

DUO-THERM "505"

HIGH DENSITY POLYETHYLENE JACKETED
CLASS A STEEL CONDUIT SYSTEM



DUO-THERM "505"

THERMACOR'S DUO-THERM "505" is a factory-fabricated, pre-insulated piping system that incorporates polyurethane foam and a rugged, noncorrosive, High Density Polyethylene (HDPE) jacket with a Class A Steel Conduit System. The system is engineered as a complete system, combining a drainable, dryable, air testable conduit system with the added insulating value of polyurethane foam and the corrosion protection of HDPE, thereby eliminating the need for cathodic protection. The system is built to withstand heavy traffic/ earth loads, high water tables, and the most corrosive of soils.

Carrier Pipe

- $d \geq 2"$ - A53 ERW Grade B, Std. Wt. Black Steel
- $d < 2"$ - A106 SML, Std. Wt. Black Steel
- Seamless & Schedule 80 pipe are available for all sizes.
- Std. Wt. is the same as Schedule 40 through 10".
- XS is the same as Schedule 80 through 8".

Conduit

- $6" \leq c \leq 26"$ - 10 Gauge
- $28" \leq c \leq 36"$ - 6 Gauge
- $38" \leq c \leq 42"$ - 4 Gauge

Outer Jacket

- High Density Polyethylene (HDPE)

Polyurethane Insulation

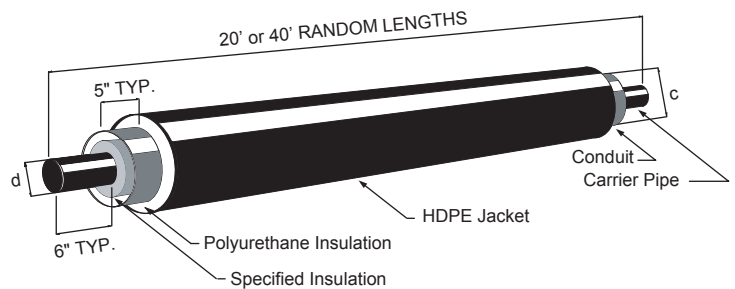
- Density $> 2.0 \text{ lbs/ft}^3$
- "K" Factor $\leq 0.15 @ 75^\circ\text{F}$
- Compressive Strength $> 30 \text{ psi @ } 75^\circ\text{F}$
- Closed Cell Content $\geq 90\%$

Carrier Pipe Insulation

- Mineral Wool or as specified by engineer

ERM Leak Detection

Duo-Therm systems can be provided with an Electric Resistance Monitoring (ERM) leak detection system in the outer layer of polyurethane insulation. This simple leak detection system is an economical, reliable, and easy to install leak detection monitoring system and should be used on all high temperature systems to ensure the longevity of the piping system. See Thermacor's ERM brochure for more information.



SPECIFICATION GUIDE *

General

All underground heat distribution lines as shown on the contract drawings shall be Duo-Therm "505" HDPE pre-insulated steel conduit as manufactured by THERMACOR PROCESS INC.

All straight sections, fittings, anchors, and other accessories shall be factory prefabricated to job dimensions and designed to minimize the number of field welds. The design shall be computer analyzed by the piping system manufacturer to determine stresses and movements of the service pipe and to insure that the system design is in strict conformance with ANSI B31.1 latest edition, and stamped by a registered professional engineer. Factory-trained field technical assistance shall be provided for the critical periods of the installation, i.e., unloading, field joint instruction, cold springing and testing.

Service Pipe

The carrier or service pipe shall be A53, Grade B, ERW standard weight steel for pipe sizes 2" and larger and A106/ A53, Grade B, seamless, standard weight for all pipe sizes 1.5" and smaller. Condensate piping materials shall be extra strong. All joints shall be butt welded for sizes 2" and larger and socket welded for 1.5" and smaller. Straight sections shall be supplied in 40' random length with 6" of piping exposed at each end for field joint fabrication where possible.

Subassemblies

Gland seals, end seals, and anchors shall be designed and factory prefabricated to prevent the moisture ingress into the system. Subassemblies shall be designed to allow for complete draining, drying, and testing of the conduit system.

Service Pipe Insulation

Insulation shall be mineral wool insulation manufactured to pass the boiling test. Insulation shall be fabricated in half or V-Groove insulation sections. The insulation shall be secured to the pipe by stainless steel bands. Insulation thickness shall be as shown on the drawings.

Outer Conduit

The steel conduit casing shall be smooth wall, welded steel conduit ASTM A135, of the thickness specified below:

| Conduit Size | Conduit Thickness |
|--------------|-------------------|
| 6" - 26" | 10 Gauge |
| 28" - 36" | 6 Gauge |
| 38" - 42" | 4 Gauge |

Oversized casing required for carrier pipe expansion shall be accomplished by eccentric and/or concentric fittings and shall provide for continuous drainage.

Pipe Supports

All pipes within the outer casing shall be supported at not more than 9-foot intervals. Supports are designed to allow for continuous airflow and drainage of the conduit in place. Straight section supports are designed to occupy not more than 10% of the annular air space. Supports shall be of the type whereby insulation thermally isolates the carrier pipe from the outer conduit. The surface of the insulation shall be protected at the support by a sleeve not less than 12 inches long.

Outer Conduit Insulation and Jacket

Conduit insulation shall be rigid polyurethane foam with a minimum 2.0 lbs/ft³ density, 90% minimum closed cell content, and a "K" factor not higher than .15 at 75°F per ASTM C518. The polyurethane foam shall be CFC-free.

The outer jacket shall be High Density Polyethylene (HDPE) with a minimum wall thickness of 125 mils for jacket sizes less than or equal to 12", 150 mils for jacket sizes larger than 12" to 24", and 175 mils for jacket sizes greater than 24".

ERM Leak Detection

The piping system can be made Leak Detection Ready by means of installing a bare copper wire between the outer conduit and the HDPE jacket. The piping system manufacturer shall install the wire in a manner that has the wire embedded in the foam insulation and incorporated into each piece of pre-insulated pipe and fittings. Connections of the ERM wire shall be made by the contractor prior to insulating joints.

Installation

The installing contractor shall be responsible to excavate, string conduit, weld, test, place in trench, backfill, or otherwise treat and install the system as per directions furnished by the manufacturer and approved by the design engineer in accordance with the plans and specifications. The conduit shall be air tested at 15 psig for not less than two hours and the carrier pipe hydrostatically tested to 1.5 times the working pressure for not less than four hours, or as specified by the engineer. A qualified representative of THERMACOR PROCESS INC. shall be present at the jobsite during critical periods of installation and testing. Backfill shall not commence until approval of tests by the THERMACOR PROCESS INC. representative. Field modifications must be approved by the manufacturer. The installing contractor shall certify that he has complied with the manufacturer's directions.

Backfill

A 6-inch layer of sand, fine gravel, or specified backfill shall be placed and tamped in the trench to provide a uniform bedding for the system. The entire trench shall be evenly backfilled with a similar material as the bedding in 6-inch compacted layers to a minimum height of 6 inches above the top of the insulated piping sections. The remaining trench shall be backfilled in uniform layers with suitable excavated soil.

** For alternate specifications, please contact THERMACOR.*

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