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Trane Announces Significant Centrifugal Chiller Line Expansion and Services for Hong Kong

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→ Read more

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Ten years ago, I suggested a rethink of using R-134a HFC (hydrofluorocarbon) chillers, because of “zero” ozone-depleting potential (ODP), while there is a choice of R-123 chiller. Finally, the wave of HFC reduction or ban has come after the Kigali Amendment of Montreal Protocol was passed, putting HFCs under its control like other ozone-depleting substances (ODS) last October at the 28th Meeting of the Parties to the Protocol in Rwanda.

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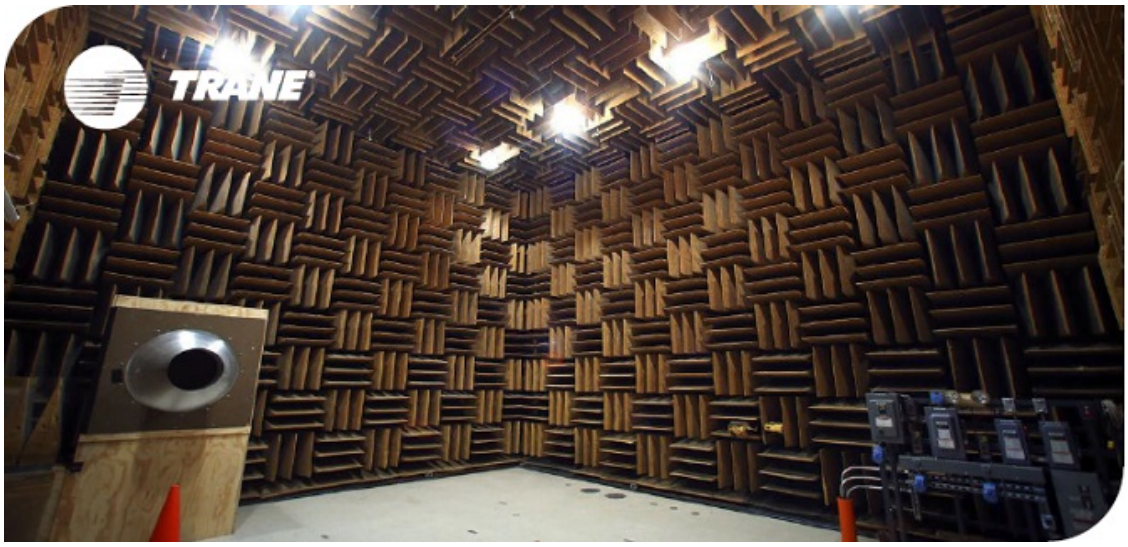
→ Read more



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→ Read more

Low-Pressure Refrigerant Handling Guidelines

Trane believes that responsible refrigerant practices are important to the environment, our customers, and the air conditioning industry. Below are some of the low-pressure refrigerant handling guidelines that could be act as a reference.

→ Read more

COIL DEFENDER
Total Protection for your Air Conditing System

Hong Kong Air-conditioning Parts Centre has been appointed as the exclusive distributor of Coil Defender products in Hong Kong. Australian Coil Defender has formulated a range of unique products to assist in cleaning and protecting the heat exchange surfaces and metal component of air conditioning systems.

→ Read more

Trane Connected Buildings Solutions

Check out our new video here:

Company News

03.07.2017 | Green Building Technical Talk

17.08.2017 | FSICA Annual Dinner

‣ View All News

Transforming Hidden Potential through Intelligent Systems, Building Automation and Energy Management

‣ Learn More

US experts to address next-gen refrigerant in Hong Kong

In August 2017, two leading figures from Trane, US, attended a seminar in Hong Kong aimed at addressing the latest refrigerant transition and chiller technology.

→ Read more

Trane Training Class 2017

Further information will be released soon. Please look out for the Trane Hong Kong news release.

Project Highlights

Trane Stealth™ Air-cooled Chiller

Trane STEALTH chiller selected for large-scale MTR Station Chiller Replacement Programme

Trane Solution: Trane Stealth Air-cooled chillers provide reliable and energy efficient solutions for the Large-scale MTR Stations Upgrade Programme. The MTR Corporation (MTRC), one of the world's leading railways for safety, reliability, customer service and cost efficiency, has selected the new line of Trane Stealth air-cooled chillers, with superior energy efficiency & acoustic performance, to upgrade its existing heating and cooling equipment. This large-scale chiller replacement programme encompasses 38 MTR stations and four railway depots. Starting from the fourth quarter of 2017, a total of 160 chillers will be replaced with more advanced and environmentally friendly systems by 2023.

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In 2018, Trane will offer small tonnage CenTraVac chillers for markets like office and commercial buildings with a choice of current, high efficiency refrigerant R-123 or R-514A. R-514A is a next-generation, low global warming potential (GWP) refrigerant from Chemours (Opteon™ XP30). Trane also offers large tonnage CenTraVac chillers for applications such as large commercial complexes, hospitals, major infra-structures, district cooling plants, data centers and higher education facilities with R-1233zd (Honeywell Solstice® zd).
Trane CenTraVac chillers are the most reliable, efficient, lowest emission and quietest centrifugal chillers on the market today. They are part of the Ingersoll Rand EcoWise™ portfolio of products that are designed to lower environmental impact with next-generation, low-GWP refrigerants and high efficiency operation.

“We are pleased to bring our customers new choices for achieving their building, business and sustainability goals without compromising safety, performance or efficiency,” said Frankie Chan, Managing Director for Hong Kong. “We paired our technical and applications expertise with new refrigerant and service offerings to deliver efficiency and reliability that customers expect.”

To provide customers maximum flexibility, Trane will offer a service option that requires minimal rework to convert existing CenTraVac chillers with R-123 to R-514A. It will also extend its availability and price guarantee on R-123 for customers purchasing a CenTraVac chiller using the refrigerant.

Ingersoll Rand Climate Commitment
Ingersoll Rand, a world leader in creating comfortable, sustainable and efficient environments, made a Climate Commitment to reduce greenhouse gas (GHG) emissions from its products and operations by 2030. The Ingersoll Rand Climate Commitment pledges to:

• Cut the refrigerant GHG footprint of its products by 50 percent by 2020 and incorporate lower GWP alternatives across its portfolio by 2030;
• Invest $500 million in product-related research and development by 2020 to fund the long-term reduction of GHG emissions; and
• Reduce company operations-related GHG emissions by 35 percent by 2020.

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Ten years ago, I suggested a rethink of using R-134a HFC (hydrofluorocarbon) chillers, because of “zero” ozone-depleting potential (ODP), while there is a choice of R-123 chiller.

Finally, the wave of HFC reduction or ban has come after the Kigali Amendment of Montreal Protocol was passed, putting HFCs under its control like other ozone-depleting substances (ODS) last October at the 28th Meeting of the Parties to the Protocol in Rwanda.

Why? HFC is “zero” ODP, or non-ODS, which has nothing to do with the Protocol. Yet this is one of the key reasons for the lengthy debate prior to this amendment, it doesn’t mean the nations involved may not reach consent to put it under control as an effective means to deal with the Climate Change. Here is the rationale behind the decision:

“We can further protect the ozone layer by accelerating the pace of phase outs. However, the acceleration can consider the impact of greenhouse gas accumulation.” said Prof. Mario Molina who received the 1995 Nobel Prize in Chemistry (with Rowland and Crutzen) for pioneering ozone depleting science. [1]

In fact, the impact of HFC (one of the six representative greenhouse gases identified by the Kyoto Protocol) accumulation is two-fold. First, obviously it has high global warming potential (GWP). Second, perhaps not known to many people, it is non-zero ODP plus has a long atmospheric life; and here is why:

“According to new research from NASA, chemical coolants known as hydrofluorocarbons that are found in refrigerators and in home and automobile air

conditioners, contribute to ozone depletion by a small but measurable amount." – a recently published scientific paper based on the results of a NASA-derived atmospheric chemistry climate model that projected the impact of HFC on the atmosphere by 2050. [2]

Figure 1 shows the HFC reduction schedule for developed nations including Hong Kong under the Kigali Amendment to the Montreal Protocol (red lines) and F-gas regulations of the European Union (blue lines) as well as for developing nations (green lines).

