TRIMO

CASE STUDY

HIGHEST ENERGY SAVINGS & AIR CLEANLINESS

EXTREMELY AIRTIGHT BUILDING

BUILDING TYPE **MANUFACTURING FACILITY**

INVESTOR **KOLEKTOR ETRA**

ARCHITECT **IKONA ARHITEKTURA**

PRODUCT TYPE **TRIMO AIRTIGHT BUILDING SOLUTION**

LOCATION **LJUBLJANA, SLOVENIA**

A high level of **air cleanliness**, low and controlled humidity were basic client requirements for a new production facility for the large electrical power transformers. **Trimo's highly airtight building system** was an ideal solution for the clients needs. The building is extremely airtight and economic in use as it facilitates **low energy consumption**, which brings substantial energy savings.

The extremely airtight prefabricated building, Etra, is built from a load-bearing **steel construction** and Trimo's **insulated, fire-proof façade cladding system Trimoterm**. It was completed with a number of demanding detailed solutions.

A calculation model of permissible losses for individual elements and a brand **new detail concept** with primary sealing on the internal side of the cladding as well as additional secondary sealing on the external surface had to be made before the project could begin. This was particularly important in order to successfully construct such a **complex building** with over 300 penetrations.

AIRTIGHTNESS BENEFITS

- **Energy savings through reduced heat loss**
- **Cleanliness and living comfort:**
  - indoor climate and air quality
  - manufacturing processes security
  - goods & materials preservation
- **Fulfilment of special requirements** (e.g. over or low pressure)
- **Improving sustainable criteria for achieving environmental certificates.**

The airtightness achieved for the building **exceeds** the airtightness level of **passive buildings by a factor of 10**.
It is almost **60 times better** that the levels of sealing achieved in common buildings.

Extremely airtight building, Etra	Passive building	Common building
$n_{50} = 0.06$	$n_{50} = 0.60$	$n_{50} = 3,50$

The exceptional airtightness level of the building was also **confirmed by the Blower door** - EN 13829 test carried out by the Slovenian National Building and Civil Engineering Institute (ZAG).

HIGH ENERGY SAVINGS

The level of airtightness achieved for the building provides the customer with **56% energy savings** in terms of heating, which equates to the energy generated using **500 kW solar power plant**, which itself can power around **600 average air conditioning systems.**

Compared to common buildings the Etra building with its 5,606 m^2 floor space and 106,691 m^3 volume will deliver **energy savings** of up to **530,000 EUR over 10 years.**

AIR CLEANLINESS

The specific demands regarding air cleanliness were also met as it is a necessary requirement for the production of power transformers and enables a **safe and smooth production process** for the client.

Airtightness of a building represents air exchange rate at pressure difference 50 Pa. Very airtight buildings are represented by very low air exchange rates. The airtightness of a building can also be expressed in terms of air leakage through the building envelope.

The airtightness of building was assessed by the Institute using the demanding Blower door test and according to the European standard EN 13829. The test results showed exceptional airtightness for Trimo's configuration and design of the large and complex Etra building.

Friderik Knez

Head of the Department of Building Physics, ZAG

ZAG, Slovenian National Building and Civil Engineering Institute.

TRIMO D.O.O., PRIJATELJEVA CESTA 12,
8210 TREBNJE, SLOVENIA
T: +386 7 34 60 200 | F: + 386 7 34 60 127
TRIMO@TRIMO-GROUP.COM | WWW.TRIMO-GROUP.COM