

# PERTINENT DATA

Description	
Gi-4™ is a revolutionary engineered heat exchanger designed to improve the performance of vertical geothermal well fields. With its certified design and third party testing, Gi-4 maximizes the heat exchanged with the formation, while minimizing the thermal pollution between the fluid supply and return ports.	
Characteristics	
Material	HDPE 100 (PE4710)
Fusion	IGSHPA and GI certified – Standard fusion tools for 4” HDPE SDR 11
Large Port	3.7404 sq in    10.6375” perimeter    1.4065 Hydraulic Diameter $\Delta P$ H <sub>2</sub> O @ 60°F 11 GPM 1.86 Ft HD or 0.81 psi per 100 Feet $\Delta P$ 10% Glycol @ 35°F 11 GPM 2.20 Ft HD or 0.95 psi per 100 Feet $\Delta P$ 20% Glycol @ 30°F 11 GPM 2.50 Ft HD or 1.08 psi per 100 Feet
Small Port	2.1081 sq in    6.5567” perimeter 1.2861 Hydraulic Diameter $\Delta P$ H <sub>2</sub> O @ 60°F 11 GPM 2.98 Ft HD or 1.29 psi per 100 Feet $\Delta P$ 10% Glycol @ 35°F 11 GPM 3.36 Ft HD or 1.45 psi per 100 Feet $\Delta P$ 20% Glycol @ 30°F 11 GPM 3.82 Ft HD or 1.65 psi per 100 Feet
End Caps	$\Delta P$ H <sub>2</sub> O @ 60°F 11 GPM 0.07 Ft HD or .028 psi per 100 Feet $\Delta P$ 10% Glycol @ 35°F 11 GPM 0.21 Ft HD or .090 psi per 100 Feet $\Delta P$ 20% Glycol @ 30° F 11 GPM 0.23 Ft HD or .010 psi per 100 Feet

Properties	
Gi4 Thermal Resistance*	0.036h*ft*°F/Btu
6” Borehole Total Thermal Resistance	1.00 grout    0.096 h*ft*°F/Btu 0.88 grout    0.104 h*ft*°F/Btu
Minimum flow rate for turbulent flow	7 GPM
Maximum flow rate recommended	15 GPM
Capacity per LF	0.3038 Gal (sum of capacity of both S & R ports)
Grout required	81 gallons/100 LF in a 6”Ø Borehole
Reduction in total LF of active HX compared with 1-1/4” U-bend (depending on formation conductivity)	60-70% (@ 1.6 Formation Thermal Conductivity +/- 66%) 100 LF of Gi4 is equivalent to +/- 300 LF of 1-1/4” U -bend

Availability	
Shipping	Pallets of 20’ sticks – 28 sticks/pallet (560 LF) FOB Orion, M I
Order Size	Most orders < 10,000 ft. filled from stock, orders > 10,000 ft. scaled 30-90 days

\*These values are not for use with most commercial field calculation software. They will return a field that design that is larger than required. Field calculations must be run by Geothermal Innovations to insure a proper design. Alternately, the following values must be modified when using GLD Software (available from Gaia Geothermal, LLC). The Thermal Conductivity of the formation calculated from insitu data must be multiplied by 1.8. The Thermal Diffusivity calculated from insitu data must be used. The BTR (Borehole Thermal Resistance) value must be changed to 0.01. This will return the results supported by insitu data using Gi4 with 0.88 Thermal Conductivity Grout in a 6” diameter borehole.