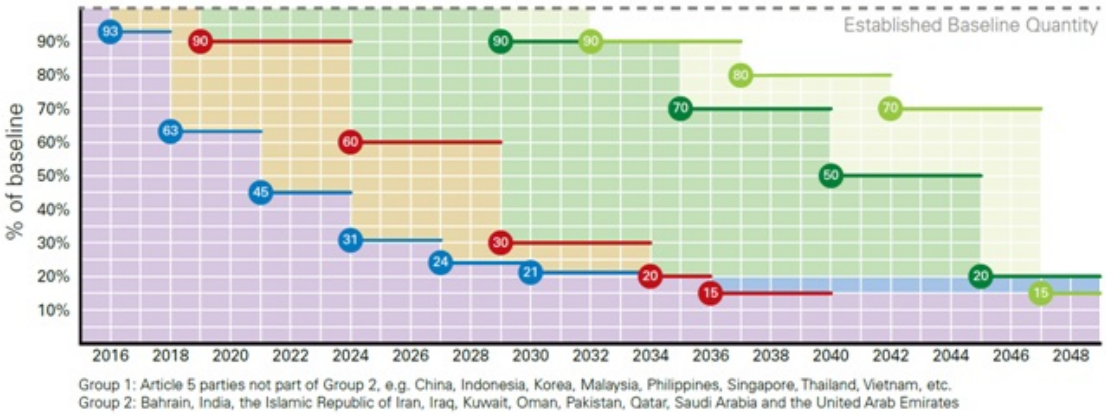

Fig.1 Global HFC reduction under Montreal Protocol and F-gas Regulation

Some countries have launched specific policies to ban high GWP HFC chemicals. For instance, the US will ban HFC-134a use in refrigeration and air-conditioning of retail food later this year, of motor vehicles by 2019 and of chillers by 2024, while Japan will ban HFC use in room air-conditioning if its GWP is greater than 750 by 2018.

Regardless of the global regulatory environment, now is the time to act without delay if you understand the science behind the call for HFC reduction. Today, the good news is that we have next-generation technologies available. Trane has been leading in next-gen chiller R&D. In the Trane Hong Kong newsletter - December 2016 issue, I mentioned the Trane Series E™ CenTraVac has adopted a new refrigerant R-1233zd(E) that is low-GWP (~1) HFO type and non-flammable. Subsequent to our first pilot launching in France three years ago, at least two other brand centrifugal chillers have also announced the adoption of the same refrigerant.

Upcoming, another new refrigerant R-514A, low-GWP (less than 2) and non-flammable, HFO blend is being adopted to the rest of the CenTraVac family and will serve as a "drop-in" refrigerant for the existing CenTraVac chillers using R-123. Besides, Trane has also launched a new air-cooled screw chiller Sintesis™ and water-cooled screw chiller Series R™ using new HFO blend refrigerant R-513A that is non-flammable and has a 55% lower GWP than the current refrigerant R-134A. These next gen chillers belong to a new branding of Ingersoll Rand (Trane's mother company) called EcoWise™ which is a portfolio of products designed to lower environmental impact with next generation low-GWP refrigerants and higher efficiency operation as part of our global Climate Commitment to reduce the greenhouse gas emissions.

In fact, not only Trane but the HVAC industry as a whole has already started transitioning towards next-generation low-GWP technology. Customers do have choice among the next-gen products. However, I have to remind you about the safety issue surrounding some flammable options. For example, R-1234ze(E) is one of the 2L [3] flammable refrigerants being adopted in

magnetic bearing centrifugal compressors. This is a unique HFO refrigerant that is considered non-flammable in European countries because it is not flammable at room temperature but becomes flammable at temperatures above 30°C! As shown in *figure 2*, we can also see the difference in refrigerant efficiency between low pressure and medium pressure options. Actually, the low pressure refrigerants not only have obviously the highest efficiency but also the lowest leakage and best safety. That explains why Trane CenTraVac chillers has been choosing low-pressure refrigerants, since 1938.

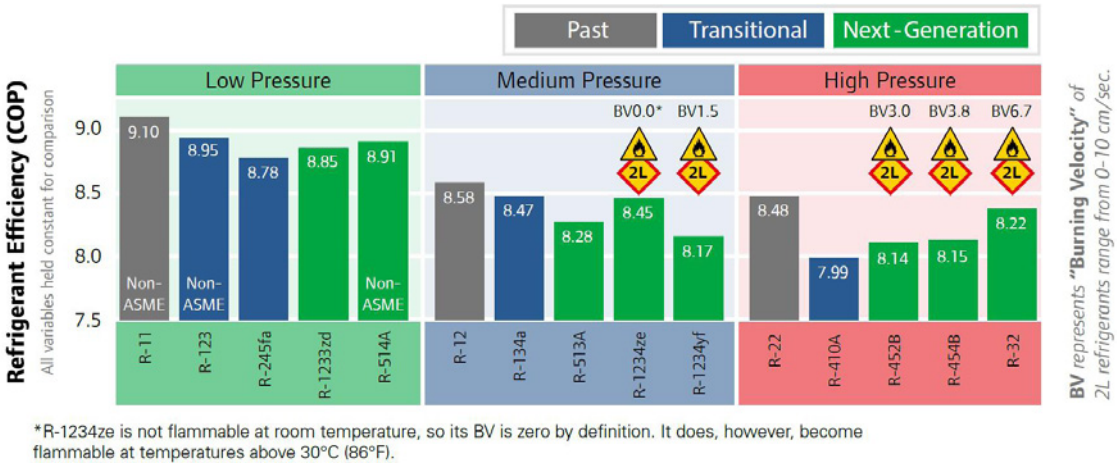

Fig.2 Comparison of environmental impact by refrigerant at theoretical efficiency.

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by Philip C.H. Yu, PhD RPE CEng LEED-AP
Director of Environmental & Applications Engineering, Trane Asia Pacific

Philip has over 25 years of professional experience in the HVAC field in Asia Pacific. He is actively involved in non-business technical activities both in Hong Kong and Mainland China. His areas of interest include building energy, chiller technology, refrigerant piping design and applications of various air-conditioning systems.

Reference

[1] Molina, M.J. 2004. Summary of the SCIENCE SYMPOSIUM: Challenges and Perspectives – Ozone Layer Protection, United Nations Environment Programme (UNEP), Report of the Sixteenth Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer, Prague, Czech Republic, p. 99-101, November.

[2]Hurwitz, M. M., et al. 2015. "Ozone depletion by hydrofluorocarbons", Geophys. Res. Lett., 42, 8686–8692, doi:10.1002/2015GL065856.

[3]ASHRAE. 2016. ANSI/ASHRAE Standard 34-2016: Designation and Safety Classification of Refrigerants, ASHRAE, Atlanta, GA 30329-2305.

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Trane Hong Kong has unveiled a new brand campaign that signifies its growth and transformation over the past 100 years. The new campaign, titled “Beyond Tomorrow”, highlights industry-leading technology and services that make buildings operate smarter and healthier.

“This new campaign speaks to who we are as a company and the transformational solutions that Trane is introducing to improve the operational and energy efficiency of buildings,” says John C K Chan, Assistant General Manager of Trane Hong Kong. “For more than a century, the Trane name has stood for products and technology that stretch the world’s idea of what is possible. Whether that’s cooling in the heat, heating in the cold, or improving a home’s air quality, the brand continues to push the boundaries of performance and reliability to provide the most reliable performance. The campaign will help to bring this to life further and refine Trane’s position in the HVAC marketplace.”

The campaign theme “Beyond Tomorrows” means:-

Trane drives the industry forward and expands its potential. Because we always have. Because it is our driving passion. Because we are expected to. Because it is the right thing to do. Because we are the only ones who can. We are Trane — the innovation leader the industry trusts to bring new technology to the market. Today that is more important than ever.

Our continued investments in new technologies and services, and our unwavering commitment to sustainability form the core of our mission to serve you and the buildings you live in. Because helping you achieve better performing buildings is at the heart of who we are. Trane has the people, products, knowledge and partnerships you can rely on. Today. And Beyond Tomorrow.

