

POLYCOR HDPE

HDPE PIPING SYSTEM



POLYCOR HDPE

THERMACOR'S POLYCOR HDPE is a factory-fabricated, pre-insulated piping system for below or above ground distribution of hot and chill water. The system is designed with a High Density Polyethylene (HDPE) carrier pipe, closed cell polyurethane foam insulation, and an HDPE jacket.

Carrier Pipe

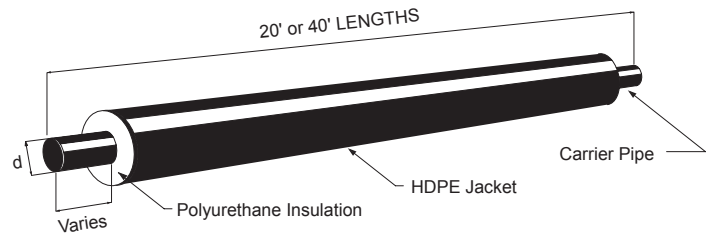
- High Density Polyethylene (HDPE)
- SDR 32.5 - SDR 7.3

Polyurethane Insulation

- Density
- "K" Factor
- Compressive Strength
- Closed Cell Content

Jacket

- High Density Polyethylene (HDPE)



- > 2.0 lbs/ft³
- ≤ 0.16 @ 75°F
- > 30 psi
- ≥ 90% @ 75°F

SPECIFICATION GUIDE *

GENERAL

All underground and above ground piping materials transporting chill water and hot water shall be **POLYCOR HDPE** as manufactured by **THERMACOR PROCESS INC.** All pre-insulated pipe, fittings, insulating materials, and technical support shall be provided by the Pre-insulated Piping System manufacturer.

SERVICE PIPE

The carrier pipe shall be high density polyethylene (HDPE), conforming to ASTM D-3350. Pipe and fittings are manufactured from extra high molecular weight polyethylene compound and fabricated to Standard Dimensional Ratio (SDR) wall thickness in standard IPS sizes. Available pressure ratings range from 50 psi (SDR-32.5) to 255 psi (SDR-7.3) at 73°F, with operating temperatures from -50°F and lower, to +140°F by applying an appropriate design factor.

INSULATION

Insulation of the service pipe 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 .16 at 75°F per ASTM C518. The polyurethane foam shall be CFC-free. The polyurethane foam shall completely fill the annular space between the service pipe and jacket, and shall be bonded to both. Insulation shall be provided to the minimum insulation thickness specified, within manufacturing tolerances.

JACKET

The outer protective jacket shall be High Density Polyethylene (HDPE). The HDPE jacket shall be seamless and pressure-tested for watertight integrity. PVC, FRP, HDUP or tape materials are not allowed.

FITTINGS

Carrier pipe fittings of the same material and pressure rating shall be heat fusion butt-welded to adjacent pipe sections. Fittings that are butt fusion welded in the field are not insulated. End seals at uninsulated fittings shall be the same as specified for the straight runs of pipe. If fittings are factory manufactured, fittings are pre-insulated using factory PE fitting covers welded to the jacket.

FIELD JOINTS

Service pipe shall be hydrostatically tested as per the Engineer's specification with a factory recommendation of 1.5 times the specified pressure of the system. Straight joint sections shall be insulated using urethane foam to the thickness specified, jacketed with split sleeve, and sealed with a heat shrink sleeve. All joint closures and insulation shall occur at straight sections of pipe. All insulation and jacketing materials shall be furnished by THERMACOR.

INSTALLATION

Installation of the piping system shall be in accordance with the manufacturer's instructions. Factory trained field technicians shall be provided for critical periods of installation, unloading, field joint instruction, and testing.

** For alternate specifications, please contact THERMACOR.*

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THERMACOR PROCESS INC. sole and exclusive warranty is as stated in the Standard Terms and Conditions of Sale for these products. In no event will THERMACOR PROCESS INC. be liable for any direct, indirect, or consequential damage.



POLYCOR HDPE

Specification Guide

PCSG

10.101

STANDARD SPECIFICATION

8.10.11

Pre-insulated Polyethylene Piping Systems

Part 1 - General

1.1 Pre-insulated Piping - Furnish a complete system of factory pre-insulated polyethylene 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 **POLYCOR HDPE** manufactured by **Thermacor Process Inc.** of Fort Worth, Texas.

