

# CO<sub>2</sub> 自然循環を用いる高効率地中熱回収システム

## Geothermal Recovery System Using Natural Circulating CO<sub>2</sub> as A Heat Transfer Fluid

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### Summary

In the conventional system, heat is recovered as sensible heat through liquid anti-freezer circulating in a piping laid underground, but if CO<sub>2</sub> is used as a heat transfer fluid, heat is recovered as latent heat which increases the capacity and enables to promote downsize of the equipment and reduction of the electric consumption. It also enables the diameter or the length of heat recovery piping for the same heat exchange performance, thus the installation cost of the piping would be reduced. In our study, a geothermal recovery system using CO<sub>2</sub> for air-conditioning was installed, and the heating capacity and the electric consumption were measured. Also, those of a conventional propylene-glycol system were measured. As a result, the CO<sub>2</sub>-system exerted the same heating ability with the propylene-glycol system with a half length of heat recovery piping and a half electric consumption of the propylene-glycol system. And the reduction in the diameter of the CO<sub>2</sub> recovery piping was possible to 50 mm at most to gain more than adequate heating effect.

**Key words:** Heat pump, Air conditioning system, Geothermal recovery system, Heat transfer fluid, CO<sub>2</sub>, Latent heat, Downsizing, Electric consumption

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