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5 Tips for Sustaining Results from Your Energy Projects

With summer right around the corner, energy efficiency is at the top of every facility manager's mind. No one wants to be forced into the position of having to choose between increased costs – either due to energy inefficiency or unplanned maintenance – or a building full of hot, sweating and uncomfortable people. In most cases in life, it's better to be proactive than reactive, and now is the time to consider what improvement projects are necessary and will pay off during the hottest days next summer — and all year long.

There is a wide range of improvements that can enhance building system performance, many of which can be easily identified using the right insight from the building's own data. We've shared five tips below as you evaluate the enhancements that can be made in your building to help optimize energy efficiency, occupant comfort and equipment performance:

1) Look At Problem Areas In Your Building

It might seem a bit obvious, but a little bit of analysis can go a long way. If you're getting frequent complaints from one area in particular, there's likely a problem there, but by taking a deeper look at those complaints, you can get a better understanding of what the problem might be. A room that gets more complaints of heat during the summer afternoons despite being part of the central air system may have windows that aren't effectively sealed. A room that complains of being too hot in the winter might be near a pipe that letting off a dangerous amount of heat and must be replaced. By analyzing the problem areas and digging a little deeper into the complaints, you can get a much better idea of what you're dealing with and prepare accordingly.

3) Start Small

When initiating the process of making improvements, fight the urge to begin with everything. While you may have a list of areas and equipment you'd like to improve, start small, identify the priorities and work through your list over time. If there's not a list, start by analyzing your building and equipment data to see how the building is operating. Using

this information, you can uncover easy, no and low-cost improvements that don't require much investment of time or money from you but that can pay off significantly in improved energy efficiency and occupant comfort.

3) Utilize Schedules That Match Building Use

Effective scheduling can be a powerful tool to help maximize your energy efficiency. Knowing which systems are going to be used the most at a certain time can allow you to plan and adjust your equipment accordingly and use the required energy in the best way possible. For example, a school would use a cooling system far less over the months of summer vacation where there is a significantly lower number of people in the building, than during the late spring. Similarly, an office building likely won't require as much heating on New Year's Day as other days in the winter. By having a good idea of the schedule on which your building's occupants run, you can better align your systems to provide them energy when they need it, and cut back when they don't..

4) Continually Commission Systems to Maintain Their Expected Performance

No matter how automated or connected an energy system is, there are always hiccups that will inevitably arise, causing equipment to not perform as expected. Regularly commission extensive systems, such as heating and cooling, to ensure they are operating at a productive level. Utilizing the system's analytics enables you to easily identify areas that can easily be improved for better efficiency, as well any issues as they arise. This will not only keep these systems performing as intended, but will make it much easier to adjust them so that they perform at levels that exceed expectations, making your job easier and leading to greater satisfaction for the people in the building.

5) Shift Energy Demand to Off Peak Hours

Supply and demand is a basic economic principle, and it applies to energy as much as anything else. The more energy that you use during peak hours – the hours when the most people are also using energy – the greater the cost. By shifting energy demand to off peak hours, which incidentally makes up the vast majority of hours in a given year, you can save an incredible amount. This can be done with storage solutions that shift energy consumption from daytime to off peak times, as well as smart meters that enable time-of-use pricing.

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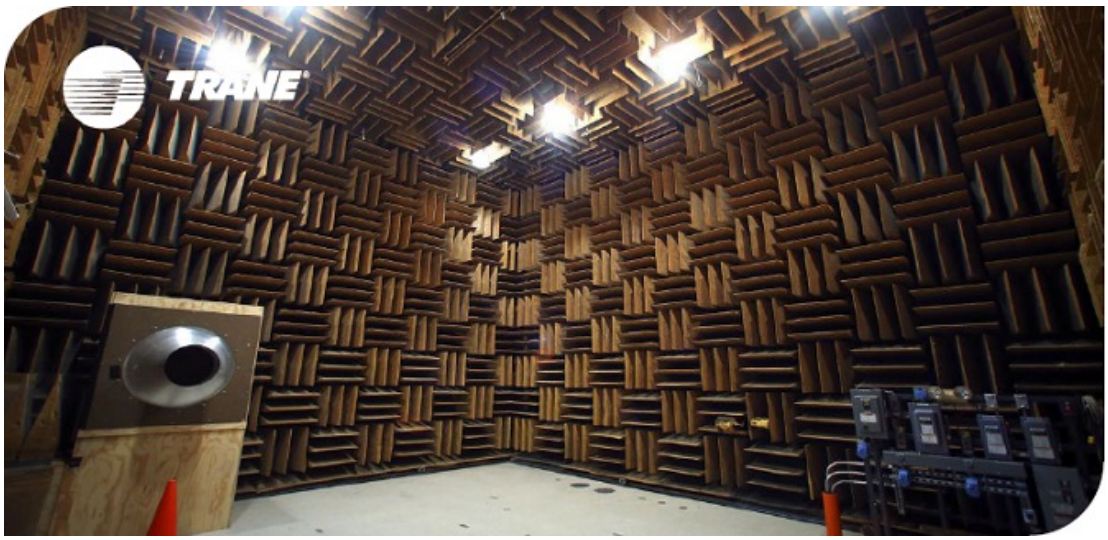
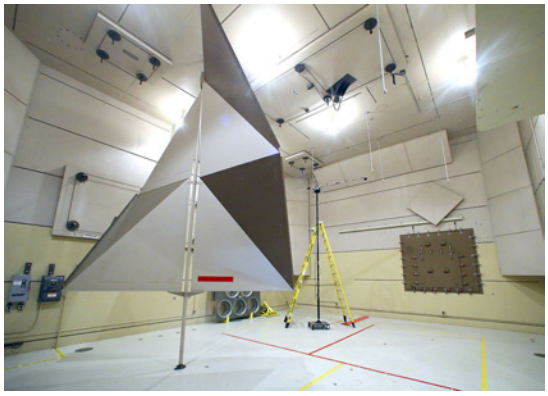
Hidden Places: Trane Acoustics Lab



World War III could break out at 21st and Horton streets in La Crosse, but you wouldn't feel or hear it if you were hunkered down in a room in the Acoustics Lab on the Trane campus there.

Oh, all right — perhaps that's an exaggeration. However, the 22-by-27-foot-30 room within the building was designed in such a way that it shuts out virtually all outside noise and traffic tremors on neighboring streets — even the construction cacophony and vibrations of the parish hall and religious education center being built at Mary, Mother of the Church across the street.



The reverberant room reflects all of the sound in it. The room is used to measure how loud a piece of equipment is while running.

The walls, ceiling and floor of the hemi-anechoic chamber are 10 inches thick, said Sean Staed, lead engineer in the lab for testing the commercial air-conditioning units that Trane manufactures for worldwide sales. The room also is lined with 3-foot thick fiberglass wedges — monster versions of noise-deadening insulation you might see in a recording studio.

"You could go crazy in this room, with no sounds," Staed said.

Indeed — a roaring motorcycle would have to be moved 2½ football fields

away to erase the noise as efficiently as the hemi-anechoic chamber does, Staed said.

The Trane Acoustics Lab has its own shop to build ductwork and other things needed to perform their tests.

The chamber's serenity also comes from the fact that the 750,000-pound room — that's 360 tons, if you're counting — is nearly completely separated from the Acoustics Lab building. It rests on gigantic springs, each of which can hold 23,000 pounds, to nullify vibrations.

The door to the room is 8 inches thick, and the portal has a gap between the building and the room that looks like that between an elevator and its shaft.

The air-conditioning and air-handling units for the lab are in a nearby building so their vibrations will not affect testing.

"The No. 1 goal for Trane is to create as quiet a product as possible for the customer when developing new products or rating for vibrations," said John Krause, Trane's North American lab leader, with responsibilities for labs in Clarksville, Tenn., Lynn Haven, Fla., and Waco. Texas.

The insulation baffles are shown inside the anechoic room in the acoustics lab at Trane Co. The room is designed to completely absorb reflections of sound.

