CASE STUDY

COPELAND HEATING SOLUTIONS

Advancing Water Heating Efficiency and Sustainability

Breakthrough hot water technologies power efficiency gains, sustainability ambitions, and new domestic and offshore business opportunities for Thai manufacturers

Thai company, GR Tech is providing hot water heat pumps - installed with cutting-edge Copeland ZWV112 compressor technology - to help existing customers reach new levels of reliability, fuel savings (up to 50% in some cases), and sustainability. These outcomes are helping GR Tech to boost new business locally and offshore, and target customers in diverse sectors who have high-temperature water needs in their processes.

GR Tech (Thailand) Co., LTD is a respected provider of heating systems in Thailand. Under its HEAT brand, GR Tech has produced heat pumps for factories, hotels, and hospitals for more than 10 years. It also provides consultation, installation, maintenance, and optimization services and advice.

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The need

Hot water is the lifeblood of industry and this is the case in Thailand which has well-developed manufacturing (auto, electronics), agricultural, service, tourism, and hospitality sectors.

Demand for hot water is particularly strong in Thailand's manufacturing sector and while mid-temperature water (60-70°C) is sufficient for many factories, hotels, and hospitals, there is a rising need for high and ultra-high-temperature water (70-90°C) to support industry-specific tasks.

Food processing plants, for instance, need high-temperature water to kill bacteria to sterilize facilities. Other industries requiring a sterile manufacturing environment include bottle-washing facilities, and hospitals.

To meet the rising demand for 70-80°C water, some factory owners - using GR Tech mid-temperature heat pumps - have added new processes, to produce high-temperature water. Several users have added boilers, powered by LPG or thermal oil to drive up the heat of the 60°C water produced by GR Tech heat pumps. While effective, these adapted solutions are neither safe nor cost-effective because they are energy-hungry – they also require more engineers to track potential boiler pressure dangers.

Sustainability is another issue. Compared to electricity-powered water heating solutions, LPG gas emit more greenhouse gas emissions. Given these factors, GR Tech engineers have advised customers - with high-temperature water needs - to adopt new heat pump technologies sooner rather than later.

Lower fuel costs, and enhanced efficiencies to reduce carbon footprint, while earning carbon credits are cited as strong outcomes and incentives to change. In terms of carbon credits, companies that emit less than their set amount of greenhouse gases can sell their unused "credits" to other companies that have exceeded their limits.

Reduced emissions also allow local companies to expand their business beyond Thailand. For example, if a Thai auto parts manufacturer wants to sell parts to customers in Europe, they have to meet comprehensive trading conditions set by the European Union, including strict emissions standards and carbon reduction best practices.

A solution ticking many boxes

GR Tech customers needing high-temperature water have switched from boilers and heaters to implement the company's high-heat heat pumps that feature the best components available today.

In terms of key components, ZWV112 compressors deliver significant performance outcomes for customers including:

95°C

- High-temperature water up to 70-80°C and ultra-high temperature water up to 95°C

- Best-in-class part load and full-load performance enabling customers to meet energy efficiency standards

Features-wise, the compressor's low Global Warming Potential option is coupled with a 36kW inverter drive to optimize efficiency and reliability.

The inverter system plays a key role. Enabling precise control - to provide high accuracy in temperature regulation and heat stability - the inverter lifts system performance to new levels. Precision control also enables hot or cold air (produced as a byproduct of the new process) to be repurposed, e.g. to dry materials or used to cool facilities to lower air conditioning demands. Installation is also straightforward allowing customers to save time and money on this front.

New business prospects

With the impact of ZWV112 compressors, GR Tech is stepping up efforts to target new customers requiring high-temperature (70-80°C) and ultra-high-temperature water (up to 95°C) by providing them with customized solutions to meet diverse needs including energy reduction and recycling, cost savings, enhanced reliability, and exceeding environmental targets.

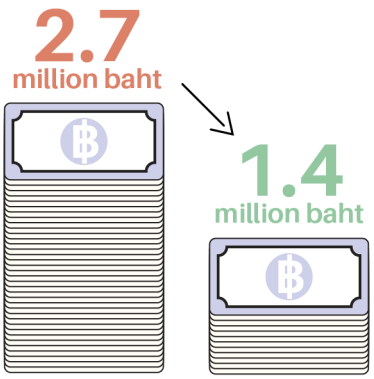
One electric cable manufacturer customer, for instance, is realizing dual benefits from a new heat pump using a ZWV112 compressor. In addition to generating hot water, the heat pump also produces hot air as a byproduct, which is used to dry power cables. The heat pump (replacing an electric heater) is also anticipated to help the manufacturer enjoy significant energy use and cost savings.

The cable manufacturer expects to halve annual energy expenses. While the previous annual energy bill - from using an electric heater - was 2.7 million baht (USD 74K), the new cost calculation is 1.4 million baht per year (USD 38K) thanks to the new heat pump technology. All things being equal, the customer anticipates saving 1.27 million baht (USD 35K) per year. The cost of the heat pump was 2.4 million baht (USD 66.5K).

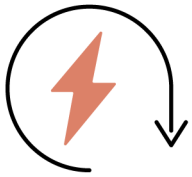
The introduction of ZWV112 compressors has also allowed GR Tech to pursue new business with industries using heat pumps to heat and control humidity in drying chambers. This process is especially important for food producers because drying to remove moisture is an essential step to stop bacteria, yeast, and mold from spoiling items such as dried fruit, vegetables, and meat.

Updated heat pumps are also making a difference in moisture control processes. Heating and cooling systems provide precise levels of humidity – this is an important requirement for pharmaceutical companies and hospitals which need sterile environments enabled by precisely controlled heat and humidity conditions.

About 5% of GR Tech's customers currently use heat pumps – installed with ZWV112 compressors – and they have enjoyed great results. On average, they have reduced their energy costs by 40-50% which is making a major difference in terms of carbon reduction, operating reliability, and savings to the bottom line.



REDUCED ENERGY COST



40-50%

ENERGY SAVING

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