



# 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.

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## Specification Guide

STANDARD SPECIFICATION

PCSG  
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.



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PCSG  
10.103

POLYURETHANE FOAM IN HDPE JACKET

8.08.11

**Carrier Pipe:**

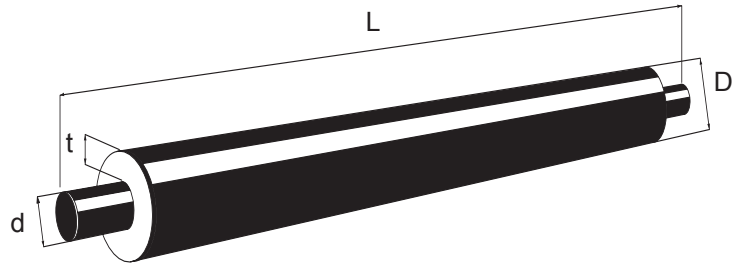
- High Density Polyethylene (HDPE)
- SDR 32.5 - SDR 7.3

**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