

DUAL-CON

INSUL-TEK® DUAL-CON

Dual-Con is both the most thermally efficient system, and the most corrosion resistant preinsulated piping system available today.

Features

- Dryable, Drainable, Air Testable system means reliability
- Two (2) protective casings means double protection.
- Two (2) insulation systems results in greater thermal efficiency.
- Corrosion-proof external High Density Polyethylene (H.D.P.E.) casing - (no cathodic protection system required).

Options

- Fiberglass Reinforced Plastic (F.R.P.) Exterior Casing
- Flexeeze Type, Air Testable Field Joints (Available with H.D.P.E. encased systems only)
- Leak Detection Systems
- Heat Trace Systems

Insul-Tek® Dual-Con

- Steam and Condensate Distribution
- District Heating and Cooling
- High Temperature Hot Water
- Cogeneration
- Process Fluids

Insul-Tek® Dual-Con Preinsulated Piping System

- Drainable, Dryable, Air Testable, Class "A"
- Steel Conduit system utilizing a non-corrosive
- High Density Polyethylene (H.D.P.E.) Exterior Casing

Insul-Tek® Dual-Con is the ideal system for use on those sites that pose the most difficult of conditions for an underground preinsulated piping system. The Dual-Con system provides "double protection" for your underground piping systems.

The Dual-Con system utilizes two (2) separate protective casings. The Exterior Casing is a Corrosion Proof, non-metallic High Density Polyethylene (H.D.P.E.) casing, which is one of the toughest and most durable materials available today. The Inner Casing is a Steel Conduit which provides the strength of steel and is easily welded in the field and air tested to prove its integrity (tightness). Dual-Con utilizes Two (2) different types of Insulation Systems, an Exterior Layer of the most thermally efficient Polyurethane Foam insulation, in conjunction with an Inner Layer of High Temperature Insulation consisting of: mineral wool, Foamglas®, calcium silicate or perlite insulation. Insul-Tek® Dual-Con is manufactured to withstand the most severe and corrosive conditions that can be found in an underground heat distribution site. Dual-Con is both the most thermally efficient system, and the most corrosion resistant preinsulated piping system available today.

PRODUCT DESCRIPTION

Carrier Pipe

The carrier pipe(s) is typically Schedule 40 A53 Grade B, E.R.W., except for condensate service which is generally Schedule 80 A53 Grade B, E.R.W. Sizes above 10" are typically standard wall dimension. Other types and grades of carrier pipe are available depending upon application. Please consult factory for recommendation.

Carrier Pipe Insulation

The carrier pipe is insulated with the customer's choice of one of today's thermally efficient dryable insulation materials. The insulation shall be the type that has passed the U.S. National Bureau of Standards Boiling Test. The standard insulation materials include; mineral wool, Foamglas®, calcium silicate, and perlite insulation. The insulation thickness will be properly sized to ensure that the piping system is thermally efficient.

Inner Steel Conduit

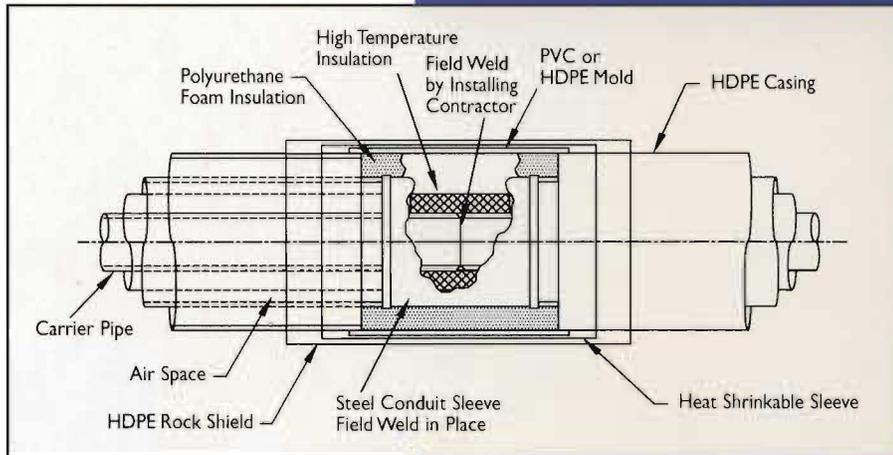
The carrier pipe with attached insulation will be supported within a smooth wall steel conduit having a wall thickness of not less than 10 gauge. Piping shall be suitably spaced and supported in the conduit by specially designed pipe supports which allow for continuous air flow and drainage of the conduit system in place. The pipe supports will be placed at not less than 10' intervals.

