




AT_Thüringen_Hilti		
Image 01: Exterior view production hall ©ATP architekten ingenieure	Image 02: Interior view production hall with sheds ©ATP architekten ingenieure	Image 03: Air-soil-heat-exchanger ©ATP architekten ingenieure
		
Building Specifications		
Address	Werkstrasse 13, 6712 Thüringen/Vorarlberg, Austria	
Building Category	Other	
Year of Construction	2009	
Special Qualities	n/a	
Location	47° northern latitude, 9° eastern longitude, 573 m above sea level	
Climate	CfB. moderate climate with high annual rainfall of 1104mm. Average temperature of 8.7 °C.	
Vent. Cooling Site Design Elements (Solar Site Design and Wind Exposure Design, Evaporative Effects from Plants or Water)		
<p>The building is situated in the middle of fields, forests and mountains. Hilti set precise specifications to leave the site as natural as possible and to minimise sealing to improve microclimate and reduce running costs for care. Thus, in summer cooler nights can be used for Ventilative Cooling.</p>		
Vent. Cooling Architectural Design Elements (Form, Morphology, Envelope, Construction&Material)		
<p>Form: A Shed Roof faces towards north to improve use of daylight. Flaps in these sheds are used for passive night ventilation.</p> <p>Morphology: The height of the hall and the shed roof enables Ventilative Cooling.</p> <p>Envelope: The building is well insulated, which reduces solar gains during summer.</p> <p>Construction: The base plate is used as a thermal buffer and can be activated for heating and cooling reasons.</p>		
Vent. Cooling Technical Components (Airflow Guiding Components, Airflow Enhancing Components, Passive Cooling Components)		
<p>Airflow Guiding Components: Window openings in the northern sheds.</p> <p>Passive Cooling Components: A well planned cooling system without conventional cooling system: The ground water is in charge of cooling the machines to reduce indoor heat gains as well as cooling down the base plate by free cooling. The ground water and the big air-soil-heat exchanger underneath the base plate pre cool the air for the ventilative cooling. During night, openings in the sheds enable night ventilation.</p>		
Actuators, Sensors and Control Strategies		
Sensors and Control Strategies: Demand control over all systems		

IEA EBC Annex 62 Ventilative Cooling

Building Energy Systems (Heating, Ventilation, Cooling, Electricity)
Heating and Cooling: A combination of waste heat recovery, air-soil-heat exchanger, ground water utilisation and high performance heat exchanger with a low temperature-heating/cooling system (base plate).
Building Ownership and Building Facility Management Structures
Building Owner: Hilti AG Facility Management: Hilti AG Architecture and building technology: ATP Architekten Ingenieure
Aknowledgements
Energy Globe Award Vorarlberg 2009 European Architecture Prize, Energy+Architecture, 2009, honourable mention Konstruktiv 2011 Liechtenstein Prize for Sustainable Building and Refurbishment in the Alps, honourable mention DGNB Certificate Gold
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