The hemi-anechoic chamber includes an array of microphones to pinpoint the source of a particular vibration and eliminate it, Staed said.

Testing a major air-conditioning unit can take from a week to three weeks, depending on what the product is and what its capabilities are.

As is the case with most do-it-yourself projects around the house, the setup often is more time-consuming than the actual project or test. Positioning everything may take two to three days for a test that takes only 45 seconds to mine the data, he said.

The Anechoic and Reverberant rooms rest

Next to the chamber is the reverberant room, designed to test the opposite conditions, with walls designed to reflect noise instead of deadening it, Staed said.

"It's used to rate the noise," Staed said, to maintain Trane's perpetual reputation as best in class among commercial air conditioners.

The two rooms in the Acoustics Lab, which was built in 1965, are part of Trane's industry-leading testing

on springs to keep outside vibrations from influencing the tests.

facility in La Crosse, which can evaluate any water-cooled chiller from any manufacturer. The National Institutes of Standards and Technology calibrates and validates the testing equipment annually.

The Trane Co., which James Trane and son Reuben founded in La Crosse in 1913, has manufactured centrifugal chillers for large commercial buildings since 1938. The chillers are used in thousands of buildings throughout the world.

Now a division of Ingersoll Rand, Trane employs about 1,800 workers in La Crosse.

This article was originally published in March 2017 by Mike Tighe, La Crosse Tribune in July 2017.

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Low-Pressure Refrigerant Handling Guidelines

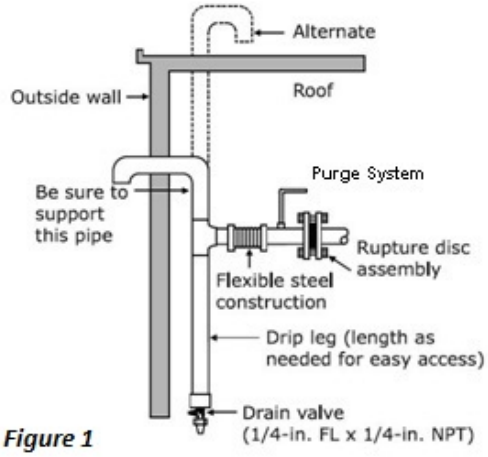

Figure 1

Trane believes that responsible refrigerant practices are important to the environment, our customers, and the air-conditioning industry. As a useful reference, see the low-pressure refrigerant handling guidelines below.

Before installing or servicing a chiller, technicians must put on all PPE (personal protective equipment) required for the work being undertaken. Chiller contains refrigerant and may be under positive pressure, so refrigerant should be recovered to relieve pressure before opening the system. Refrigerant vapours may collect and concentrate in confined spaces or low-lying areas, which will result in the displacement of air. This poses a potential health risk due to suffocation. The following key areas should be attended to:

1. Refrigerant Detector — Sensors that are capable of monitoring the appropriate refrigerant concentration levels are required. If high concentrations exceeding the applicable exposure limit are indicated, activate ventilation per ASHRAE Standard 15 to ensure an adequate supply of fresh air.

2. Mechanical Ventilation — Use mechanical ventilation sized as directed in ASHRAE Standard 15 and local codes for details.

3. Alarms — Use an alarm activated at, or below, the TLV-TWA or equivalent. The alarm will annunciate visual and audible alarms inside the refrigerating machinery room and outside each entrance to the refrigerating machinery room.

4. Purge Venting — Pipe the relief device and purge outdoors using refrigerant-compatible materials (refer to Figure 1).

For details regarding low-pressure refrigerant handling guidelines, please contact your unit manufacturer and refrigerant supplier.

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- WATER BASED
- NON Flammable
- Green Non Destructive Cleaners
- Ozone Safe
- Ultra Thin Protective Coating
- Environmentally Friendly

Please contact HKAPC at 2885 1968 for details.

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Trane Hong Kong Company News

Green Building Technical Talk

Joseph Lau shares his expertise in Building Services

We were delighted to have Mr Joseph Lau of Building Services Design Studio Limited deliver a technical talk to our engineers entitled "Green Building Technology Update" on 3 July 2017. Mr Lau is an expert in building services design. Trane engineers were delighted to expand their horizons by upgrading their professional knowledge. We would like to express our gratitude and appreciation to Mr Lau.

FSICA Annual Dinner

Albert Lo (third right) joins the FSICA Annual Dinner

On 17 August 2017, the Association of Registered Fire Service Installation Contractors of Hong Kong Limited (FSICA) held its annual dinner at Royal Plaza Hotel. Albert Lo, Head of Business Development of TYS, was invited to join the memorable annual event.

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US experts to address next-gen refrigerant in Hong Kong

Vijay Deshmukh (left) and Mike Thompson (right)

In August 2017, two leading figures from Trane, US, attended a seminar in Hong Kong aimed at addressing the latest refrigerant transition and chiller technology. We were happy to play host to Vijay Deshmukh, Global and Americas Portfolio Leader: Centrifugal Chillers, and Mike Thompson, Global Leader of Refrigerant Strategy.

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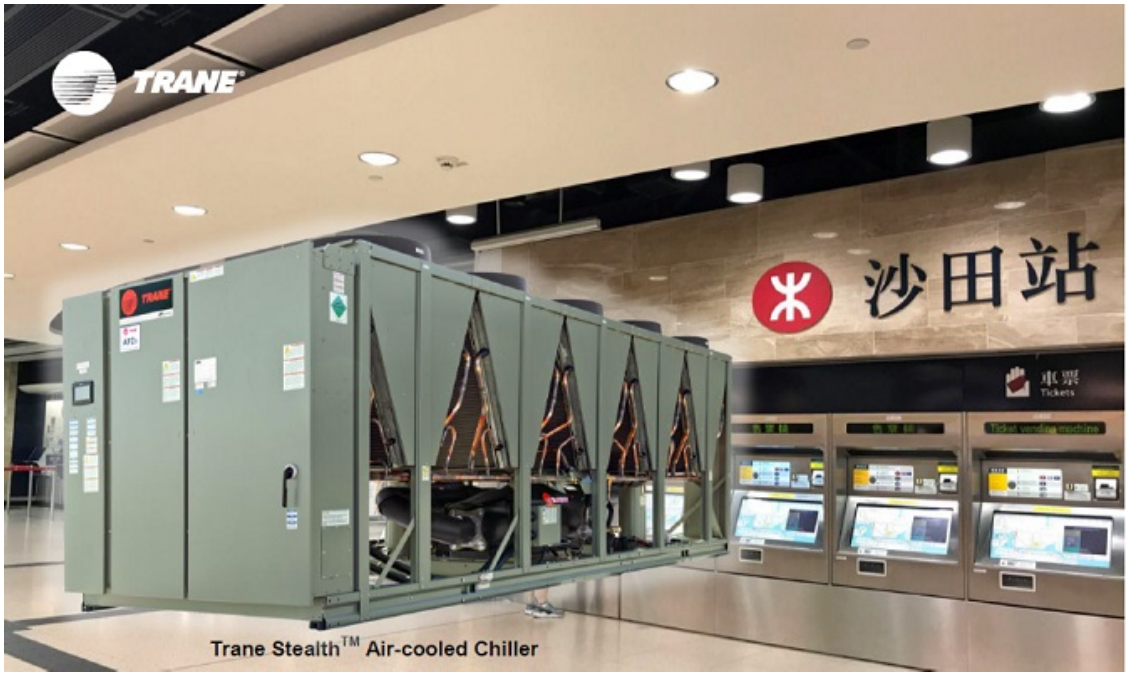
Project Highlights

Supply Product / Energy Solution / Control



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MTRC has favoured and trusted Trane with its heating and cooling systems for more than two decades. Despite this, several competitors took the opportunity to challenge the Trane team on this job. “We offered our new line of RTAE chiller units with Adaptive Frequency Drive (AFD) to the client,” said John C K Chan, Assistant General Manager of Trane Hong Kong. This was the solution to MTRC’s reliability, durability and low-maintenance equipment needs. With AFD, the RTAE units deliver unmatched low-energy consumption, which meets MTRC’s energy conservation goals.

