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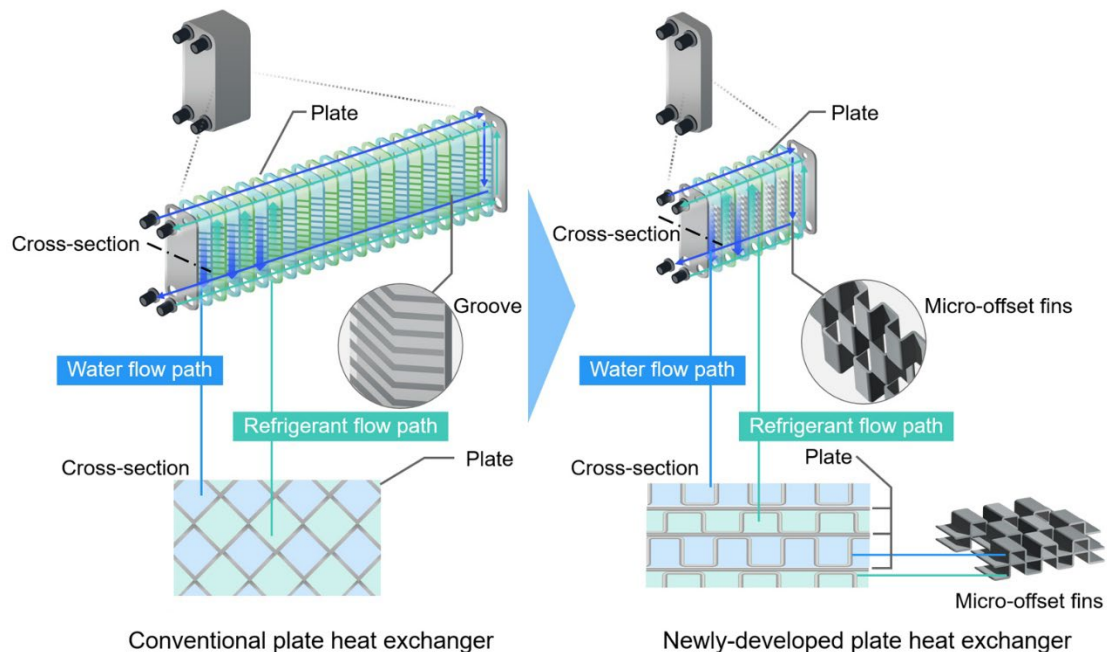
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Mitsubishi Electric's New Plate Heat Exchanger Delivers 3x Conventional Heat Transfer Performance

Reduces refrigerant charge to one-third for lower environmental impact and enhanced safety



Comparison of plate heat exchanger structures

TOKYO, September 14, 2026 – [Mitsubishi Electric Corporation](https://www.mitsubishielectric.com) (TOKYO: 6503) announced today that it has developed a plate heat exchanger for heat pump¹ cooling and heating equipment with industry-leading² heat transfer performance – triple³ that of conventional models. Specifically, the new heat exchanger reduces the number of plate layers allowing the refrigerant charge to be reduced to approximately one-third that of conventional levels, resulting in lower environmental impact and improved safety.

The urgent need to achieve carbon neutrality has led to stricter refrigerant regulations, requiring a shift to next-generation refrigerants and a reduction in the refrigerant charge in heat pump cooling and heating equipment. While next-generation refrigerants like R32 have a lower Global Warming Potential (GWP), many are

¹ A system that transfers heat from the environment (air, water, etc.) for heating or cooling.

² As of September 14, 2026, according to Mitsubishi Electric's research on plate heat exchangers for heat pump-type cooling/heating equipment.

³ Compared to Mitsubishi Electric's conventional grooved plate heat exchangers.

flammable, making it essential to minimize their volume to reduce the danger of accidental leaks. Although increasing heat transfer performance reduces the refrigerant charge, conventional heat exchangers with grooved plates perform insufficiently. Inserting micro-offset fins⁴ between the flat plates was considered to promote heat transfer, but tests confirmed that the refrigerant's gas-liquid two-phase flow does not distribute uniformly across an entire plate.

Mitsubishi Electric's new plate heat exchanger has distribution channels at the fluid inlets and outlets that ensure uniform refrigerant flow across plates, even those fitted with micro-offset fins. The result is an even distribution of gas-liquid two-phase flow refrigerant. Channel placement was optimized using proprietary analysis technology that simulates the complex flow of two-phase refrigerants between fine fins. As a result, Mitsubishi Electric has achieved industry-leading heat transfer performance, approximately three times that of conventional heat pump-type cooling and heating equipment.

