Customer Success Story

Swire Partners with Trane to Create a Greener Built Environment at Two Taikoo Place

Project Highlights

Customer Name	Swire Properties Limited
Building Location	Two Taikoo Place, Quarry Bay, Eastern District, Hong Kong
Products Used	Nine Trane® CenTraVac® Water-Cooled Centrifugal Chillers

Two Taikoo Place by Swire Properties

The Challenge

Two Taikoo Place, a newly constructed property located in Quarry Bay of the Eastern District and owned by Swire Properties Limited, is one of the most sought-after business addresses in the city. Built to the highest sustainability standards, the triple Grade A rated office tower has achieved the highest Platinum ratings for LEED, Provisional BEAM Plus and WELL Pre-certification.

Swire Properties was the first real estate developer in Hong Kong and Mainland China to have its new 1.5°C-aligned science-based targets approved in 2021. It is now on track to achieve net-zero emissions by 2050. As a key part of the Taikoo Place redevelopment project, Two Taikoo Place has embedded sustainability into its features to meet green building benchmarks at both the local and global levels.

Trane's Solution

Two Taikoo Place has been designed and built by Swire Properties with an aim to save **35%** of energy consumption based on the American Society of Heating, Refrigerating and Air-Conditioning Engineers' (ASHRAE) baseline Standard 90.1. Hence, the leading property developer was keen to adopt a more aggressive and sustainable energy solution.

Trane Hong Kong, having maintained a long-term partnership with Swire Properties, was in the best position to help it meet its sustainability goal.

Trane recommended adopting its CenTraVac® Water-cooled Centrifugal chillers, applying environment friendly hydrofluoroolefin (HFO) refrigerant R514A with low Global Warming Potential (GWP) of less than 2 to achieve ultra-high energy efficiency and eventually meet the customer's sustainability goals.

The simple, robust, low-speed, direct-drive design of Trane® CenTraVac chillers enables reliable performance, reduces maintenance costs, and ensures quiet, vibration-free operation to maintain a pleasant built environment. Trane CenTraVac Chiller with HFO R514A is also among the first commercial chillers in Hong Kong that have earned the highest Green Product Accreditation and Standards rating of Platinum granted by the Construction Industry Council (CIC). It has fulfilled stringent third-party requirements such as the BEAM Plus on the procurement of sustainable building materials.

Project Implementation

- **Selecting the Right Chillers**

Trane collaborated with Swire Properties to determine the chiller options. Since the chiller plant would consume more than 20% of the building's energy use, the project team performed a life-cycle cost analysis and extensive modelling of several chiller options to explore the right solution for the project.

After reviewing the chiller analysis, the team selected nine ultra-efficient Trane CenTraVac water-cooled centrifugal chillers for the plant at Two Taikoo Place, aiming to meet full-load efficiency of 6.35 which was about 8% higher than what is required by the law.

Seven 1,000-ton and two 500-ton Trane CenTraVac centrifugal chillers were installed at the premises to handle the cooling needs of the new triple Grade-A office tower. Being part of the EcoWise™ portfolio of Trane's products, these chillers were designed using cutting-edge technology to achieve the highest efficiency, lowest possible emissions, and most reliable performance.

- **Aligning with Sustainability Approach**

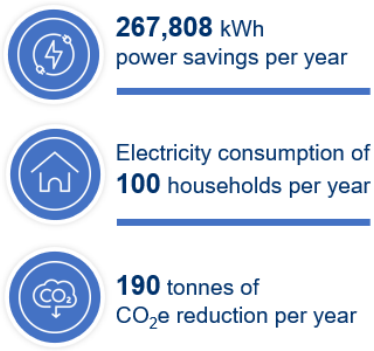
Reducing carbon emissions is the top priority in achieving sustainability. Environmental sustainability is at the heart of Trane CenTraVac design. Low pressure refrigerants operate in a vacuum, virtually eliminating leaks and enabling near-zero emissions. In addition, the next-generation refrigerant R514A, featuring non-ozone depleting and low GWP, offers excellent capacity and energy efficiency.

- **Confirming Best Performance via Tests**

To confirm the chiller actual performance in customer-specified conditions matches the modelling predictions established during the selection, performance testing was conducted for every single unit at the Trane facility in the USA. All chiller units have gone through various tests, including but not limited to full and part load operation test, variable flow demonstration test, rapid restart function test etc.

