Energy saving of cold/hot water pumps for central air-conditioning systems of buildings

Pipe Drag-reducing Additive ECOMISEL

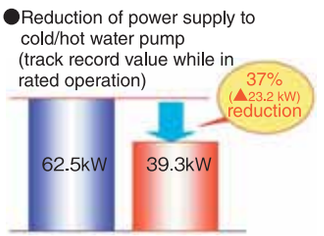
Features

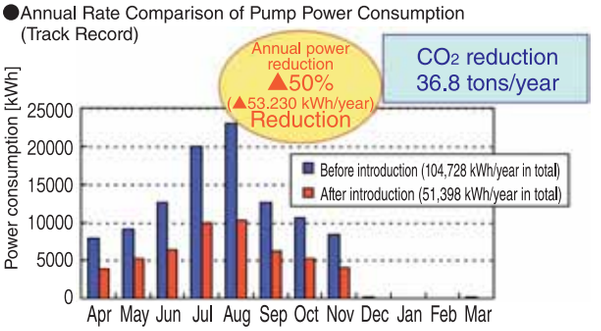
- Saves the power of cold/hot water pumps for central air-conditioning systems by approximately 30%.
- Applicable to both new and existing buildings that have inverter-type cold-hot water pumps.
- A store building with a total floor area of 14,000 m² has been saving 53,000 kWh with a CO_2 reduction of 36 tons annually.

Overview (Technical principles, actions, etc.)

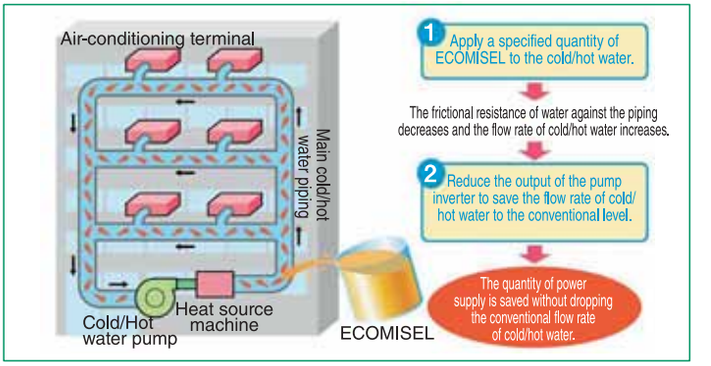
- A pipe drag-reducing additive is a water additive that contains a specific organic salt as a main ingredient. When the specific organic salt is added to water at the rate of several hundreds of parts per million, the self-organization action of the specific organic salt under Van der Waals' forces gathers the molecules of the specific organic salt and forms nano-sized aggregates (called cylindrical micells) each consisting of several hundreds to thousands of molecules. These aggregates change the turbulent flow of water into a pseudo layer flow, thus reducing loss of water pressure and saving the power of devices, such as pumps, employed for the transfer of the water.
- Osaka Gas's pipe drag-reducing additive ECOMISEL demonstrates a 70% pressure loss reduction in straight piping portions. The effect of pressure loss reduction is mitigated in bent piping and valve parts. ECOMISEL, if used in a building, however, ensures an approximately 30% pressure loss reduction in the entire building. Furthermore, the power consumption of the air conditioner pumps for the building will be saved by approximately 30%.
- Conventional materials degrade the heat transfer performance of heat source machines and air-conditioning terminals with a reduction in pump power. The greatest feature of Osaka Gas's pipe drag-reducing additive ECOMISEL as a new material, however, is that it does not cause the degradation of heat transfer under such conditions.

Site: Store building
Total floor area: 14,000 m²
Rated air-conditioning capacity:2,532 kW (720 RT)
Supply quantity of ECOMISEL: 40 kg





Introductory Effect Example



Introduction Image of ECOMISEL to Central Air-conditioning System for Building

Introductory Track Record

Introduced in China

Building use	Place	Total floor area (m²)
Office building	Shanghai, China	11,100
Office building	Shanghai, China	13,800
Office building	Shanghai, China	15,000

Effects

◎The cold/hot water pump power of central air-conditioning systems for office buildings can be saved by approximately 30%. Two examples are shown below.

①Example of Introduction to Office Building

[Total floor] 26,500 m² [Use] Office building
[Track record of saved power consumption of cold/hot water pumps] 30% (7.657 kWh/year)
[Amount of CO_2 reduction] 5.3 tons/year

②Example of Introduction to Store Building

[Total floor] 14,000 m² [Use] Store building
[Track record of saved power consumption of cold/hot water pumps] 50% (53,330 kWh/year)
[Amount of CO_2 reduction] 36.8 tons/year

Applicable field
Central Air-conditioning Systems for Office Buildings, Stores, Hospitals, and Factories

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