Energy

Utilization of Hydrocarbon Refrigerant (GF-08)

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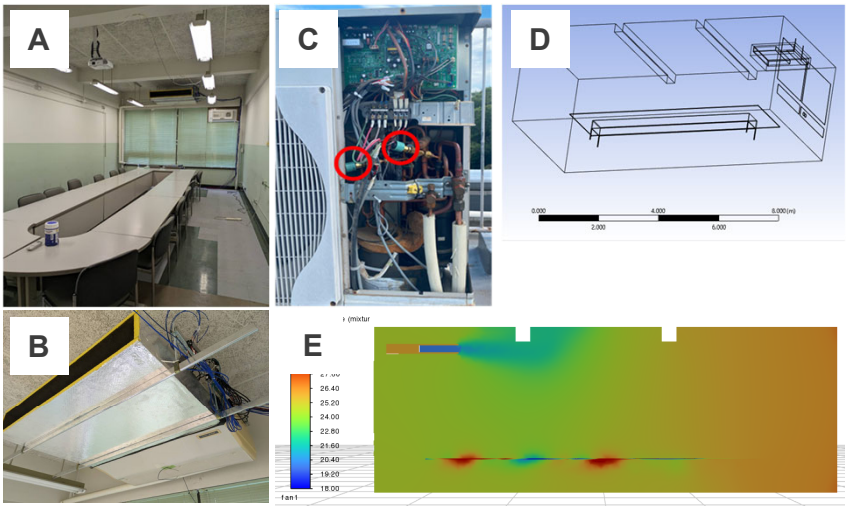
Purpose of Research

—Currently, due to stricter regulations on fluorinated refrigerants under the EU‘s proposed regulations (PFAS, F-Gas), air conditioning (A/C) systems are required to use natural refrigerants (ammonia, CO2, hydrocarbons, etc.). This research evaluates the energy efficiency of GF-08, a mixed refrigerant of propane and propylene, and examines the usefulness of GF-08-based systems to promote its adoption.

Summary of Research

This research evaluated the energy-saving performance of GF-08. The experimental evaluation involved installing GF-08 in an A/C unit in a university conference room, measuring the thermal environment and the refrigerant's operating pressure. The theoretical evaluation calculated power consumption based on the refrigerant's properties and simulated the thermal environment using computational fluid dynamics (CFD).



A：Target Room B：A/C C：Pressure measurement
D：CFD model E：Simulation result

Points

- ✓ Verification of energy efficiency through actual measurement tests
- ✓ Simulation of thermal environment using CFD analysis

Comparison with Conventional or Competitive Technologies

- ➢ GF-08 has a lower GWP and superior energy efficiency compared to conventional refrigerants (R410A, R32).

Expected Applications

- ➢ Utilization of drop-in refrigerants (without equipment modification) in residential and office A/C.

Challenges in Implementation

- ➢ GF-08 is used as a drop-in refrigerant, but dedicated A/C units for GF-08 are required to promote its widespread adoption.

Looking for the collaborative companies

- ➢ We are seeking companies willing to collaborate on the development of this A/C unit(esp. compressor).

Future Developments

Focusing on the quality of produce as the cooled item, we intend to develop a cooking system using GF-08 that combines energy efficiency with additional value-added features.

■ Associated System:	None
■ Awards:	None
■ Intellectual Property:	None
■ Prototype:	None
■ Sample	None

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