“Once again, MTRC has put its trust in Trane to supply the best heating and cooling

systems and provide the most reliable equipment for its plants," John added.

Project	Completion Date	Client	Trane Equipment	Trane Features/Benefits
HKAPA Chiller Replacement	Q2 2018	HKAPA	Trane CenTraVac Water-cooled	Reliable Products
MTR Chiller Replacement Project - SHT Station	Q1 2018	MTRC	Trane Stealth Air-cooled Chiller	Energy Saving Products
MTR Chiller Replacement Project - TWO Station	Q2 2018	MTRC	Trane Stealth Air-cooled Chiller	Energy Saving Products
MTR Chiller Replacement Project - SSW Depot	Q3 2018	MTRC	Trane Stealth Air-cooled Chiller	Energy Saving Products
The Repulse Bay (Taggart/Harsto/Nichoson) Chiller P.2	Q2 2018	The Hongkong And Shanghai Hotels, Limited	Trane Koolman Air-cooled Chiller	Reliable Products
TMTL499 Tseng Choi Street	Q4 2018	Chun Wo Development	Trane Concealed Fan Coil Unit	Flexible Products
M+ RDE Building	Q4 2018	WKDCA	Trane Performance Climate Changer	Flexible Products

Service/Maintenance Contract

Project	Completion Date	Client	Trane Service Contract	Trane Features/Benefits
Replacement of Aged and Deteriorated Chiller No. 4 and Associated Pump Sets at Chiller Plant Room of New Town Plaza III	Q1 2018	Kai Shing Management Services Limited	Trane R134a Water Cooled Centrifugal Chiller	Reliable Equipment & Service
Replacement of Air Cooled Chiller No. 4 and 5 at Island Place Tower	Q2 2017	Island Place (Management) Limited	Trane Sintesis Air Cooled Chiller	Reliable Service
Design and Build of Installation of 1 no. of 300Tr Water Cooled Chiller at Landmark North	Q2 2017	Kai Shing Management Services Limited	Trane R134a Screw Chiller	Energy saving product
To Design and Build Chiller Plant System Replacement Work for Shopping Arcade Phase 2 at Grand Century Place	Q3 2017	Tsang Lik Company Limited	Trane R134a Air Cooled Screw Chiller	Reliable Service
Replacement of Air Cooled Chiller No. 3 and 4 at United Centre	Q4/2017	Stratton Property Management Limited	Trane Air Cooled Screw Chiller	Reliable Service

第七期 / 2017年9月

特靈宣布
擴展本港離心式冷水機組產品系列與服務

2017年9月8日　全球知名室內空調產品及服務供產商、英格索蘭旗下品牌之一的特靈宣布，正式擴展CenTraVac™冷水機組產品系列，並於香港所有工商業項目中應用。該產品為客戶提供環境友好的解決方案，以滿足其對高效、可靠、安全冷水機組產品與服務的需求，更同時符合現行及擬定法規。

→ 了解更多

HFC時間到了

作為環保倡導者，本人在十年前已提出對使用HFC冷媒的反思 — 既然還可以用R-123冷水機，何必因所謂「零」ODP（臭氧層消耗潛力）而選用R-134a（HFC氫氟烴）冷水機。隨著去年10月在盧旺達基加利舉行的《蒙特利爾議定書》第28次締約國代表大會，通過了最新的修訂案，名爲「基加利修訂」，將HFC物質納入管制範圍，如同現有的臭氧層消耗物質(ODS)， HFC的稍減甚至禁用潮也終於來臨。

→ 了解更多

特靈香港全新品牌活動 "Beyond Tomorrow" 隆重登場

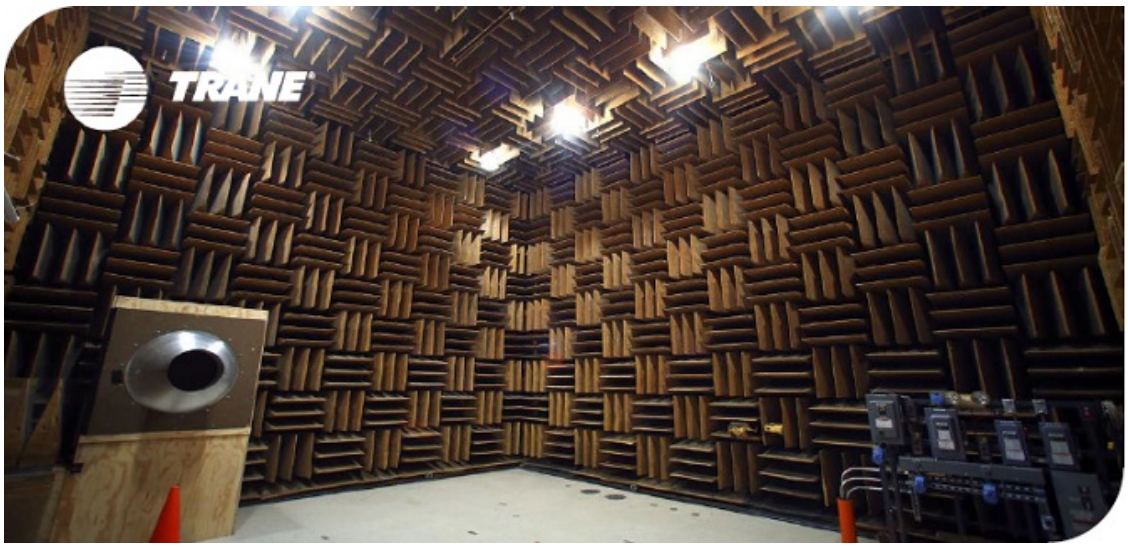
特靈香港推出全新品牌活動"Beyond Tomorrow"，標誌集團過去百年不斷成長與演進，更突出我們領導業界的技術與服務，以令更多建築配備智能及環保暖通空調，成就超越未來。(僅提供英文版內容)

→ 了解更多

增強節能項目成果的5大竅門

(僅提供英文版內容)

→ 了解更多



特靈聲學實驗室

置身美國威斯康辛州拉克羅斯的特靈聲學實驗室，就算這刻爆發第三次世界大戰，您也會毫不察覺。

→ 了解更多

低壓冷媒處理守則

特靈相信，負責任的冷媒處理對環境、客戶以至空調行業皆非常重要。以下低壓冷媒處理守則，可供各位參考。

→ 了解更多

COIL DEFENDER
全方位保護您的空調系統

香港冷氣配件中心獲Coil Defender 委任為本港的獨家經銷商。來自澳洲的Coil Defender研發了一系列產品，助清潔和保護空調系統的熱交換表面與金屬部件，以進一步提升其耐用程度。

→ 了解更多

特靈 Connected Buildings方案
歡迎瀏覽我們的最新影片：

透過智能系統、屋宇自控和能源管理來釋放潛力。

→ 了解更多

最新消息

03.07.2017 | 綠色建築技術講座

17.08.2017 | 香港註冊消防工程公司商會有限公司週年晚會

→ 了解更多

美國專家親臨香港
分享新一代冷媒資訊

2017年8月，美國特靈兩位專家親臨香港，出席了關於冷媒世代轉換和最新冷水機技術的研討會。

→ 了解更多

特靈學堂 2017

最新消息即將公布，詳情請密切留意特靈通訊。

工程項目

特靈STEALTH冷水機
獲港鐵大型更換製冷機組工程選用

特靈方案：特靈Stealth風冷式冷水機為港鐵大型更換製冷機組工程提供可靠和節能的解決方案。港鐵被公認為全球首屈一指的鐵路系統，以安全、可靠程度、卓越顧客服務及高成本效率見稱。其大型更換製冷機組工程選擇了特靈新一代Stealth風冷式冷水機組，以取代現有的供暖和製冷設備。這項涉及38個地鐵站和4個鐵路車站的大型冷水機更換計劃，會於2017年第4季開始，到2023年，共有160個冷水機將被更先進和環保的系統所取代。