Outer Layer of Insulation

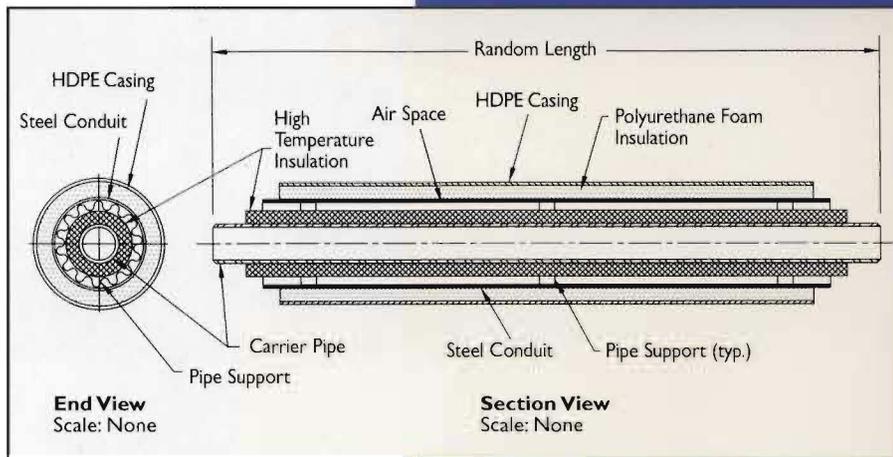
An outer layer of the most thermally efficient insulation, polyurethane foam, will be applied to the steel conduit and will be protected by the external casing of non-corrosive H.D.P.E. The utilization of polyurethane foam allows for the service pipe insulation to be reduced in thickness, while still maintaining a low heat loss.

Exterior High Density Polyethylene (H.D.P.E.) Casing

The entire piping system will be protected by a non-corrosive, seamless, extruded, High Density Polyethylene (H.D.P.E.) casing. H.D.P.E. is the toughest, most durable casing available today. H.D.P.E. will stand up very well to the rigors of physical abuse often encountered in the field, including: trucking, unloading and backfilling. This seamless casing is also impervious to most chemicals as well as electrolytic attack. Thus, there is no need for expensive, maintenance oriented, and most often, ineffective cathodic protection systems. H.D.P.E. is also an excellent casing for cold weather installations, as this material does not become brittle or crack at even sub zero temperatures.



Dual-Con Standard Heat Shrink Type Field Joint



Dual-Con Random Length

Typical Insulation Thickness and Casing Sizes

(Based upon Operating Temperature of 353 Degrees Fahrenheit)

Nominal Pipe Size (inches)	Mineral Wool Insulation Thickness (inches)	Inner Steel Conduit O.D. (inches)	Nominal Polyurethane Foam Thickness (inches)	H.D.P.E. Wall Thickness (inches)	H.D.P.E. Casing O.D. (inches)
2	1-1/2	8-5/8	1.7	.175	12.43
3	1-1/2	8-5/8	1.7	.175	12.43
4	1-1/2	10-3/4	1.5	.175	14.06
6	2	12-3/4	1.4	.175	15.87
8	2	16	1.7	.200	19.80
10	2	18	1.9	.200	22.17
12	2-1/2	20	2.2	.275	24.92

* For larger pipes, please consult factory.

* For higher temperatures, please consult factory.



