

Proterceiling radiant chilled ceilings

comfort - efficiency - savings - aesthetics

WHAT | HOW | WHERE | WHY

What How

The false ceiling becomes radiant with the application of a copper coil on the hidden side of the panel where cold or hot water flows depending on the season. **As chilled water (15°C) passes through the coil, it offers a cool ceiling surface that provides space cooling by both radiation (60%) and convection (40%).**

The radiant ceiling creates an uniform temperature distribution in the rooms, thus giving a very high level of comfort. It also absorbs the heat radiated from hot surfaces in the room such as lights and computers without air currents.

The use of water to transport heat and cold around a building is more energy efficient than the use of air by 20 times. Chilled ceilings require a **low water temperature which can be obtained from natural or renewable sources** (as rivers, lakes).

The radiant principle - all bodies emit thermal radiation and absorb the ones emitted by their surroundings.

The body principle - the human body is constantly outputting thermal energy into the environment like a furnace. It releases heat in three ways: radiation, evaporation (sweating) and convection. Radiation is the main way human body releases excess heat (50%), so if there are cold surfaces that will absorb it, the comfort will increase.

Radiant cooling - radiant cool transmits in straight lines, cooling surfaces that are 'visible' to the source. However, these surfaces in turn re-radiate cold and cool air adjacent to them by convection. This allows cool from a radiant source to distribute through a space.

Where

Radiant chilled ceiling is a perfect solution for most buildings. Its flexibility is due to the hybrid nature of the system. The chilled ceilings can only deal with sensible cooling loads, the latent loads (“humidity”) have to be dealt with by the supply air.

Less air in the environment means no annoying air draughts and reduced operating costs that make the radiant chilled ceiling particularly attractive for **hospitals and healthcare facilities** where the air can't be recirculated.

The absence of maintenance cost, the complete accessibility of the ceiling void, the phono-absorption and the high light reflection make radiant ceilings the best solution for **offices and schools**. Due to the silence of the system and the high level of comfort combined with the other advantages, radiant ceilings are increasingly used in **homes**.

Why

Energy efficiency that pays off - up to 30 percent of energy can be saved by using radiant chilled ceilings from Proter Imex, which significantly reduces operating costs.

Room comfort that satisfies - Proter Imex offers you high-quality radiant ceilings with the possibility to integrate other plants as ventilation and lighting to improve the comfort of your building.

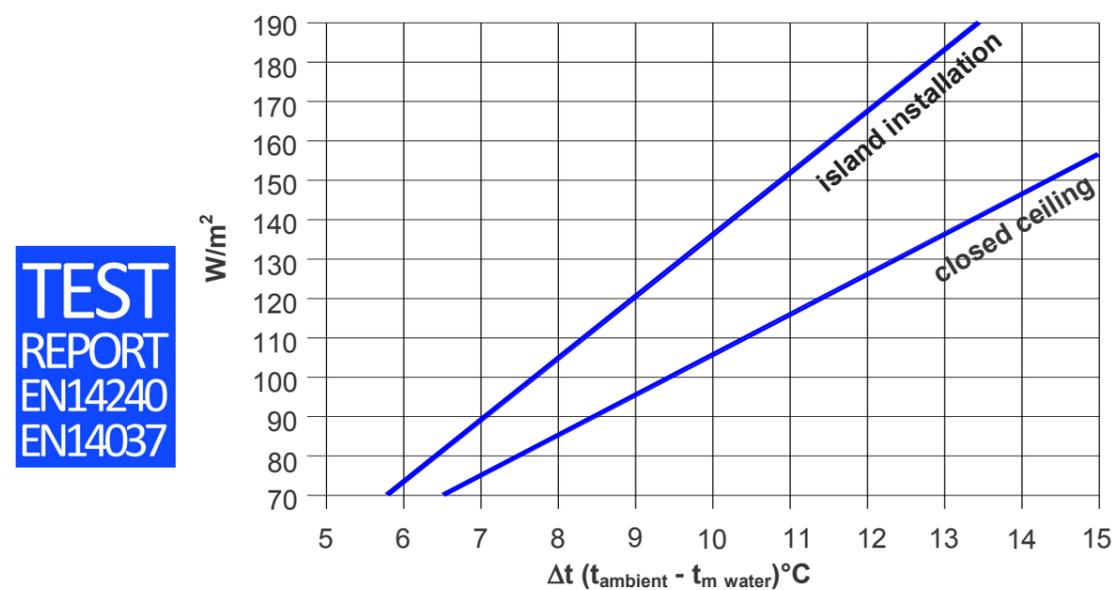
Flexibility to meet all requirements - when it comes to functionality, individual preferences, design, mounting and integration options, the product range offered by Proter Imex is exceptionally flexible.