→ 了解更多

第七期 / 2017年9月

特靈宣布
擴展本港離心式冷水機組產品系列與服務

2017年9月8日
全球知名室內空調產品及服務供產商、英格索蘭旗下品牌之一的特靈宣布，正式擴展CenTraVac™冷水機組產品系列，並於香港所有工商業項目中應用。該產品為客戶提供環境友好的解決方案，以滿足其對高效、可靠、安全冷水機組產品與服務的需求，更同時符合現行及擬定法規。

於2018 年，我們將為小冷噸CenTraVac™冷水機組提供R-123或R-514A冷媒。R-514A 是由科慕公司（Chemours®）提供的新一代低全球暖化潛值（GWP）的冷媒產品（即Opteon™ XP30）。與此同時，我們將於大型綜合商業項目、醫院、大型基建項目、區域供冷系統、數據中心及高等教育項目提供應用R-1233zd 冷媒（即霍尼韋爾Solstice®zd）的大冷噸CenTraVac™冷水機組。

特靈CenTraVac™冷水機組是現時市場上最可靠、最高效、最低排放及最寧靜的離心式冷水機，是英格索蘭EcoWise™產品組合的一員，應用了新一代低GWP的冷媒，能降低對環境的影響，並達致更高的運行效能。

特靈香港董事總經理陳偉平先生表示：「我們很高興能為客戶提供實現其建築、業務和可持續發展目標的新選擇，更無損產品的安全、性能及效能。」他續指出：「我們將技術、專業應用融入新冷媒及服務，以滿足客戶對產品效能和可靠性的需求。」

另外，為了向客戶提供更靈活的選擇，特靈特別推出R-514A替代R-123的工程服務選項，以最小程度的改造，為客戶的R-123 CenTraVac™冷水機組轉為R-514A。此外，我們會為

使用R-123 冷媒的CenTraVac™冷水機組的客戶，延續R-123供應和價格保證。

關於我們的氣候承諾

截至目前，英格索蘭《氣候承諾》已減少了約200萬噸二氧化碳的排放，這相當於超過27萬家庭每年因使用能源而產生的二氧化碳排放量，或相當於超過9.45億公斤燃煤產生的二氧化碳排放量。到2030年，我們預計將減少5000萬噸的碳排放足跡。

Vol. 7 / September 2017

HFC時間到了

作為環保倡導者，本人在十年前已提出對使用HFC冷媒的反思 —— 既然還可以用R-123冷水機，何必因所謂「零」ODP（臭氧層消耗潛力）而選用R-134a（HFC氫氟烴）冷水機。

隨著去年10月在盧旺達基加利舉行的《蒙特利爾議定書》第28次締約國代表大會，通過了最新的修訂案，名爲「基加利修訂」，將HFC物質納入管制範圍，如同現有的臭氧層消耗物質(ODS)， HFC的稍減甚至禁用潮也終於來臨。

相信很多人會問HFC是「零」ODP或更好說非ODS，而《蒙特利爾議定書》卻是針對ODS的淘汰制訂，爲何混爲一談呢？對，這正正是「基加利修訂」通過前漫長討論的主因，但並不妨礙各國就控制HFC以應對氣候變化達成共識，相信背後的理念不乏科學依據的支持：

1995年諾貝爾化學獎得主(與Rowland 及 Crutzen共享）、消耗臭氧層的科學先驅 Mario Molina教授曾指出：「加快淘汰的進程固然可進一步保護臭氧層，但同時亦要關注溫室氣體累積所帶來的影響。」[1]

事實上，HFC（在《京都議定書》中被確認為六種具代表性溫室氣體之一）的累積會帶來雙重影響。首先，它的全球暖化潛能值（GWP）高；另外，更鮮為人知的是其ODP並非為零！與此同時，HFC的大氣壽命長更為現時受關注的環保問題。

一份最近發表的科學論文以美國太空總署的大氣化學氣候模型推算出2050年HFC對大氣層的影響：「根據美國太空總署最新研究結果，在家用雪櫃與汽車空調中使用的冷媒，名爲氫氟烴，會消耗臭氧層，影響縱輕微但仍可測量得到。」[2]

圖1 顯示了根據「基加利修訂」的稍減HFC時間表，紅線為已發展國家的時間，包括香港在內，綠線則為發展中國家的時間；而藍線是按歐盟的F-gas條例所訂時間。

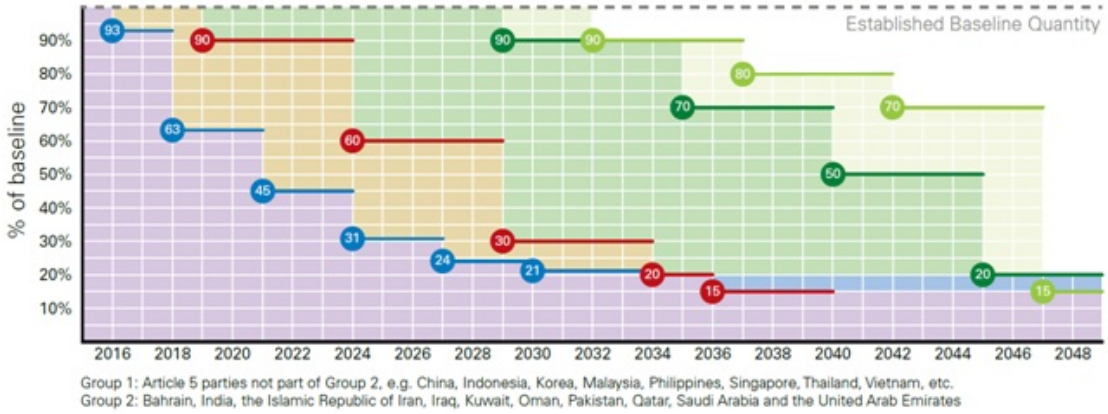


圖1：全球稍減HFC時間表，根據《蒙特利爾議定書》及歐盟F-gas條例所訂

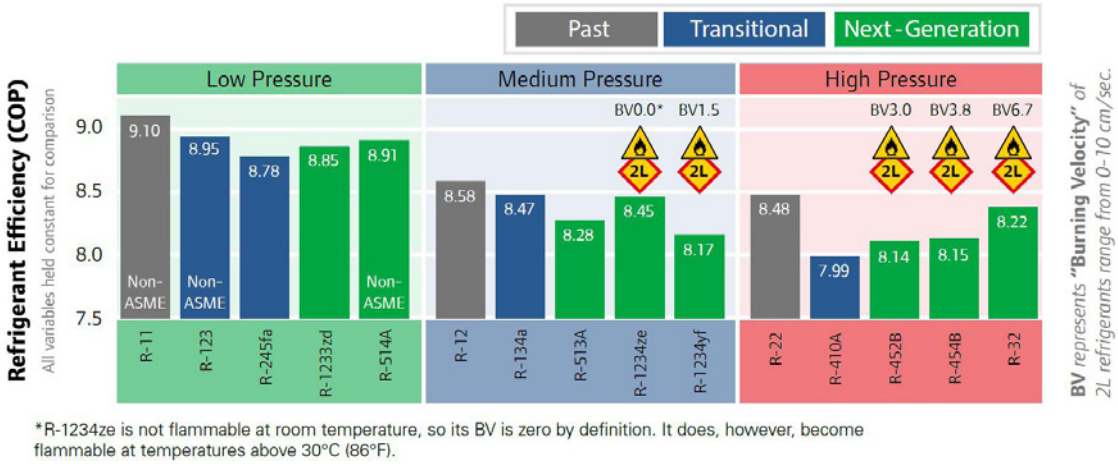
此外，部分國家更公布了禁用高GWP值HFC類化學品的具體政策，以美國為例，在今年稍後時間將禁止在零售食品的製冷和空調上使用HFC-134a； 2019年起會在車輛製冷和空調上禁止使用HFC-134a；到2024年，禁用HFC-134a範圍將延伸至冷水機組。日本方面，2018年起將禁止GWP值超逾750的HFC冷媒在家用冷氣機使用。

