


DK_ Amager_Københavns Universitet (KUA1)		
<p>Image 01: East façade ©Rasmus81 Danish Wikipedia</p>	<p>Image 02: External solar shading ©Nykolas Andreou</p>	<p>Image 03: Three parts of KUA construction process ©Københavns Universitet</p>
		
Building Specifications		
Address	Karen Blixens Vej 4, 2300 Copenhagen S, Denmark	
Building Category	Educational building	
Year of Construction	Construction started in 2000 (3 different steps)	
Special Qualities	New concepts and strategies for control of natural and hybrid ventilation. User-friendly control	
Location	56° northern latitude, 13° eastern longitude, located in urban area. The building complex is surrounded by other same size buildings to the east, west and south and free land to the north. There is a water channel located along the west side of the building complex	
Climate	Cfb (warm temperate climate, moist with adequate precipitation in all months and no dry season, warm summer with the warmest month below 22°C)	
Vent. Cooling Site Design Elements (Solar Site Design and Wind Exposure Design, Evaporative Effects from Plants or Water)		
Evaporative cooling effect of the water channel to the west facilitates the natural cooling effect. The building is sheltered from wind by neighboring buildings		
Vent. Cooling Architectural Design Elements (Form, Morphology, Envelope, Construction & Material)		
<p>Form: Consists of several long, stretched, rectangular 6 storey buildings placed along north/south direction</p> <p>Morphology: The building is divided in 6 floors, where the first two are intend for teaching, while the 4 last floors are used for offices and research. An atrium, which connects all the different floors, is placed in the middle of each building</p> <p>Envelope: Large windows sections facing east of west, as well as skylights above the atriums on the roof are designed with natural ventilation in mind</p> <p>Construction: Heavy mass building</p>		

IEA EBC Annex 62 Ventilative Cooling

Vent. Cooling Technical Components (Airflow Guiding Components, Airflow Enhancing Components, Passive Cooling Components)
Natural ventilation is used in rooms for up till 36 persons (offices, group rooms). Mechanical ventilation is used in rooms, which are designed for more than 36 persons (auditoriums, meeting rooms) and in rooms where is required to have mechanical ventilation according to legislation. Around 65% of the floor area is naturally ventilated. Both the inlet and outlet is placed close to the ceiling, and the air is extracted through the chimneys. A mechanical ventilator is located in the top of the chimneys to assist the natural ventilation, when it isn't efficient enough. The group rooms can also be ventilated by manually opening the windows. The offices are ventilated by single sided or cross ventilation principle depending on their location in the building. Night ventilation is done by automated window control making use of the stack-effect. Comfort ventilation is ensured by automatic window ventilation system. Automated awnings are installed on the on the east and west façade windows to provide solar shading.
Actuators, Sensors and Control Strategies
Room sensors for CO ₂ and temperature to control the automatic ventilation Users always have the option to overwrite the automatic control. Simple on/off buttons together with an instruction are added to each room The automatically controlled openings and sensors are connected to a CTS-system
Building Energy Systems (Heating, Ventilation, Cooling, Electricity)
District heating, radiators Hybrid ventilation with both mechanical ventilation and automatic natural window ventilation Heating surfaces are added to secure a satisfactory air temperature Information about electricity was not available
Building Ownership and Building Facility Management Structures
Bygningsstyrelsen is the owner of the building, and Københavns Universitet is the user Architect: Arkitema Architects
Aknowledgements
The buildings are a part of a larger project (3 parts, KUA1, KUA2 and KUA3 – only KUA1 and KUA2 are done).
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