Part 2 - Products

2.1 Carrier pipe shall be high density polyethylene (HDPE), conforming to ASTM D-3350 and the specification standards listed below. Pipe and fittings are manufactured from extra high molecular weight polyethylene compound and fabricated to Standard Dimensional Ratio (SDR) wall thickness in standard IPS sizes. Available pressure ratings range from 50 psi (SDR-32.5) to 255 psi (SDR-7.3) at 73°F, with operating temperatures from -50°F and lower, to +140°F by applying an appropriate design factor.

2.2 Insulation shall be polyurethane foam either spray applied or injected with one shot into the annular space between carrier pipe and jacket with a minimum thickness of one inch. 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 0.16 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, and shall not result in less than 1" thickness.

2.3 Jacketing material shall be extruded, black, high density polyethylene (HDPE), having a minimum wall thickness of 100 mils for jacket sizes less than or equal to 12", 125 mils for jacket sizes larger than 12" to 24", and 150 mils for jacket sizes greater than 24". 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 butt fusion welded and field insulated using urethane foam to the thickness specified and jacketed with heat shrink tape. Joints can be made beside the trench or inside the trench.

2.5 Carrier pipe fittings shall be butt fusion- welded to adjacent pipe sections. Fittings that are butt fusion welded in the field are not insulated. End seals at uninsulated fittings shall be field-applied mastic moisture barriers. If fittings are factory manufactured, fittings are pre-insulated using factory PE fitting covers welded to the jackets.

Part 3 - Execution

3.1 Field-engineered piping systems shall be fabricated from factory insulated sections of straight pipe and fittings. When practical, piping shall be provided in 40-foot double-random lengths. All HDPE piping shall have ends cut square in preparation for butt fusion welding.

3.2 Carrier pipe joining shall be accomplished using an authorized butt fusion welding machine preheated to the correct pipe temperature for fusion welding. All heating surfaces shall be clean and free of dirt and residue before applying to ends of pipe to be joined. After heating, the softened ends are pressed together by the machine and held until the joint has hardened. Improperly accomplished, uneven, or joints with questionable appearance shall be cut out and re-accomplished. Transitions to other piping materials shall be accomplished using suitable flanged or mechanical adapters.

3.3 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.

(Continued)



POLYCOR HDPE

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STANDARD SPECIFICATION

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10.102

3.14.07

3.4 Trench bottom shall have a minimum of 6" of sand, pea gravel, or specified backfill material as a cushion for the piping. All field cutting of the pipe shall be performed in accordance with the manufacturer's installation instructions.

3.5 A hydrostatic pressure test shall be performed before insulating the field joints or burying the system, and shall be performed per the Engineer's specifications. The factory recommended pressure test consists of an expansion phase and a test phase. Care shall be taken to insure all trapped air is removed from the system prior to the test. The expansion phase consists of an initial pressurization period of three hours at one and one-half times the normal system operating pressure. Make-up water shall be added to the system during this period to maintain the desired pressure. The test shall commence immediately after the expansion phase. The pressure shall be reduced by 10 psi and the test clock started. System pressure remaining within 5% of the target test pressure for one hour indicates no leakage has occurred. If the entire test procedure cannot be completed within eight hours of the initial pressurization, the system shall be depressurized and allowed to relax for a minimum of eight hours before another test is attempted. The piping system shall be restrained from uncontrolled movement in the event of a failure. *Appropriate safety precautions shall be taken to guard against possible injury to personnel in the event of a failure.*

3.6 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.



