

Keynote Lecture 2

Latest simulation & actual system evaluation technologies using next generation refrigerants

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Biography:

2020	President, Strategic open innovation consortium of next generation heat pump technologies
2018	Director, Mathematical energy conversion engineering, Research organization for open innovation strategy
2018	President, Japan air-conditioning and refrigeration testing laboratory
2014	Vice dean of school of fundamental science and engineering, Waseda University
2014	Visiting professor, University of Indonesia
2011	Visiting professor, University of the Philippines
2008-Present	Professor, Waseda University

- Vice president of E2 (Heat pump) division, International institute of refrigeration
- Former Managing director, Japan Society of Refrigerating and Air Conditioning Engineers
- Former chairman of environmental engineering division, Japan Society of Mechanical Engineers

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ABSTRACT

In heat pump, refrigeration and air-conditioning technologies, there is an urgent need to switch the current refrigerants to the next-generation low GWP refrigerants. As next-generation refrigerants, non-azeotropic refrigerants with a large temperature glide, which is a mixture of multiple refrigerants including HFO refrigerants, has also been proposed.

Since the behavior of the system that uses such a refrigerant is significantly different from that of conventional one that uses a single refrigerant or an azeotropic mixed refrigerant, it is necessary to evaluate its theoretical performance and the operating performance of the actual system.

Through NEDO project, we have developed a simulator that can evaluate the unsteady state performance and LCCP of heat pump related technologies using next-generation refrigerants.

Furthermore, we have developed a hybrid-type performance evaluation equipment that can measure the actual system operating performance in a reproducible manner with an environmental test room that adopts the tunnel-type air enthalpy method and the virtual load calculator. I will explain these latest simulation and evaluation method.