撇除全球各國對HFC的管制，當您明白稍減HFC背後的科學理據，自會意識到問題刻不容緩。值得慶幸的是新一代科技已經出現，而特靈在新一代冷水機組的研發方面一直領先。2016年12月號的特靈通訊中，我已率先介紹Trane新一代水冷離心機E™系列CenTraVac™，它採用了新一代低GWP（一1）HFO型、非易燃冷媒R-1233zd（E）。特靈於3年前在法國首次試點推出，及後至少有兩家品牌的離心式冷水機組也宣布採用同樣的冷媒，可見其受業界重視。

至於即將推出的另一種新一代HFO混合型冷媒R-514A，也是低GWP和非易燃性，會用於CenTraVac系列其餘的產品，並可作為現行使用R-123的CenTraVac冷水機的「直接替換」冷媒。此外，特靈還推出了新一代Sintesis™系列風冷螺桿式冷水機以及R™系列水冷螺桿式冷水機，兩者均採用非易燃的新一代HFO混合型冷媒R-513A，與目前使用的冷媒R-134a比較，其GWP值低55%。上述各款新一代冷水機都同屬英格索蘭（特靈母公司）的新品牌EcoWise™，此系列產品旨在憑藉新一代低GWP冷媒以及高能效的操作，減低對環境造成的影響，並兌現公司減少溫室氣體排放的保護氣候承諾。

展望將來，特靈以至整個暖通空調業界，正朝着新一代低GWP的科技過渡，令消費者有更多環保選擇。然而，大家對易燃的冷媒須注意安全問題，以R-1234ze(E)為例，它是磁浮式軸承離心機採用的其中一種2L安全級別[3]易燃冷媒，由於在室溫環境下它是非易燃，而歐洲的可燃性測試環境剛好是室溫，故在歐洲被視作非易燃HFO型冷媒；但是，當環境溫度超過30°C，R-1234ze(E)就變得易燃！全世界大多數國家的可燃性測試環境都超過30°C，所以它在香港仍是一種易燃冷媒。

由*圖2*可見，低壓冷媒與中壓冷媒在效能上明顯的分別。事實上，低壓冷媒不但擁有最高效能以及最低滲漏率，應用安全性也是最高，這些優點亦解釋了爲何特靈CenTraVac冷水機自1938年第一代面世起一直無間斷地選用低壓冷媒，既確保核心技術的可持續發展，又能讓客戶用得安心。



*R-1234ze is not flammable at room temperature, so its BV is zero by definition. It does, however, become flammable at temperatures above 30°C (86°F).

圖2： 冷媒在理論效能下對環境影響的比較

余中海博士工程師
亞太區 環保及應用技術總監

余博士擁有超過25年在亞太地區暖通空調(HVAC)領域的專業經驗。除了繁忙的業務之外，他還很熱心參與香港及國內的技術活動。研究範疇包括建築節能、冷水機技術、冷媒管道設計及各種空調系統等。

Reference

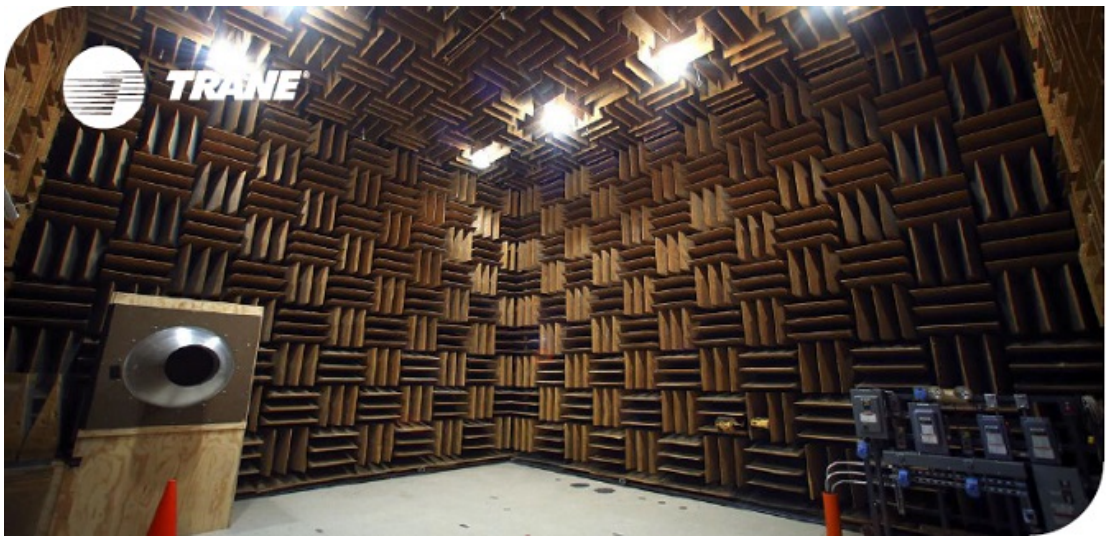
[1] Molina, M.J. 2004. Summary of the SCIENCE SYMPOSIUM: Challenges and Perspectives – Ozone Layer Protection, United Nations Environment Programme (UNEP), Report of the Sixteenth Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer, Prague, Czech Republic, p. 99-101, November.

[2]Hurwitz, M. M., et al. 2015. “Ozone depletion by hydrofluorocarbons”, Geophys. Res. Lett., 42, 8686–8692, doi:10.1002/2015GL065856.

[3]ASHRAE. 2016. ANSI/ASHRAE Standard 34-2016: Designation and Safety Classification of Refrigerants, ASHRAE, Atlanta, GA 30329-2305.

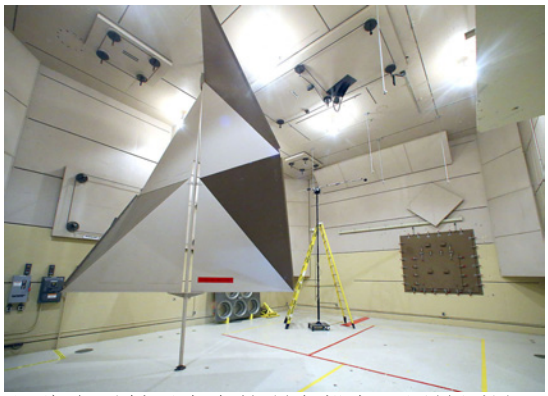
第七期 / 2017年9月

特靈聲學實驗室



置身美國威斯康辛州拉克羅斯的特靈聲學實驗室，就算這刻爆發第三次世界大戰，您也會毫不察覺。

上述情景或許有點浮誇，但身處這個為隔絕外界聲響，以及鄰近交通帶來的震顫而設計，長22呎、闊27呎、高30呎的房間內，無論是工程雜音，還是周邊建築物的噪音，您都不會聽到。



混響室反射了當中的所有聲音，用於測量一台設備運行時的聲量。

首席工程師Sean Staed表示：「這測試特靈行銷全球商用冷水機的半無回聲(hemi-anechoic)房間，天花板及地板都厚10吋，房間內壁更貼上3呎厚的玻璃纖維隔音板，猶如一個巨大版唱片錄音室。」

「在這裏一點聲音也沒有，待久了很易讓人瘋掉。」Sean Staed笑道。

Sean Staed補充：「的而且確，這半無回聲房間的消音效果顯著，就如您絕不可能聽到距離您兩個半欖球場以外的摩托車聲響。」

卓越的消音效果來自這750,000磅、即360噸的房間，設置於多個巨形彈簧

特靈聲學實驗室擁有自己的工房，用以製作管道系統和其他測試所需的設備。

上，和整個聲學實驗室接近完全分離。而每一個彈簧足夠承重23,000磅，以抵銷震動。

至於房間門亦厚達8吋，而且建築物和房間的出入口之間有一個間隙，就像升降機的設計。

「實驗室空調及風櫃被設置在旁的建築物，所以震動不會影響測試。當特靈在產品開發及測試時，首要目標是為顧客製造最寧靜的產品。」特靈北美克拉克斯維爾（田納西州）、林恩港（佛羅里達州）及韋科（德克薩斯州）的實驗室主管John Krause說。

