Pre-insulated Ductile Iron Piping Systems *suitable for Chilled Water and Heating Hot Water distribution piping*

Part 1 – General

1.1 Pre-insulated Piping - Furnish a complete system of factory pre-insulated Ductile Iron 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 **FERRO-THERM D.I.** manufactured by **Thermacor Process, L.P.**, of Fort Worth Texas.

Part 2 – Products

2.1 Carrier pipe shall be Ductile Iron**,** Pressure or Special Class as specified, in nominal lengths standard to the industry for the specified product. Pipe and fittings shall contain an internal cement lining and be coated inside and out with a bitumastic seal coat. Systems operating over 140°F shall not be coated internally. Pre-insulated pipe sections shall be insulated from the bell end to just short of the spigot insertion stop mark. Joints shall be bell and spigot, push-on type, with SBR gaskets for cold applications, or EPDM gaskets for applications operating over 140°F. Mechanical or restrained joints may be used if required by the project. Maximum operating temperature with EPDM gaskets is 250°F.

2.2 Insulation shall be 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, 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 calling out appropriate carrier pipe and jacket size combinations as listed on drawing DISG 8.103.

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 larger than 12” to 20”, and 175 mils for jacket sizes 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 ingression of water at the jacket/ foam interface.

2.4 Straight run joints are push-on, mechanical, or restrained-joint type straight field joints. At the Engineer’s option, joints may be jacketed with a split sleeve and sealed with a heat shrink sleeve to prevent the ingression of water or debris.

2.5 Fittings shall be Ductile Iron with gasket joint similar to that of the ductile iron pipe. Push-on and mechanical-joint style fittings are not insulated and concrete thrust blocks are poured at all changes of direction. *Thrust block design and sizing is the responsibility of the design engineer.* Restrained-joint fittings, when used with restrained-joint piping, shall be thrust blocked and may be insulated with flexible urethane foam insulation, jacketed and wrapped with polyethylene backed, pressure sensitive rubberized bitumen adhesive tape, 30 mils thick.

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 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 fittings shall be suitably thrust blocked before attempting any pressure tests of the system.

(Continued)

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.*

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.

THERMACOR

FERRO-THERM D.I.

Specification Guide

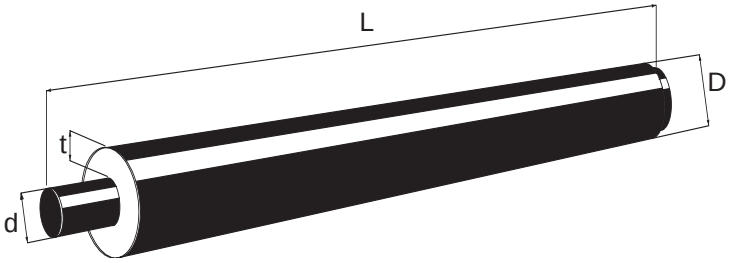
POLYURETHANE FOAM IN HDPE JACKET

DISG
8.103
3.14.07

Carrier Pipe:
- Class 50, Ductile Iron w/ EPDM Gaskets
- Class 51, Ductile Iron w/ EPDM Gaskets (3" & 4")
- Note: 3" DI has a long lead time.

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.)
4"	8.7"	18'	1.81"	8.68"	14.43
6"	10.7"	20'	1.84"	10.85"	20.55
8"	12.7"	20'	1.77"	12.85"	28.06
10"	14.1"	20'	1.35"	14.12"	36.51
12"	16.1"	20'	1.31"	16.14"	46.27
14"	18.2"	20'	1.23"	18.22"	57.24
16"	20.3"	20'	1.22"	20.28"	67.94
18"	22.3"	20'	1.15"	22.25"	77.71
20"	24.4"	20'	1.17"	24.38"	88.00
24"	28.3"	20'	.95"	28.25"	110.88

* Other sizes are available