

Seng Choon Engineering Office, Singapore



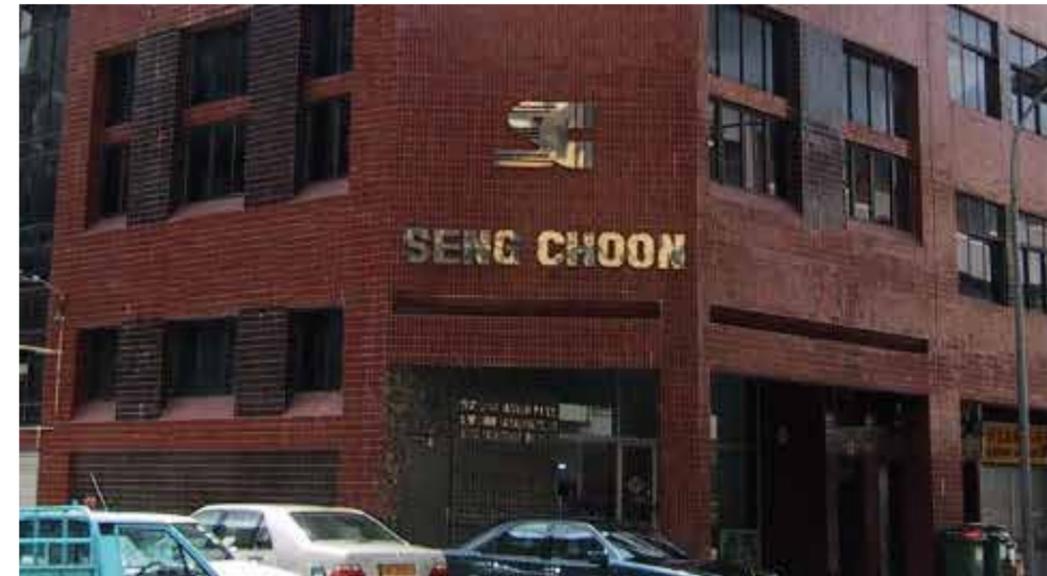
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A complete HVAC concept design entirely by Uponor in combination with DOAS and Radiant Ceiling Cooling systems was introduced to Seng Choon Engineering. From the renovation concept, design, procurement to supervision and commissioning were done by Uponor, and the entire project was completed in June 2016.

Renovation project with Radiant Ceiling Cooling in Tropical climate

Seng Choon Engineering PTE. LTD, established in 1951, with a historic shop house located in Singapore served as office area. They decided in 2015 to renovate their 2 storeies building of being more sustainable, with low energy consumption and achieve high level of thermal comfort.



316 m² of office area and meeting rooms are equipped with Uponor Spectra, Velum and Quello panels with Uponor Radiant Ceiling cooling system.

The cooling loads of the entire conditioned space have been split into internal sensible, internal latent and fresh air respectively. 100% of the internal latent load and 30% of the internal sensible loads are covered by the DOAS. All other loads are covered by the Uponor radiant cooling system. A chilled water network including buffer tank and double mixing circuits provide two different temperature levels for the radiant panels and the DOAS respectively.

Sensible loads are absorbed directly via chilled ceiling panels, on the other hand the dehumidification and individual room control are combined together in a BMS system, Rooms are cooled individually which help to provide high level of comfort at the same time achieving highest energy saving.

Uponor Radiant Ceiling Cooling Systems

Regarding this is a renovation project, Uponor decided to use Spectra Ceiling panels for the Radiant Cooling system, due to its unique magnetic connection and register can be pre-assembled, this enhance the ease of installation. The entire system is invisible with our different panel designs, therefore, provides architectural and interior design freedom of office decorations.



Uponor Velum Canopy is equipped in the meeting room of Seng Choon office, which combined high cooling capacity with draught-free comfort. The extremely flat canopy mounted at around 30cm below the main ceiling panels. Warm air rising from the floor to the ceiling naturally and circulates around the cooled panel surfaces to cooling down the air. Unlike a conventional air conditioner, which circulates a large volume of air, the cooling canopy creates a pleasant draught-free climate with no dust circulation or ventilation noise.

