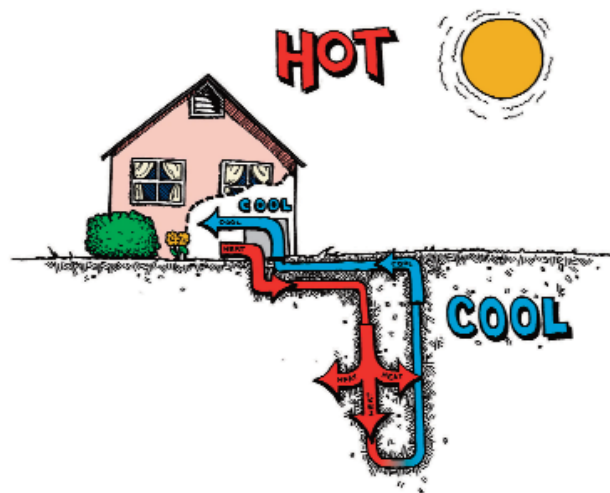


Blue Diamond Industries

GEOHERMAL HDPE PRESSURE PIPE



Scope

Geothermal exchange is a clean energy method of heating and cooling commercial and residential buildings. The technology is proven and has been in use for decades. In simplest terms, HDPE (High Density Polyethylene) pipe is buried in the ground, allowing energy transfer between the fluid in the pipe and the earth. The fluid in the piping is warmed in the winter and cooled in the summer. The system consists of buried HDPE pipe, a heat pump, and air distribution system.

The buried piping heat exchanger is a key component of the geothermal system. Blue Diamond Geothermal Pressure Pipe is manufactured from PE 3408/3608 resin listed in PPI(Plastics Pipe Institute) Standard TR 4 and meets the requirements of IGSHA (the International Ground Source Heat Pump Association). Blue Diamond is also certified to produce PE 4710 piping, which has a higher Hydrostatic Design Stress and higher environmental stress crack rating. Pipe manufactured from PE 4710 resin will have a higher pressure rating for the same SDR wall thickness compared to 3408/3608 resin. Contact the BDI technical staff for further information. BDI PE 4710 is listed in PPI Standard TR 4.

IGSHA recommends HDPE pipe for its superior properties.

- **CHEMICAL AND CORROSION RESISTANCE**-Will not corrode or rot, even in the most aggressive soil conditions
- **TOUGH AND FLEXIBLE**-Good impact and abrasion resistance
- **FLEXIBLE**-Can be bent to 1.5 times the outside diameter without kinking to follow the contours of the bore hole installation
- **THERMAL CONDUCTIVITY**-Excellent heat transfer properties
- **LEAK TIGHT JOINTS**-Fusion welded joints provide long term leak free joints

Materials and Standards

Blue Diamond Geothermal Pipe is manufactured from PE 3408/3608 resin with an ASTM cell classification of 345464 meeting IGSHA material requirements. The resin has an HDB rating of 1600 psi at 73°F, is listed in PPI technical report TR 4 and is formulated for long term performance and superior stress crack resistance. BDI HDPE pipe meets ASTM D 3035 and ASTM F 714.

PE 3408 / 3608				
*AT 73°F				
PIPE SIZE	OUTSIDE DIAMETER		*DR 9 PC=200 PSI	*DR 11 PC=160 PSI
3/4"	1.050"	MIN WALL	0.117"	0.095"
		WT/100'	15.2lbs	13.0lbs
1"	1.315"	MIN WALL	0.146"	0.120"
		WT/100'	23.5lbs	20.0lbs
1 1/4"	1.660"	MIN WALL	0.184"	0.151"
		WT/100'	37.2lbs	31.4lbs
2"	2.375"	MIN WALL	0.264"	0.216"
		WT/100'	76.2lbs	63.9lbs
3"	3.500"	MIN WALL	0.389"	0.318"
		WT/100'	165.5lbs	138.7lbs
4"	4.500"	MIN WALL	0.500"	0.409"
		WT/100'	273.7lbs	229.3lbs
6"	6.625"	MIN WALL	0.824"	0.602"
		WT/100'	593.1lbs	497.1lbs

- Notes:
- Table values are within ASTM tolerances.
 - BDI PE 4710 pipe will have higher Pressure Class (PC) for the same DR as compared to PE 3408/3608 pipe. Contact the BDI technical staff for pressure values.

U-BENDS

BDI Geothermal Pipe Coils can be supplied with a U-Bend (180 degree elbow) installed at the manufacturing facility eliminating a field weld. These coils consist of the supply and return loop in parallel with the U-Bend welded at one end. U-Bend coils are typically supplied with 5 feet of extra piping on each supply and return loops to facilitate connection to the header. BDI pipe is also supplied in basic coil lengths or 20 foot sticks for custom applications.

JOINING

BDI Geothermal Pipe is manufactured according to ASTM D 3035 dimensions based on IPS (Iron Pipe Size) “outside diameter” dimensions. Heat fusion is the preferred method of joining lengths of pipe. Pipe installers should be certified in heat fusion of HDPE pipe. Refer to PPI TR 3 and IGSHPA guidelines for heat fusion joints. Piping above ground may be joined with mechanical fittings made to ASTM D 3035 standards.

INSTALLATION

Refer to IGSHPA Installation Manual for Geothermal Systems and PPI’s “Handbook of Polyethylene Pipe” for guidelines on installation of pipe and grouting methods. After installation, but prior to backfilling, pipe should be flushed, purged and hydrostatically pressure tested to ensure there was no shipment or installation damage.

GENERAL GUIDELINES

- Calculate the total working pressure of the system and check it does not exceed the performance capabilities of the pipe and fittings. (*Pressure Class ratings listed are calculated at 73°. Operating temperatures above 73° will have lower pressure ratings. Call Blue Diamond Industries or consult the PPI “Handbook of Polyethylene Pipe” for Temperature Compensation Multipliers.)
- Inspect the pipe when delivered and prior to installation to detect any damage that might have occurred in shipment or handling.
- When installing in a trench, ensure the bedding and backfill is smooth and free from rocks and debris. Install pipe in accordance with IGSHPA guidelines and ASTM D 2774 - “Underground Installation of Thermoplastic Pressure Pipe.” When installing in a bore hole, make sure any ballast used will not damage the piping.



Standard Coils



U-Bend Welder



U-Bend Coils

Standard Put Ups

Blue Diamond runs Geothermal U-bend and standard coils in the following sizes. U-bend coils are typically supplied with 5 feet of extra piping on each the supply and return loops to facilitate connection to the header.

COIL PIPE SIZE	U-BEND COILS	STANDARD COILS
3/4"	310'	300'
	410'	400'
	610'	600'
1"	310'	300'
	410'	400'
	610'	600'
1 1/4"	310'	300'
	410'	400'
	510'	500'
HEADER MATERIAL	STICK LENGTHS	
2"	20'/40'	
3"	20'/40'	
4"	20'/40'	
6"	20'/40'	



FOR MORE INFORMATION ON GEOTHERMAL PRESSURE PIPE
CONTACT BLUE DIAMOND INDUSTRIES