Specifications for INSUL-TEK® Dual-Con Steel Conduit System

General

All underground heat distribution piping shall be Dual-Con Preinsulated Piping System as manufactured by INSUL-TEK® Piping Systems, Inc. All straight lengths of pipe, fittings, anchors, and other accessories shall be factory prefabricated by the manufacturer. No field fabrication of fittings, anchors or other accessories will be allowed. The design and layout of the piping system shall be in strict compliance with the latest edition of ANSI B31.1. On-site, technical field support will be performed at critical times by a certified field service technician. Critical times include: unloading, field joint instruction, cold springing (if required) and testing of the piping system.

Carrier Pipe

The carrier pipe shall be carbon steel, beveled for welding. Pipe sizes 2" through 10" shall be Schedule 40 A53 Grade B, E.R.W. steel. Sizes larger than 10" shall be standard wall thickness. Pipe sizes 1-1/2" and smaller shall be A106/A53 seamless type. All joints for pipe 2-1/2" and larger in size shall be butt welded. Sizes 2" and smaller shall be socket welded. Schedule 80 steel pipe will be utilized on all condensate piping in lieu of Schedule 40 steel pipe. Straight lengths of piping will be supplied with 6" of piping exposed at each end for field joint fabrication.

Sub-Assemblies

Gland seals, end seals and anchors shall be designed and factory prefabricated to prevent the ingress of moisture into the piping system. All sub-assemblies shall be designed and manufactured to allow for complete draining, drying and testing of the conduit system.

Insulation

Carrier pipe insulation shall be one of the following types; mineral wool, Foamglas® or calcium silicate. (Please specify type desired.) The insulation will be held in place by stainless steel bands on 18" centers. The insulation shall be applied to a thickness of _____. (Please specify thickness.)

Inner Conduit

The inner conduit shall be a smooth wall, spiral welded steel casing of the thickness specified below:

Conduit Size	Conduit Thickness
6" - 26"	10 Gauge
28" - 36"	06 Gauge
38" - 42"	04 Gauge

Carrier pipe expansion will be accommodated with over sized casing utilized in conjunction with eccentric and/or concentric fittings, which will allow for continuous draining of the piping system shall it be necessary.

Pipe Supports

All pipe within the inner-conduit shall be supported at not more than 10' intervals. The supports shall be designed to allow for continuous airflow and draining of the conduit system in place. The support shall be the type whereby an insulation material thoroughly isolates the carrier pipe from the inner steel conduit.

Outer Conduit Insulation

The outer conduit insulation shall be factory-applied polyurethane foam not less than 1" thick. The polyurethane foam shall have a minimum density of 2.2 to 3.0 PCF, shall be 90% to 95% closed cell content per ASTM D-2856, and shall have a "K" factor of .14 per ASTM C-518. Quality assurance procedures shall be implemented to assure there are no voids in the polyurethane foam insulation. The procedure may be one of the following; visual inspection, infrared test, sonic test, or thermal measurement.

Outer Casing

The outer casing shall be a seamless, extruded, High Density Polyethylene (H.D.P.E.). The High Density Polyethylene shall be Resin Type III, Grade P34 per ASTM D-1248. The minimum wall thickness of the casing will be .175". No polyethylene tape or P.V.C. casings will be allowed.

Installation

The installing contractor shall handle the piping system in accordance with the directions furnished by the manufacturer and as approved by the architect and engineer. The inner-steel conduit casing shall be air tested at 15 psig. The carrier piping shall be hydrostatically tested to 150 psig or 1-1/2" times the operating pressure, or as specified in the contract documents. The test shall be maintained for a minimum time of 2 hours.

Backfill

A 4" layer of sand or fine gravel shall be placed and tamped in the trench to provide a stable and uniform bedding for the conduit system. Once the conduit system is in place, the trenches shall be carefully backfilled and hand tamped in 6" layers until a cover of at least 24" from the top of the pipe has been achieved. The first 12" of backfill shall be sand or fine gravel less than 1/2" in diameter. The remainder of the backfill shall be void of rocks, frozen earth and foreign material over 6" in diameter. The trench shall be compacted to comply with H-20 Highway loading.

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