This technology can be applied to a wide range of products, including water-based cooling and heating equipment, heat pump systems for electric vehicles (EVs) and air-cooled air conditioners. Mitsubishi Electric plans to incorporate this new technology into its diverse product lineup to contribute to global efforts to achieve carbon neutrality.

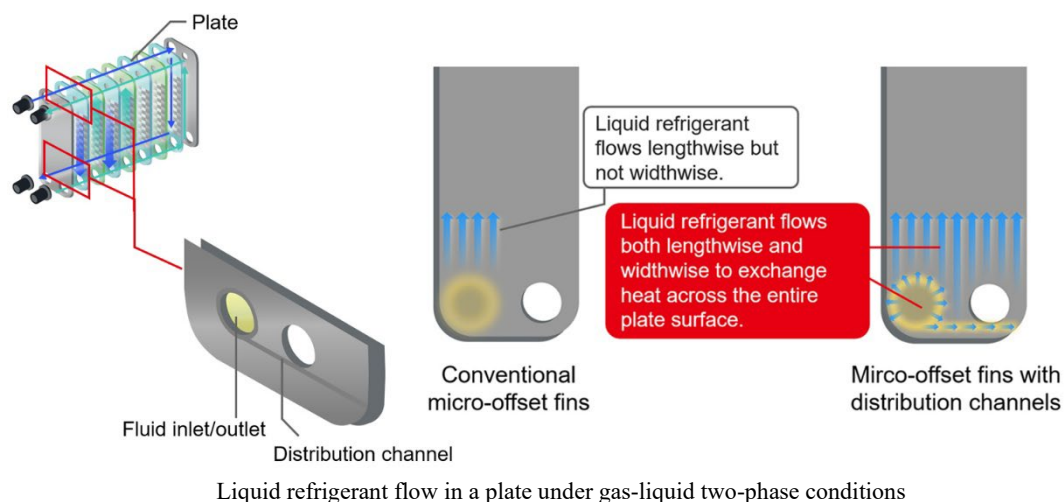
Features

1) Micro-offset fins placed between flat plates significantly enhance heat transfer

- To overcome the performance limitations of conventional heat exchangers that use grooved plates, Mitsubishi Electric developed a new structure featuring high-density micro-offset fins between flat plates. This new structure significantly improves heat transfer.

2) Distribution channels at fluid inlets/outlets ensure uniform liquid distribution

- To address the problem of refrigerant drift due to non-uniform flow caused by micro-offset fins, distribution channels were installed around the fluid inlets and outlets to ensure more uniform liquid distribution.
- Proprietary analysis technology was used to simulate complex two-phase (gas and liquid) flow between the micro-offset fins. The results were used to optimize channel placement to uniformly distribute the two-phase refrigerant across the entire plate.



⁴ A structure where fine fins are arranged in an offset pattern to promote turbulence and heat transfer.

3) *Refrigerant charge reduced to one-third by enabling fewer plate layers*

- The threefold increase in heat transfer performance enables a significant reduction in the number of plate layers, cutting the required refrigerant charge by two-thirds in a plate heat exchanger. This reduction lowers the environmental load and enhances safety as the use of flammable next-generation refrigerants accelerates in response to stricter regulation of fluorocarbons with high GWP.

Future Development

Mitsubishi Electric plans to expand the use of this new technology to a wide range of products, including commercial and residential cooling and heating equipment, as well as heat pump systems for EVs that use water or coolant, thereby contributing to a more carbon-neutral world.

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About Mitsubishi Electric Corporation

Guided by its corporate philosophy, Mitsubishi Electric Corporation (TOKYO: 6503) places sustainability at the core of its operations and values stakeholder trust—encompassing society, customers, shareholders and employees. In pursuing profitability, capital efficiency and growth, Mitsubishi Electric works closely alongside customers to develop value-added solutions that address today's complex challenges while enhancing the company's sustainable corporate value.

Founded in 1921, Mitsubishi Electric has over a century of experience in delivering reliable, high-quality products and solutions. With over 200 group companies and approximately 150,000 employees worldwide, the company is a recognized global leader in manufacturing, marketing and selling electrical and electronic equipment and systems across a broad range of sectors, including public utility systems, energy systems, defense and space systems, factory automation systems, automotive equipment, building systems, air conditioning systems & home products, digital innovations, and semiconductor & devices.

Mitsubishi Electric recorded consolidated revenue of 5,894.7 billion yen (U.S.\$ 36.8 billion*) in the fiscal year that ended on March 31, 2026. For more information, please visit www.MitsubishiElectric.com

*JPY 160=USD 1, the approximate rate on the Tokyo Foreign Exchange Market on March 31, 2026