Another advantage of Uponor Radiant Ceiling Cooling systems is sound absorption functions of our panels. Specially designed acoustic fleece is attached on the metal tile. It is also possible to equip the ceiling panel with other features such as indirect lighting, sprinkler systems, loud-speakers.

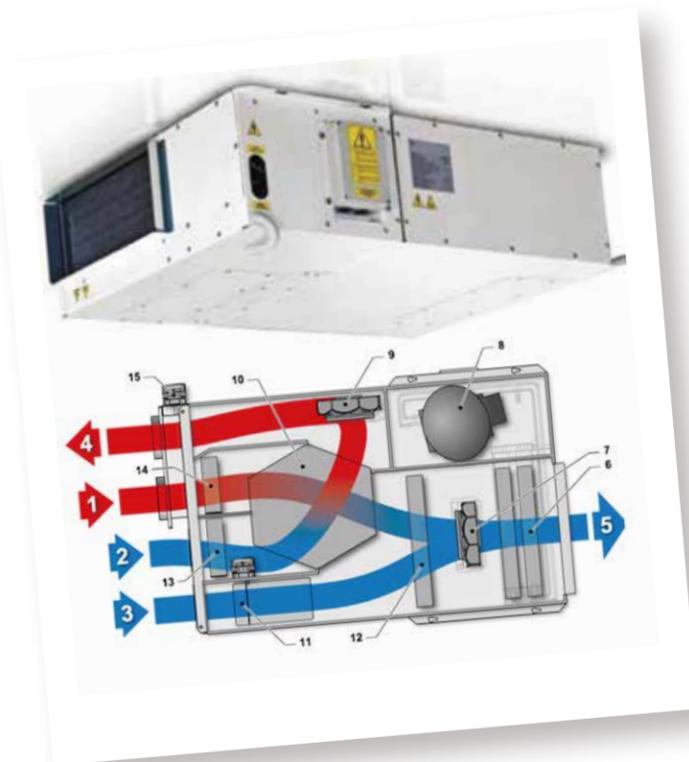
DOAS & Radiant Cooling in Humid Climates

With a combination with DOAS used in the case, it consists of three VSD fans for exhaust, recirculation and fresh air. The fresh airflow streams through a heat exchanger to enter the pre cooling coil, which is served by the shared chiller plant.