Long-term investment protection - copper, steel and aluminum: durable products for decades of operation. An efficient and maintenance-free air conditioning system increases the value of the property.

Proterceiling radiant chilled ceilings: the alternative to traditional air conditioning systems

COMFORT	Quiet operation with no noise. Not affecting a class lesson or a good night sleep	Uniform cooling across the room giving a more even temperature distribution	No drafts of cold air with unnaturally cold spot
	The air is transparent to radiation so radiant cooling has no direct impact on the air moisture content	Naturally responds to the human body needs to radiate	More healthy, reducing problems associated with dust, pollen and other pollutants
EFFICIENCY	The low operating temperature fit well with renewable energy sources	Easy to install in retrofitting	Low energy demand. Low operating temperature optimizes the performances of water production systems
	Fast response time (few minutes)	Every room temperature can be independent	Less expensive to run. Low temperature systems achieve comfortable ambient conditions at low water temperature
AESTHETICS	Completely invisible	Architects are free to create their personal ceiling design	Integration of the lighting system
	Integration of the ventilation system	Free space in the floor and walls	
SAVINGS & ADVANTAGES	Reduced floor height. No need of large air ducts in the ceiling void.	Durable with a reference service life of more than 25 years	Accessible ceiling void for service without stopping the cooling system
	No maintenance required for the radiant chilled ceilings. No moving parts, no filters installed	Need just a small pump to distribute a great amount of energy	
	Improvement of room acoustics	No floor demolition in renovations	High simplicity and speed of installation: speeded up construction sites thanks to free floor surfaces

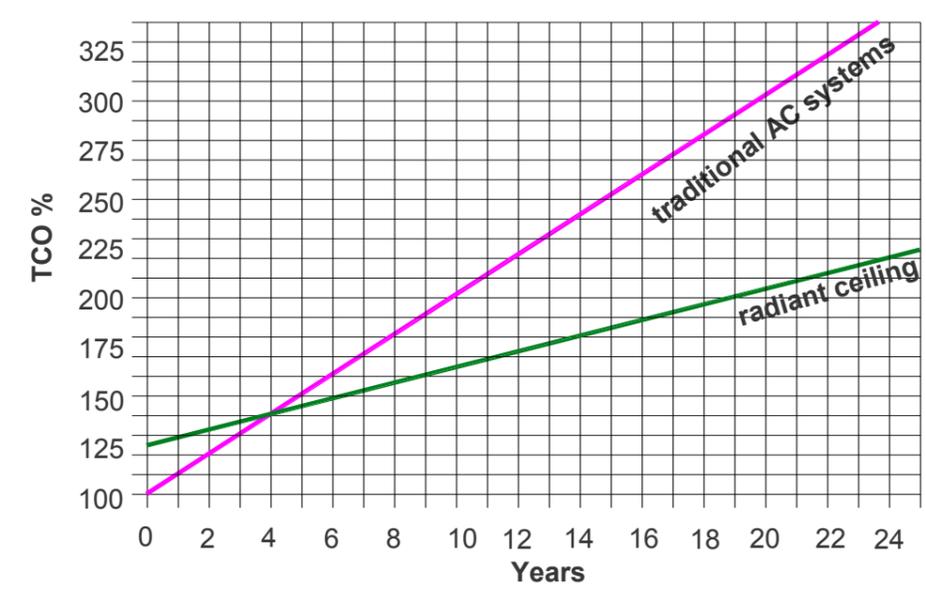
Summer thermal outlet according to EN 14240



TEST REPORT
EN14240
EN14037

Standardised specific outlet in compliance with the EN 14240 standard, in relation to the difference (Δt) between the room temperature and the mean temperature of cooling fluid, referred to the panels active surface.

Total cost of ownership (TCO)



Comparing the total cost of acquisition and operating costs, the radiant ceiling, despite a more expensive acquisition cost, gains the difference in just 4 years (calculation refers to an office building of 1200 square meters).