www.geoproinc.com | (877) 580-9348

Heat Transfer

Nu	h
118.76	345.22

GeoPro, Inc.
THE ORIGINAL DEVELOPER OF THERMALLY ENHANCED GROUTS

Pipe Headloss Calculator

Pipe Selection

Pipe Material: Polyethylene
DR/SCH/TYPE: DR-11
Nominal Size: 1-1/4"
☐ U-Bend Pipe

Fluid Flow Information

Beginning Flow Rate (gpm): 8.50
Flow Rate Intervals (Step): 0.00

NOTE: Ensure to Refresh Each Pulldown for Every Use

Pipe Selection Verification

Pipe Information					
	Pipe Type	Polyethylene		DR/SCH/TYPE	DR-11
	Nominal Size (ID)	1-1/4"	(1.358")	Pipe Volume	7.53 gal / 100'

Circulating Fluid Information

Circulating Fluid: Water
Temperature

Fluid Selection Verification

Fluid Information					
	Fluid Type	Water		Visc. (cp)	1.55
	Conc. / Temp.	100%	40	Density (lb_m/ft^3)	62.43

32 °F Estimated Freeze Point

Head Loss Calculations

GPM	Vel. (ft/sec)	Re Number	HL* (ft./100 ft)	PD (lbs./100 ft)
8.50	1.88	12,799	1.41	0.61
8.50	1.88	12,799	1.41	0.61
8.50	1.88	12,799	1.41	0.61
8.50	1.88	12,799	1.41	0.61
8.50	1.88	12,799	1.41	0.61
8.50	1.88	12,799	1.41	0.61
8.50	1.88	12,799	1.41	0.61
8.50	1.88	12,799	1.41	0.61
8.50	1.88	12,799	1.41	0.61
8.50	1.88	12,799	1.41	0.61
8.50	1.88	12,799	1.41	0.61
8.50	1.88	12,799	1.41	0.61
8.50	1.88	12,799	1.41	0.61
8.50	1.88	12,799	1.41	0.61
8.50	1.88	12,799	1.41	0.61
8.50	1.88	12,799	1.41	0.61
8.50	1.88	12,799	1.41	0.61
8.50	1.88	12,799	1.41	0.61
8.50	1.88	12,799	1.41	0.61
8.50	1.88	12,799	1.41	0.61

NOTES:

1) Head Loss (HL) is determined using the Darcy-Weisbach eq. { $(HL)_f = f * (L/D) * (V^2/2g)$ }
2) PEX, Polyethylene, PVC, and Copper Assumed Smooth - Churchill equation used to calculate friction factors
3) Steel Assumed to Have Effective Roughness of $1.8*10^{-6}$ inches (ASHRAE Fundamentals). Swamee-Jain Equation Used to Calculate Friction Factors
4) Rubber Hose Assumed to Have Effective Roughness of $4.0*10^{-4}$ inches (Fluid Mechanics - Cengel). Swamee-Jain Equation Used to Calculate Friction Factors
5) Refer to state and local regulations to ensure compliance when selecting circulating fluid type for use with the ground heat exchanger portion of a geothermal heat pump system (GSHP)

www.geoproinc.com | (877) 580-9348

Heat Transfer

Nu	h
92.53	268.97

Pipe Headloss Calculator

GeoPro, Inc.
THE ORIGINAL DEVELOPER OF THERMALLY ENHANCED GROUTS

Pipe Selection

Pipe Material	Polyethylene
DR/SCH/TYPE	DR-11
Nominal Size	1-1/4"

☐ U-Bend Pipe

Fluid Flow Information

Beginning Flow Rate (gpm)	6.50
Flow Rate Intervals (Step)	0.00

NOTE: Ensure to Refresh Each Pulldown for Every Use

Pipe Selection Verification

Pipe Information					
	Pipe Type	Polyethylene		DR/SCH/TYPE	DR-11
	Nominal Size (ID)	1-1/4"	(1.358")	Pipe Volume	7.53 gal / 100'

Circulating Fluid Information

Circulating Fluid: Water

Temperature

Fluid Selection Verification

Fluid Information					
	Fluid Type	Water		Visc. (cp)	1.55
	Conc. / Temp.	100%	40	Density (lb_m/ft^3)	62.43

32 °F Estimated Freeze Point

Head Loss Calculations

The desired range for head loss is 1-3 ft of head loss per 100' of pipe length

GPM	Vel. (ft/sec)	Re Number	HL* (ft./100 ft)	PD (lbs./100 ft)
6.50	1.44	9,787	0.89	0.38
6.50	1.44	9,787	0.89	0.38
6.50	1.44	9,787	0.89	0.38
6.50	1.44	9,787	0.89	0.38
6.50	1.44	9,787	0.89	0.38
6.50	1.44	9,787	0.89	0.38
6.50	1.44	9,787	0.89	0.38
6.50	1.44	9,787	0.89	0.38
6.50	1.44	9,787	0.89	0.38
6.50	1.44	9,787	0.89	0.38
6.50	1.44	9,787	0.89	0.38
6.50	1.44	9,787	0.89	0.38
6.50	1.44	9,787	0.89	0.38
6.50	1.44	9,787	0.89	0.38
6.50	1.44	9,787	0.89	0.38
6.50	1.44	9,787	0.89	0.38
6.50	1.44	9,787	0.89	0.38
6.50	1.44	9,787	0.89	0.38
6.50	1.44	9,787	0.89	0.38
6.50	1.44	9,787	0.89	0.38

NOTES:

1) Head Loss (HL) is determined using the Darcy-Weisbach eq. { $(HL)_f = f * (L/D) * (V^2/2g)$ }
2) PEX, Polyethylene, PVC, and Copper Assumed Smooth - Churchill equation used to calculate friction factors
3) Steel Assumed to Have Effective Roughness of $1.8*10^{-6}$ inches (ASHRAE Fundamentals).
   Swamee-Jain Equation Used to Calculate Friction Factors
4) Rubber Hose Assumed to Have Effective Roughness of $4.0*10^{-4}$ inches (Fluid Mechanics - Cengel).
   Swamee-Jain Equation Used to Calculate Friction Factors
5) Refer to state and local regulations to ensure compliance when selecting circulating fluid type for use with the ground heat exchanger portion of a geothermal heat pump system (GSHP)