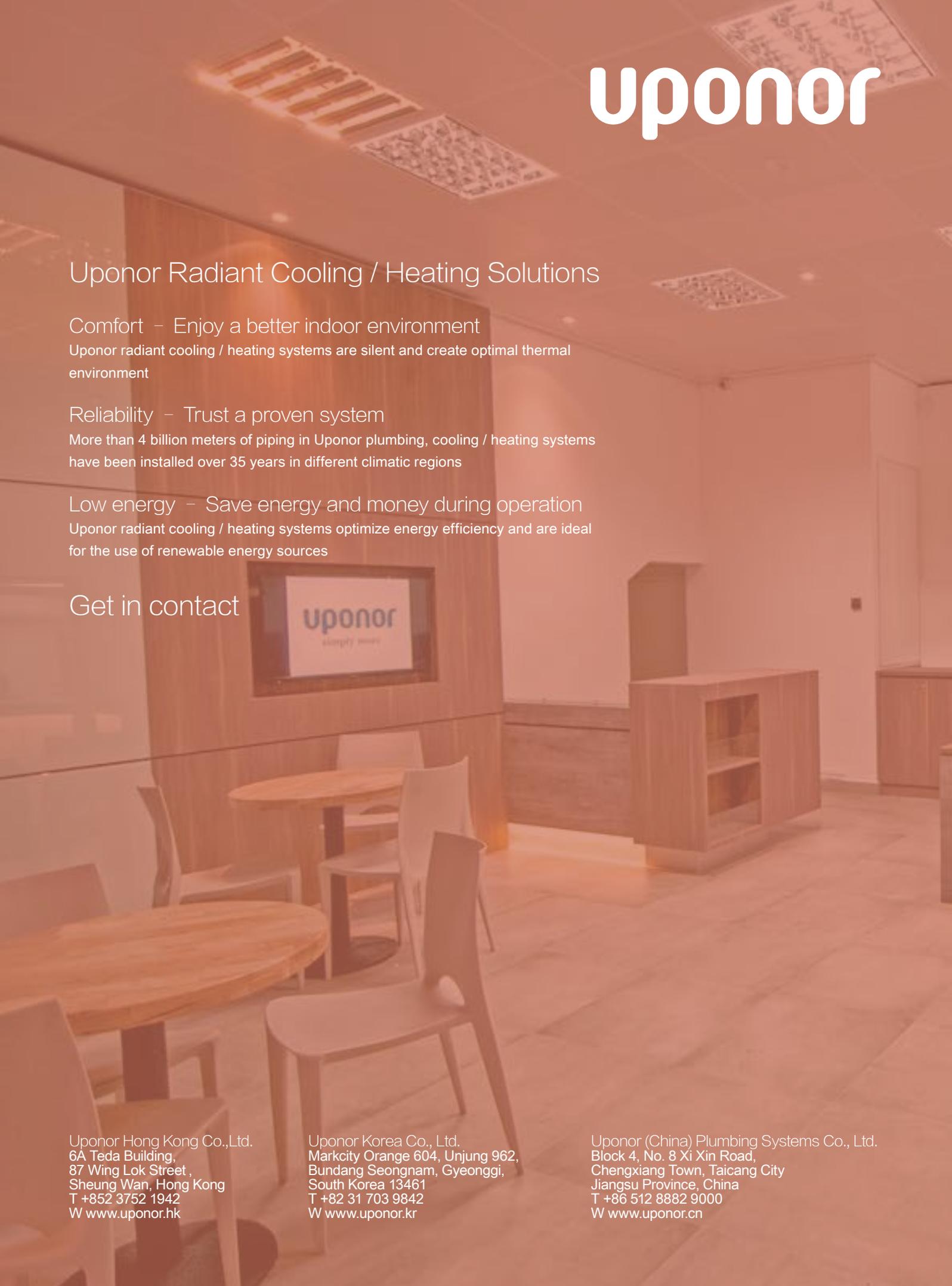
below 15°C respectively water content of 10g/kg air. Maintaining this dew point through the use of humidity sensors with the DOAS, which regulates the fan speed of the recirculation air, and keeps the energy consumption as low as possible when needed.

For a typical DOAS ventilation system, the outside air system can accommodate around 0-30% of the conditioned space sensible load. In order to create a comfortable indoor environment, the balance of the space sensible loads is to be covered by radiant ceiling panels. In this case, 10° C is the dew point in the conditioned space, which is

Furthermore, the DOAS is designed to mix 20%-50% return air with fresh air in order to provide fresh air and maintaining healthy CO₂ levels of approx. 700ppm. The reduction and control of incoming fresh air contributes to energy saving and high indoor air quality.



In humid climate zones, where the capacity of the designed air flow, to provide hygienic ventilation, is lower than the air flow needed to remove all latent loads, a DOAS with a mixing chamber and recirculation air is essential to save energy.



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Uponor Radiant Cooling / Heating Solutions

Comfort – Enjoy a better indoor environment

Uponor radiant cooling / heating systems are silent and create optimal thermal environment

Reliability – Trust a proven system

More than 4 billion meters of piping in Uponor plumbing, cooling / heating systems have been installed over 35 years in different climatic regions

Low energy – Save energy and money during operation

Uponor radiant cooling / heating systems optimize energy efficiency and are ideal for the use of renewable energy sources

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