return.*

### Part 1 - General

**1.1 Pre-insulated Piping** - Furnish a complete system of factory pre-insulated Fiberglass Reinforced Plastic (FRP) 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 **FIBER-THERM** manufactured by **Thermacor Process, L.P.**, of Fort Worth, Texas.

### Part 2 - Products

**2.1 Carrier pipe** shall be FRP, fiberglass reinforced epoxy. Pipe and fittings are capable of operating from -40 to 250°F at 140 psi. Piping is provided as plain-end by plain-end with an FRP coupling for adhesive joining for 2" thru 6" and integrated bell by spigot for 8" thru 16". All FRP pipe and fittings shall be joined with a matched taper epoxy adhesive joint cured by an external heat source.

**2.2 Insulation** shall be rigid polyurethane foam either spray applied or injected with one shot into the annular space between carrier pipe and jacket, and shall be bonded to both. Insulation shall be rigid, minimum 90% closed cell polyurethane with a minimum 2.0 lbs per cubic foot density, compressive strength of 30 psi @ 75°F, and coefficient of thermal conductivity (K-Factor) of not higher than 0.15 @ 75°F per ASTM C-518. Maximum operating temperature of urethane shall not exceed 250°F. Insulation thickness shall be specified by calling out appropriate carrier pipe and jacket size combinations as listed on drawing FISG 9.103.

**2.3 Jacketing material** shall be extruded, black, high density polyethylene (HDPE), having a wall thickness not less than 125 mils for jacket sizes less than or equal to 12", 150 mils for jacket sizes between 12" and 20", and 175 mils for jacket greater than 20". No tape jacket allowed. The inner surface of the HDPE jacket shall be oxidized by means of corona treatment, flame treatment (patent pending), or other approved methods. This will ensure a secure bond between the jacket and foam insulation preventing any ingress of water at the jacket/ foam interface.

**2.4 Straight run joints** are not insulated on FRP systems. (*At the Engineer's option*, straight field joints may be covered by a split or oversized sleeve and sealed with a heat shrink sleeve to prevent the ingress of moisture or debris.)

**2.5 Fittings** shall be FRP, filament wound and joined with Thermosetting epoxy adhesive and cured with an external heat source. Fittings are not insulated and are poured in concrete thrust blocks at all changes of direction. Flanges are filament wound matching ANSI B16.1 for 150 lb. flanges. *Thrust block design and sizing is the responsibility of the design engineer.*

### Part 3 - Execution

**3.1 Underground systems** shall be buried in a trench of not less than two feet deeper than the top of the pipe and not less than eighteen inches wider than the combined O.D. of all piping systems. A minimum thickness of 24 inches of compacted backfill over the top of the pipe will meet H-20 highway loading.

**3.2 Trench bottom** shall have a minimum of 6" of sand, pea gravel, or specified backfill material, as approved by the engineer, as a cushion for the piping. Pipe and fittings shall be laid sequentially, field cutting the pipe as necessary per the manufacturer's installation instructions. At least the center 75% of each section of pre-insulated pipe shall be covered (approximately one foot of cover per 100 psi of test pressure) with select backfill material. All field shall be suitably thrust blocked before attempting any pressure tests of the system.

**3.3 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.*

(Continued)



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**9.102**

3.14.07

**3.4 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. This service will be added into the cost as part of the project technical services required by the pre-insulated pipe manufacturer.



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POLYURETHANE FOAM IN HDPE JACKET

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**Carrier Pipe:**

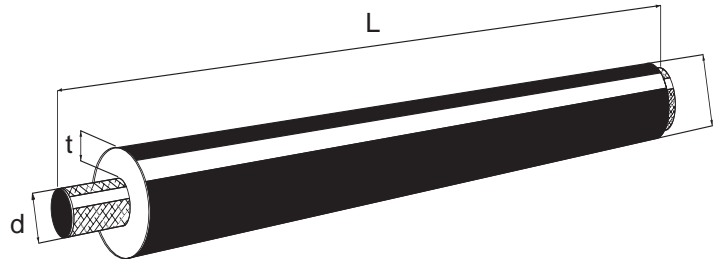
- Fiberglass Reinforced Plastic (FRP)
- FRP pipe is filament wound using glass fibers and epoxy resin with a nominal 0.02" reinforced liner.
- Note: 1" & 1-1/2" are long lead time items.

**Jacketing Material:**

High Density Polyethylene (HDPE)

**Insulation:**

Polyurethane Foam



Pipe Size	Jacket Size	Standard Length L	Insulation Thickness t	External Diameter D	Weight Per Foot (lbs.)
1"	5.4"	10'	1.91"	5.40"	1.9
1-1/2"	5.4"	10'	1.62"	5.40"	2.2
2"	5.4"	20'	1.38"	5.40"	2.2
3"	6.7"	20'	1.46"	6.68"	3.0
4"	8.7"	20'	1.96"	8.68"	4.4
6"	10.9"	20'	1.98"	10.85"	6.4
8"	12.9"	20'	1.98"	12.85"	8.7
10"	14.1"	20'	1.55"	14.12"	10.6
12"	16.1"	20'	1.56"	16.14"	12.8

\* Other pipe and jacket size combinations are available.

\*\* Insulation thickness is calculated using minimum wall thickness. Actual wall thickness may be greater than stated, thereby minimally decreasing actual foam thickness.