聲學實驗室的無回聲房間內的絕緣擋板以完全吸收聲音反射。

此外，半無回聲房間設置了一系列麥克風，來追踪特定的振動來源，並且消除它。

一般來說，測試一部空調需時一至三個星期，視乎產品及性能而定。

而和其他項目一樣，設置通常比實際的項目或測試更耗時。他表示，設置往往需要兩到三天，而收集數據可能只花45秒。

房間安放在很多巨形彈簧上，以抵銷震動減少對測試影響。

Staed則指出:「旁邊的房間是混響室，是為了在相反的條件下做測試，牆壁會反射噪音，而不是消除噪音。這全為了噪音評分，藉此讓特靈在商用空調中保持領導地位。」

聲學實驗室的兩個房間建於1965年，是特靈在拉克羅斯（La Crosse）其中一種領先業界的測試設備，可以評估任何製造商的水冷式冷水機組，而國家標準與技術研究院每年都會校準和驗證檢測設備，確保測試無誤。

James Trane與兒子Reuben於1913年在拉克羅斯創立的特靈公司，自1938年以來就為大型商業建築生產離心式冷水機，於世界各地數以千計建築帶來卓越體驗。

現在，英格索蘭旗下的特靈於拉克羅斯僱用約1800名員工，繼續開創未來。

此文章最初由Mike Tighe於2017年7月在La Crosse Tribune發表。

第七期 / 2017年9月

低壓冷媒處理守則

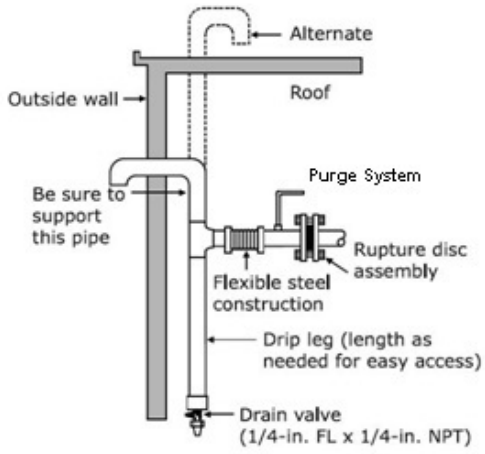


圖1

特靈相信，負責任的冷媒處理對環境、客戶以至空調行業皆非常重要。以下低壓冷媒處理守則，可供各位參考。

在安裝或維修冷水機之前，技術人員必須佩戴工作所需的個人保護裝備。由於載有冷媒的冷水機，系統可能處於正壓，因此在打開系統之前需回收冷媒以降低系統壓力。冷媒可能積存和集中在密閉或低窪空間，令空氣被取代構成窒息的潛在風險。故務必遵守下列要點：

1. 冷媒監測器 —— 能夠監測冷媒濃度水平的感應器，如果濃度超標，需按照ASHRAE Standard 15啟動通風，確保提供足夠的新鮮空氣。

2. 機械通風 —— 根據ASHRAE Standard 15以及當地的規定使用適當的機械通風。

3. 警報 —— 當監測指數低過或等於時間加權平均閾值 (TLV–TWA)或同等標準，警報會被啟動。警報器應以聲音及視覺形式，在機房內及機房各入口外作出提示。

4. 排氣 —— 使用可兼容冷媒的物料作管道排放到戶外（參見*圖1*）。

以上是部分低壓冷媒處理守則。詳情請聯絡使用相關冷媒的冷水機製造商與冷媒供應商。

第七期 / 2017年9月

COIL DEFENDER
全方位保護您的空調系統

香港冷氣配件中心獲Coil Defender 委任為本港的獨家經銷商。來自澳洲的Coil Defender研發了一系列產品，助清潔和保護空調系統的熱交換表面與金屬部件，以進一步提升其耐用程度。

詳情請聯絡香港冷氣配件中心2885 1968 。

第七期 / 2017年9月

最新消息

綠色建築技術講座

劉鎮忠先生分享他建築服務設計的經驗

2017年7月3日，我們很高興屋宇裝備設計坊有限公司的劉鎮忠先生與我們的工程師進行主題為“綠色建築技術更新”的技術講座。劉先生是建築服務設計專家。特靈工程師很高興通過提升他們本身的專業知識來拓展他們的視野。特靈十分感謝劉先生的專業分享。

香港註冊消防工程公司商會有限公司週年晚會

勞燦傑先生 (右三)參加香港註冊消防工程公司商會有限公司週年晚會

2017年8月17日, 香港註冊消防工程公司商會有限公司在帝京酒店舉行了週年晚會。主管特靈香港的業務發展的勞燦傑先生參加了這次值得紀念活動。

第七期 / 2017年9月

美國專家親臨香港分享新一代冷媒資訊

Vijay Deshmukh (左)與Mike Thompson來港參與研討會。

2017年8月，美國特靈兩位專家親臨香港，出席了關於冷媒世代轉換和最新冷水機技術的研討會。應邀的分別為特靈全球及美洲離心式製冷機總幹事Vijay Deshmukh（圖左）以及特靈冷媒全球總幹事Mike Thompson（圖右）。

第七期 / 2017年9月

工程項目

產品供應 / 能源方案 / 屋宇自控

特靈STEALTH冷水機
獲港鐵大型更換製冷機組工程選用

特靈方案：特靈Stealth風冷式冷水機為大型地鐵站升級計劃提供可靠和節能的解決方案。港鐵被公認為全球首屈一指的鐵路系統，以安全、可靠程度、卓越顧客服務及高成本效率見稱。其大型更換製冷機組工程選擇了特靈新一代Stealth風冷式冷水機組，以取代現有的供暖和製冷設備。這項涉及38個地鐵站和4個鐵路站的大型冷水機更換計劃，會於2017年第4季開始，到2023年，共有160個冷水機將被更先進和環保的系統所取代。

特靈擁有暖通空調系統的多年豐富經驗及領先技術，因而令港鐵放心選用。對於團隊在這競爭激烈的項目中脫穎而出，特靈香港副總經理陳俊傑先生表示：「我們向客戶提供了新一代帶有變頻器（AFD）的RTAE冷水機，完全符合港鐵要求高可靠性，耐久性和低設備維修需求的營運方針。通過AFD，RTAE能提供無與倫比的低耗能，亦切合港鐵公司的節能目標。」

他補充說：「港鐵公司深信特靈能夠提供最佳的暖通空調系統，並為其水冷機房提供最可靠的設備，促成我們持續合作。」

項目	完成日期	客戶	特靈產品	特靈方案
香港演藝學院冷水機更換	2018 第二季	香港演藝學院	特靈 CenTraVac 離心冷水機	可靠產品
港鐵沙田站冷水機更換	2018 第四季	港鐵	特靈 Stealth 風冷式冷水機	節能產品
港鐵太和站冷水機更換	2018 第四季	港鐵	特靈 Stealth 風冷式冷水機	節能產品
港鐵小蠔灣冷水機更換	2018 第四季	港鐵	特靈 Stealth 風冷式冷水機	節能產品
淺水灣影灣園二號 冷水機更換	2018 第二季	香港上海大酒店 有限公司	特靈 Koolman 風冷式冷水機	可靠產品
TMTL499 屯門井財街	2018 第四季	俊和集團	特靈風機盤管	靈活產品
M+RDE 大樓	2018 第四季	西九文化區	特靈空氣處理機組	靈活產品

服務 / 保養合約

項目	完成日期	客戶	特靈服務合約	特靈方案
更換新城市廣場 4 號 冷水機組及相關泵組	2018 第一季	啓勝管理服務 有限公司	特靈 CenTraVac 離心冷水機	可靠產品及 服務
更換 4 號和 5 號 港運大廈風冷式冷水機	2017 第二季	港運城物業 管理有限公司	特靈 Sintesis 風冷式冷水機	可靠服務
上水廣場 設計及安裝一台 300 冷噸水冷式冷水機	2017 第二季	啓勝管理服務 有限公司	特靈 R 系列水冷式冷水機	可靠產品及 服務
新世紀廣場 設計及更換商場二期 冷水機組系統	2017 第三季	增力服務 有限公司	特靈 R 系列風冷式冷水機	可靠服務
統一中心 更換 3 號及 4 號 風冷式冷水機組	2017 第四季	兆達隆 物業管理 有限公司	特靈 R 系列風冷式冷水機	可靠服務