New Head Office and Lab Building, Riedering, Germany

by Monika Lauster / 2021-03-11 12:24:57 / Deutschland / 2500 / DE

Primary energy need :

145 kWhpe/m^2.year

(Calculation method : Other)

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 : Factories
Construction Year : 2019
Delivery year : 2019
Address 1 - street : Ahornweg 8 83083 RIEDERING, Deutschland
Climate zone : [CsC] Interior Mediterranean - Mild & dry summer.

Net Floor Area : 2 050 m^2 SHON (fr)

General information

Building Owner: Endolab

Architect: Bathke Geisel

The company EndoLab - a test lab for medical implants - moved its headquarters from Thansau to Riedering near Rosenheim and built a new office and laboratory building for this new location. The task in the first planning phase was the development of a location-specific energy concept as well as climate concepts adapted to the building uses.

A number of main uses are defined within the building:

These are laboratory rooms for the durability test, an employee cafeteria with a kitchenette on the ground floor, the office rooms and a seminar room. An open meeting area is located in the central atrium, which is flooded with skylights and extends over the first to third floors. The skylights also serve as smoke / heat exhaust and can also be used for normal ventilation of the atrium. The supply air then flows in from the ground floor through an electrically controlled lamella cassette.

Unusually for a laboratory building, large parts of the building use purely natural window ventilation.
An external, static sun protection system offers summer thermal protection based on robust “Low-Tec”: the first and second floors feature vertical wooden slats which characterize the appearance of the façade.

Large amounts of waste heat accumulate throughout the year in the thermally highly stressed laboratory and simulator rooms, the majority of which is collected via a hydraulic circuit. This heat had to be used for building heating. A "LowEx" concept approach was the ideal solution for this; the system is thus thermodynamically optimized, i.e. coordinated with the temperature level of the waste heat.

By integrating thermally activated ceilings, the building can be heated on a room-specific basis as well as cooled if required. The central energetic component is a geothermal field consisting of 2,400 running metre boreholes, which serves as a seasonal buffer for the building's waste heat. Free re-cooling regenerates the soil thermally if necessary and ensures the permanent system function. In this way, the geothermal field can also be used for free, direct building cooling. A reversible heat pump can be switched on temporarily to enable active heating in cold winter periods and active cooling in long summer periods.

A 55 kWp PV system rounds off the energy concept regeneratively and enables CO2 and climate-neutral building operation.

In the first year of use, there are only very short operating times for the heat pump. This means that direct, sole heating using the laboratory waste heat is usually sufficient. The same applies to the cooling mode: A predominantly free cooling via the geothermal field is able to cover the cooling energy requirement of the building.

See more details about this project

https://transsolar.com/de/projects/riedering-endolab

Data reliability

Self-declared

Photo credit

Stefan Müller-Naumann

Stakeholders

Contractor

Name : Endolab

Construction Manager

Name : Bathke Geisel

Owner approach of sustainability

Innovation and efficiency

Architectural description

The company Endolab carries out wear tests on a wide range of medical implants. It is active worldwide as a testing laboratory for medical products.

The building with a square floor plan is located on the eastern edge of an industrial estate, literally on a greenfield site. Generous recesses for entrances and outdoor areas structure the form sculpturally and thus create a wide variety of views - depending on the angle of view.

The building develops around a central atrium. On the ground floor, which is also accessible to visitors, there is a laboratory that serves as a showroom, especially for customers. The other laboratories are located on the floor above. On the second floor, separated from the laboratories for acoustic reasons, are the offices with four small terraces that serve as break areas. The central air space is a communicative and connecting element. It is lit from above by 16 skylights, which also serve to ventilate the building.

The vibrations of the testing equipment required a massive construction made of reinforced concrete. Two wall-like girder constructions on the north and south sides support the large column-free cantilevers on the ground floor. The skylight element and the highly insulating façade are also made of wood as a reference to the surroundings. Different types of treatment of the formwork form the sun protection, create views in and out and a play of light and shadow on the surface.

Energy

Energy consumption

Primary energy need : 145,00 kWhpe/m^2.year

Calculation method : Other

Final Energy : 80,00 kWhfe/m^2.year

More information :
The average electricity consumption (final energy) in recent years was 225 MWh/a; however, this includes everything from artificial lighting to laboratory equipment to heating/cooling. Unfortunately, a further differentiation is not possible.
In terms of floor space, this is approx. 110 kWh/(m^2 a) of final energy. The electricity yield of the 55 kWp PV system of approx. 60 MWh/a is deducted from this,

leaving 165 MWh/a or 80 kWh/(m² a).
In terms of primary energy, the following calculation can be made: 165 MWh of electricity correspond to 297 MWh of PE (non-renewable).

Renewables & systems

Systems

Heating system :
- Geothermal heat pump

Hot water system :
- Heat pump

Cooling system :
- Radiant ceiling

Ventilation system :
- Natural ventilation

Bauteilaktivierung zum Heizen
Renewable systems :
- Solar photovoltaic
- Heat Pump on geothermal probes

Costs

Contest

Building candidate in the category

Alle Kategorien

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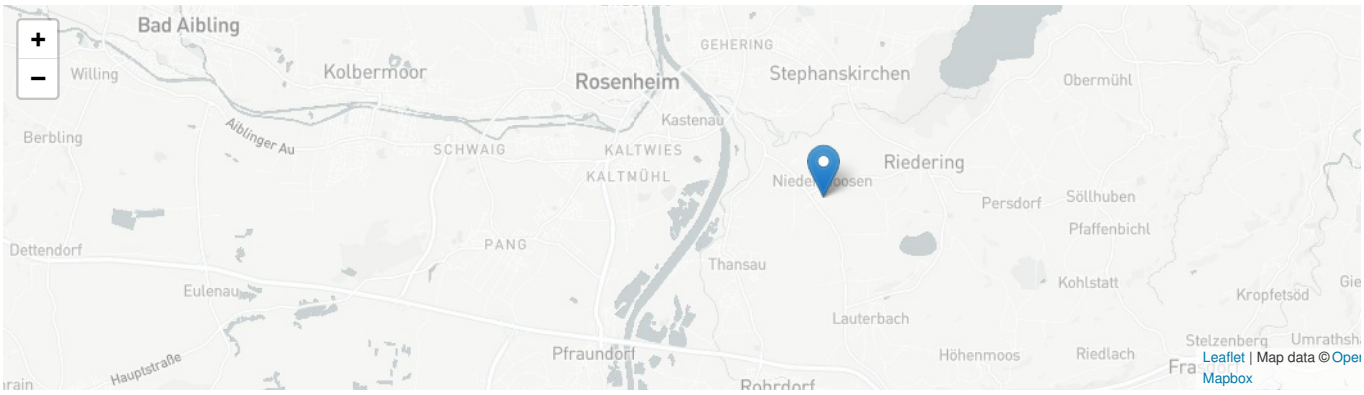

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