POLYCOR HDPE

Specification Guide

PCSG
10.103

POLYURETHANE FOAM IN HDPE JACKET

8.08.11

Carrier Pipe:

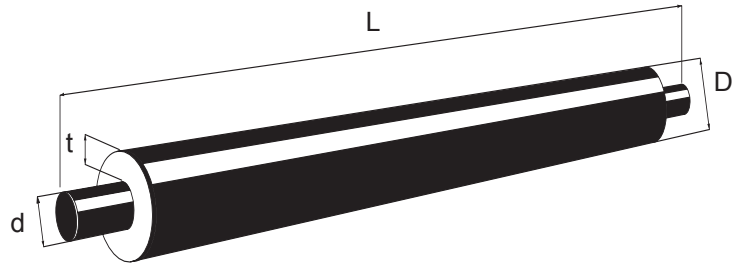
- High Density Polyethylene (HDPE)
- SDR 32.5 - SDR 7.3

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.)
2"	5.40"	40'	1.41"	5.40"	1.87
3"	6.68"	40'	1.49"	6.68"	2.78
4"	8.68"	40'	1.99"	8.68"	4.20
6"	10.85"	40'	2.01"	10.85"	7.11
8"	12.85"	40'	1.99"	12.85"	9.97
10"	14.12"	40'	1.56"	14.12"	13.81
12"	16.14"	40'	1.57"	16.14"	18.61
16"	20.28"	40'	2.02"	20.28"	75.26
18"	22.25"	40'	2.00"	22.25"	35.24
20"	24.38"	40'	2.04"	24.38"	42.13
24"	28.25"	40'	1.98"	28.25"	58.08
28"	32.25"	40'	1.98"	32.25"	78.20
30"	36.60"	40'	3.15"	36.60"	90.84

* Other sizes are available

* Weights given with SDR 17 HDPE pipe



POLYCOR HDPE

Installation Manual

PCIM
10.201

GENERAL INSTALLATION INSTRUCTIONS

3.14.07

INSTALLATION INSTRUCTIONS

UNLOADING & HANDLING

Lift joints from trucks. DO NOT DROP SHARP OR HEAVY OBJECTS ON INSULATED UNITS. DO NOT use chains or other devices which might puncture insulation jacket.

STORAGE

Pipe is stockpiled off the ground. Do not exceed a stacking height of 6'. Prevent dirt and debris from entering pipe. Fittings, joining materials, etc. must be stored indoors to protect them from freezing, overheating, moisture, or loss.

LAYING OF PIPE UNITS – TRENCHING

All sharp rocks, roots, and other abrasive material must be removed from the trench. The trench bed should be 6" of sand or backfill as specified by the engineer, providing a smooth and uniform stabilizing surface (sandbags may be used as a means to keep the pipe off the ground until backfilling is started). The trench width should provide a minimum of 6" from trench wall to jacket O.D. and a minimum of 6" between pipe units. Trench depths will be indicated on the contract drawing and in line with good construction practices. Trench depth should allow for a minimum cover of 24" on top of the insulated unit.

FIELD JOINING METHODS

Polycor piping and fittings shall be joined in the field using approved methods for butt-fusion welding for appropriate pipe. Pipe ends should be clean and the butt-fusion welding machine preheated to the correct pipe temperature for fusion welding. NOTE: Butt-fusion welding equipment is furnished by the contractor.

FIELD ALTERATIONS

Pipe will be cut in the field, based on the appropriate field measurements for fabrication of loops, fittings, and/ or making manhole or wall entries. If special short pieces are required, measure distance needed for field alteration and cut through unit with saw. Using factory insulated pipe as guide, cut back insulation and insure that HDPE piping has ends cut square in preparation for butt fusion welding (simultaneously removing burrs, cuts, nicks, and scratches). Apply end seal to the clean, dry, exposed insulation surface, if required.

HYDROSTATIC TESTING

A hydrostatic pressure test shall be performed per the Engineer's specifications before insulating the field joints or burying the system. The factory recommended pressure test consists of an expansion phase and a test phase. Care shall be taken to insure all trapped air is removed from the system prior to the test. The expansion phase consists of an initial pressurization period of three hours at one and one-half times the normal system operating pressure. Make-up water shall be added to the system during this period to maintain the desired pressure. The test shall commence immediately after the expansion phase. The pressure shall be reduced by 10 psi and the test clock started. System pressure remaining within 5% of the target test pressure for one hour indicates no leakage has occurred. If the entire test procedure cannot be completed within eight hours of the initial pressurization, the system shall be depressurized and allowed to relax for a minimum of eight hours before another test is attempted. The piping system shall be restrained from uncontrolled movement in the event of a failure. *Appropriate safety precautions shall be taken to guard against possible injury to personnel in the event of a failure.*

FIELD JOINT & FITTING INSULATION

See Drawings furnished with job material.

