Aquatic Center Champsaur

by Frédéric RONFORT / 2016-06-29 07:49:49 / France / 11575 / FR

Primary energy need :

2100 kWhep/m².an

(Calculation method :)

ENERGY CONSUMPTION

Economical building *Building*

< 50	A
51 à 90	B
91 à 150	C
151 à 230	D
231 à 330	E
331 à 450	F
> 450	G

Energy-intensive building

Building Type : Swimming pool
Construction Year : 2016
Delivery year : 2016
Address 1 - street : 05500 SAINT BONNET EN CHAMPSAUR, France
Climate zone : [Dfb] Humid Continental Mild Summer, Wet All Year

Net Floor Area : 1 957 m²
Construction/refurbishment cost : 3 500 000 €
Number of Shower/day : 360 Shower/day
Cost/m2 : 1788.45 €/m²

General information

This aquatic center was created from the old village pool which only worked in the summer: it is now ope all year long as it is roofed now. To reduce energy consumptions, the principles of bioclimatic architecture have been met:

- passive pool should receive maximum sun: the new roof is transparent and made Texlon, allowing to benefit from the light and heat of the sun. The walls are fully glazed, offering swimmers a magnificent view of the Alps.
- high insulation and airtightness reduce condensation and able to implement an efficient system involved not only appropriate times.

The energy production were also given special consideration to consume as little as possible and recover waste energy:

- thermodynamics dehumidification: use of indirect heating with absorption chiller to dehumidify principal.
- the valuation of the "heat rejection" from the machine that heats the pool water showers and water basins.

All these solutions have helped to drastically reduce the energy consumption of the aquatic center and the luxury of swimming under the sky Hautes-Alpes with views of the mountains Champsaur in winter and summer.

Sustainable development approach of the project owner

A swimming pool is as a consumption gap. Moreover, the absence of thermal regulation makes it the most energy consumer of all building up to 2800 kWh / m² of water for existing pools! Our goal: Leverage our expertise to improve the energy performance of these energy efficient buildings, where considerable progress

channels are inventing in the general interest (energy and pollution).
This aquatic center has been designed by combining building performance (passive building, building insulation and beaches ...) and facilities offered (cover pools, dehumidified fi thermodynamics cation with recovery of heat), to achieve a gain energy 50% compared to conventional pool dehumidification operating with a modulation of the fresh air flow. Performance indicators covered were: - 1500 kWh thermic / m² pool (thermal blanket) - 150 l / day / bather - 850 kWh.electricity / m² pool (with natural lighting)

Architectural description

The passive pool should receive maximum sunlight. The transparent roof made Texlon Solar brings the capital element of passive architecture: more light and more free solar gain. It consists of airbags, themselves composed of 3 or 4 layers of ETFE. A fully transparent cover has not only advantages, especially in summer when the sun hits at an almost vertical angle. It is therefore essential to control solar gain using active climate control systems which modify the transmission depending on external conditions and domestic needs. Similarly, high insulation and air sealing to reduce condensation and able to implement an efficient system involved not only appropriate times. The lobby is surprisingly coverage betraying in its totality the sky and its fully glazed walls on sunny facades. These two elements are involved in technical choices together they bring a quality of remarkable nautical space: luxury to swim under the sky of the French Alps with views of the mountains Champsaur, in winter and summer.

Stakeholders

Stakeholders

Function : Thermal consultancy agency

AILLAUD Frères

Contracting method

Separate batches

Type of market

Table 'c21_belgium.rex_market_type' doesn't exist

Energy

Energy consumption

Primary energy need : 2 100,00 kWhep/m^2.an

Primary energy need for standard building : 2 800,00 kWhep/m^2.an

Calculation method :

CEEB : 0.0002

Breakdown for energy consumption : Part dehumidification / basins lobby Ventilation represents 54% of overall energy consumption.

Initial consumption : 1 800,00 kWhep/m^2.an

Envelope performance

Envelope U-Value : 0,57 $W.m^{-2}.K^{-1}$

More information

Before the works, basins were discovered. There were dehumidification system. Energy consumption only corresponded to heating the pool water.

Renewables & systems

Systems

Heating system :

- Individual electric boiler

Hot water system :

- No domestic hot water system

Cooling system :

- No cooling system

Ventilation system :
- Nocturnal Over ventilation
- Double flow heat exchanger

Deshumidification thermodynamique par une machine absorption
Renewable systems :
- No renewable energy systems

Smart Building

BMS :
Establishing a brand TREND Centralized Technical Management. This Centralized Technical Management tracks the performance indicators.

