Keynote Lecture 2

Latest simulation & actual system evaluation technologies using next generation refrigerants

Prof. Kiyoshi Saito

Professor, Waseda University, School of fundamental science and engineering, department of applied mechanics & aerospace engineering
Director, Institute of mathematical energy conversion engineering, Research organization for open innovation strategy

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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Kiyoshi SAITO\textsuperscript{(a), (b)}

\textsuperscript{(a)} Waseda University, School of fundamental science and engineering, department of applied mechanics & aerospace engineering.

\textsuperscript{(b)} Institute of mathematical energy conversion engineering, Research organization for open innovation strategy.

saito@waseda.jp

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.