BACKFILL FINAL

Before backfilling is started, the trench should be cleaned of any trench wall cave-ins and general trash, especially metal. Backfilling should be done with sand or other engineer-approved material 6" below the casing to 1' above. Engineer-approved backfill may be used to fill the rest of the trench. This material should be free of rocks, roots, large clods, or anything that could cause damage to the jacket. Jacket should have a minimum of 2' cover.

WHEELED OR TRACKED VEHICLES SHALL NOT BE USED FOR TAMPING!

SHIPPING & HANDLING INSTRUCTIONS

HANDLE COATED PIPE WITH EXTRA CARE! THIS PIPE CAN DAMAGE WHEN HANDLED, MOVED, OR STORED IMPROPERLY!

UPON RECEIPT OF MATERIALS

Make an overall inspection of the load, checking all bands and braces to see if they are intact. Also, check the load for shifting. If the load has shifted, or if the braces and bands are broken, examine each pipe for damage. **HAVE THE TRUCK DRIVER MAKE AN ITEMIZED NOTATION OF ANY DAMAGE ON THE DELIVERY RECEIPT AND HAVE IT SIGNED BY THE DRIVER.**

CHECK PACKING LIST

Compare materials received with those listed on the packing list. Count all pipe and boxes. **NOTE ANY SHORTAGES ON DRIVER'S DELIVERY RECEIPT.**

CHECK BOXES

Open all boxes and inspect for damages, shortages, and correct size. **REPORT ANY DISCREPANCIES WITHIN 30 DAYS AFTER RECEIPT.**

CLAIMS FOR DAMAGES

Claims for damages in transit or lost goods must be made within 30 days. The filing of any claim is the Purchaser's Responsibility. Thermacor will file any claim on Purchaser's behalf upon receipt of the following:

1. Written authority to file such a claim.
2. Written notice of loss or damage (signed and noted Bill of Lading) by truck driver or carrier freight agent.

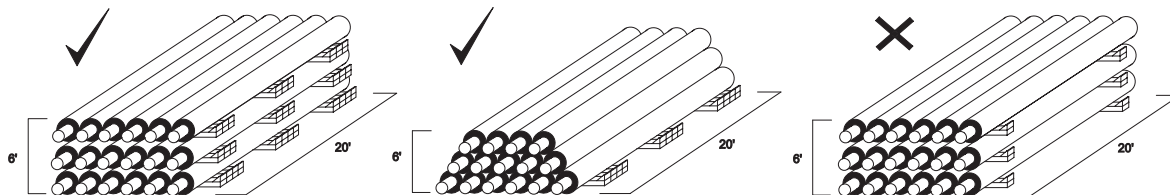
UNLOADING PIPE

Pipe may be unloaded by hand or with fork lifts*, cherry pickers, or cranes. **DO NOT HOOK** pipe ends. Minimum 4" wide straps or slings should be used.

*Fork Lift – When using Fork Lift, wide tines or a large surface covering the fork tines must be used to prevent coating damage. Fork Lift must be able to handle the weight of the insulated pipe length.

PIPE STOCKPILING

Pipe should be stored on level ground, elevated to be as dry as possible, and in such a way that the pipe ends do not lie in water or on the ground. To prevent deformation of the jacket and insulation due to the weight of the pipe, place a series of supports (3 for 20' or 5 for 40') of ample size generally constructed from 2" x 4"s under the pipe as shown below. Supports should increase in width as weight load increases so that the top supports of a fully loaded stockpile should be approximately 10" wide, gradually increasing to the bottom level, approximately 18" wide. Pipe can be pyramided (within reasonable and safe limits) approximately 6' high after a properly braced or chocked base is formed. Pipe stored outside for long periods of time can be covered with blue mesh tarpaulin (plywood can also be used). **Do not prevent airflow as jacket can be deformed from heat buildup.**



BE VERY CAREFUL NOT TO DROP THE PIPE!

NOTE: Thermacor does not approve of the practice of installing pipe and fittings, and backfilling the pipe before testing. Thermacor will not allow or pay claims for charges which arise in locating and digging up leaks regardless of cause.