Key Outcomes

After running Trane's TRACE 700 design and energy/economic analysis programme for simulation and analysis of the chiller plant, we found that the overall electricity consumption at Two Taikoo Place could be lowered by **267,808 kWh** per year, in comparison with the ASHRAE's minimum energy efficiency requirements as set out in its Standard 90.1. That is equivalent to the savings of electricity for use by 100 local households in one year, which could lead to annual reduction in carbon emissions of more than 190 metric tons.



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客戶成功故事

太古地產與特靈協力締造更環保的太古坊二座建築環境

項目摘要

客戶名稱	太古地產有限公司
建築位置	香港東區鰂魚涌太古坊二座
使用的產品	九台特靈®CenTraVac®水冷離心式冷水機組

太古地產太古坊二座

迎接挑戰

位於東區鰂魚涌的太古坊二座由太古地產有限公司興建，是香港最受歡迎的商業地標之一。這座新落成的甲級辦公大樓採用最高級別的可持續發展標準施工，已獲得能源與環境設計先鋒（LEED）最高等級的鉑金級認證，並且取得綠建環評（BEAM Plus）臨時鉑金級認證及 WELL 建築標準下的鉑金級預認證。

太古地產是香港和中國內地首家在 2021 年獲科學基礎目標倡議組織（SBTi）批核其 1.5°C 科學基礎減碳目標的地產發展商，目前正朝著於 2050 年前達致淨零碳排放的目標邁進。作為太古坊重建計劃項目的重要組成部分，太古坊二座將可持續發展融入其建築特色中，務求達致本港及全球綠色建築基準。

特靈方案

作為領先地產發展商的太古地產在設計建造太古坊二座時，便致力在美國供暖製冷及空調工程師學會（ASHRAE）的基線標準 90.1 上節省35%的能源消耗，因此期望採用更加進取並且可持續的能源方案。

特靈香港與太古地產保持長期合作關係，是協助太古地產實現可持續發展目標的最佳選擇。

特靈建議安裝 CenTraVac®水冷離心式冷水機，該冷水機使用全球變暖潛能值（GWP）低於 2 的環保型氫氟烯烴（HFO）製冷劑 R514A，以實現超高能源效益，從而最終實現客戶的可持續發展目標。

特靈®CenTraVac 冷水機採用簡單設計，材質堅固，以低速、直接驅動的方式運行，性能可靠，能降低維修成本，並確保運行安靜、無振動，以維持舒適的建築環境。配備 HFO 製冷劑 R514A 的特靈 CenTraVac 冷水機也是香港首批獲得建造業議會（CIC）頒發最高綠色產品認證及標準評級（鉑金）的商用冷水機之一。它滿足了嚴格的第三方要求，例如取得有關採購可持續建築材料的 BEAM Plus 認證。

項目實施

- **挑選合適的冷水機組**

特靈與太古地產合作以釐定冷水機方案。由於冷水機房的能源消耗佔比將達到 20%以上，因此項目團隊對多種冷水機選項進行了生命周期成本分析及廣泛建模，以探索適合該項目的解決方案。

在對可用的冷水機進行審視及分析後，特靈團隊為太古坊二座機房挑選了九台具有超高能效的特靈 CenTraVac 水冷離心式冷水機組，旨在達到 6.35 的滿負荷效率，比法例所要求的高出約 8%。

特靈在機房安裝了七台 1,000 噸及兩台 500 噸特靈 CenTraVac 離心式冷水機，以滿足該座全新甲級辦公大樓的製冷需求。這些冷水機屬於特靈 EcoWise™產品組合，以尖端科技設計而成，可實現最高效率、最低碳排放及最可靠的性能。

- **秉持可持續發展方針**

減少碳排放是實現可持續發展的重中之重。環境可持續性是特靈 CenTraVac 產品設計的核心。低壓製冷劑在真空中運行，從本質上消除了洩漏問題，因而可實現近乎零排放。此外，新一代製冷劑 R514A 具有不破壞臭氧層及低 GWP 的特點，可提供出色的容量及實現超高能源效益。

- **透過測試確保最佳性能**

為了確保冷水機組在特定客戶環境下的實際性能與挑選期間透過建模所預測的情況相符，特靈在位於美國的廠房對每台機組進行性能測試。所有冷水機組都經過了多項測試，包括但不限於滿負荷及部分負荷運行測試、變流量演示測試、快速重啟功能測試等。

主要成果

在運行特靈 TRACE 700 設計及能源 / 經濟分析程式對冷水機組進行模擬分析之後，我們發現，與 ASHRAE 標準 90.1 所設定的最低能效規定相比，太古坊二座的整體電量消耗每年可降低 **267,808 度**，這相當於香港 100 戶家庭的全年用電量，以及每年減少超過 190 公噸的碳排放量。