Environment

Urban environment

Located in the heart of the Alps, the aquatic center offers panoramic views of the mountains of the Champsaur. It was approximately 1000 meters and is part of the municipality of Saint Bonnet

Products

Product

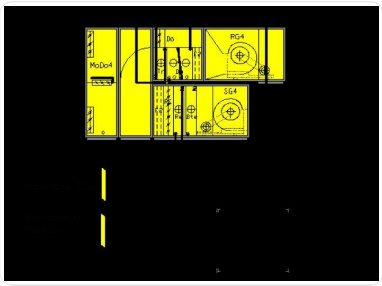
Absorption Machine

Yasaki

Ecoenergie

http://www.ecoenergie.com

Product category : Génie climatique, électricité / Ventilation, rafraîchissement



The interest of this thermodynamic dehumidification system through an absorption chiller:
- Washing absorption whose lifespan is 21 to 25 years instead of 7 to 14 years for an electric compressor (base: 5000 to 6000 h operating on 8300 h per year).
- Refrigerating fluid used matching of water mixed with lithium bromure (nontoxic sea salt and not rated Kyoto) while with a compression solution, uses an Hydrochlorofluorocarbon refrigerant whose future is uncertain because of environmental problems that entails.
- No special equipment room or transformer as compression solution.
- Cost P2 + P3 + operating lower P4.
- Cost Of lesser works.

In addition to the savings of energy made, the fact of not having to use a refrigeration but a service technician having been formed in a few days to realize a random empty every 2000 hours (approximately 3 procedures per year) and reduced maintenance costs have convinced the Owner.

Costs

Construction and exploitation costs

Cost of studies : 350 000 €

Total cost of the building : 3 550 000 €

Contest

Reasons for participating in the competition(s)

The renovation's goal is the reduction of energy consumption by 50% compared to the existing by the establishment:

- In thermodynamic dehumidification (through an absorption chiller)
- Coverage of the basins,
- Reinforced insulation

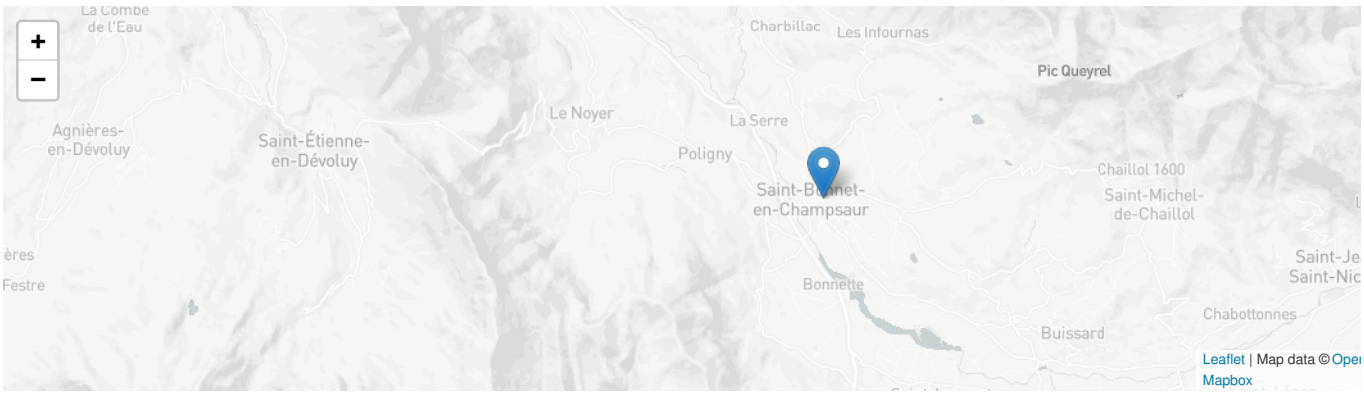
The advantages are significant: no Kyoto rated refrigerant, reliability, thermal performance and heat recovery with a thermal efficiency exceeding 2.

With building performance (passive building, building insulation and beaches ...) and equipment proposed (cover pools, thermodynamic dehumidification with heat recovery), the energy gain of 50% from a pool classic running dehumidification by modulating the fresh air flow.

Building candidate in the category

Energie & Climats Tempérés

Coup de Coeur des Internautes



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