# General information and model

The new testhall is divided into 3 parts:

- Office area: This area contains a workshop room, an office of E3D, one office from the EBC, toilet rooms, a battery room and a two-part conference room, where one part is directly connected to a kitchen area.
- Hall 1: This area is intended to provide space for experimental setups of E3D and EBC, where E3D holds 2/3 of the space. The first floor above the office area contains the devices for supplying the building as well as a small bearing.
- Hall 2: This area is owned by the ProdE institute. It contains a building robot, researching the possibilities of completely building facades. Hall 2 is supplied from hall 1.

The energy supply system generally consists of the following components:

- Office area:
  - Chilled beams - The office rooms are merely supplied with heat and cooling via ventilation. Each chilled beam has both a heating and cooling register and volumetric flow controllers for adjusting supply and exhaust air.
  - Room controller - Besides the actuators described above, the rooms also possess temperature control units for setting an offset (+/- 5 °C) from the general temperature setpoint (21 °C), sensors for the exhaust air temperature and CO2 concentration as well as summarizing room control modules, which connect all theses sensors and actuators to the PLC.
  - Poppet Valves - Supply air and exhaust air in the toilet rooms are realized with poppet valves. The exhaust air is extracted by a radial fan, running 24/7, whereas the supply air is provided by the central AHU. There are no decentral registers available.
- Hall 1:
  - Concrete core activation (CCA) - The central heat supply is provided by the concrete core activation. The CCA is designed with a maximimum heating power of roughly 50 kW. The supply temperature may accept temperatures as high as 50 °C.
  - District heating station - Heat generation is realized by utilizing district heating from the cogeneration plant located directly across the street. Currently, a maximum heating power of 270 kW is warranted by the RWTH. The hot water arrives with a temperature of roughly 130 °C and should not return below 55 °C. The amount of used thermal energy is regulated by two valves, one destined for high variations, and one for more precise adjustments. The temperature on the heat exchanger output can be controlled via a 0-10 V signal from the PLC. The maximum temperature is designed to reach 80 °C, whereas 0 V gives a minimum of about 20 °C.

There is a BIM model as well as a high order and a low order Modelica model. Both can be found in the follwing Git group

https://git-ce.rwth-aachen.de/ebc/projects/ebc0316_efre_radioduct_ga/newtesthall

Further plans are available (Entwurfsplanung, Ausführungsplanung, TGA, Architektur) here: N:\Institut\EBC0006_Gebaeude_Hallenneubau_tos