

AT_Wien_Wohnen am Mühlgrund

Image 01:
Exterior view ©Bruno Klomfar



Image 02:
Interior view ©Bruno Klomfar



Image 03:
Section ©ARTEC architects



Building Specifications

Address	Mühlgrundgasse 3, 1220 Vienna, Austria
Building Category	Residential
Year of Construction	2011
Special Qualities	Passive House
Location	48° northern latitude, 16° eastern longitude
Climate	Cfb (warm temperate, fully humid, warm summer) (monthly mean temperature below 19 °C, at least five months with a monthly mean temperature above 10 °C)

Vent. Cooling Site Design Elements (Solar Site Design and Wind Exposure Design, Evaporative Effects from Plants or Water)

Evaporative Effects are achieved by a vertical garden extended through the entire north façade. This garden is responsible for the comfort climate in the whole access zone of the building. Every level offers a different kind of plantation.

Vent. Cooling Architectural Design Elements (Form, Morphology, Envelope, Construction&Material)

Form: The building offers a different appearance from different angles. The north side of the building with its ventilated corrugated metal façade has an industrial appeal and protects the building from the noise of the subway line. Through its opening to the south, the building makes use of solar radiation.

Morphology: The inside of the building is illuminated by a vertically five storey high access hall. The building gives space to a common room and a roof terrace. Every apartment has its own loggia and provides an exemplary acoustic insulation.

Envelope: The metal facade is rear-ventilated in outer layers and not ventilated in the area of the composite insulation system.

Construction: Massive concrete construction with multi-layered insulation system in combination with lightweight steel construction

Vent. Cooling Technical Components (Airflow Guiding Components, Airflow Enhancing Components, Passive Cooling Components)

Airflow Guiding Components: Windows in the stairwell can be opened.

Airflow Enhancing Components: The window openings and skylights in the stairwell are positioned strategically to use the stack effect for Ventilative Cooling.

IEA EBC Annex 62 Ventilative Cooling

Actuators, Sensors and Control Strategies
Control Strategies: Natural ventilation is achieved by managing the interior temperature of the vertical garden and the access zone by a temperature difference control which opens up the windows on the ground- and the top floors.
Building Energy Systems (Heating, Ventilation, Cooling, Electricity)
Heating: Residual heat is provided by means of a district heat connection to the heat supply network of Vienna. Trench heaters are installed in each living area Ventilation: The ventilation system is based on the principles of a passive house concept. The building is equipped by highly efficient central comfort ventilation with heat recovery which provides an even distribution of heat and fresh dehumidified air in all the rooms. To achieve a better thermal characteristic behaviour, base plate activation with heat exchanger was installed in the ventilation unit. Ventilation is controlled by “three tiers” ventilation controller and room thermostats for each apartment. Interior ventilation through a chemical management (choice and use of low-emission building materials) In summer, it pre-cools incoming air to support residential characteristics in hot periods. Because of building by a water table drawdown, the base plate is situated in the level of the groundwater and can be used for heating and cooling according to demand and seasonal requirements. According to this intervention, it is possible to renounce the process of pre-cooling incoming air. The ventilation unit is not connected to the district heating and utilizes only power of ventilating fans. Electricity: The concept is supplemented by a photovoltaic system and a solar system to supply the hot water provision.
Building Ownership and Building Facility Management Structures
Cooperative society building Architect: ARTEC
Aknowledgements
Austrian national award for Architecture and Sustainability 2012 (Nomination) Ernst A. Plischke Preis 2014 (Nomination) klima:aktiv, Object of the Month 2/2012 Focus on multigeneration homes with special interior areas for private space
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